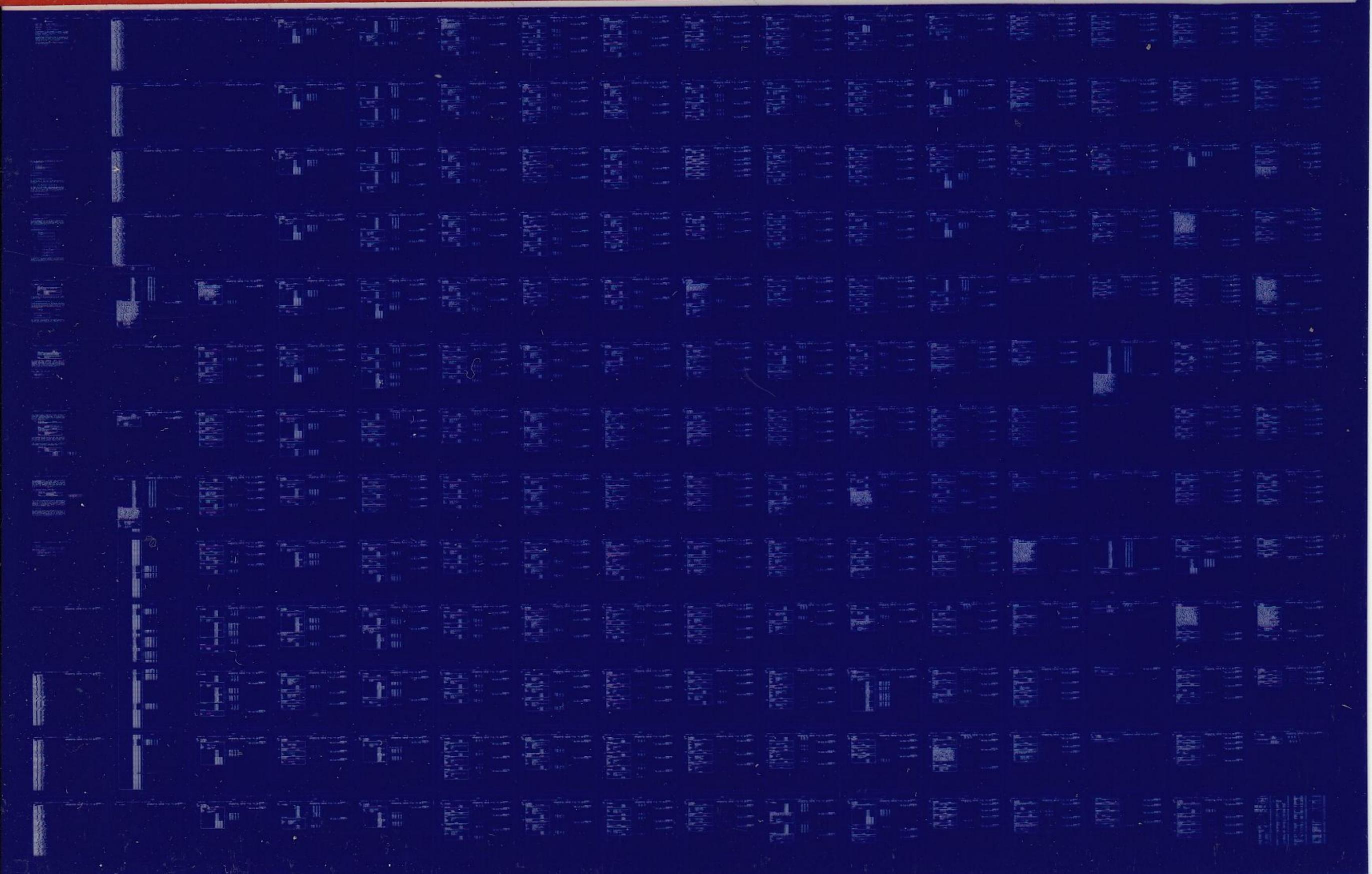


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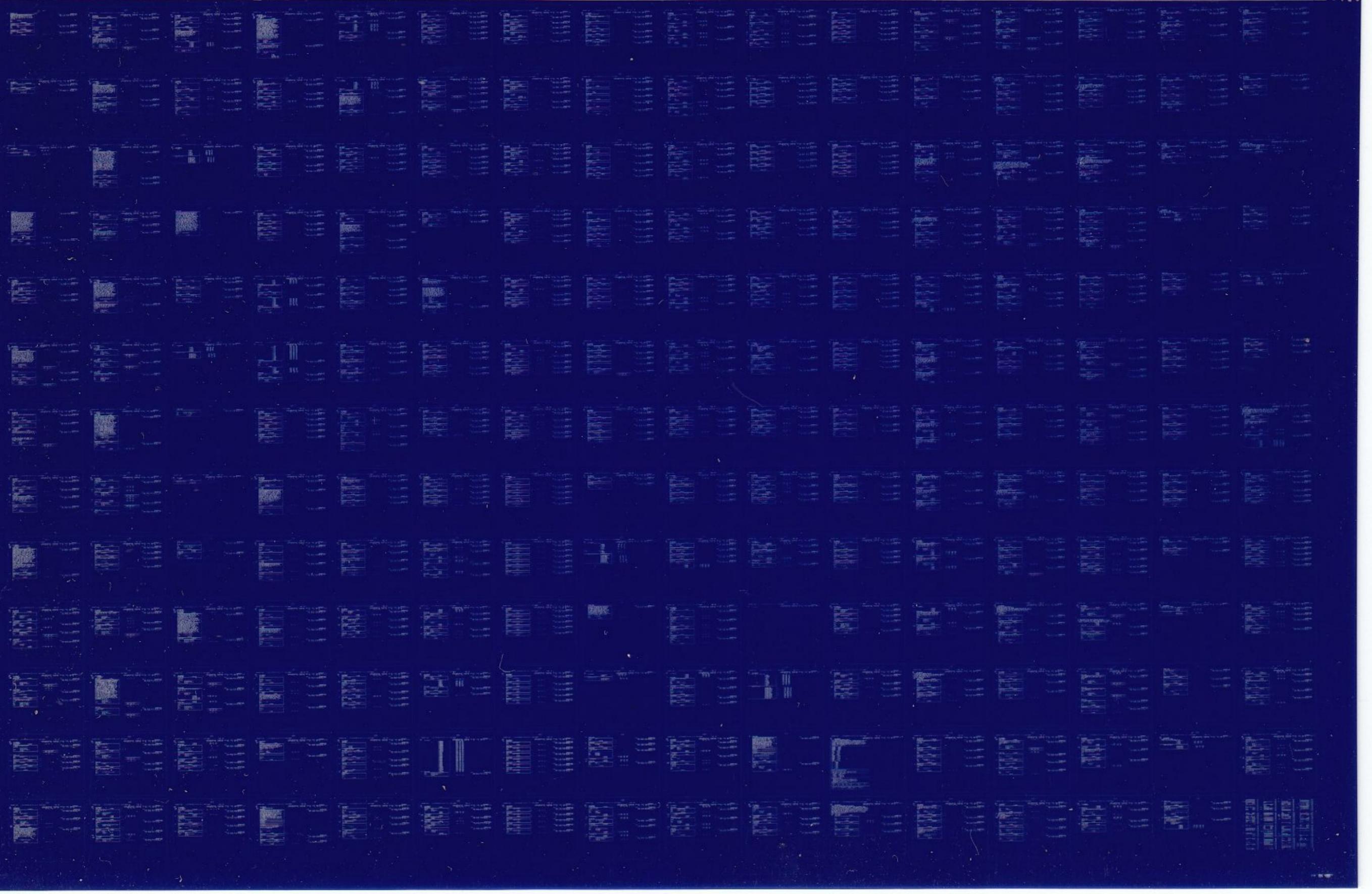


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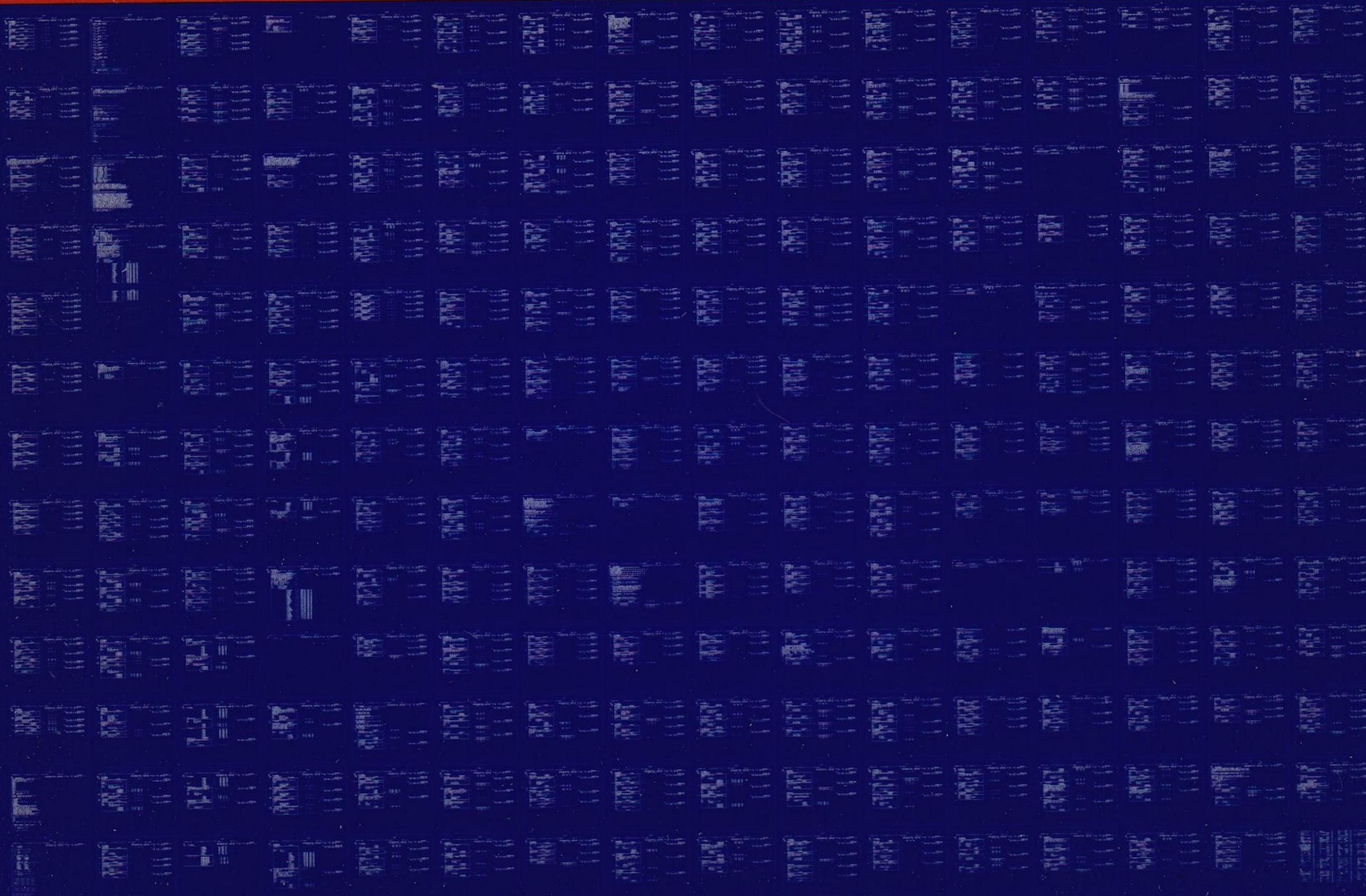


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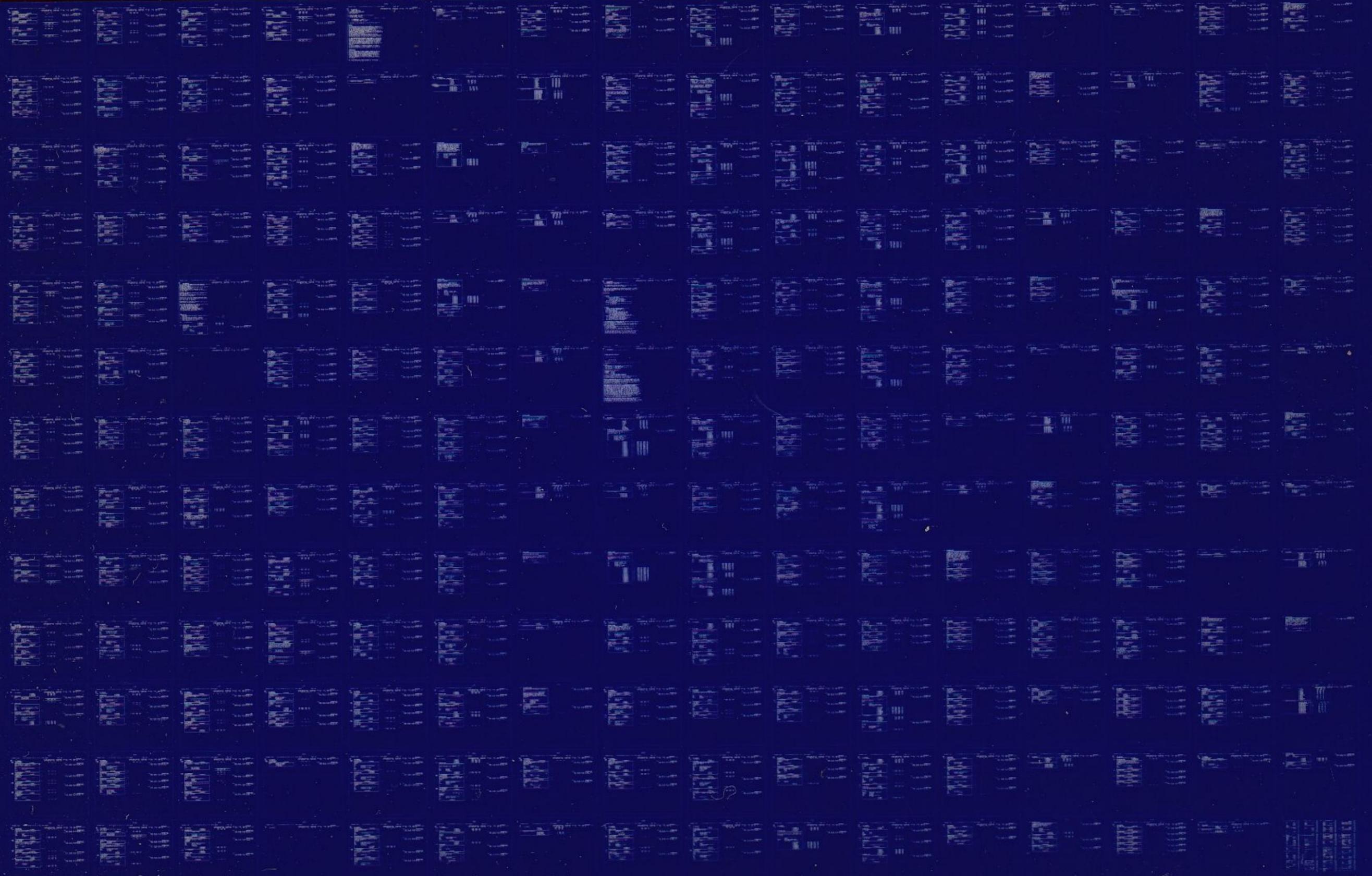


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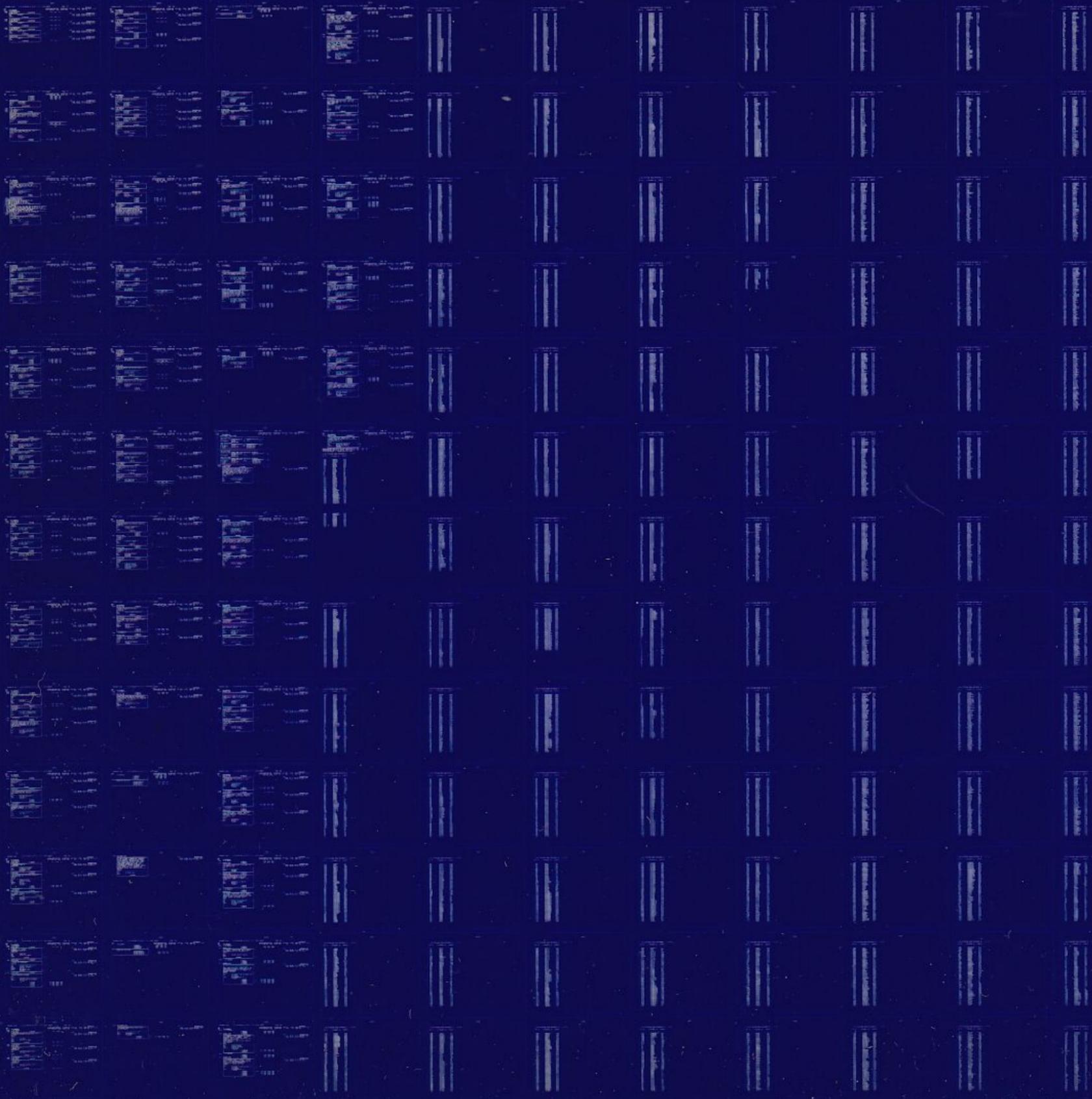
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11-00000-01
11-00000-02
11-00000-03
11-00000-04
11-00000-05
11-00000-06
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11-00000-11
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801

EOF1DZPRBASEQ
PDP10 411

00010000

770608

PDP10 411

10HDR1DQMCAASEQ

00010000

770608

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DQMCA-A-D
PRODUCT NAME: PDP11/60 11/70 ROM BOOTSTRAP/TEST PROG
PRODUCT DATE: JULY 1977
MAINTAINER: DIAGNOSTIC ENGINEERING

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CO1

INTRODUCTION

This file is produced by the Autodocumentation System ADSYS. The file constitutes the microprogram documentation for the 11/60 MICROCODE system.

The file consists of four parts, namely:

1. Introduction
2. Microprogram Table Of Contents
3. Microprogram Definitions
4. Microprogram Flows

A brief description of each of these parts follows.

1. THE INTRODUCTION

The first part of the file, this introduction, describes the file.

2. THE MICROPROGRAM TABLE OF CONTENTS

The second part of the file, the microprogram table of contents, contains an entry for each .TOC line in the microprogram. A typical entry in this part of the file has the form:

12 * LOGIC OPERATIONS ON FALU AND LOAD AR

The number, 23 in this example, indicates the page on which the .TOC entry with the text "LOGIC OPERATIONS ON FALU AND LOAD AR" can be found. The page number indicates the page in the third or fourth part of the file, depending on whether the entry appears in the first or second part of the microprogram table of contents.

3. THE MICROPROGRAM DEFINITIONS

The third part of the file, the microprogram definitions, contains the definitions exactly as they are given in the microprogram.

4. MICROPROGRAM FLOWS

The fourth part of the file contains the microprogram flows, constructed by ADSYS from the Assembler Output Listing. These flows resemble the one-to-one, hand-drawn flows that have previously accompanied a microprogram. They contain the cross-reference information that is necessary to interpret the microprogram.

4.1 Microinstruction Format

A microinstruction is represented in the following format in the microprogram flows:

```

box   tag, addr
      *****
      * comment ... *
      * ... *
      *-----*
      * time-state macro, macro *
      * ... *
      * ... *
      *****

```

where:

| | |
|------------|---|
| box | is an identifying number assigned to the box |
| tag | is the microinstruction tag |
| addr | is the microinstruction address |
| comment | is the text of comments associated with the micro instruction |
| time-state | is the name of a time state specified in the microinstruction |
| macro | is the name of a macro used in the microinstruction |

The characters '...' indicate repetition. In the above box, the use of the repetition indicator shows that several comments can be given in a box, that a time-state can have many macros associated with it, and that a microinstruction can contain several time-states.

For example, consider the following excerpt from a microprogram flow:

```

104  LOADZ: 113
*****
*LOAD FIRB <5:3> = MO. TRANSFER FROM *
*AC[SF] TO AC[DF]. *
*-----*
*P2,      AR+FSPAD[SF], ER+EB[SF], *
*        SD+SCROUT, ENB-FPACK, ENB-PAUSE, *
*        ENB-ABORT, *
*NEXT,    J/LOADZ, 02 *
*****

```

In this excerpt, box 104 is associated with the tag 'LOADZ' at address 113. A comment and two time-states, 'P2' and 'NEXT', are shown.

4.2 Cross-Reference Information

For each microinstruction box, all the points from which control can pass to the box are indicated by arrows pointing into the box and all the points to which control can pass from the box are shown by arrows pointing from the box. The microinstruction box with cross-reference information has the following form:

```

F/from-tag1      <-- from-info
F/from-tag2      <-- from-info
...
*****
*                *
* J/to-tag1      * --> to-info
* J/to-tag2      * --> to-info
* ...           *
*****

```

The 'from-info' gives the address, box-number, page-number, and microfiche coordinates for the associated tag. The 'to-info' gives that information and, in addition, contains offset information if the transfer is an n-way branch.

Consider the following excerpt from a microprogram flow:

```

107 STSTZ: 115          F/PREP          <--      21   3   3   D 1
          F/ADDNZ.02    <--      254  80  30  G 3
*****
*!SYSYZ: ! STST INSTRUCTION IS EXECUTED *
*IN BM BY WARM FLOATING POINT MICROCODE. *
*-----*
*          ENB-FPACK,ENB-PAUSE,ENB-ABORT, *
*NEXT,      J/STST.02          * -->    336 108 39  D 4
*****

```

The cross-reference information shows that the microinstruction 'PREP', address 21 at box 3 on page 3 with microfiche coordinates D 1, and the microinstruction 'ADDNZ.02', address 254 at box 80 on page 30 with microfiche coordinates G 3, transfer to the box for microinstruction 'STSTZ'. Further, it shows that the microinstruction 'STSTZ' transfers to microinstruction 'STST.02', address 336 at box 108 on page 39 with microfiche coordinates D 4.

4.3 Types of Flow

Three types of flow are distinguished by the Autodocumentation System, namely:

- Simple Transfer
- N-Way Branch Transfer
- Subroutine Call

The following sections give the method of representing each kind of flow.

4.3.1 Simple Transfer - A box that transfers directly to another box illustrates simple flow. If the box transfers to the next sequential box on the page, the 'to-info' is not given but instead the sequential flow is indicated by down pointers. Simple flow is shown in the following excerpt from a microprogram flow:

```

148 DIV.20: 465          F/DIV.18          <-- VV
*****
*AR GETS DIVIDEND.      *
-----*
*      AR+FSPAD[DF],ER+FPEMITE(352), *
*NEXT,      J/DIV.22          * --> VV
*****
149 DIV.22: 470          F/DIV.20          <-- VV
*****
*FIRST DIVIDE STEP.    *
-----*
*      AR+FSPAD[TMP1]-PLUS-AR,      *
*      INBUF+INBUF-LEFT-1          *
*NEXT,      J/DIV.24          * -->      471 150 51  D 5
*****

```

In this example, box 148 transfers to the next sequential box. Box 149 transfers to box 150, which is the next sequential box. However, since box 150 is on another page, the 'to-info' is given, showing a transfer to address 471, box 150 on page 51 with microfiche coordinates D 5.

4.3.2 N-Way Branch Transfer - A box that contains a branching-but illustrates n-way branch transfer. Consider the following excerpt from a microprogram flow:

```

111 CMPXNZ.02: 342
*****
*      AR+ZERO,                    *
*      ER+EA[SF]-MINUS-EB[DF],      *
*      SD+SCROUT,                    *
*NEXT,      BUT(EAEQO'EBEQO), J/CMPXZ.02 *
*      J/CMPXZ.02          * -->      00 234 113 40  E 4
*      J/CMPXZ.22          * -->      01 235 123 43  H 4
*      J/CMPXZ.24          * -->      10 236 124 43  H 4
*      J/CMPXZ.26          * -->      11 237 125 44  I 4
*****

```

The microinstruction contains a branching-but 'BUT(EAEOO EBEOO)' to a branch base 'CMPXZ.02'. The four possible destinations of this box are shown. For the offset '00', tag 'CMPXZ.02', address 0234 at box 113 on page 40 with microfiche coordinates E 4, is the destination. For offset '01', tag 'CMPXZ.22', address 0235 at box 123 on page 43 with microfiche coordinates H 4, is the destination. And so on.

4.3.3 Subroutine Transfer - A box that calls a subroutine is illustrated in the following excerpt:

```

98  LOAD,30: 316          F/LOAD          <-- VV
*****
*          FSPAD-CD[6]+AR,          *
*NEXT,          CALL(NZEROH,LOADNZERO)  *
***** -->
*****
442 339 107  L 9
*****
          VV
322 103 37  b 4

```

The 'to-info' for the subroutine called is given enclosed in a box. The 'to-info' for the return is shown below the subroutine. In the above excerpt, the subroutine 'NZEROH', address 442 at box 339 on page 107 with microfiche coordinates L 9, is called. Control is returned by the subroutine to 'LOADNZERO', address 322 at box 103 on page 37 with microfiche coordinates B 4.

4.4 The Microword

The bits of the microword are displayed to the right of the microinstruction box. Usually, the bits are given in several formatted lines. At the top of each page, the abbreviated field names for each line of bits are given. The first line of the heading gives the field names for the first line of bits; the second line of the heading, the field names for the second line of bits; and so on.

5. CONCLUSION

This file was produced by the Auto Documentation SYSTEM,
ADSYS. Further information on this system can be found in
the following documents:

1. Autodocumentation System (ADSYS), System Specification, No. 010777-01
2. Autodocumentation System (ADSYS), User's Guide, No. 010777-02

K01

XXPROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 1

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

L01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 2

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | EXTENSION | | | CLOCKS |
|------------|-------------------|--------------------|----------|-----------------------|--------------|---------|-----------|----------|---------|--------|
| | | OFST | ADDR BOX | | | | PAGE | BUSA UBF | RIF UPF | |
| BRA01 | .BEGIN = 10 | | | | | | | | | |
| BJMP22 | .BEGIN = 10 | | | | | | | | | |
| BSRC38 | .BEGIN = 10 | | | | | | | | | |
| BASR02 | .BEGIN = 1110 | | | | | | | | | |
| BSER03 | .BEGIN = 01 | | | | | | | | | |
| BMOV62 | .BEGIN = 10 | | | | | | | | | |
| BBICB03 | .BEGIN = 10 | | | | | | | | | |
| BASRB02 | .BEGIN = 1110 | | | | | | | | | |
| BOTH01 | .BEGIN = 00000 | | | | | | | | | |
| BJMP10 | .BEGIN = 01 | | | | | | | | | |
| BJMP17 | .BEGIN = 01 | | | | | | | | | |
| BASR06 | .BEGIN = 10 | | | | | | | | | |
| BASR06 | .BEGIN = 1110 | | | | | | | | | |
| BCTANZW | .BEGIN = 10 | | | | | | | | | |
| BINTRO3 | .BEGIN = 01 | | | | | | | | | |
| BHALT01 | .BEGIN = 10 | | | | | | | | | |
| BSTCPZW | .BEGIN = 10 | | | | | | | | | |
| BMOV32 | .BEGIN = 101 | | | | | | | | | |
| BSRC39 | .BEGIN = 1000 | | | | | | | | | |
| BLDFPS3 | .BEGIN = 10 | | | | | | | | | |
| BMULFZ | .BEGIN = 0101 | | | | | | | | | |
| BLOADZW | .BEGIN = 10 | | | | | | | | | |
| BSETCLASS | .BEGIN = 0101 | | | | | | | | | |
| BSETFD02 | .BEGIN = 0000 | | | | | | | | | |
| BHFORK | .BEGIN = 00000 | | | | | | | | | |
| BRES01 | .BEGIN = 10 | | | | | | | | | |
| BSETCLASSW | .BEGIN = 1001 | | | | | | | | | |
| BRSVD03 | .BEGIN = 00 | | | | | | | | | |
| BHFORK | .BEGIN = 00000 | | | | | | | | | |
| BOST21 | .BEGIN = 0000 | | | | | | | | | |
| BOST27 | .BEGIN = 1000 | | | | | | | | | |
| BOST41 | .BEGIN = 0000 | | | | | | | | | |
| BFETO3 | .BEGIN = 00000000 | | | | | | | | | |
| BSRC01 | .BEGIN = 010 | | | | | | | | | |
| BSXT02 | .BEGIN = 100 | | | | | | | | | |
| BRESTCSP17 | .BEGIN = 00 | | | | | | | | | |
| BJMP02 | .BEGIN = 01 | | | | | | | | | |
| BSTATUSW | .BEGIN = 1000 | | | | | | | | | |
| BOST42 | .BEGIN = 0000 | | | | | | | | | |
| BOST01 | .BEGIN = 100 | | | | | | | | | |
| BMOV40 | .BEGIN = 100 | | | | | | | | | |
| BSRC17 | .BEGIN = 0000 | | | | | | | | | |
| BSRC20 | .BEGIN = 0111 | | | | | | | | | |
| BOST23 | .BEGIN = 10 | | | | | | | | | |
| BJSR01 | .BEGIN = 1000 | | | | | | | | | |
| BSRC18 | .BEGIN = 0000 | | | | | | | | | |
| BCMP01 | .BEGIN = 00 | | | | | | | | | |
| BMOV27 | .BEGIN = 100 | | | | | | | | | |
| BOST19 | .BEGIN = 0000 | | | | | | | | | |
| BSRC21 | .BEGIN = 0000 | | | | | | | | | |
| BSRC22 | .BEGIN = 10 | | | | | | | | | |
| BOST24 | .BEGIN = 10 | | | | | | | | | |
| BMOV45 | .BEGIN = 100 | | | | | | | | | |
| BSRC23 | .BEGIN = 10 | | | | | | | | | |
| BCSR07 | .BEGIN = 10 | | | | | | | | | |

N = 10

MO1

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 3

| | | | | | | | |
|--|--------------------|------------|------|-----|------|------|-----------------|
| | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSB | EXTENSION |
| | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | UPF |

| BOX NO. | TAG: ADDRESS |
|----------|----------------|
| BE0506 | .BEGIN = 10 |
| BSDCD11 | .BEGIN = 10 |
| BASH003 | .BEGIN = 01 |
| BMULT7 | .BEGIN = 10 |
| BSVDEF | .BEGIN = 110 |
| BSDCD16 | .BEGIN = 10 |
| BJAM02 | .BEGIN = 110 |
| BEXN02 | .BEGIN = 10 |
| BSE009 | .BEGIN = 110 |
| BDEP02 | .BEGIN = 10 |
| BJAM02E | .BEGIN = 01 |
| BE0511 | .BEGIN = 10 |
| BSDCD07 | .BEGIN = 10 |
| BMULT | .BEGIN = 01 |
| BASH013 | .BEGIN = 01 |
| BSDCD20 | .BEGIN = 1011 |
| BMULT2 | .BEGIN = 10 |
| BMULT17 | .BEGIN = 01 |
| BSDCD13 | .BEGIN = 001 |
| BSDCD09 | .BEGIN = 001 |
| BASHEX03 | .BEGIN = 00 |
| BSDCD05 | .BEGIN = 1110 |
| BSDCD14 | .BEGIN = 001 |
| BIIA03 | .BEGIN = 10 |
| BSTC07 | .BEGIN = 1110 |
| BIIA02 | .BEGIN = 01 |
| BJAM05 | .BEGIN = 01 |
| BDISP02 | .BEGIN = 01 |
| BSBRC03 | .BEGIN = 1100 |
| BASH006 | .BEGIN = 01 |
| BSDCD04 | .BEGIN = 1001 |
| BLDCT2 | .BEGIN = 01 |
| BASHEX01 | .BEGIN = 0111 |
| BJAM11 | .BEGIN = 0000 |
| BSCPE07 | .BEGIN = 1110 |
| BASH011 | .BEGIN = 0111 |
| BSCPE04 | .BEGIN = 10 |
| BEIS02 | .BEGIN = 10111 |
| BASH01 | .BEGIN = 0111 |
| BSIN05 | .BEGIN = 011 |
| BJAM10 | .BEGIN = 01 |
| BXFC01 | .BEGIN = 101 |
| BUB07 | .BEGIN = 01 |
| BXFC14 | .BEGIN = 01 |
| BXFC16 | .BEGIN = 10 |
| BE0538 | .BEGIN = 10 |
| BPST05 | .BEGIN = 1110 |
| BPST10 | .BEGIN = 01 |
| BASH016 | .BEGIN = 0 |
| BDIAG03 | .BEGIN = 10 |
| BDIV20 | .BEGIN = 01 |
| BDIV23 | .BEGIN = 01 |
| BDIV27 | .BEGIN = 00 |
| BDIV33 | .BEGIN = 01 |
| BDIV04 | .BEGIN = 00 |

NO1

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 4

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-------------|---------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| BDIV08 | .BEGIN = 01 | | | | | | |
| BDIV05 | .BEGIN = 01 | | | | | | |
| BDIV14 | .BEGIN = 01 | | | | | | |
| BDIV18 | .BEGIN = 0 | | | | | | |
| BDIV24 | .BEGIN = 10 | | | | | | |
| BASHR00 | .BEGIN = 100 | | | | | | |
| BMULDIV | .BEGIN = 0111 | | | | | | |
| BEOS04A | .BEGIN = 01 | | | | | | |
| BMULTLOOP3 | .BEGIN = 1110 | | | | | | |
| BML00P3 | .BEGIN = 010 | | | | | | |
| BPST07 | .BEGIN = 1001 | | | | | | |
| BSE11 | .BEGIN = 0000 | | | | | | |
| BXFC03 | .BEGIN = 1000 | | | | | | |
| BSCPE03 | .BEGIN = 01 | | | | | | |
| BUB11 | .BEGIN = 01 | | | | | | |
| BSDEF02 | .BEGIN = 01 | | | | | | |
| BJDEF02 | .BEGIN = 101 | | | | | | |
| BMOD3CLSS8 | .BEGIN = 0 | | | | | | |
| BMULMODW8 | .BEGIN = 10 | | | | | | |
| BMULMODW6 | .BEGIN = 10 | | | | | | |
| BSTOREINT | .BEGIN = 1000 | | | | | | |
| BMFAT03 | .BEGIN = 00 | | | | | | |
| BM0017W | .BEGIN = 01 | | | | | | |
| BSETFZFN2 | .BEGIN = 00 | | | | | | |
| BRESTART17B | .BEGIN = 1110 | | | | | | |
| BNROUND35 | .BEGIN = 10 | | | | | | |
| BFETCHINT | .BEGIN = 1000 | | | | | | |
| BM0012W | .BEGIN = 00 | | | | | | |
| BRTSHFDST2 | .BEGIN = 011 | | | | | | |
| BM0013W | .BEGIN = 10 | | | | | | |
| BMULMODW2 | .BEGIN = 1101 | | | | | | |
| BANMRTBAK4 | .BEGIN = 10 | | | | | | |
| BRSHFDSTN | .BEGIN = 10 | | | | | | |
| BNROUND28 | .BEGIN = 01 | | | | | | |
| BMULMODW3 | .BEGIN = 1110 | | | | | | |
| BANMRTBAK3 | .BEGIN = 01 | | | | | | |
| BM00W3C | .BEGIN = 01 | | | | | | |
| BNROUND | .BEGIN = 10 | | | | | | |
| BM005CLSS5B | .BEGIN = 1110 | | | | | | |
| BNROUND6 | .BEGIN = 00 | | | | | | |
| BIAD5 | .BEGIN = 0101 | | | | | | |
| BMULMODW4 | .BEGIN = 1011 | | | | | | |
| BNROUND7 | .BEGIN = 10 | | | | | | |
| BRTSHFSFSN | .BEGIN = 10 | | | | | | |
| BFSDM3INT2 | .BEGIN = 01 | | | | | | |
| BM003CLS10B | .BEGIN = 1100 | | | | | | |
| BNROUND24 | .BEGIN = 01 | | | | | | |
| BM0014W | .BEGIN = 01 | | | | | | |
| BNROUND31 | .BEGIN = 1110 | | | | | | |
| BNROUND18 | .BEGIN = 10 | | | | | | |
| BMFRAC10 | .BEGIN = 100 | | | | | | |
| BM005CLSS7 | .BEGIN = 10 | | | | | | |
| BM003CLSS16 | .BEGIN = 1110 | | | | | | |
| BRTSHFSF2 | .BEGIN = 011 | | | | | | |
| BMULMODW16 | .BEGIN = 1011 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|---------------------------|--|--------------------------|-----------------|------------|-------------|------------------------------|--------|
| | BABSZM3 .BEGIN = 01 | | | | | | | |
| | BMFRAC12 .BEGIN = 1011 | | | | | | | |
| | BMOD1CLSS3 .BEGIN = 01 | | | | | | | |
| | BMOD1CLSS10 .BEGIN = 10 | | | | | | | |
| | BNROUND45 .BEGIN = 01 | | | | | | | |
| | BLDCPM3 .BEGIN = 1110 | | | | | | | |
| | BLEFTSHFSF .BEGIN = 10 | | | | | | | |
| | BRMDLEFT10 .BEGIN = 00 | | | | | | | |
| | BMOD1CLSS5 .BEGIN = 10 | | | | | | | |
| | BFSOM6INT .BEGIN = 1110 | | | | | | | |
| | BIA06 .BEGIN = 110 | | | | | | | |
| | BIA207A .BEGIN = 01 | | | | | | | |
| | BDIVDM5 .BEGIN = 1100 | | | | | | | |
| | BMOD3CLSS27 .BEGIN = 11 | | | | | | | |
| | BQUOLEFT10 .BEGIN = 10 | | | | | | | |
| | BDFRAC18 .BEGIN = 10 | | | | | | | |
| | BNROUND16 .BEGIN = 1110 | | | | | | | |
| | BMFRAC .BEGIN = 10 | | | | | | | |
| | BNROUND34 .BEGIN = 110 | | | | | | | |
| | BRTSHFSF4 .BEGIN = 011 | | | | | | | |
| | BMOD5CLSS3 .BEGIN = 01 | | | | | | | |
| | BRTSHFDST4 .BEGIN = 011 | | | | | | | |
| | BNROUND41 .BEGIN = 00 | | | | | | | |
| | BRESTART4 .BEGIN = 00 | | | | | | | |
| | BNROUND32 .BEGIN = 01 | | | | | | | |
| | BLFSHFSF7 .BEGIN = 011 | | | | | | | |
| | BDFRACSUB5 .BEGIN = 10 | | | | | | | |
| | BMOD3CLSS9 .BEGIN = 1110 | | | | | | | |
| | BRSHFDSTSN4 .BEGIN = 011 | | | | | | | |
| | BMOD3CLSS15 .BEGIN = 1110 | | | | | | | |
| | BMFAT09 .BEGIN = 01 | | | | | | | |
| | BRTSHFDST .BEGIN = 10 | | | | | | | |
| | BRTSHFSF .BEGIN = 10 | | | | | | | |
| | BRTSHFSF3 .BEGIN = 1110 | | | | | | | |
| | BEXPTST4 .BEGIN = 01 | | | | | | | |
| | BLDCPM4 .BEGIN = 01 | | | | | | | |
| | BMOD5CLSS9 .BEGIN = 10 | | | | | | | |
| | BRTSHFDST3 .BEGIN = 1110 | | | | | | | |
| | BDFRAC00 .BEGIN = 10 | | | | | | | |
| | BMOD3CLSS14 .BEGIN = 1110 | | | | | | | |
| | BLFSHFSF2 .BEGIN = 011 | | | | | | | |
| | BMFRACF11 .BEGIN = 011 | | | | | | | |
| | BMOD3CLSS13 .BEGIN = 1110 | | | | | | | |
| | BMORDCMP .BEGIN = 00 | | | | | | | |
| | BRMDLEFT7 .BEGIN = 10 | | | | | | | |
| | BCTANNZM2 .BEGIN = 1100 | | | | | | | |
| | BRESTART17 .BEGIN = 0111 | | | | | | | |
| | BMORDCMP6 .BEGIN = 01 | | | | | | | |
| | BQUOLEFT8 .BEGIN = 011 | | | | | | | |
| | BMOD1CLSS7 .BEGIN = 1110 | | | | | | | |
| | BMULMODM17 .BEGIN = 10 | | | | | | | |
| | BRSHFDSTSN3 .BEGIN = 1110 | | | | | | | |
| | BINIT03 .BEGIN = 1110 | | | | | | | |
| | BINIT10 .BEGIN = 1101 | | | | | | | |
| | BLDEXP16 .BEGIN = 10 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---|---------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| BADDW08 | .BEGIN = 01 | | | | | | |
| BFSOM6FLT2 | .BEGIN = 1110 | | | | | | |
| BLDCTW26 | .BEGIN = 01 | | | | | | |
| BFSOMOFLT2 | .BEGIN = 10 | | | | | | |
| BFSOMOFLT3 | .BEGIN = 01 | | | | | | |
| BNZERO | .BEGIN = 1101 | | | | | | |
| BFSOM6FLT3 | .BEGIN = 0001 | | | | | | |
| BWAIT02 | .BEGIN = 10 | | | | | | |
| BWARNDIS2 | .BEGIN = 10 | | | | | | |
| BADDSHDF | .BEGIN = 10 | | | | | | |
| BADDW02 | .BEGIN = 1100 | | | | | | |
| BMOVFDSTSF | .BEGIN = 10 | | | | | | |
| BTRP15 | .BEGIN = 0111 | | | | | | |
| BWCS02 | .BEGIN = 01 | | | | | | |
| BLDCTW6 | .BEGIN = 01 | | | | | | |
| BVDIS | .BEGIN = 10 | | | | | | |
| BLDCTW108 | .BEGIN = 1001 | | | | | | |
| BFS2DM1FLT | .BEGIN = 0001 | | | | | | |
| BMODEALTER4 | .BEGIN = 01 | | | | | | |
| BSF2SCMPF1 | .BEGIN = 10 | | | | | | |
| BADDW11 | .BEGIN = 10 | | | | | | |
| BTRAPEND | .BEGIN = 101 | | | | | | |
| BADDW21 | .BEGIN = 10 | | | | | | |
| BFDST2SCF1 | .BEGIN = 10 | | | | | | |
| BNROUNDEND | .BEGIN = 1011 | | | | | | |
| BHFPPTAP7 | .BEGIN = 1000 | | | | | | |
| BFFLT4 | .BEGIN = 10 | | | | | | |
| BNROUNDEND1 | .BEGIN = 1100 | | | | | | |
| BDMOFLT | .BEGIN = 10 | | | | | | |
| BHOTSUNC | .BEGIN = 0101 | | | | | | |
| BSTFLT4 | .BEGIN = 10 | | | | | | |
| BOPCODERR | .BEGIN = 10 | | | | | | |
| BFSOMOFLT | .BEGIN = 10 | | | | | | |
| BDISAB | .BEGIN = 1001 | | | | | | |
| BSTOREHOT3 | .BEGIN = 10 | | | | | | |
| BHFPVSVC6 | .BEGIN = 110 | | | | | | |
| BTRP06 | .BEGIN = 01 | | | | | | |
| BTSTNZW5 | .BEGIN = 1110 | | | | | | |
| BUVDIS | .BEGIN = 10 | | | | | | |
| BDIFF | .BEGIN = 10 | | | | | | |
| BFDW67FLT | .BEGIN = 10 | | | | | | |
| BSTOREHOT | .BEGIN = 1110 | | | | | | |
| BFETCHINTLG | .BEGIN = 011 | | | | | | |
| BSTIMM1 | .BEGIN = 10 | | | | | | |
| BSTIMM4 | .BEGIN = 1110 | | | | | | |
| BSTOREINTLG | .BEGIN = 011 | | | | | | |
| BLDCTW5 | .BEGIN = 10 | | | | | | |
| BTSTNZW6 | .BEGIN = 10 | | | | | | |
| BSTOREHOT20 | .BEGIN = 01 | | | | | | |
| BSTCT4 | .BEGIN = 10 | | | | | | |
| BLDCTW15 | .BEGIN = 10 | | | | | | |
| .TOC "INSTRUCTION FETCH" | | | | | | | |
| ;; IN FET03 THE UPDATING OF THE PC AND THE BUS CYCLE "DATI NOINT" ARE | | | | | | | |
| .CASE 3 OF BCMP01 | | | | | | | |
| F/FET02 | <-- | | 1 | 2 | 10 | | |
| F/CMP01 | <-- | | 442 | 74 | 52 | | |
| F/BIT01 | <-- | | 443 | 75 | 52 | | |
| F/BIC01 | <-- | | 444 | 76 | 53 | | |

| | | | | |
|----------|-----|------|-----|-----|
| F/BIS01 | <-- | 445 | 27 | 53 |
| F/ADD01 | <-- | 446 | 78 | 54 |
| F/SUB01 | <-- | 456 | 79 | 54 |
| F/CMPB01 | <-- | 452 | 80 | 55 |
| F/BITB01 | <-- | 453 | 81 | 55 |
| F/BICB01 | <-- | 454 | 82 | 56 |
| F/BISB01 | <-- | 455 | 83 | 56 |
| F/CLRD1 | <-- | 550 | 117 | 70 |
| F/COMD1 | <-- | 551 | 118 | 70 |
| F/INCD1 | <-- | 552 | 119 | 71 |
| F/DECD1 | <-- | 553 | 120 | 71 |
| F/ADCD1 | <-- | 555 | 123 | 72 |
| F/TSTD1 | <-- | 557 | 127 | 73 |
| F/ROLD1 | <-- | 541 | 129 | 74 |
| F/ASLD1 | <-- | 543 | 134 | 76 |
| F/CLRB01 | <-- | 570 | 135 | 76 |
| F/COMB01 | <-- | 571 | 136 | 77 |
| F/INCB01 | <-- | 572 | 137 | 77 |
| F/DECB01 | <-- | 573 | 138 | 78 |
| F/ADCB01 | <-- | 575 | 141 | 79 |
| F/TSTB01 | <-- | 577 | 145 | 80 |
| F/ROLB01 | <-- | 561 | 147 | 81 |
| F/ASLB01 | <-- | 563 | 152 | 83 |
| F/MOVD1 | <-- | 441 | 188 | 95 |
| F/BRA06 | <-- | 210 | 284 | 126 |
| F/MFAT15 | <-- | 2034 | 583 | 223 |

702

1 FET01:0702

```

*****
*FETCH SOURCE DESTINATION RRM & RRB RMW & *
*RMB MRW & MRB MMW & MMB RW & RB MW & MB *
*MOV JSR & JMP BRANCH OTHER FSM ASH, *
*ASHC, MUL, DIV FLT. PT. ENTRY SERVICE *
*JAM UPP CONSOLE #OVERVIEW-FUNCTION FETCH *
*FETCH FETCHES THE INSTRUCTION IN MEMORY *
*POINTED TO BY THE PC, UPDATES THE PC, *
*LOADS THE IR AND PARTIALLY DECODES THE *
*INSTRUCTION. IF THE INSTRUCTION FETCHED *
*WAS REGISTER ONLY ADDRESSING MODE (WITH *
*SOME EXCEPTIONS) THE NEXT INSTRUCTION IS *
*FETCHED ALSO. THIS IS CALLED FETCH *
*OVERLAP. IF THE INSTRUCTION FETCHED HAD *
*INDEX SOURCE MODE ADDRESSING OR REGISTER *
*SOURCE MODE ADDRESSING AND INDEX MODE *
*DESTINATION MODE ADDRESSING THEN THE *
*INDEX IS FETCHED. IN BOTH OF THESE *
*CONDITIONAL MEMORY CYCLES THE PC IS *
*UPDATED. IN NO CASE DOES FETCH GET *
*OPERANDS FOR INSTRUCTIONS USING *
*IMMEDIATE MODE ADDRESSING. *
*-----*
*P1, BA+PC,CURRENT MODE, *
*P2, D+PC PLUS 2,D(C)+CIN,CLOCK CC, *
*P3, PC+D (A ADDR), *
*P3, U,DAT! .CLKIR, *
*NEXT, *
* J/FET02 -->
*****

```

```

702 000000001011
1001 11 11 10 01 111 000 0101 0
10000 000110 11000 000000001

```

1 2 10

G02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 9

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

H02

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 10

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UBF | COUT | CLOCKS |
|---------|---|-------------------|--------------------|------|------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| | | | OFST | ADDR | BOX | | | | | | | | |
| | | F/FETO1 | <-- | 702 | 1 | 2 | | | | | | | |
| | | F/FETO1F2 | <-- | 4233 | 1315 | 427 | | | | | | | |
| 2 | FET02:0001 | F/FETO1F | <-- | 4722 | 1316 | 427 | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | * LATCH INSTRUCTION INTO IR WITH A COPY * | | | | | | | | | | | | |
| | * IN THE MD CLEARS SHORT SHORT TERM FLAGS * | | | | | | | | | | | | |
| | *(FLAGS<3:0>) GO TO * | | | | | | | | | | | | |
| | *DECODE * | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P2 | U, IR+DATA, | * | | | | | | | | | | |
| | *P3 | MD+DATA, | * | | | | | | | | | | |
| | *NEXT, | BUT(CLEAR FLAGS), | * | | | | | | | | | | |
| | * | J/FETO3 | * --> | 700 | 3 | 11 | | | | | | | |
| | ***** | | | | | | | | | | | | |

1 0000 11 10 00 00 000 000 0000 0
 00000 100000 1000 111000000

BOX NO. TAG:ADDRESS .CASE 1 OF BCMP01

SOURCE/DESTINATION OFST ADDR BOX PAGE

MICROFICHE COORD CARD

ADDR ALU BUS

BUSB SP

BUSA UBF

EXTENSION RIF COOT CLOCKS UPF

Table listing microcode instructions (F/FET02, F/CMP01, etc.) with their source/destination and microfiche coordinates.

3 FET03:0700

*OVERLAPPED INSTRUCTION FETCH ENTRY *
*POINT. DECODE INSTRUCTION AND PERFORM *
*WIDE BRANCH (INSTRUCTION 1) THIS BRANCH *
*...
*P1, BA+PC, CURRENT MODE, *
*P2, D+PC PLUS 2, D(C)+CIN, CLOCK CC, *
*P3, PC+D (A ADDR), *
*P3, U, DATI NOINT, *
*SELECT 1 OR 2 (FIRST), *
*NEXT, BUT(INSTR 1), *
* J/400 *
* UNDEFINED CASE *
* UNDEFINED CASE *
* UNDEFINED CASE *
* UNDEFINED CASE *

700 00000011011
1001 11 11 10 01 111 000 0101 0
10001 000110 00110 10000000

N02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 12

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COOT CLOCKS
UPF

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 13

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

C03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 14

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

D03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 15

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

E03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 16

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

F03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 17

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--------------------|------|-----|-----------------------|------|---------|---------|----------|-----------|-----|--------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF | |
| 4 | SRC01:0711 | F/FET03 | <-- | 700 | 3 | 11 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *AT THIS POINT THE FLOW PROCEEDS TO ONE * *OF THE EIGHT CLASSES CLASS COMMENTS/NEXT * *LOCATION ***** * *0 ALL INSTRUCTIONS WHICH DO NOT FALL IN * *ANY OF THE FOLLOWING CLASSES * *1 REGISTER-REGISTER IF DOP, WORD AND * *BYTE (ALSO TESTS PRESENCE OF FAST * *FLOATING POINT) 2 DESTINATION * *CALCULATION 3 SINGLE OPERAND, REGISTER, * *WORD AND BYTE 4 MOVE INSTRUCTION (HAS A * *SEPARATE FLOW TO MAXIMIZE SPEED) * *-----* | | | | | | | | | | | |
| | *P1, | BA+R(SF),MF MODE, | * | | | | | | | | | |
| | *P3 | U,DATIB, | * | | | | | | | | | |
| | *NEXT, | BUTR(DMO # BYTE), | * | | | | | | | | | |
| | * | J/SRC18 | * | --> | 010 | 462 | 19 | | | | | |
| | * | J/SRC20 | * | --> | 011 | 463 | 20 | | | | | |
| | * | J/SRC17 | * | --> | 110 | 466 | 21 | | | | | |
| | * | J/SRC19 | * | --> | 111 | 467 | 22 | | | | | |
| | ***** | | | | | | | | | | | |

711 0000 00 00 10 11 00000001000
10011 000000 01001 100110010

G03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 18

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE 5 | 203 OF BFET03 SRC02:0712 | F/FET03 <-- | 700 3 11 | 712 | | | | 000000001000 |
| | ***** | | | | 1001 | 11 11 | 10 11 | 000 000 0101 0 |
| | *-----* | | | | 1001 | 000110 | 01001 | 100110010 |
| | *P1, BA+R(SF), MF MODE, * | | | | | | | |
| | *P2, D+R(SF) PLUS (1 OR 2), * | | | | | | | |
| | *P3, R(SF)+D (A ADDR), * | | | | | | | |
| | *P3, U, DATIB, * | | | | | | | |
| | *NEXT, BUTR(DMO # BYTE), * | | | | | | | |
| | * J/SRC18 * --> | 010 462 | 19 22 | | | | | |
| | * J/SRC20 * --> | 011 463 | 20 22 | | | | | |
| | * J/SRC17 * --> | 110 466 | 21 23 | | | | | |
| | * J/SRC19 * --> | 111 467 | 22 23 | | | | | |
| | ***** | | | | | | | |
| .CASE 6 | 204 OF BFET03 SRC03:0713 | F/FET03 <-- | 700 3 11 | 713 | | | | 000000001011 |
| | ***** | | | | 1001 | 11 11 | 10 11 | 000 100 0101 0 |
| | *-----* | | | | 10110 | 000110 | 11100 | 000000101 |
| | *P1, BA+R(SF), CURRENT MODE, * | | | | | | | |
| | *P2, D+R(SF) PLUS 2, * | | | | | | | |
| | *P3, R(SF)+D (A ADDR), * | | | | | | | |
| | *P3, U, DATI, * | | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+4, * | | | | | | | |
| | * J/SRC14 * --> | 4005 | 12 20 | | | | | |
| | ***** | | | | | | | |
| .CASE 7 | 205 OF BFET03 SRC04:0714 | F/FET03 <-- | 700 3 11 | 714 | | | | 000000001000 |
| | ***** | | | | 1101 | 11 11 | 10 11 | 000 000 0100 0 |
| | * GO TO TOP OF THIS * | | | | 00000 | 000110 | 11000 | 111001001 |
| | *PAGE * | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, D+R(SF) MINUS (1 OR 2), * | | | | | | | |
| | *P3, R(SF)+D (A ADDR), * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | * J/SRC01 * --> | 711 | 4 17 | | | | | |
| | ***** | | | | | | | |

H03

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|---|
| 8 | .CASE 206 OF BFET03 SRC05:0715 | F/FET03 <-- | 700 3 11 | 715 | 1101 00000 | 11 11 000110 | 10 11 11100 | 000000001000 000 100 0100 0 000000100 |
| | *-----* | | | | | | | |
| | *P2, D+R(SF) MINUS 2, *P3, R(SF)+D (A ADDR) *NEXT, BUT(GO TO), PAGE+4, * J/SRC11 | --> | 4004 11 19 | | | | | |
| 9 | .CASE 207 OF SFET03 SRC06:0716 | F/FET03 <-- | 700 3 11 | 716 | 1010 00000 | 11 10 100000 | 00 00 11100 | 000000001000 000 100 0100 0 000001100 |
| | *-----* | | | | | | | |
| | *P2, D+MD, MD+DATA, *NEXT, BUT(GO TO), PAGE+4, * J/SRC09 | --> | 4014 13 20 | | | | | |
| 10 | .CASE 208 OF BFET03 SRC07:0717 | F/FET03 <-- | 700 3 11 | 717 | 1010 00000 | 11 10 100000 | 00 00 11100 | 000000001000 000 100 0100 0 000001110 |
| | *-----* | | | | | | | |
| | *P2, D+MD, MD+DATA, *NEXT, BUT(GO TO), PAGE+4, * J/SRC12 | --> | 4016 15 20 | | | | | |
| 11 | SRC11:4004 | F/SRC05 <-- | 715 8 19 | 4004 | 0000 10110 | 00 00 000000 | 10 11 11000 | 000000001011 000 000 0001 0 000000101 |
| | *-----* | | | | | | | |
| | *P1, BA+R(SF), CURRENT MODE, *P3, U, DATI, *NEXT, J/SRC14 | --> | 4005 12 20 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | | | | | | | | | | | | |
|---------|---------------------------|---------------------------------------|-----------------------|---------------------|---------------|----------------|----------|---------|------|--------|--|--|--|--|--|--|--|--|--|--|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT | CLOCKS | | | | | | | | | | |
| 12 | SRC14:4005 | F/SRC03 F/SRC11 F/SRC13 | <-- <-- <-- | 713 4004 4020 | 6 11 16 | 18 19 21 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | | | | | | | | | | | | |
| | *NEXT, J/SRC15 | | --> | 4022 | 17 | 21 | | | | | | | | | | | | | | |
| 13 | SRC09:4014 | F/SRC06 | <-- | 716 | 9 | 19 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *P2, D+R(SF) PLUS MD(D), | | | | | | | | | | | | | | | | | | | |
| | *P3, R(SRC X)+D (B ADDR), | | | | | | | | | | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | | | | | | | | | | | |
| | * J/SRC10 | | --> | VV | | | | | | | | | | | | | | | | |
| 14 | SRC10:0004 | F/SRC09 | <-- | VV | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *P1, BA+R(SRC X),MF MODE, | | | | | | | | | | | | | | | | | | | |
| | *P3, U,DATIB | | | | | | | | | | | | | | | | | | | |
| | *NEXT, BUTR(DMO # BYTE), | | | | | | | | | | | | | | | | | | | |
| | * J/SRC18 | | --> | 010 462 | 19 | 22 | | | | | | | | | | | | | | |
| | * J/SRC20 | | --> | 011 463 | 20 | 22 | | | | | | | | | | | | | | |
| | * J/SRC17 | | --> | 110 466 | 21 | 23 | | | | | | | | | | | | | | |
| | * J/SRC19 | | --> | 111 467 | 22 | 23 | | | | | | | | | | | | | | |
| 15 | SRC12:4016 | F/SRC07 | <-- | 717 | 10 | 19 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *P2, D+R(SF) PLUS MD(D), | | | | | | | | | | | | | | | | | | | |
| | *P3, R(SRC X)+D (B ADDR), | | | | | | | | | | | | | | | | | | | |
| | *NEXT, J/SRC13 | | --> | 4020 | 16 | 21 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |

```

4005 0000 11 10 00 00 000000001000 0
      00000 100000 11000 000010010

4014 1001 10 10 10 11 110 000 0100 0
      00010 011110 11100 000000100

4 0000 00 00 11 00 110 000 0001 0
   10011 000000 01001 100110010

4016 1001 10 10 10 11 110 000 0100 0
      00010 011110 11000 000010000

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J03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 21

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--|------|----------------------------|------------|-------------|-----------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 16 | SRC13:4020 ***** *-----* *P1, BA+R(SRC X),CURRENT MODE, *P3 U,DATI, *NEXT, * J/SRC14 ***** | <-- | 4016 15 20 | 4020 | 0000 00 00 10110 000000 | 11 00 | 110 000 | 0001 0 | 000000001011 | 0001 0 |
| 17 | SRC15:4022 ***** *-----* *P2, D+MD *P3 R(SRC I)+D (A ADDR), *NEXT, BUT(GO TO),PAGE+D, * J/SRC16 ***** | <-- | 4005 12 20 | 4022 | 1010 11 10 00000 010010 | 00 00 | 110 000 | 0100 0 | 000000001000 | 0100 0 |
| 18 | SRC16:0005 ***** *-----* *P1, BA+R(SRC I),MF MODE, *P3 U,DATI, *NEXT, BUTR(DMO # BYTE), * J/SRC18 * J/SRC20 * J/SRC17 * J/SRC19 ***** | <-- <-- <-- | 4022 17 21 620 1755 570 3225 682 250 | 5 | 0000 00 00 10011 000000 | 11 00 | 110 000 | 0001 0 | 000000001000 | 0001 0 |
| | | | 010 462 19 22 011 463 20 22 110 466 21 23 111 467 22 23 | | | | | | | |

K03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 22

| BOX NO. .CASE | TAG: ADDRESS 1 OF BSRC01 | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|----------------------------------|-----------------------------|-----------------|--------------------|------|-----|--------------------------|-------------|------------|------------|-------------|-----------|-----|--------|------|
| | | | OFST | ADDR | BOX | | | | | | PAGE | RIF | | COUT |
| 19 | SRC18:0462 | F/SRC01 | <-- | 711 | 4 | 17 | | | | | | | | |
| | | F/SRC02 | <-- | 712 | 5 | 18 | | | | | | | | |
| | | F/SRC10 | <-- | 4 | 14 | 20 | | | | | | | | |
| | | F/SRC16 | <-- | 5 | 18 | 21 | | | | | | | | |
| | | F/JAM25 | <-- | 3013 | 415 | 171 | | | | | | | | |
| | | F/MOV20 | <-- | 673 | 214 | 103 | | | | | | | | |
| | | F/MOV40 | <-- | 144 | 232 | 109 | | | | | | | | |
| | | ***** | | | | | | | | | | | | |
| | | *-----* | | | | | | | | | | | | |
| | | *P3, MD+DATA, * | | | | | | | | | | | | |
| *NEXT, BUT(MOV # DM), * | | | | | | | | | | | | | | |
| * J/660 * | | | | | | | | | | | | | | |
| * UNDEFINED CASE * | | | | | | | | | | | | | | |
| * J/SRC21 * --> 0001 661 23 24 | | | | | | | | | | | | | | |
| * J/SRC32 * --> 0010 662 24 25 | | | | | | | | | | | | | | |
| * J/SRC33 * --> 0011 663 25 26 | | | | | | | | | | | | | | |
| * J/SRC34 * --> 0100 664 26 27 | | | | | | | | | | | | | | |
| * J/SRC35 * --> 0101 665 27 28 | | | | | | | | | | | | | | |
| * J/SRC36 * --> 0110 666 28 29 | | | | | | | | | | | | | | |
| * J/SRC37 * --> 0111 667 29 30 | | | | | | | | | | | | | | |
| * UNDEFINED CASE * | | | | | | | | | | | | | | |
| * J/MOV08 * --> 1001 671 211 102 | | | | | | | | | | | | | | |
| * J/MOV13 * --> 1010 672 212 102 | | | | | | | | | | | | | | |
| * J/MOV20 * --> 1011 673 214 103 | | | | | | | | | | | | | | |
| * J/MOV33 * --> 1100 674 215 103 | | | | | | | | | | | | | | |
| * J/MOV37 * --> 1101 675 216 103 | | | | | | | | | | | | | | |
| * J/MOV42 * --> 1110 676 217 104 | | | | | | | | | | | | | | |
| * J/MOV55 * --> 1111 677 219 104 | | | | | | | | | | | | | | |
| ***** | | | | | | | | | | | | | | |
| 20 | SRC20:0463 | F/SRC01 | <-- | 711 | 4 | 17 | | | | | | | | |
| | | F/SRC02 | <-- | 712 | 5 | 18 | | | | | | | | |
| | | F/SRC10 | <-- | 4 | 14 | 20 | | | | | | | | |
| | | F/SRC16 | <-- | 5 | 18 | 21 | | | | | | | | |
| | | F/JAM25 | <-- | 3013 | 415 | 171 | | | | | | | | |
| | | F/MOV20 | <-- | 673 | 214 | 103 | | | | | | | | |
| | | F/MOV40 | <-- | 144 | 232 | 109 | | | | | | | | |
| | | ***** | | | | | | | | | | | | |
| | | *-----* | | | | | | | | | | | | |
| | | *P3, MD+DATA, * | | | | | | | | | | | | |
| *NEXT, BUTR(MOV), * | | | | | | | | | | | | | | |
| * J/SRC23 * --> 0111 627 30 30 | | | | | | | | | | | | | | |
| * J/SRC38 * --> 1111 637 31 31 | | | | | | | | | | | | | | |
| ***** | | | | | | | | | | | | | | |

462
0000 11 10 00 00 00000001000
00000 100000 00101 110110000

463
0000 11 10 00 00 00000001000
00000 100000 00101 110010111

L03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 23

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|------------------|--------------------|-------|------|-----|------|-----------------------|------|---------|---------|----------|--------------------|--------|
| .CASE | 3 OF BSRC01 | | | | | | | | | | | | |
| | | F/SRC01 | <-- | 711 | 4 | 17 | | | | | | | |
| | | F/SRC02 | <-- | 712 | 5 | 18 | | | | | | | |
| | | F/SRC10 | <-- | 4 | 14 | 20 | | | | | | | |
| | | F/SRC16 | <-- | 5 | 18 | 21 | | | | | | | |
| | | F/JAM25 | <-- | 3013 | 415 | 171 | | | | | | | |
| | | F/MOV20 | <-- | 673 | 214 | 103 | | | | | | | |
| | | F/MOV40 | <-- | 144 | 232 | 109 | | | | | | | |
| 21 | SRC17:0466 | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | | | | | |
| | *NEXT, BUT(DOP), | | | | | | | | | | | | |
| | * J/620 | | | | | | | | | | | | |
| | | UNDEFINED CASE | * | | | | | | | | | | |
| | | J/MOV05 | * --> | 0001 | 621 | 210 | 101 | | | | | | |
| | | J/CMP02 | * --> | 0010 | 622 | 84 | 57 | | | | | | |
| | | J/BIT02 | * --> | 0011 | 623 | 86 | 57 | | | | | | |
| | | J/BIC02 | * --> | 0100 | 624 | 87 | 58 | | | | | | |
| | | J/BIS02 | * --> | 0101 | 625 | 88 | 58 | | | | | | |
| | | J/ADD02 | * --> | 0110 | 626 | 89 | 59 | | | | | | |
| | | UNDEFINED CASE | * | | | | | | | | | | |
| | | UNDEFINED CASE | * | | | | | | | | | | |
| | | J/MOV06 | * --> | 1001 | 631 | 221 | 105 | | | | | | |
| | | J/CMP02 | * --> | 1010 | 632 | 91 | 60 | | | | | | |
| | | J/BIT02 | * --> | 1011 | 633 | 92 | 60 | | | | | | |
| | | J/BIC02 | * --> | 1100 | 634 | 93 | 61 | | | | | | |
| | | J/BIS02 | * --> | 1101 | 635 | 94 | 61 | | | | | | |
| | | J/SUB02 | * --> | 1110 | 636 | 90 | 59 | | | | | | |
| | | UNDEFINED CASE | * | | | | | | | | | | |
| .CASE | 4 OF BSRC01 | | | | | | | | | | | | |
| | | F/SRC01 | <-- | 711 | 4 | 17 | | | | | | | |
| | | F/SRC02 | <-- | 712 | 5 | 18 | | | | | | | |
| | | F/SRC10 | <-- | 4 | 14 | 20 | | | | | | | |
| | | F/SRC16 | <-- | 5 | 18 | 21 | | | | | | | |
| | | F/JAM25 | <-- | 3013 | 415 | 171 | | | | | | | |
| | | F/MOV20 | <-- | 673 | 214 | 103 | | | | | | | |
| | | F/MOV40 | <-- | 144 | 232 | 109 | | | | | | | |
| 22 | SRC19:0467 | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | | | | | |
| | *NEXT, J/SRC22 | | | | | | | | | | | | |
| | | | * --> | 10 | 36 | 33 | | | | | | | |
| | ***** | | | | | | | | | | | | |

```

466
0000 11 10 00 00 000 000 0000 0
00000 100000 00001 110010000
    
```

```

467
0000 11 10 00 00 000 000 0000 0
00000 100000 11000 000001000
    
```


| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|----------|--------------------------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------------|
| .CASE 25 | 4 OF BSRC18 | | | | | | |
| | SRC33:0663 | F/SRC18 | <-- | 462 | 19 | 22 | |
| | ***** | | | | | | |
| | *P2, D+MD | * | | | | | 663 000000101000 |
| | *P3, R(SRC)+D (A ADDR), | * | | | | | 1010 11 10 00 00 110 000 0100 0 |
| | *SETUP | * | | | | | 00000 010110 00101 111100000 |
| | *SELECT 1 OR 2 (SECOND), | * | | | | | |
| | *NEXT, BUT(MOV#DM), | * | | | | | |
| | * J/740 | * | | | | | |
| | * J/SXT05 | * --> | 0000 740 | 300 | 134 | | |
| | * J/DST11 | * --> | 0001 741 | 46 | 38 | | |
| | * J/DST12 | * --> | 0010 742 | 47 | 39 | | |
| | * J/DST13 | * --> | 0011 743 | 48 | 40 | | |
| | * J/DST14 | * --> | 0100 744 | 49 | 40 | | |
| | * J/DST15 | * --> | 0101 745 | 50 | 41 | | |
| | * J/DST16 | * --> | 0110 746 | 51 | 41 | | |
| | * J/DST17 | * --> | 0111 747 | 52 | 42 | | |
| | * UNDEFINED CASE | * | | | | | |
| | * UNDEFINED CASE | * | | | | | |
| | * UNDEFINED CASE | * | | | | | |
| | * UNDEFINED CASE | * | | | | | |
| | * UNDEFINED CASE | * | | | | | |
| | * UNDEFINED CASE | * | | | | | |
| | * UNDEFINED CASE | * | | | | | |
| | * UNDEFINED CASE | * | | | | | |
| | ***** | | | | | | |

F04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 30

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|----------|---------------------------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|
| .CASE 29 | 8 OF BSRC18 SRC37:0667 | F/SRC18 <-- | 462 19 22 | 667 | | | 000000101000 |
| | *P2, D+MD | | | 1010 | 11 10 | 00 00 | 110 000 0100 0 |
| | *P3, R(SRC)+D (A ADDR), | | | 00000 | 010110 | 00101 | 111100000 |
| | *SETUP | | | | | | |
| | *SELECT | | | | | | |
| | *NEXT, 1 OR 2 (SECOND), | | | | | | |
| | BUT (MOV#CM), | | | | | | |
| | J/740 | | | | | | |
| | J/SXT05 | * --> | 0000 740 300 134 | | | | |
| | J/DST11 | * --> | 0001 741 46 38 | | | | |
| | J/DST12 | * --> | 0010 742 47 39 | | | | |
| | J/DST13 | * --> | 0011 743 48 40 | | | | |
| | J/DST14 | * --> | 0100 744 49 40 | | | | |
| | J/DST15 | * --> | 0101 745 50 41 | | | | |
| | J/DST16 | * --> | 0110 746 51 41 | | | | |
| | J/DST17 | * --> | 0111 747 52 42 | | | | |
| | UNDEFINED CASE | | | | | | |
| | UNDEFINED CASE | | | | | | |
| | UNDEFINED CASE | | | | | | |
| | UNDEFINED CASE | | | | | | |
| | UNDEFINED CASE | | | | | | |
| | UNDEFINED CASE | | | | | | |
| | UNDEFINED CASE | | | | | | |
| | UNDEFINED CASE | | | | | | |
| .CASE 30 | 1 OF BSRC20 SRC23:0627 | F/SRC20 <-- | 463 20 22 | 627 | | | 000000001000 |
| | *P2, D+MD | | | 1010 | 11 10 | 00 00 | 000 000 0100 0 |
| | *NEXT, BUTR(ODD ADDRESS), | | | 00000 | 000000 | 10011 | 111111010 |
| | J/SRC30 | * --> | 10 772 32 31 | | | | |
| | J/SRC31 | * --> | 11 773 33 32 | | | | |

H04

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 32

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUSB BUSA EXTENSION RIF COUT CLOCKS |
|---------|-----------------------------------|---------------------------------------|-----------------------|--|
| .CASE | | | | UPF |
| 33 | SRC31:0773 | F/SRC23 <-- | 627 30 30 | 773 000000101000 |
| | | | | 1111 00 10 01 01 110 011 0100 0 |
| | | | | 00100 011110 00101 111100000 |
| | *P2, D+D(HI) # D(HI), D(C)+ALU07, | | | |
| | *P3, R(SRC)+D (B ADDR), | | | |
| | *SETUP | | | |
| | *SELECT 1 OR 2 (SECOND), | | | |
| | *NEXT, BUT(MOV # DM), | | | |
| | J/740 | | | |
| | J/SXT05 | * --> | 0000 740 300 134 | |
| | J/DST11 | * --> | 0001 741 46 38 | |
| | J/DST12 | * --> | 0010 742 47 39 | |
| | J/DST13 | * --> | 0011 743 48 40 | |
| | J/DST14 | * --> | 0100 744 49 40 | |
| | J/DST15 | * --> | 0101 745 50 41 | |
| | J/DST16 | * --> | 0110 746 51 41 | |
| | J/DST17 | * --> | 0111 747 52 42 | |
| | UNDEFINED CASE | | | |
| 34 | SRC39:0012 | F/SRC38 <-- | 637 31 31 | 12 000000101000 |
| | | | | 1111 00 10 01 01 110 011 0100 0 |
| | | | | 00001 011110 00101 001101000 |
| | *P2, D+D(LO) # D(LO), D(C)+ALU07, | | | |
| | *P3, R(SRC)+D (B ADDR), | | | |
| | *SETUP | | | |
| | *SELECT 1 OR 2 (SECOND), | | | |
| | *NEXT, BUT(MOV # DM), | | | |
| | J/150 | | | |
| | UNDEFINED CASE | | | |
| | J/MOV10 | * --> | 1001 151 222 105 | |
| | J/MOV15 | * --> | 1010 152 223 106 | |
| | J/MOV22 | * --> | 1011 153 225 106 | |
| | J/MOV35 | * --> | 1100 154 226 107 | |
| | J/MOV39 | * --> | 1101 155 227 107 | |
| | J/MOV44 | * --> | 1110 156 228 107 | |
| | J/MOV57 | * --> | 1111 157 230 108 | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|----------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------------|--------|
| 35 | SRC40:0013 | F/SRC38 | <-- | 637 | 31 | 31 | | | |
| | ***** | | | | 13 | | | 000000101000 | |
| | *-----* | | | | | | | 1111 00 10 01 01 110 011 0100 0 | |
| | *P2, D+D(HI) * D(HI),D(C)+ALU07, | | | | | | | 00100 011110 00101 001101000 | |
| | *P3, R(SRC)+D (B ADDR), | | | | | | | | |
| | *SETUP | | | | | | | | |
| | *SELECT 1 OR 2 (SECOND), | | | | | | | | |
| | *NEXT, BUT(MOV * DM), | | | | | | | | |
| | * J/150 | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| | | J/MOV10 | --> | 1001 | 151 | 222 | 105 | | |
| | | J/MOV15 | --> | 1010 | 152 | 223 | 106 | | |
| | | J/MOV22 | --> | 1011 | 153 | 225 | 106 | | |
| | | J/MOV35 | --> | 1100 | 154 | 226 | 107 | | |
| | | J/MOV39 | --> | 1101 | 155 | 227 | 107 | | |
| | | J/MOV44 | --> | 1110 | 156 | 228 | 107 | | |
| | | J/MOV57 | --> | 1111 | 157 | 230 | 108 | | |
| | ***** | | | | | | | | |
| 36 | SRC22:0010 | F/SRC19 | <-- | 467 | 22 | 23 | | | |
| | ***** | | | | 10 | | | 000000001000 | |
| | *-----* | | | | | | | 1010 11 10 00 00 000 000 0100 0 | |
| | *P2, D+MD | | | | | | | 00000 000000 10011 111101010 | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | | |
| | * J/SRC24 | | | | | | | | |
| | | J/SRC24 | --> | 10 | 752 | 37 | 34 | | |
| | | J/SRC29 | --> | 11 | 753 | 38 | 35 | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|-----------------------------------|--------------------|------------|-------|--------|-------|-----------|--------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF COUT | CLOCKS |
| 38 | SRC29:0753 | F/SRC22 <-- | | 10 | 36 | 33 | | |
| | | | | 753 | | | | 000000001000 |
| | | | | 1111 | 00 10 | 01 01 | 110 011 | 0100 0 |
| | | | | 00100 | 011110 | 00001 | 110010000 | |
| | *P2, D+D(HI) # D(HI), D(C)+ALU07, | | | | | | | |
| | *P3, R(SRC)+D (B ADDR), | | | | | | | |
| | *NEXT, BUT(DOP), | | | | | | | |
| | J/620 | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | J/MOV05 | --> | 0001 | 621 | 210 | 101 | | |
| | J/CMP02 | --> | 0010 | 622 | 84 | 57 | | |
| | J/BIT02 | --> | 0011 | 623 | 86 | 57 | | |
| | J/BIC02 | --> | 0100 | 624 | 87 | 58 | | |
| | J/BIS02 | --> | 0101 | 625 | 88 | 58 | | |
| | J/ADD02 | --> | 0110 | 626 | 89 | 59 | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | J/MOV06 | --> | 1001 | 631 | 221 | 105 | | |
| | J/CMP02 | --> | 1010 | 632 | 91 | 60 | | |
| | J/BIT02 | --> | 1011 | 633 | 92 | 60 | | |
| | J/BIC02 | --> | 1100 | 634 | 93 | 61 | | |
| | J/BIS02 | --> | 1101 | 635 | 94 | 61 | | |
| | J/SUB02 | --> | 1110 | 636 | 90 | 59 | | |
| | UNDEFINED CASE | | | | | | | |
| | ***** | | | | | | | |
| | .TOC "DESTINATION CALCULATION" | | | | | | | |
| 39 | DST01:0511 | F/FET03 <-- | | 700 | 3 | 11 | | |
| | | | | 511 | | | | 000000001111 |
| | | | | 0000 | 00 00 | 10 10 | 000 000 | 0001 0 |
| | | | | 10011 | 000000 | 01001 | 101010100 | |
| | *P1, BA+R(DF), CURRENT MODE, | | | | | | | |
| | *ENABLE, MAINTENANCE, | | | | | | | |
| | *P3, L, DATIB(P), | | | | | | | |
| | *NEXT, BUTR(SMD # BYTE), | | | | | | | |
| | J/DST21 | | | | | | | |
| | J/DST21 | --> | 100 | 524 | 55 | 43 | | |
| | J/DST22 | --> | 101 | 525 | 56 | 44 | | |
| | J/DST19 | --> | 110 | 526 | 57 | 44 | | |
| | J/DST20 | --> | 111 | 527 | 58 | 45 | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|----------|------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE 40 | 75 OF BFET03 DST02:0512 | F/FET03 <-- | 700 3 11 | 512 | | | | 00000000111 |
| | ***** | | | | 1001 | 11 11 | 10 10 | 000 000 0101 0 |
| | ----- | | | | 10011 | 000110 | 01001 | 101010100 |
| | *P1, BA+R(DF), CURRENT MODE, | | | | | | | |
| | *ENABLE, MAINTENANCE, | | | | | | | |
| | *P2, D+R(DF) PLUS (1 OR 2), | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | |
| | *P3, U, DATIB(P), | | | | | | | |
| | *NEXT, BU+R(SMO # BYTE), | | | | | | | |
| | * J/DST21 | | | | | | | |
| | | J/DST21 --> | 100 524 55 43 | | | | | |
| | | J/DST22 --> | 101 525 56 44 | | | | | |
| | | J/DST19 --> | 110 526 57 44 | | | | | |
| | | J/DST20 --> | 111 527 58 45 | | | | | |
| | ***** | | | | | | | |
| .CASE 41 | 76 OF BFET03 DST03:0513 | F/FET03 <-- | 700 3 11 | 513 | | | | 000000001011 |
| | ***** | | | | 1001 | 11 11 | 10 10 | 000 000 0101 0 |
| | ----- | | | | 10110 | 000110 | 11000 | 110100101 |
| | *P1, BA+R(DF), CURRENT MODE, | | | | | | | |
| | *P2, D+R(DF) PLUS 2, | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | |
| | *P3, U, DATI, | | | | | | | |
| | *NEXT, J/DST38 | | | | | | | |
| | | --> | 645 63 46 | | | | | |
| | ***** | | | | | | | |
| .CASE 42 | 77 OF BFET03 DST04:0514 | F/FET03 <-- | 700 3 11 | 514 | | | | 000000001000 |
| | ***** | | | | 1101 | 11 11 | 10 10 | 000 000 0100 0 |
| | ----- | | | | 00000 | 000110 | 11000 | 000001001 |
| | *P2, D+R(DF) MINUS (1 OR 2), | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | |
| | *NEXT, J/DST08 | | | | | | | |
| | | --> | 11 53 42 | | | | | |
| | ***** | | | | | | | |

M04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 37

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|----------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|---|
| .CASE 43 | 78 OF BFET03 DST05:0515 | F/FET03 <-- | 700 3 11 | 515 | 1101 00000 | 11 11 000110 | 10 10 11000 | 000000001000 000 000 0100 0 000001100 |
| | *-----* | | | | | | | |
| | *P2, D+R(DF) MINUS 2, *P3, R(DF)+D (A ADDR), *NEXT, | | | | | | | |
| | * J/DST09 * | --> | 14 54 43 | | | | | |
| .CASE 44 | 79 OF BFET03 DST06:0516 | F/FET03 <-- | 700 3 11 | 516 | 1010 00000 | 11 10 100000 | 00 00 11000 | 000000001000 000 000 0100 0 000001101 |
| | *-----* | | | | | | | |
| | *P2, D+MD, MD+DATA, *NEXT, | | | | | | | |
| | * J/DST29 * | --> | 15 59 45 | | | | | |
| .CASE 45 | 80 OF BFET03 DST07:0517 | F/FET03 <-- | 700 3 11 | 517 | 1010 00000 | 11 10 100000 | 00 00 11000 | 000000001000 000 000 0100 0 000010010 |
| | *-----* | | | | | | | |
| | *P2, D+MD, MD+DATA, *NEXT, | | | | | | | |
| | * J/DST35 * | --> | 22 61 46 | | | | | |

BOX NO. TAG: ADDRESS
 .CASE 2 OF BSRC21

SOURCE/DESTINATION
 OFST ADDR BOX PAGE

MICROFICHE
 COORD CARD

ADDR ALU
 BUS

BUSB
 SP

BUSA
 UBF

EXTENSION
 RIF COUT CLOCKS
 UPF

| | | | | |
|---------|-----|-----|-----|-----|
| F/SRC21 | <-- | 661 | 23 | 24 |
| F/SRC32 | <-- | 662 | 24 | 25 |
| F/SRC33 | <-- | 663 | 25 | 26 |
| F/SRC34 | <-- | 664 | 26 | 27 |
| F/SRC35 | <-- | 665 | 27 | 28 |
| F/SRC36 | <-- | 666 | 28 | 29 |
| F/SRC37 | <-- | 667 | 29 | 30 |
| F/SRC30 | <-- | 772 | 32 | 31 |
| F/SRC31 | <-- | 773 | 33 | 32 |
| F/SMB03 | <-- | 73 | 289 | 129 |
| F/XOR02 | <-- | 47 | 294 | 131 |
| F/SXT03 | <-- | 464 | 298 | 132 |
| F/SXT04 | <-- | 465 | 299 | 133 |

46 DST11:0741

741

0000 00 00 10 10 000 000 0001 0
 10011 000000 01001 101010100

```

*****
*
*-----*
*P1      BA+R(DF), CURRENT MODE,
*ENABLE, MAINTENANCE,
*P3      U, DATIB(P),
*NEXT,   BUTR(SMO # BYTE),
*
*          J/DST21
*          J/DST21      * --> 100 524 55 43
*          J/DST22      * --> 101 525 56 44
*          J/DST19      * --> 110 526 57 44
*          J/DST20      * --> 111 527 58 45
*****
    
```

BOX NO. TAG: ADDRESS
.CASE 3 OF BSRC21

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

| | | | | |
|---------|-----|-----|-----|-----|
| F/SRC21 | <-- | 661 | 23 | 24 |
| F/SRC32 | <-- | 662 | 24 | 25 |
| F/SRC33 | <-- | 663 | 25 | 26 |
| F/SRC34 | <-- | 664 | 26 | 27 |
| F/SRC35 | <-- | 665 | 27 | 28 |
| F/SRC36 | <-- | 666 | 28 | 29 |
| F/SRC37 | <-- | 667 | 29 | 30 |
| F/SRC30 | <-- | 772 | 32 | 31 |
| F/SRC31 | <-- | 773 | 33 | 32 |
| F/SMB03 | <-- | 73 | 289 | 129 |
| F/XOR02 | <-- | 47 | 294 | 131 |
| F/SXT03 | <-- | 464 | 298 | 132 |
| F/SXT04 | <-- | 465 | 299 | 133 |

742

```

00000000111
1001 11 11 10 10 000 000 0101 0
10011 000110 01001 101010100

```

47 DST12:0742

```

*****
*
*-----*
*P1,      BA+R(DF), CURRENT MODE,
*ENABLE,  MAINTENANCE,
*P2,      D+R(DF) PLUS (1 OR 2),
*P3,      R(DF)+D (A ADDR),
*P3,      U, DATIB(P),
*NEXT,    BUTR(SMO # BYTE),
*          J/DST21
*
*          J/DST21
*          J/DST22
*          J/DST19
*          J/DST20
*****

```

| | | | | | |
|---------|-------|-----|-----|----|----|
| J/DST21 | * --> | 100 | 524 | 55 | 43 |
| J/DST22 | * --> | 101 | 525 | 56 | 44 |
| J/DST19 | * --> | 110 | 526 | 57 | 44 |
| J/DST20 | * --> | 111 | 527 | 58 | 45 |

BOX NO. TAG: ADDRESS
.CASE 4 OF BSRC21

SOURCE/DESTINATION OFST ADDR BOX PAGE

MICROFICHE COORD CARD

ADDR ALU BUS

RUSB SP

BUSA UBF

EXTENSION RIF COUT CLOCKS UPF

| | | | | | |
|----|---------|-----|-----|-----|-----|
| | F/SRC21 | <-- | 661 | 23 | 24 |
| | F/SRC32 | <-- | 662 | 24 | 25 |
| | F/SRC33 | <-- | 663 | 25 | 26 |
| | F/SRC34 | <-- | 664 | 26 | 27 |
| | F/SRC35 | <-- | 665 | 27 | 28 |
| | F/SRC36 | <-- | 666 | 28 | 29 |
| | F/SRC37 | <-- | 667 | 29 | 30 |
| | F/SRC30 | <-- | 772 | 32 | 31 |
| | F/SRC31 | <-- | 773 | 33 | 32 |
| | F/SWB03 | <-- | 73 | 289 | 129 |
| | F/XOR02 | <-- | 47 | 294 | 131 |
| | F/SXT03 | <-- | 464 | 298 | 132 |
| 48 | F/SXT04 | <-- | 465 | 299 | 133 |

743
 000000001011
 1001 11 11 10 10 000 000 0101 0
 10110 000110 11000 110100101

DST13:0743

```

*****
*-----*
*P1,      BA+R(DF), CURRENT MODE,
*P2,      D+R(DF) PLUS 2,
*P3,      R(DF)+D (A ADDR),
*P3,      U, DATI,
*NEXT,
*          J/DST38
*****

```

.CASE 5 OF BSRC21

| | | | | | |
|----|---------|-----|-----|-----|-----|
| | F/SRC21 | <-- | 661 | 23 | 24 |
| | F/SRC32 | <-- | 662 | 24 | 25 |
| | F/SRC33 | <-- | 663 | 25 | 26 |
| | F/SRC34 | <-- | 664 | 26 | 27 |
| | F/SRC35 | <-- | 665 | 27 | 28 |
| | F/SRC36 | <-- | 666 | 28 | 29 |
| | F/SRC37 | <-- | 667 | 29 | 30 |
| | F/SRC30 | <-- | 772 | 32 | 31 |
| | F/SRC31 | <-- | 773 | 33 | 32 |
| | F/SWB03 | <-- | 73 | 289 | 129 |
| | F/XOR02 | <-- | 47 | 294 | 131 |
| | F/SXT03 | <-- | 464 | 298 | 132 |
| 49 | F/SXT04 | <-- | 465 | 299 | 133 |

744
 000000001000
 1101 11 11 10 10 000 000 0100 0
 00000 000110 11000 000001001

DST14:0744

```

*****
*-----*
*P2,      D+R(DF) MINUS (1 OR 2),
*P3,      R(DF)+D (A ADDR),
*NEXT,
*          J/DST08
*****

```

11 53 42

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|--------------|---------------------|-------|------|-----|------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| .CASE | 6 OF BSRC21 | F/SRC21 | <-- | 661 | 23 | 24 | | | | | | | | |
| | | F/SRC32 | <-- | 662 | 24 | 25 | | | | | | | | |
| | | F/SRC33 | <-- | 663 | 25 | 26 | | | | | | | | |
| | | F/SRC34 | <-- | 664 | 26 | 27 | | | | | | | | |
| | | F/SRC35 | <-- | 665 | 27 | 28 | | | | | | | | |
| | | F/SRC36 | <-- | 666 | 28 | 29 | | | | | | | | |
| | | F/SRC37 | <-- | 667 | 29 | 30 | | | | | | | | |
| | | F/SRC30 | <-- | 772 | 32 | 31 | | | | | | | | |
| | | F/SRC31 | <-- | 773 | 33 | 32 | | | | | | | | |
| | | F/SWB03 | <-- | 73 | 289 | 129 | | | | | | | | |
| | | F/XOR02 | <-- | 47 | 294 | 131 | | | | | | | | |
| | | F/SXT03 | <-- | 464 | 298 | 132 | | | | | | | | |
| 50 | DST15:0745 | F/SXT04 | <-- | 465 | 299 | 133 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | |
| | *P2, | D+R(DF) MINUS 2, | * | | | | | | | | | | | |
| | *P3, | R(DF)+D (A ADDR), | * | | | | | | | | | | | |
| | *NEXT, | | * | | | | | | | | | | | |
| | * | J/DST09 | * --> | 14 | 54 | 43 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| .CASE | 7 OF BSRC21 | F/SRC21 | <-- | 661 | 23 | 24 | | | | | | | | |
| | | F/SRC32 | <-- | 662 | 24 | 25 | | | | | | | | |
| | | F/SRC33 | <-- | 663 | 25 | 26 | | | | | | | | |
| | | F/SRC34 | <-- | 664 | 26 | 27 | | | | | | | | |
| | | F/SRC35 | <-- | 665 | 27 | 28 | | | | | | | | |
| | | F/SRC36 | <-- | 666 | 28 | 29 | | | | | | | | |
| | | F/SRC37 | <-- | 667 | 29 | 30 | | | | | | | | |
| | | F/SRC30 | <-- | 772 | 32 | 31 | | | | | | | | |
| | | F/SRC31 | <-- | 773 | 33 | 32 | | | | | | | | |
| | | F/SWB03 | <-- | 73 | 289 | 129 | | | | | | | | |
| | | F/XOR02 | <-- | 47 | 294 | 131 | | | | | | | | |
| | | F/SXT03 | <-- | 464 | 298 | 132 | | | | | | | | |
| 51 | DST16:0746 | F/SXT04 | <-- | 465 | 299 | 133 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | |
| | *P1, | BA+PC CURRENT MODE, | * | | | | | | | | | | | |
| | *P2, | D+PC PLUS 2, | * | | | | | | | | | | | |
| | *P3, | PC+D (A ADDR), | * | | | | | | | | | | | |
| | *P3, | U,DATI, | * | | | | | | | | | | | |
| | *NEXT, | | * | | | | | | | | | | | |
| | * | J/DST0E | * --> | 516 | 44 | 37 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |

745 00000001000
 1101 11 11 10 10 000 000 0100 0
 00000 000110 11000 000001100

746 00000001011
 1001 11 11 10 01 111 000 0101 0
 10110 000110 11000 101001110

E05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 42

| BOX NO. .CASE | TAG: ADDRESS 8 OF BSRC21 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------------|---------------------------------------|--|--------------------------|--------------------|------------|-------------|-------------------------------------|
| | | F/SRC21 <-- | 661 23 24 | | | | |
| | | F/SRC32 <-- | 662 24 25 | | | | |
| | | F/SRC33 <-- | 663 25 26 | | | | |
| | | F/SRC34 <-- | 664 26 27 | | | | |
| | | F/SRC35 <-- | 665 27 28 | | | | |
| | | F/SRC36 <-- | 666 28 29 | | | | |
| | | F/SRC37 <-- | 667 29 30 | | | | |
| | | F/SRC30 <-- | 772 32 31 | | | | |
| | | F/SRC31 <-- | 773 33 32 | | | | |
| | | F/SWB03 <-- | 73 289 129 | | | | |
| | | F/XOR02 <-- | 47 294 131 | | | | |
| | | F/SXT03 <-- | 464 298 132 | | | | |
| | | F/SXT04 <-- | 465 299 133 | | | | |
| 52 | DST17:0747 | | | | | | |
| | ***** | | | | | | |
| | *-----* | | | | | | |
| | *P1, BA+PC CURRENT MODE, | * | | | | | |
| | *P2, D+PC PLUS 2, | * | | | | | |
| | *P3, PC+D (A ADDR), | * | | | | | |
| | *P3 U,DATI, | * | | | | | |
| | *NEXT, | * | | | | | |
| | * J/DST07 | * --> | 517 45 37 | | | | |
| | ***** | | | | | | |
| | | F/DST04 <-- | 514 42 36 | | | | |
| | | F/DST14 <-- | 744 49 40 | | | | |
| 53 | DST08:0011 | | | | | | |
| | ***** | | | | | | |
| | *-----* | | | | | | |
| | *P1 BA+R(DF) CURRENT MODE, | * | | | | | |
| | *ENABLE, MAINTENANCE, | * | | | | | |
| | *P3 U,DATI, | * | | | | | |
| | *NEXT, BUTR(SMO # BYTE), | * | | | | | |
| | * J/DST21 | * | | | | | |
| | | J/DST21 * --> | 100 524 55 43 | | | | |
| | | J/DST22 * --> | 101 525 56 44 | | | | |
| | | J/DST19 * --> | 110 526 57 44 | | | | |
| | | J/DST20 * --> | 111 527 58 45 | | | | |
| | ***** | | | | | | |

747 00000001011
 1001 11 11 10 01 111 000 0101 0
 10110 000110 11000 101001111

11 00000001111
 0000 00 00 10 10 000 000 0001 0
 10011 000000 01001 101010100

F05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 43

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|--------|
| | | OFST | ADDR | BOX | | | | | PAGE | RIF | |
| 54 | DST09:0014 | F/DST05 | <-- | 515 | 43 | 37 | | | | | |
| | | F/DST15 | <-- | 745 | 50 | 41 | | | | | |
| | ***** | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P1, BA+R(DF), CURRENT MODE, | | | | | | | | | | |
| | *P3 U, DATI, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | | J/DST38 | --> | 645 | 63 | 46 | | | | | |
| | ***** | | | | | | | | | | |
| .CASE | 1 OF BDST01 | F/DST01 | <-- | 511 | 39 | 35 | | | | | |
| | | F/DST02 | <-- | 512 | 40 | 36 | | | | | |
| | | F/DST11 | <-- | 741 | 46 | 38 | | | | | |
| | | F/DST12 | <-- | 742 | 47 | 39 | | | | | |
| | | F/DST08 | <-- | 11 | 53 | 42 | | | | | |
| | | F/DST30 | <-- | 20 | 60 | 45 | | | | | |
| | | F/DST40 | <-- | 30 | 65 | 47 | | | | | |
| 55 | DST21:0524 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | | | |
| | *NEXT, BUT(DOP), | | | | | | | | | | |
| | | J/DST41 | --> | 0000 | 400 | 69 | 48 | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | J/CMPOS | --> | 0010 | 402 | 106 | 66 | | | | |
| | | J/BIT04 | --> | 0011 | 403 | 107 | 66 | | | | |
| | | J/BIC04 | --> | 0100 | 404 | 108 | 66 | | | | |
| | | J/BIS04 | --> | 0101 | 405 | 109 | 67 | | | | |
| | | J/ADD04 | --> | 0110 | 406 | 110 | 67 | | | | |
| | | J/XOR03 | --> | 0111 | 407 | 295 | 131 | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | |
| | ***** | | | | | | | | | | |

```

14      0000 00 00 10 10 000 000 0001 0
      10110 000000 11000 110100101
    
```

```

524    0000 11 10 00 00 000 000 0000 0
      00000 100000 00001 100000000
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|-----------------------|--------------------|------|------|-----|------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| .CASE | 2 OF BDST01 | | | | | | | | | | | | | |
| | | F/DST01 | <-- | 511 | 39 | 35 | | | | | | | | |
| | | F/DST02 | <-- | 512 | 40 | 36 | | | | | | | | |
| | | F/DST11 | <-- | 741 | 46 | 38 | | | | | | | | |
| | | F/DST12 | <-- | 742 | 47 | 39 | | | | | | | | |
| | | F/DST08 | <-- | 11 | 53 | 42 | | | | | | | | |
| | | F/DST30 | <-- | 20 | 60 | 45 | | | | | | | | |
| 56 | DST22:0525 | F/DST40 | <-- | 30 | 65 | 47 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | | | | | | |
| | *NEXT, BUT(DIAGNOSE), | | | | | | | | | | | | | |
| | * J/DST24 | | --> | 31 | 56 | 47 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| .CASE | 3 OF BDST01 | | | | | | | | | | | | | |
| | | F/DST01 | <-- | 511 | 39 | 35 | | | | | | | | |
| | | F/DST02 | <-- | 512 | 40 | 36 | | | | | | | | |
| | | F/DST11 | <-- | 741 | 46 | 38 | | | | | | | | |
| | | F/DST12 | <-- | 742 | 47 | 39 | | | | | | | | |
| | | F/DST08 | <-- | 11 | 53 | 42 | | | | | | | | |
| | | F/DST30 | <-- | 20 | 60 | 45 | | | | | | | | |
| | | F/DST40 | <-- | 30 | 65 | 47 | | | | | | | | |
| 57 | DST19:0526 | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | | | | | | |
| | *NEXT, BUT(DOP), | | | | | | | | | | | | | |
| | * J/SWB04 | | --> | 0000 | 720 | 290 | 129 | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | | |
| | | J/CMP04 | --> | 0010 | 722 | 95 | 62 | | | | | | | |
| | | J/BIT03 | --> | 0011 | 723 | 96 | 62 | | | | | | | |
| | | J/BIC03 | --> | 0100 | 724 | 97 | 63 | | | | | | | |
| | | J/BIS03 | --> | 0101 | 725 | 98 | 63 | | | | | | | |
| | | J/ADD03 | --> | 0110 | 726 | 99 | 63 | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | | |
| | | J/CMP03 | --> | 1010 | 732 | 102 | 64 | | | | | | | |
| | | J/BIT03 | --> | 1011 | 733 | 103 | 65 | | | | | | | |
| | | J/BIC03 | --> | 1100 | 734 | 104 | 65 | | | | | | | |
| | | J/BIS03 | --> | 1101 | 735 | 105 | 65 | | | | | | | |
| | | J/SUB03 | --> | 1110 | 736 | 100 | 64 | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | |

525
 0000 11 10 00 00 000 000 0000 0
 00000 100000 11011 000011001

526
 0000 11 10 00 00 000 000 0000 0
 00000 100000 00001 111010000

H05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 45

| BOX NO. .CASE | TAG: ADDRESS 4 OF BDST01 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | EXTENSION | | | | | | | | | |
|------------------|---------------------------------|--|--------------------------|------|------------|------------|-----------|-----|-----|-------------|--|-----|--|--|--|---------------------------------|
| | | | | | | | UBF | UPF | RIF | COUT CLOCKS | | | | | | |
| | | F/DST01 | <-- | 511 | 39 | 35 | | | | | | | | | | |
| | | F/DST02 | <-- | 512 | 40 | 36 | | | | | | | | | | |
| | | F/DST11 | <-- | 741 | 46 | 38 | | | | | | | | | | |
| | | F/DST12 | <-- | 742 | 47 | 39 | | | | | | | | | | |
| | | F/DST08 | <-- | 11 | 53 | 42 | | | | | | | | | | |
| | | F/DST30 | <-- | 20 | 60 | 45 | | | | | | | | | | |
| 58 | DST20:0527 | F/DST40 | <-- | 30 | 65 | 47 | | | | | | | | | | |
| | ***** | | | | | | | | | | | 527 | | | | 000000001000 |
| | *-----* | | | | | | | | | | | | | | | 0000 11 10 00 00 000 000 0000 0 |
| | *P3, MD+DATA, | | | | | | | | | | | | | | | |
| | *NEXT, BUT(DIAGNOSE), | | | | | | | | | | | | | | | |
| | * J/DST23 | | --> | 34 | 71 | 49 | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | |
| 59 | DST29:0015 | F/DST06 | <-- | 516 | 44 | 37 | | | | | | | | | | |
| | ***** | | | | | | | | | | | 15 | | | | 000000001000 |
| | *-----* | | | | | | | | | | | | | | | 1001 10 11 10 10 110 000 0100 0 |
| | *P2, D+R(DF) PLUS MD(D), | | | | | | | | | | | | | | | |
| | *P3, R(DST X)+D (B ADDR), | | | | | | | | | | | | | | | |
| | *NEXT, J/DST30 | | --> | VV | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | |
| 60 | DST30:0020 | F/DST29 | <-- | VV | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | 20 | | | | 00000000111 |
| | *-----* | | | | | | | | | | | | | | | 0000 00 00 11 01 110 000 0001 0 |
| | *P1, BA+R(DST X), CURRENT MODE, | | | | | | | | | | | | | | | |
| | *ENABLE, MAINTENANCE, | | | | | | | | | | | | | | | |
| | *P3, U, DATIB(P), | | | | | | | | | | | | | | | |
| | *NEXT, BUTR(SMD # BYTE), | | | | | | | | | | | | | | | |
| | * J/DST21 | | --> | 100 | 524 | 55 | 43 | | | | | | | | | |
| | * J/DST22 | | --> | 101 | 525 | 56 | 44 | | | | | | | | | |
| | * J/DST19 | | --> | 110 | 526 | 57 | 44 | | | | | | | | | |
| | * J/DST20 | | --> | 111 | 527 | 58 | 45 | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | |

J05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 47

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | | | | | |
|-------------|--------------|--|-----------------------|-----------|---------|---------|----------|---------|------|--------|--|--|--|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT | CLOCKS | | | |
| 65 | DST40:0030 | F/DST39 | <-- | 25 | 64 | 46 | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P1, | BA+R(DST I), CURRENT MODE, | | | | | | | | | | | |
| | *ENABLE, | MAINTENANCE, | | | | | | | | | | | |
| | *P3, | U, DATIB(P), | | | | | | | | | | | |
| | *NEXT, | BUTR(SMD # BYTE), | | | | | | | | | | | |
| | | J/DST21 | | | | | | | | | | | |
| | | J/DST21 | --> | 100 | 524 | 55 | 43 | | | | | | |
| | | J/DST22 | --> | 101 | 525 | 56 | 44 | | | | | | |
| | J/DST19 | --> | 110 | 526 | 57 | 44 | | | | | | | |
| | J/DST20 | --> | 111 | 527 | 58 | 45 | | | | | | | |
| ***** | | | | | | | | | | | | | |
| 66 | DST24:0031 | F/DST22 | <-- | 525 | 56 | 44 | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P2, | D+MD, | | | | | | | | | | | |
| | *NEXT, | BUTR(ODD ADDRESS), | | | | | | | | | | | |
| | | J/DST27 | --> | 10 | 762 | 67 | 47 | | | | | | |
| | J/DST28 | --> | 11 | 763 | 68 | 48 | | | | | | | |
| ***** | | | | | | | | | | | | | |
| .CASE 67 | 1 OF BDST24 | F/DST24 | <-- VV | | | | | | | | | | |
| | DST27:0762 | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P2, | D+D(LO) # D(LO), | | | | | | | | | | | |
| | | SR+D(LO) # D(LO), D(C)+PS(C), | | | | | | | | | | | |
| | *P3, | R(DST)+D (B ADDR), | | | | | | | | | | | |
| | *NEXT, | BUT(DOP), | | | | | | | | | | | |
| | | J/DST42 | | | | | | | | | | | |
| | | J/DST42 | --> | 1000 | 410 | 70 | 49 | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | |
| | | J/CMPB04 | --> | 1010 | 412 | 113 | 68 | | | | | | |
| | | J/BITB04 | --> | 1011 | 413 | 114 | 68 | | | | | | |
| | | J/BICB04 | --> | 1100 | 414 | 115 | 69 | | | | | | |
| | J/BISB04 | --> | 1101 | 415 | 116 | 69 | | | | | | | |
| | J/SUB05 | --> | 1110 | 416 | 111 | 67 | | | | | | | |
| | J/OTH01 | --> | 1111 | 417 | 285 | 127 | | | | | | | |
| ***** | | | | | | | | | | | | | |

```

30
0000 00 00 11 01 110 000 0001 0
10011 000000 01001 101010100

```

```

31
1010 11 10 00 00 000 000 0100 0
00000 000000 10011 111110010

```

```

762
1111 00 11 01 01 110 001 0110 0
00001 011110 00001 100001000

```

K05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 48

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|------------------------------------|--------------------|------------|-------|--------|-------|-------------|-----------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF COUT | CLOCKS |
| | | | | | | | UPF | |
| 68 | 2 OF BDST24 DST28:0763 | F/DST24 <-- | | 31 | 66 | 47 | | |
| | ***** | | | 763 | | | 00000001000 | |
| | *-----* | | | 1111 | 00 11 | 01 01 | 110 001 | 0110 0 |
| | *P2, D+D(HI) # D(HI), | | | 00100 | 011110 | 00001 | 100001000 | |
| | * SR+D(HI) # D(HI), D(C)+PS(C), | | | | | | | |
| | *P3, R(DST)+D (B ADDR), | | | | | | | |
| | *NEXT, BUT(DOP), | | | | | | | |
| | * J/DST42 | | | | | | | |
| | | J/DST42 --> | 1000 | 410 | 70 | 49 | | |
| | | UNDEFINED CASE | | | | | | |
| | | J/CMPB04 --> | 1010 | 412 | 113 | 68 | | |
| | | J/BITB04 --> | 1011 | 413 | 114 | 68 | | |
| | | J/BICB04 --> | 1100 | 414 | 115 | 69 | | |
| | | J/BISB04 --> | 1101 | 415 | 116 | 69 | | |
| | | J/SUB05 --> | 1110 | 416 | 111 | 67 | | |
| | | J/OTH01 --> | 1111 | 417 | 285 | 127 | | |
| | ***** | | | | | | | |
| 69 | 1 OF BDST21 DST41:0400 | F/DST21 <-- | | 524 | 55 | 43 | | |
| | ***** | | | 400 | | | 00000001000 | |
| | * FOR SOP'S TO MEMORY FOR SOP'S TO | | | 1010 | 11 10 | 00 00 | 000 001 | 0110 0 |
| | *MEMORY FOR ROR, SBC | | | 00000 | 000000 | 00100 | 100010000 | |
| | *-----* | | | | | | | |
| | *P2, D+MD, SR+MD, D(C)+PS(C), | | | | | | | |
| | *NEXT, BUT(SOP), | | | | | | | |
| | * J/ASR06 | | | | | | | |
| | | J/ASR06 --> | 0000 | 420 | 165 | 87 | | |
| | | J/ROL03 --> | 0001 | 421 | 163 | 87 | | |
| | | J/ASR05 --> | 0010 | 422 | 164 | 87 | | |
| | | J/ASL03 --> | 0011 | 423 | 168 | 88 | | |
| | | UNDEFINED CASE | | | | | | |
| | | J/SXT06 --> | 0101 | 427 | 301 | 134 | | |
| | | UNDEFINED CASE | | | | | | |
| | | UNDEFINED CASE | | | | | | |
| | | J/CLR02 --> | 1000 | 430 | 153 | 83 | | |
| | | J/COM03 --> | 1001 | 431 | 154 | 84 | | |
| | | J/INC03 --> | 1010 | 432 | 155 | 84 | | |
| | | J/DEC03 --> | 1011 | 433 | 156 | 84 | | |
| | | J/NEG03 --> | 1100 | 434 | 157 | 85 | | |
| | | J/ADC03 --> | 1101 | 435 | 159 | 85 | | |
| | | J/SBC05 --> | 1110 | 436 | 160 | 86 | | |
| | | J/TST02 --> | 1111 | 437 | 162 | 86 | | |
| | ***** | | | | | | | |

L05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 49

| BOX NO. .CASE | TAG: ADDRESS 1 OF BOST27 | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------------|-------------------------------------|--------------------|--------------------|------------|----------|--------------------------|-------------|------------|------------|-------------|----------------|-----|--------|
| | | | OFST | ADDR | BOX | | | | | | PAGE | RIF | |
| 70 | DST42:0410 | F/DST27 F/DST28 | <-- <-- | 762 763 | 67 68 | 47 48 | | | | | | | |
| | | ***** | | | | | | | | | 000000001000 | | |
| | | ----- | | | | | | | | | 000 010 0100 0 | | |
| | *P2, D+D SIGN EXTENDED, D(C)+ALU00, | | | | | | | | | | 101010000 | | |
| | *NEXT, BUT(SOP), | | | | | | | | | | | | |
| | * J/ASRB11 | | | | | | | | | | | | |
| | | J/ASRB11 | --> | 0000 | 520 | 186 | 94 | | | | | | |
| | | J/ROLB02 | --> | 0001 | 521 | 179 | 92 | | | | | | |
| | | J/ASRB05 | --> | 0010 | 522 | 180 | 92 | | | | | | |
| | | J/ASLB02 | --> | 0011 | 523 | 187 | 94 | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | | |
| | | J/CLRB02 | --> | 1000 | 530 | 169 | 89 | | | | | | |
| | | J/COMB02 | --> | 1001 | 531 | 170 | 89 | | | | | | |
| | | J/INCB02 | --> | 1010 | 532 | 171 | 89 | | | | | | |
| | | J/DECB02 | --> | 1011 | 533 | 172 | 90 | | | | | | |
| | | J/NEGB03 | --> | 1100 | 534 | 173 | 90 | | | | | | |
| | | J/ADCB02 | --> | 1101 | 535 | 175 | 91 | | | | | | |
| | | J/SBCB05 | --> | 1110 | 536 | 176 | 91 | | | | | | |
| | | J/TSTB02 | --> | 1111 | 537 | 178 | 92 | | | | | | |
| | ***** | | | | | | | | | | | | |
| 71 | DST23:0034 | F/DST20 | <-- | 527 | 58 | 45 | | | | | | | |
| | | ***** | | | | | | | | | 000000001000 | | |
| | | ----- | | | | | | | | | 000 000 0100 0 | | |
| | *P2, D+MD | | | | | | | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | | | | | | |
| | * J/DST25 | | | | | | | | | | | | |
| | | J/DST25 | --> | 10 | 642 | 72 | 50 | | | | | | |
| | | J/DST26 | --> | 11 | 643 | 73 | 51 | | | | | | |
| | | ***** | | | | | | | | | | | |

410
1111 00 00 01 01 000 010 0100 0
00010 000000 00100 101010000

34
1010 11 10 00 00 000 000 0100 0
00000 000000 10011 110100010

M05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 50

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | |
|------------------|-------------------------|--|--------------------------|-------------|------------|------------|-------------|--------------|
| | | | | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | RIF UPF |
| 72 | DST25:0642 | F/DST23 <-- | 34 71 49 | 642 | | | | 000000001000 |
| | | | | 1111 | 00 11 | 01 01 | 110 000 | 0100 0 |
| | | | | 00001 | 011110 | 00001 | 111010000 | |
| | *P2, D+D(L0) # D(L0) | | | | | | | |
| | *P3, R(DST)+D (B ADDR), | | | | | | | |
| | *NEXT, BUT(DOP), | | | | | | | |
| | J/SWB04 | * --> | 0000 720 290 129 | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | J/CMPO4 | * --> | 0010 722 95 62 | | | | | |
| | J/BIT03 | * --> | 0011 723 96 62 | | | | | |
| | J/BIC03 | * --> | 0100 724 97 63 | | | | | |
| | J/BIS03 | * --> | 0101 725 98 63 | | | | | |
| | J/ADD03 | * --> | 0110 726 99 63 | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | J/CMPO3 | * --> | 1010 732 102 64 | | | | | |
| | J/BIT03 | * --> | 1011 733 103 65 | | | | | |
| | J/BIC03 | * --> | 1100 734 104 65 | | | | | |
| | J/BIS03 | * --> | 1101 735 105 65 | | | | | |
| | J/SUB03 | * --> | 1110 736 100 64 | | | | | |
| | UNDEFINED CASE | | | | | | | |

N05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 51

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------------|-------------------------|--|--------------------------|------|------------|------------|--------------------|------------------|----------------|--|
| | | | | | | | | RIF | COUT CLOCKS | |
| 73 | DST26:0643 | F/DST23 <-- | | 34 | 71 | 49 | | | | |
| | ***** | | | | | | | 643 | 00000001000 | |
| | *-----* | | | | | | | 1111 00 11 01 01 | 110 000 0100 0 | |
| | *P2, D+D(HI) # D(HI), | | | | | | 00100 011110 00001 | 111010000 | | |
| | *P3, R(DST)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUT(DOP), | | | | | | | | | |
| | J/SWB04 | J/SWB04 --> | 0000 | 720 | 290 | 129 | | | | |
| | UNDEFINED CASE | | | | | | | | | |
| | J/CMP04 | J/CMP04 --> | 0010 | 722 | 95 | 62 | | | | |
| | J/BIT03 | J/BIT03 --> | 0011 | 723 | 96 | 62 | | | | |
| | J/BIC03 | J/BIC03 --> | 0100 | 724 | 97 | 63 | | | | |
| | J/BIS03 | J/BIS03 --> | 0101 | 725 | 98 | 63 | | | | |
| | J/ADD03 | J/ADD03 --> | 0110 | 726 | 99 | 63 | | | | |
| | UNDEFINED CASE | | | | | | | | | |
| | UNDEFINED CASE | | | | | | | | | |
| | UNDEFINED CASE | | | | | | | | | |
| | J/CMP03 | J/CMP03 --> | 1010 | 732 | 102 | 64 | | | | |
| | J/BIT03 | J/BIT03 --> | 1011 | 733 | 103 | 65 | | | | |
| | J/BIC03 | J/BIC03 --> | 1100 | 734 | 104 | 65 | | | | |
| | J/BIS03 | J/BIS03 --> | 1101 | 735 | 105 | 65 | | | | |
| | J/SUB03 | J/SUB03 --> | 1110 | 736 | 100 | 64 | | | | |
| | UNDEFINED CASE | | | | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|-------------------------------------|--------------------|------------|------|-----|------|------|---------------------------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | UPF | |
| 76 | 37 OF BFET03 BIC01:0444 | F/FET03 <-- | | 700 | 3 | 11 | | |
| | ***** | | | | | | | 444 00000001000 |
| | *-----* | | | | | | | 0010 00 00 10 11 000 001 0100 1 |
| | *P2, D+-R(SF) * R(DF),D(C)+PS(C), * | | | | | | | 00010 101110 10000 111000000 |
| | *P2, U,IR+DATA, * | | | | | | | |
| | *P3, R(DF)+D (B ADDR),MD(D)+DATA, * | | | | | | | |
| | * RESET STATE, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), * | | | | | | | |
| | * J/FET03 * | | | | | | | |
| | * J/FET03 --> | 00 | 700 | 3 | 11 | | | |
| | * J/SER01 --> | 01 | 701 | 385 | 160 | | | |
| | * J/FET01 --> | 10 | 702 | 1 | 2 | | | |
| | * J/SER02 --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | |
| 77 | 38 OF BFET03 BIS01:0445 | F/FET03 <-- | | 700 | 3 | 11 | | |
| | ***** | | | | | | | 445 00000001000 |
| | *-----* | | | | | | | 1110 00 00 10 11 000 001 0100 1 |
| | *P2, D+R(SF) OR R(DF),D(C)+PS(C), * | | | | | | | 00010 101110 10000 111000000 |
| | *P2, U,IR+DATA, * | | | | | | | |
| | *P3, R(DF)+D (B ADDR),MD(D)+DATA, * | | | | | | | |
| | * RESET STATE, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), * | | | | | | | |
| | * J/FET03 * | | | | | | | |
| | * J/FET03 --> | 00 | 700 | 3 | 11 | | | |
| | * J/SER01 --> | 01 | 701 | 385 | 160 | | | |
| | * J/FET01 --> | 10 | 702 | 1 | 2 | | | |
| | * J/SER02 --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|------------------------------------|--------------------|------------|------|-----|------|------|---------------------------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | | UPF |
| 78 | 39 OF BFET03 ADD01:0446 | F/FET03 <-- | | 700 | 3 | 11 | | |
| | ***** | | | | | | | 446 000000001000 |
| | *-----* | | | | | | | 1001 00 00 10 11 000 110 0100 1 |
| | *P2, D+R(SF) PLUS R(DF), | | | | | | | 00010 101110 10000 111000000 |
| | * D(C)+COUT15, | | | | | | | |
| | *P2 U, IR+DATA, | | | | | | | |
| | *P3, R(DF)+D (B ADDR), MD(D)+DATA, | | | | | | | |
| | * RESET STATE, | | | | | | | |
| | * *DEFER, SET CC, | | | | | | | |
| | * *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | | J/FET03 --> | | 00 | 700 | 3 | 11 | |
| | | J/SER01 --> | | 01 | 701 | 385 | 160 | |
| | | J/FET01 --> | | 10 | 702 | 1 | 2 | |
| | | J/SER02 --> | | 11 | 703 | 387 | 162 | |
| | ***** | | | | | | | |
| 79 | 47 OF BFET03 SUB01:0456 | F/FET03 <-- | | 700 | 3 | 11 | | |
| | ***** | | | | | | | 456 000000001000 |
| | *-----* | | | | | | | 1101 00 01 10 10 000 110 0100 1 |
| | *P2, D+R(DF) MINUS R(SF), | | | | | | | 00010 100110 10000 111000000 |
| | * D(C)+COUT15, | | | | | | | |
| | *P2 U, IR+DATA, | | | | | | | |
| | *P3, R(DF)+D (A ADDR), MD(D)+DATA, | | | | | | | |
| | * RESET STATE, | | | | | | | |
| | * *DEFER, SET CC, | | | | | | | |
| | * *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | | J/FET03 --> | | 00 | 700 | 3 | 11 | |
| | | J/SER01 --> | | 01 | 701 | 385 | 160 | |
| | | J/FET01 --> | | 10 | 702 | 1 | 2 | |
| | | J/SER02 --> | | 11 | 703 | 387 | 162 | |
| | ***** | | | | | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------------------|---|---------------------------------------|-----------------------|------|--------------------|----------------|----------|---------------------------|
| .TOC .CASE 80 | REGISTER-REGISTER DOUBLE OPERAND - BYTE" 43 OF BFET03 CMPB01:0452 F/FET03 | <-- | 700 3 11 | 452 | | | | 000000001000 |
| | *-----* | | | | 1101 00 00 10 11 | 000 101 0100 1 | | |
| | *P2, D+R(SF) MINUS R(DF), | | | | 00010 100000 10000 | 111000000 | | |
| | * D(C)+COUT07, | | | | | | | |
| | *P2 U, IR+DATA, | | | | | | | |
| | *P3 MD(D)+DATA, RESET STATE, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | * J/FET03 | --> | 00 700 3 11 | | | | | |
| | * J/SER01 | --> | 01 701 385 160 | | | | | |
| | * J/FET01 | --> | 10 702 1 2 | | | | | |
| | * J/SER02 | --> | 11 703 387 162 | | | | | |
| .CASE 81 | 44 OF BFET03 BITB01:0453 F/FET03 | <-- | 700 3 11 | 453 | | | | 000000001000 |
| | *-----* | | | | 1011 00 00 10 11 | 000 001 0100 1 | | |
| | *P2, D+R(SF) AND R(DF), D(C)+PS(C), | | | | 00010 100000 10000 | 111000000 | | |
| | *P2 U, IR+DATA, | | | | | | | |
| | *P3 MD(D)+DATA, RESET STATE, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | * J/FET03 | --> | 00 700 3 11 | | | | | |
| | * J/SER01 | --> | 01 701 385 160 | | | | | |
| | * J/FET01 | --> | 10 702 1 2 | | | | | |
| | * J/SER02 | --> | 11 703 387 162 | | | | | |

F06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 56

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|-------------|--------------|--|--------------------------|------|------------|------------|-------------|--------------|------|--------|--|
| | | | | | | | | RIF | COUT | | |
| .CASE 82 | 45 OF BFET03 | | | | | | | | | | |
| | BICB01:0454 | F/FET03 | <-- | 700 | 3 | 11 | | | | | |
| | ***** | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P2, | D+-R(SF) * R(DF), | | | | | | | | | |
| | *P2, | U, IR+DATA, | | | | | | | | | |
| | *P3, | R(DF)(LO)+D (B ADDR) | | | | | | | | | |
| | * | MD(D)+DATA, RESET STATE, | | | | | | | | | |
| | *DEFER, | SET CC, | | | | | | | | | |
| | *NEXT, | BUT(FOV # SERVICE), | | | | | | | | | |
| | J/FET03 | | | | | | | | | | |
| | J/FET03 | | --> | 00 | 700 | 3 | 11 | | | | |
| | J/SER01 | | --> | 01 | 701 | 385 | 160 | | | | |
| | J/FET01 | | --> | 10 | 702 | 1 | 2 | | | | |
| | J/SER02 | | --> | 11 | 703 | 387 | 162 | | | | |
| ***** | | | | | | | | | | | |
| .CASE 83 | 46 OF BFET03 | | | | | | | | | | |
| | BISB01:0455 | F/FET03 | <-- | 700 | 3 | 11 | | | | | |
| | ***** | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P2, | D+R(SF) OR R(DF), D(C)+PS(C), | | | | | | | | | |
| | *P2, | U, IR+DATA, | | | | | | | | | |
| | *P3, | R(DF)(LO)+D (B ADDR) | | | | | | | | | |
| | * | MD(D)+DATA, RESET STATE, | | | | | | | | | |
| | *DEFER, | SET CC, | | | | | | | | | |
| | *NEXT, | BUT(FOV # SERVICE), | | | | | | | | | |
| | J/FET03 | | | | | | | | | | |
| | J/FET03 | | --> | 00 | 700 | 3 | 11 | | | | |
| | J/SER01 | | --> | 01 | 701 | 385 | 160 | | | | |
| | J/FET01 | | --> | 10 | 702 | 1 | 2 | | | | |
| | J/SER02 | | --> | 11 | 703 | 387 | 162 | | | | |
| ***** | | | | | | | | | | | |
| | | | | 454 | | | | 000000111000 | | | |
| | | | | | 0010 | 00 00 | 10 11 | 000 000 | 0100 | 1 | |
| | | | | | 00010 | 101110 | 10000 | 111000000 | | | |
| | | | | 455 | | | | 000000111000 | | | |
| | | | | | 1110 | 00 00 | 10 11 | 000 001 | 0100 | 1 | |
| | | | | | 00010 | 101110 | 10000 | 111000000 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|---|------------------------------------|---------------------------------------|-----------------------|-------------------|----------------|----------------|----------|---------------------------------|--------------|
| .TOC " MEMORY-REGISTER DOUBLE OPERAND - WORD" | | | | | | | | | |
| .CASE 3 OF BSRC17 | | | | | | | | | |
| 84 | CMPO2:0622 | F/SRC17 F/SRC24 F/SRC29 | <-- <-- <-- | 466 752 753 | 21 37 38 | 23 34 35 | | | |
| | ***** | | | | | | | 622 | 000000001000 |
| | *-----* | | | | | | | | |
| | *P2, SR+MD, | | | | | | | 1010 11 10 00 00 000 000 0010 0 | |
| | *NEXT, | | | | | | | 00000 000000 11000 000011101 | |
| | * J/CMPO3 | | --> VV | | | | | | |
| 85 | CMPO3:0035 | F/CMPO2 | <-- VV | | | | | | |
| | ***** | | | | | | | 35 | 000000001000 |
| | *-----* | | | | | | | | |
| | *P2, D+SR MINUS R(DF),D(C)+COUT15, | | | | | | | 1101 00 00 00 00 000 110 0100 1 | |
| | *DEFER, SET CC, | | | | | | | 00000 000000 10000 111000010 | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | |
| | * J/FETO1 | | | | | | | | |
| | * J/FETO3 | | --> | 00 700 | 3 | 11 | | | |
| | * J/SERO1 | | --> | 01 701 | 385 | 160 | | | |
| | * J/FETO1 | | --> | 10 702 | 1 | 2 | | | |
| | * J/SERO2 | | --> | 11 703 | 387 | 162 | | | |
| ***** | | | | | | | | | |
| .CASE 4 OF BSRC17 | | | | | | | | | |
| 86 | BIT02:0623 | F/SRC17 F/SRC24 F/SRC29 | <-- <-- <-- | 466 752 753 | 21 37 38 | 23 34 35 | | | |
| | ***** | | | | | | | 623 | 000000001000 |
| | *-----* | | | | | | | | |
| | *P2, D+R(DF) AND MD,D(C)+PS(C), | | | | | | | 1011 11 10 10 10 000 001 0100 1 | |
| | *DEFER, SET CC, | | | | | | | 00000 000000 10000 111000010 | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | |
| | * J/FETO1 | | | | | | | | |
| | * J/FETO3 | | --> | 00 700 | 3 | 11 | | | |
| | * J/SERO1 | | --> | 01 701 | 385 | 160 | | | |
| | * J/FETO1 | | --> | 10 702 | 1 | 2 | | | |
| | * J/SERO2 | | --> | 11 703 | 387 | 162 | | | |
| ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---------------------------------------|--------------------|------------|-------|--------|-------|----------------|-----------|
| .CASE | 5 OF BSRC17 | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | RIF COUT | CLOCKS |
| 87 | BIC02:0624 | F/SRC17 <-- | 466 21 23 | | | | | |
| | | F/SRC24 <-- | 752 37 34 | | | | | |
| | | F/SRC29 <-- | 753 38 35 | | | | | |
| | ***** | | | 624 | | | 000000001000 | |
| | *-----* | | | 0111 | 11 10 | 10 10 | 000 001 0100 1 | |
| | *P2, D+R(DF) AND NOT MD,D(C)+PS(C), * | | | 00000 | 000110 | 10000 | 111000010 | |
| | *P3, R(DF)+D (A ADDR), * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUTR(SERVICE), * | | | | | | | |
| | * J/FET01 * | | | | | | | |
| | * J/FET03 * --> | 00 700 3 11 | | | | | | |
| | * J/SER01 * --> | 01 701 385 160 | | | | | | |
| | * J/FET01 * --> | 10 702 1 2 | | | | | | |
| | * J/SER02 * --> | 11 703 387 162 | | | | | | |
| | ***** | | | | | | | |
| .CASE | 6 OF BSRC17 | | | | | | | |
| 88 | BIS02:0625 | F/SRC17 <-- | 466 21 23 | | | | | |
| | | F/SRC24 <-- | 752 37 34 | | | | | |
| | | F/SRC29 <-- | 753 38 35 | | | | | |
| | ***** | | | 625 | | | 000000001000 | |
| | *-----* | | | 1110 | 11 10 | 10 10 | 000 001 0100 1 | |
| | *P2, D+R(DF) OR MD,D(C)+PS(C), * | | | 00000 | 000110 | 10000 | 111000010 | |
| | *P3, R(DF)+D (A ADDR), * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUTR(SERVICE), * | | | | | | | |
| | * J/FET01 * | | | | | | | |
| | * J/FET03 * --> | 00 700 3 11 | | | | | | |
| | * J/SER01 * --> | 01 701 385 160 | | | | | | |
| | * J/FET01 * --> | 10 702 1 2 | | | | | | |
| | * J/SER02 * --> | 11 703 387 162 | | | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|-------------------------------------|---------------------------------------|-----------------------|------|--------------|---------|-----------|---------------------------|
| .CASE | 7 OF BSRC17 | | | | | | | |
| 89 | ADD02:0626 | F/SRC17 <-- | 466 21 23 | | | | | |
| | | F/SRC24 <-- | 752 37 34 | | | | | |
| | | F/SRC29 <-- | 753 38 35 | | | | | |
| | ***** | | | 626 | | | | 000000001000 |
| | *P2, D+R(DF) PLUS MD(D), | | | | 1001 10 00 | 10 10 | 000 110 | 0100 1 |
| | * D(C)+COUT15, | | | | 00010 000110 | 10000 | 111000010 | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | | J/FETO3 * --> | 00 700 3 11 | | | | | |
| | | J/SERO1 * --> | 01 701 385 160 | | | | | |
| | | J/FETO1 * --> | 10 702 1 2 | | | | | |
| | | J/SERO2 * --> | 11 703 387 162 | | | | | |
| | ***** | | | | | | | |
| .CASE | 15 OF BSRC17 | | | | | | | |
| 90 | SUB02:0636 | F/SRC17 <-- | 466 21 23 | | | | | |
| | | F/SRC24 <-- | 752 37 34 | | | | | |
| | | F/SRC29 <-- | 753 38 35 | | | | | |
| | ***** | | | 636 | | | | 000000001000 |
| | *P2, D+R(DF) MINUS MD, D(C)+COUT15, | | | | 1101 11 10 | 10 10 | 000 110 | 0100 1 |
| | *P3, R(DF)+D (A ADDR), | | | | 00000 000110 | 10000 | 111000010 | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | | J/FETO3 * --> | 00 700 3 11 | | | | | |
| | | J/SERO1 * --> | 01 701 385 160 | | | | | |
| | | J/FETO1 * --> | 10 702 1 2 | | | | | |
| | | J/SERO2 * --> | 11 703 387 162 | | | | | |
| | ***** | | | | | | | |

JOB

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 60

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS | |
|---|-------------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------------|--------|-------------|
| .TOC " MEMORY-REGISTER DOUBLE OPERAND - BYTE" | | | | | | | | | |
| .CASE 11 OF BSRC17 | | | | | | | | | |
| 91 | CMPB02:0632 | F/SRC17 <-- | 466 21 23 | | | | | | |
| | | F/SRC24 <-- | 752 37 34 | | | | | | |
| | | F/SRC29 <-- | 753 38 35 | | | | | | |
| | ***** | | | | | | | 632 | 00000001000 |
| | *-----* | | | | | | | | |
| | *P2, D+R(SRC) MINUS R(DF), | | | | | | 1101 00 00 11 00 110 101 0100 1 | | |
| | * D(C)+COUT07, | | | | | | 00000 000000 10000 111000010 | | |
| | *DEFER, SET CC, | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | |
| | * J/FET01 | | | | | | | | |
| | | J/FET03 <--> | 00 700 3 11 | | | | | | |
| | | J/SER01 <--> | 01 701 385 160 | | | | | | |
| | | J/FET01 <--> | 10 702 1 2 | | | | | | |
| | | J/SER02 <--> | 11 703 387 162 | | | | | | |
| ***** | | | | | | | | | |
| .CASE 12 OF BSRC17 | | | | | | | | | |
| | | F/SRC17 <-- | 466 21 23 | | | | | | |
| | | F/SRC24 <-- | 752 37 34 | | | | | | |
| | | F/SRC29 <-- | 753 38 35 | | | | | | |
| 92 | BITB02:0633 | | | | | | | | |
| | ***** | | | | | | | 633 | 00000001000 |
| | *-----* | | | | | | | | |
| | *P2, D+R(SRC) AND R(DF),D(C)+PS(C), | | | | | | 1011 00 00 11 00 110 001 0100 1 | | |
| | *DEFER, SET CC, | | | | | | 00000 000000 10000 111000010 | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | |
| | * J/FET01 | | | | | | | | |
| | | J/FET03 <--> | 00 700 3 11 | | | | | | |
| | | J/SER01 <--> | 01 701 385 160 | | | | | | |
| | | J/FET01 <--> | 10 702 1 2 | | | | | | |
| | | J/SER02 <--> | 11 703 387 162 | | | | | | |
| ***** | | | | | | | | | |

K06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 61

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|--------------|-------------------------------|-------|------|-----|------|-----------------------|------|---------|---------|----------|-----------|--------|
| | | | | | | | | | | | | RIF | COUT |
| .CASE | 13 OF BSRC17 | | | | | | | | | | | | |
| 93 | BICB02:0634 | F/SRC17 | <-- | 466 | 21 | 23 | | | | | | | |
| | | F/SRC24 | <-- | 752 | 37 | 34 | | | | | | | |
| | | F/SRC29 | <-- | 753 | 38 | 35 | | | | | | | |
| | ***** | | | | | | | 634 | 0010 | 00 00 | 11 00 | 110 001 | 0100 1 |
| | *-----* | | | | | | | | 00000 | 001110 | 10000 | 111000010 | |
| | *P2, | D←R(SRC) * R(DF) D(C)+PS(C), | * | | | | | | | | | | |
| | *P3, | R(DF)(LO)+D (B ADDR), | * | | | | | | | | | | |
| | *DEFER, | SET CC, | * | | | | | | | | | | |
| | *NEXT, | BUTR(SERVICE), | * | | | | | | | | | | |
| | * | J/FETO1 | * | | | | | | | | | | |
| | * | J/FETO3 | * --> | 00 | 700 | 3 | 11 | | | | | | |
| | * | J/SERO1 | * --> | 01 | 701 | 385 | 160 | | | | | | |
| | * | J/FETO1 | * --> | 10 | 702 | 1 | 2 | | | | | | |
| | * | J/SERO2 | * --> | 11 | 703 | 387 | 162 | | | | | | |
| | ***** | | | | | | | | | | | | |
| .CASE | 14 OF BSRC17 | | | | | | | | | | | | |
| 94 | BISB02:0635 | F/SRC17 | <-- | 466 | 21 | 23 | | | | | | | |
| | | F/SRC24 | <-- | 752 | 37 | 34 | | | | | | | |
| | | F/SRC29 | <-- | 753 | 38 | 35 | | | | | | | |
| | ***** | | | | | | | 635 | 1110 | 00 00 | 11 00 | 110 001 | 0100 1 |
| | *-----* | | | | | | | | 00000 | 001110 | 10000 | 111000010 | |
| | *P2, | D←R(SRC) OR R(DF) D(C)+PS(C), | * | | | | | | | | | | |
| | *P3, | R(DF)(LO)+D (B ADDR), | * | | | | | | | | | | |
| | *DEFER, | SET CC, | * | | | | | | | | | | |
| | *NEXT, | BUTR(SERVICE), | * | | | | | | | | | | |
| | * | J/FETO1 | * | | | | | | | | | | |
| | * | J/FETO3 | * --> | 00 | 700 | 3 | 11 | | | | | | |
| | * | J/SERO1 | * --> | 01 | 701 | 385 | 160 | | | | | | |
| | * | J/FETO1 | * --> | 10 | 702 | 1 | 2 | | | | | | |
| | * | J/SERO2 | * --> | 11 | 703 | 387 | 162 | | | | | | |
| | ***** | | | | | | | | | | | | |

L06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 62

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---|------------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .TOC " REGISTER-MEMORY DOUBLE OPERAND - WORD" | | | | | | | |
| .CASE 3 OF BDST19 | | | | | | | |
| 95 | CMP04:0722 | F/DST19 <-- | 526 57 44 | | | | |
| | | F/DST25 <-- | 642 72 50 | | | | |
| | | F/DST26 <-- | 643 73 51 | | | | |
| | ***** | | | | | | |
| | * RELEASE BUS | | | | | | |
| | ----- | | | | | | |
| | *P2, D+R(SF) MINUS MD,D(C)+COUT15, | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | |
| | * J/FET01 | | | | | | |
| | | J/FET03 * --> | 00 700 3 11 | | | | |
| | | J/SER01 * --> | 01 701 385 160 | | | | |
| | | J/FET01 * --> | 10 702 1 2 | | | | |
| | | J/SER02 * --> | 11 703 387 162 | | | | |
| | ***** | | | | | | |
| .CASE 4 OF BDST19 | | | | | | | |
| 96 | BIT03:0723 | F/DST19 <-- | 526 57 44 | | | | |
| | | F/DST25 <-- | 642 72 50 | | | | |
| | | F/DST26 <-- | 643 73 51 | | | | |
| | ***** | | | | | | |
| | * RELEASE BUS | | | | | | |
| | ----- | | | | | | |
| | *P2, D+R(SF) AND MD,D(C)+PS(C), | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | |
| | * J/FET01 | | | | | | |
| | | J/FET03 * --> | 00 700 3 11 | | | | |
| | | J/SER01 * --> | 01 701 385 160 | | | | |
| | | J/FET01 * --> | 10 702 1 2 | | | | |
| | | J/SER02 * --> | 11 703 387 162 | | | | |
| | ***** | | | | | | |

722
 1101 11 10 10 11 00000001000
 00000 000000 10000 111000010

723
 1011 11 10 10 11 0000001000
 00000 000000 10000 111000010

M06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 63

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|-------------------------------------|---------------------------------------|-----------------------|-------------------|----------------|----------------|---------------------------------|
| .CASE 5 | OF BST19 | | | | | | |
| 97 | BIC03:0724 | F/DST19 F/DST25 F/DST26 | <-- <-- <-- | 526 642 643 | 57 72 73 | 44 50 51 | |
| | * PSZ01 SAME AS | | | | | | 724 |
| | *BRAOS | | | | | | 0010 11 10 10 11 000 001 0100 1 |
| | *-----* | | | | | | 10010 000000 11000 000000011 |
| | *P2, D+NOT R(SF) AND MD,D(C)+PS(C), | | | | | | |
| | *P3, U,DATO, | | | | | | |
| | *ENABLE, KJ, | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/BRAOS | | --> | 3 | 283 | 126 | |
| .CASE 6 | OF BST19 | | | | | | |
| 98 | BIS03:0725 | F/DST19 F/DST25 F/DST26 | <-- <-- <-- | 526 642 643 | 57 72 73 | 44 50 51 | |
| | * PSZ01 SAME AS | | | | | | 725 |
| | *BRAOS | | | | | | 1110 11 10 10 11 000 001 0100 1 |
| | *-----* | | | | | | 10010 000000 11000 000000011 |
| | *P2, D+R(SF) OR MD,D(C)+PS(C), | | | | | | |
| | *P3, U,DATO, | | | | | | |
| | *ENABLE, KJ, | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/BRAOS | | --> | 3 | 283 | 126 | |
| .CASE 7 | OF BST19 | | | | | | |
| 99 | ADD03:0726 | F/DST19 F/DST25 F/DST26 | <-- <-- <-- | 526 642 643 | 57 72 73 | 44 50 51 | |
| | * PSZ01 SAME AS | | | | | | 726 |
| | *BRAOS | | | | | | 1001 11 10 10 11 000 110 0100 1 |
| | *-----* | | | | | | 10010 000000 11000 000000011 |
| | *P2, D+R(SF) PLUS MD,D(C)+COUT15, | | | | | | |
| | *P3, U,DATO, | | | | | | |
| | *ENABLE, KJ, | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/BRAOS | | --> | 3 | 283 | 126 | |

N06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 64

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | CLOCK |
|------------|------------------------------------|---------------------------------------|-----------------------|-------------------|----------------|----------------|-------------------|-------|
| .CASE | 15 OF BOST19 | | | | | | | |
| 100 | SUB03:0736 | F/DST19 F/DST25 F/DST26 | <-- <-- <-- | 526 642 643 | 57 72 73 | 44 50 51 | | |
| | ***** | | | | | | | |
| | * P2, SR+MD, J/SUB04 | | --> VV | | | | | |
| 101 | SUB04:0045 | F/SUB03 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | * PSZ01 SAME AS | | | | | | | |
| | *BRA05 | | | | | | | |
| | ***** | | | | | | | |
| | *P2, D+SR MINUS R(SF),D(C)+COUT15, | | | | | | | |
| | *P3, U DATO, | | | | | | | |
| | *ENABLE, KJ | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | |
| .TOC .CASE | 11 OF BOST19 | | | | | | | |
| 102 | CMPB03:0732 | F/DST19 F/DST25 F/DST26 | <-- <-- <-- | 526 642 643 | 57 72 73 | 44 50 51 | | |
| | ***** | | | | | | | |
| | * RELEASE BUS | | | | | | | |
| | ***** | | | | | | | |
| | *P2, D+R(SF) MINUS R(DST), | | | | | | | |
| | * D(C)+COUT07, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FET01 | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | |
| | ***** | | | | | | | |

```

736
1010 11 10 00 00 000 000 0010 0
00000 000000 11000 000100101

45
1101 00 01 00 00 000 110 0100 1
10010 000000 11000 000000011

732
1101 01 11 10 11 110 101 0100 1
00000 000000 10000 111000010
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|--------------------|-------------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .CASE 12 OF BDST19 | | | | | | | |
| 103 | BITB03:0733 | F/DST19 <-- | 526 57 44 | | | | |
| | | F/DST25 <-- | 642 72 50 | | | | |
| | | F/DST26 <-- | 643 73 51 | | | | |
| | ***** | | | | | | |
| | * RELEASE BUS | | | | | | |
| | ***** | | | | | | |
| | *P2, D+R(SF) AND R(DST),D(C)+PS(C), | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | |
| | * J/FETO1 | | | | | | |
| | | J/FETO3 --> | 00 700 3 11 | | | | |
| | | J/SERO1 --> | 01 701 385 160 | | | | |
| | | J/FETO1 --> | 10 702 1 2 | | | | |
| | | J/SERO2 --> | 11 703 387 162 | | | | |
| | ***** | | | | | | |
| .CASE 13 OF BDST19 | | | | | | | |
| 104 | BICB03:0734 | F/DST19 <-- | 526 57 44 | | | | |
| | | F/DST25 <-- | 642 72 50 | | | | |
| | | F/DST26 <-- | 643 73 51 | | | | |
| | ***** | | | | | | |
| | * P2, D+-R(SF) * R(DST),D(C)+PS(C), | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | |
| | * J/BYTE01 | | | | | | |
| | | J/BYTE01 --> | 10 32 253 116 | | | | |
| | | J/BYTE02 --> | 11 33 254 116 | | | | |
| | ***** | | | | | | |
| .CASE 14 OF BDST19 | | | | | | | |
| 105 | BISB03:0735 | F/DST19 <-- | 526 57 44 | | | | |
| | | F/DST25 <-- | 642 72 50 | | | | |
| | | F/DST26 <-- | 643 73 51 | | | | |
| | ***** | | | | | | |
| | *P2, D+R(SF) OR R(DST),D(C)+PS(C), | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | |
| | * J/BYTE01 | | | | | | |
| | | J/BYTE01 --> | 10 32 253 116 | | | | |
| | | J/BYTE02 --> | 11 33 254 116 | | | | |
| | ***** | | | | | | |

733
 1011 01 11 10 11 00000001000
 00000 000000 10000 110 001 0100 1
 111000010

734
 0010 01 11 10 11 00000001000
 00000 000000 10011 000011010
 110 001 0100 1

735
 1110 01 11 10 11 00000001000
 00000 000000 10011 000011010
 110 001 0100 1

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|-----------|-------------------------------------|---------------------------------------|-----------------------|------|------------|--------------|-------------|-----------------------------|
| .CASE 106 | 3 OF BDST21 CMPOS:0402 | F/DST21 <-- | 524 55 43 | 402 | | | | 000000001000 |
| | * RELEASE BUS | | | | 1101 00000 | 11 10 000000 | 11 00 10000 | 110 110 0100 1 111000010 |
| | *P2, D+R(SRC) MINUS MD,D(C)+COUT15, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | * J/FETO3 | * --> | 00 700 3 11 | | | | | |
| | * J/SERO1 | * --> | 01 701 385 160 | | | | | |
| | * J/FETO1 | * --> | 10 702 1 2 | | | | | |
| | * J/SERO2 | * --> | 11 703 387 162 | | | | | |
| .CASE 107 | 4 OF BDST21 BIT04:0403 | F/DST21 <-- | 524 55 43 | 403 | | | | 000000001000 |
| | * RELEASE BUS | | | | 1011 00000 | 11 10 000000 | 11 00 10000 | 110 001 0100 1 111000010 |
| | *P2, D+R(SRC) AND MD,D(C)+PS(C), | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | * J/FETO3 | * --> | 00 700 3 11 | | | | | |
| | * J/SERO1 | * --> | 01 701 385 160 | | | | | |
| | * J/FETO1 | * --> | 10 702 1 2 | | | | | |
| | * J/SERO2 | * --> | 11 703 387 162 | | | | | |
| .CASE 108 | 5 OF BDST21 BIC04:0404 | F/DST21 <-- | 524 55 43 | 404 | | | | 000001001000 |
| | * PSZ01 SAME AS | | | | 0010 10010 | 11 10 000000 | 11 00 11000 | 110 001 0100 1 000000011 |
| | *BRA05 | | | | | | | |
| | *P2, D+NOT R(SRC) AND MD, | | | | | | | |
| | * D(C)+PS(C), | | | | | | | |
| | *ENABLE, KJ, | | | | | | | |
| | *P3, U.DATO, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, J/BRA05 | * --> | 3 283 126 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|-----------|---|---------------------------------------|------------------------|------|---------------|-----------------|----------------|---|
| .CASE 109 | 6 OF BDST21 BIS04:0405 | F/DST21 <-- | 524 55 43 | 405 | 1110 10010 | 11 10 000000 | 11 00 11000 | 000001001000 110 001 0100 1 000000011 |
| | * PSZ01 SAME AS *BRA05 | | | | | | | |
| | *P2, D+R(SRC) OR MD,D(C)+PS(C), *P3, U DATO, *ENABLE, KJ *DEFER, SET CC, *NEXT, * J/BRA05 | --> | 3 283 126 | | | | | |
| .CASE 110 | 7 OF BDST21 A0004:0406 | F/DST21 <-- | 524 55 43 | 406 | 1001 10010 | 11 10 000000 | 11 00 11000 | 000001001000 110 110 0100 1 000000011 |
| | * PSZ01 SAME AS *BRA05 | | | | | | | |
| | *P2, D+R(SRC) PLUS MD,D(C)+COUT15, *P3, U DATO, *ENABLE, KJ *DEFER, SET CC, *NEXT, * J/BRA05 | --> | 3 283 126 | | | | | |
| .CASE 111 | 7 OF BDST27 SUB05:0416 | F/DST27 <-- F/DST28 <-- | 762 67 47 763 68 48 | 416 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000000001000 000 000 0010 0 000101010 |
| | * SR+MD, *NEXT, * J/SUB06 | --> | 52 112 68 | | | | | |

E07

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | F/SUBOS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|--------------------------------------|--------------------|---------------------------------------|------------------------|----------|---------|---------|----------|-------------------|------|--------|
| 112 | SUB06:0052 | F/SUB05 | <-- | 416 111 67 | 52 | | | | 000001001000 | | |
| | * PSZ01 SAME AS | | | | | 1101 | 01 10 | 00 00 | 110 110 | 0100 | 1 |
| | *BRA05 | | | | | 10010 | 000000 | 11000 | 000000011 | | |
| | *P2, D+SR MINUS R(SRC),D(C)+COUT15, | | | | | | | | | | |
| | *P3, U DATO, | | | | | | | | | | |
| | *ENABLE, KJ | | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/BRA05 | | --> | 3 283 126 | | | | | | | |
| .TOC | MEMOR - MEMORY DOUBLE OPERAND - BYTE | | | | | | | | | | |
| .CASE | 3 OF BDST27 | | | | | | | | | | |
| 113 | CMP04:0412 | F/DST27 F/DST28 | <-- <-- | 762 67 47 763 68 48 | 412 | | | | 000000001000 | | |
| | * RELEASE BUS | | | | | 1101 | 01 11 | 11 00 | 110 101 | 0100 | 1 |
| | *P2, D+R(SRC) MINUS R(DST), | | | | | 00000 | 000000 | 10000 | 111000010 | | |
| | * D(C)+COUT07, | | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | | |
| | * J/FET01 | | | | | | | | | | |
| | * J/FET03 | | --> | 00 700 3 11 | | | | | | | |
| | * J/SER01 | | --> | 01 701 385 160 | | | | | | | |
| | * J/FET01 | | --> | 10 702 1 2 | | | | | | | |
| | * J/SER02 | | --> | 11 703 387 162 | | | | | | | |
| .CASE | 4 OF BDST27 | | | | | | | | | | |
| 114 | BIT04:0413 | F/DST27 F/DST28 | <-- <-- | 762 67 47 763 68 48 | 413 | | | | 000000001000 | | |
| | * RELEASE BUS | | | | | 1011 | 01 11 | 11 00 | 110 001 | 0100 | 1 |
| | *P2, D+R(SRC) AND R(DST), | | | | | 00000 | 000000 | 10000 | 111000010 | | |
| | * D(C)+PS(C), | | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | | |
| | * J/FET01 | | | | | | | | | | |
| | * J/FET03 | | --> | 00 700 3 11 | | | | | | | |
| | * J/SER01 | | --> | 01 701 385 160 | | | | | | | |
| | * J/FET01 | | --> | 10 702 1 2 | | | | | | | |
| | * J/SER02 | | --> | 11 703 387 162 | | | | | | | |

F07

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|-------------------------------------|--|-----------------------|------------|----------|----------|----------|--------------------|--------|
| .CASE | 5 OF BDST27 | | | | | | | | |
| 115 | BICB04:0414 | F/DST27 F/DST28 | <-- <-- | 762 763 | 67 68 | 47 48 | | | |
| | ***** | | | | | | | | |
| | * PSZ01 SAME AS | | | | | | | | |
| | *BRA05 | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D←R(SRC) * R(DST),D(C)+PS(C), | | | | | | | | |
| | *P3, U, DATOB, | | | | | | | | |
| | *ENABLE, KJ | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | |
| | ***** | | | | | | | | |
| .CASE | 6 OF BDST27 | | | | | | | | |
| 116 | BISB04:0415 | F/DST27 F/DST28 | <-- <-- | 762 763 | 67 68 | 47 48 | | | |
| | ***** | | | | | | | | |
| | * PSZ01 SAME AS | | | | | | | | |
| | *BRA05 | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D←R(SRC) OR R(DST),D(C)+PS(C), | | | | | | | | |
| | *P3, U, DATOB, | | | | | | | | |
| | *ENABLE, KJ | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | |
| | ***** | | | | | | | | |

```

414
0010 01 11 11 00 110 001 0100 1
10101 000000 11000 000000011
    
```

```

415
1110 01 11 11 00 110 001 0100 1
10101 000000 11000 000000011
    
```

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------------------------------------|--------------------------------|---------------------------------------|-----------------------|--------|---------|---------|----------|--|
| .TOC "SINGLE OPERAND EXECUTION" | | | | | | | | |
| .TOC "REGISTER SINGLE OPERAND - WORD" | | | | | | | | |
| .CASE 105 OF BFET03 | | | | | | | | |
| 117 | CLR01:0550 F/FET03 | <-- | 700 3 11 | 550 | 0011 | 11 10 | 00 10 | 00000001000 0000 100110 10000 111000000 |
| ***** | | | | | | | | |
| *-----* | | | | | | | | |
| | *P2, D+D,D(C)+ALU00, | | | | | | | |
| | *P2, U,IR+DATA, | | | | | | | |
| | *P3, R(DF)+D (A ADDR),MD+DATA, | | | | | | | |
| | * RESET STATE, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | | J/FET03 | --> | 00 700 | 3 | 11 | | |
| | | J/SER01 | --> | 01 701 | 385 | 160 | | |
| | | J/FET01 | --> | 10 702 | 1 | 2 | | |
| | | J/SER02 | --> | 11 703 | 387 | 162 | | |
| ***** | | | | | | | | |
| .CASE 106 OF BFET03 | | | | | | | | |
| 118 | COM01:0551 F/FET03 | <-- | 700 3 11 | 551 | 0000 | 11 10 | 10 10 | 00000001000 0000 100110 10000 111000000 |
| ***** | | | | | | | | |
| * CIN = 1 WITH ALU FUNCTION A | | | | | | | | |
| *-----* | | | | | | | | |
| | *P2, D+NOT R(DF) (A),D(C)+CIN, | | | | | | | |
| | *P2, U,IR+DATA, | | | | | | | |
| | *P3, R(DF)+D (A ADDR),MD+DATA, | | | | | | | |
| | * RESET STATE, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | | J/FET03 | --> | 00 700 | 3 | 11 | | |
| | | J/SER01 | --> | 01 701 | 385 | 160 | | |
| | | J/FET01 | --> | 10 702 | 1 | 2 | | |
| | | J/SER02 | --> | 11 703 | 387 | 162 | | |
| ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------------------|----------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------|
| 125 | SBC02:0065 | F/SBC01 | <-- | 556 | 124 | 72 | | |
| | ***** | | | 65 | | | | 000000001000 |
| | *-----* | | | | 0101 | 11 01 | 11 00 | 110 100 0100 0 |
| | *P2, D+R(SRC) MINUS 1 PLUS D(C), | | | | 00000 | 000000 | 11000 | 000111010 |
| | * D(C)+ALU15, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/SBC03 | | --> VV | | | | | |
| 126 | SBC03:0072 | F/SBC02 | <-- VV | | | | | |
| | ***** | | | 72 | | | | 000000001000 |
| | *-----* | | | | 0101 | 11 01 | 10 10 | 000 110 0100 1 |
| | *P2, D+R(DF) MINUS 1 PLUS D(C), | | | | 00000 | 000110 | 10000 | 111000010 |
| | * D(C)+COUT15, | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FET01 | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | |
| | ***** | | | | | | | |
| .CASE 112 OF BFET03 | TST01:0557 | F/FET03 | <-- | 700 | 3 | 11 | | |
| 127 | ***** | | | 557 | | | | 000000001000 |
| | * CIN IS 0, D(C)+D | | | | 1010 | 00 00 | 00 00 | 000 000 0100 1 |
| | *-----* | | | | 00010 | 100000 | 10000 | 111000000 |
| | *P2, D+R(DF) (B), D(C)+CIN, | | | | | | | |
| | *P2, U, IR+DATA, | | | | | | | |
| | *P3, MD(D)+DATA, RESET STATE, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | |
| | ***** | | | | | | | |

K07

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|-----------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE 128 | 97 OF BFET03 ROR01:0540 | F/FET03 <-- | 700 3 11 | 540 | 1111 | 00 00 | 10 10 | 00000001000 000 001 0110 0 |
| | *-----* | | | | 00000 | 000000 | 11000 | 000111101 |
| | *P2, D+R(DF) (A),SR+R(DF) (A), | | | | | | | |
| | * D(C)+PS(C), | | | | | | | |
| | *NEXT, J/ASR02 | --> | 75 131 75 | | | | | |
| .CASE 129 | 98 OF BFET03 ROLO1:0541 | F/FET03 <-- | 700 3 11 | 541 | 0001 | 00 00 | 10 10 | 00000001000 000 110 0100 1 |
| | * R(DF) PLUS R(DF) PLUS PS(C) | | | | 00010 | 100110 | 10000 | 111000000 |
| | *-----* | | | | | | | |
| | *P2, D+ 2 R(DF) PLUS PS(C), | | | | | | | |
| | * D(C)+COUT15, | | | | | | | |
| | *P2 U,IR+DATA, | | | | | | | |
| | *P3, R(DF)+D (A ADDR),MD(D)+DATA, | | | | | | | |
| | * RESET STATE, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | --> | 00 700 3 11 | | | | | |
| | * J/SER01 | --> | 01 701 385 160 | | | | | |
| | * J/FET01 | --> | 10 702 1 2 | | | | | |
| | * J/SER02 | --> | 11 703 387 162 | | | | | |
| .CASE 130 | 99 OF BFET03 ASR01:0542 | F/FET03 <-- | 700 3 11 | 542 | 1111 | 00 00 | 10 10 | 00000001000 000 100 0110 0 |
| | *-----* | | | | 00000 | 000000 | 11000 | 000111101 |
| | *P2, D+R(DF) (A),SR+R(DF) (A), | | | | | | | |
| | * D(C)+ALU15, | | | | | | | |
| | *NEXT, J/ASR02 | --> | 75 131 75 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|-----------|-------------------------------------|--------------------|------------|------------|-----------------------|----------|---------|---------|----------|-----------|---------|------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF UPF | COUT |
| 131 | ASR02:0075 | F/ROR01 F/ASR01 | <-- <-- | 540 542 | 128 130 | 74 74 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *P2, D+D RIGHT 1, | | | | | | | | | | | |
| | *P3, R(DF)+D (B ADDR), | | | | | | | | | | | |
| | *NEXT, BUTR(SR00), | | | | | | | | | | | |
| | * J/ASR03 | | | | | | | | | | | |
| | | J/ASR03 | --> | 1110 | 16 | 132 | | | | | | |
| | | J/ASR04 | --> | 1111 | 17 | 133 | | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 132 | 1 OF BASR02 | | | | | | | | | | | |
| | ASR03:0016 | F/ASR02 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | * MUST CLOCK D TO CLOCK D(C) | | | | | | | | | | | |
| | *P2, D+R(DF) (B) D(C)+CIN, | | | | | | | | | | | |
| | *P3, R(DF)+D (B ADDR), RESET STATE, | | | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | | | |
| | * J/FET01 | | | | | | | | | | | |
| | | J/FET03 | --> | 00 | 700 | 3 | | | | | | |
| | | J/SER01 | --> | 01 | 701 | 385 | | | | | | |
| | | J/FET01 | --> | 10 | 702 | 1 | | | | | | |
| | | J/SER02 | --> | 11 | 703 | 387 | | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 133 | 2 OF BASR02 | | | | | | | | | | | |
| | ASR04:0017 | F/ASR02 | <-- | 75 | 131 | 75 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *P2, D+D, D(C)+CIN, | | | | | | | | | | | |
| | *P3, R(DF)+D (B ADDR), RESET STATE, | | | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | | | |
| | * J/FET01 | | | | | | | | | | | |
| | | J/FET03 | --> | 00 | 700 | 3 | | | | | | |
| | | J/SER01 | --> | 01 | 701 | 385 | | | | | | |
| | | J/FET01 | --> | 10 | 702 | 1 | | | | | | |
| | | J/SER02 | --> | 11 | 703 | 387 | | | | | | |
| | ***** | | | | | | | | | | | |

75
 1111 00 00 01 10 000 000 0100 0
 00000 001110 00000 000001110

16
 1010 00 00 00 00 000 000 0100 1
 00000 001110 10000 111000010

17
 1111 00 00 01 01 000 000 0100 1
 00000 001110 10000 111000010

M07

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BIJ8 SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|--------------------------------------|---------------------------------------|-----------------------|------|--------------|---------|-----------|-------------------------------|
| .CASE 134 | 100 OF BFET03 ASL01:0543 | F/FET03 <-- | 700 3 11 | 543 | | | | 00000001000 |
| | * R(Df) PLUS R(Df) * | | | | 1001 00 00 | 10 10 | 000 110 | 0100 1 |
| | ----- | | | | 00010 100110 | 10000 | 111000000 | |
| | *P2, D+ 2 R(Df),D(C)+COUT15, * | | | | | | | |
| | *P2, U,IR+DATA, * | | | | | | | |
| | *P3, R(Df)+D (A ADDR),MD(D)+DATA, * | | | | | | | |
| | * RESET STATE, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), * | | | | | | | |
| | * J/FET03 * | | | | | | | |
| | | J/FET03 --> | 00 700 3 11 | | | | | |
| | | J/SER01 --> | 01 701 385 160 | | | | | |
| | | J/FET01 --> | 10 702 1 2 | | | | | |
| | | J/SER02 --> | 11 703 387 162 | | | | | |
| | ***** | | | | | | | |
| .TOC " | REGISTER SINGLE OPERAND - BYTE" | | | | | | | |
| .CASE 135 | 121 OF BFET03 CLR01:0570 | F/FET03 <-- | 700 3 11 | 570 | | | | 000000111000 |
| | * R(Df) (LO)+D (A ADDR),MD+DATA, * | | | | 0011 11 10 | 00 10 | 000 010 | 0100 1 |
| | ----- | | | | 00000 100110 | 10000 | 111000000 | |
| | *P2, D+0,D(C)+ALU00, * | | | | | | | |
| | *P2, U,IR+DATA, * | | | | | | | |
| | *P3, R(Df)(LO)+D (A ADDR),MD+DATA, * | | | | | | | |
| | * RESET STATE, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), * | | | | | | | |
| | * J/FET03 * | | | | | | | |
| | | J/FET03 --> | 00 700 3 11 | | | | | |
| | | J/SER01 --> | 01 701 385 160 | | | | | |
| | | J/FET01 --> | 10 702 1 2 | | | | | |
| | | J/SER02 --> | 11 703 387 162 | | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUSB BUSA EXTENSION RIF COUT CLOCKS |
|-----------|--|---------------------------------------|-----------------------|--|
| .CASE 138 | 124 OF BFET03 DEC801:0573 | F/FET03 <-- | 700 3 11 | 573 0101 01 11 10 10 101 001 0100 1 00010 100110 10000 111000000 |
| | ***** * ALU IS A PLUS NOT B PLUS D(C), D(C) * * WAS SET TO 0 IN FET03 B IS R(ZERO) * *-----* | | | |
| | *P2, D+R(DF) MINUS 1, D(C)+PS(C), * *P2, U, IR+DATA, * *P3, R(DF)(LO)+D (A ADDR), * * M(D)+DATA, RESET STATE, * *DEFER, SET CC, * *NEXT, BUT(FOV # SERVICE), * * J/FET03 * * J/FET03 * --> 00 700 3 11 * J/SER01 * --> 01 701 385 160 * J/FET01 * --> 10 702 1 2 * J/SER02 * --> 11 703 387 162 ***** | | | |
| .CASE 139 | 125 OF BFET03 NEG801:0574 | F/FET03 <-- | 700 3 11 | 574 0011 00 00 00 00 000 000 0010 0 00000 000000 11000 000111111 |
| | ***** *-----* | | | |
| | *P2, SR+0, * *NEXT, * * J/NEG802 * --> VV ***** | | | |
| 140 | NEG802:0077 | F/NEG801 <-- VV | | 77 1101 00 00 00 00 000 101 0100 1 00000 001110 10000 111000010 |
| | ***** *-----* | | | |
| | *P2, D+SR MINUS R(DF), D(C)+COUT07, * *P3, R(DF)(LO)+D (B ADDR), * * RESET STATE, * *DEFER, SET CC, * *NEXT, BUTR(SERVICE), * * J/FET01 * * J/FET03 * --> 00 700 3 11 * J/SER01 * --> 01 701 385 160 * J/FET01 * --> 10 702 1 2 * J/SER02 * --> 11 703 387 162 ***** | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUA UBF | EXTENSION RIF COUT CLOCKS |
|---------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|---|
| 141 | 126 OF BFET03 ADC01:0575 | F/FET03 <-- | 700 3 11 | 575 | 0001 00010 | 01 11 100110 | 10 10 10000 | 000000111000 101 101 0100 1 111000000 |
| | * ALU IS A PLUS B PLUS PS(C), B IS * *R(ZERO) (I.E., 0) * | | | | | | | |
| | *P2, D+R(DF) PLUS PS(C), * * D(C)+COUT07, * | | | | | | | |
| | *P2, U, IR+DATA, * | | | | | | | |
| | *P3, R(DF)(LO)+D (A ADDR) * | | | | | | | |
| | * MD(D)+DATA, RESET STATE, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), * | | | | | | | |
| | * J/FET03 * | | | | | | | |
| | | J/FET03 --> | 00 700 3 11 | | | | | |
| | | J/SER01 --> | 01 701 385 160 | | | | | |
| | | J/FET01 --> | 10 702 1 2 | | | | | |
| | | J/SER02 --> | 11 703 387 162 | | | | | |
| 142 | 127 OF BFET03 SBC01:0576 | F/FET03 <-- | 700 3 11 | 576 | 0011 00000 | 00 10 011110 | 00 00 11000 | 000000001000 110 001 0100 0 001000000 |
| | *P2, D+D, D(C)+PS(C), * | | | | | | | |
| | *P3, R(SRC)+D (B ADDR), * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | | J/SBC02 --> VV | | | | | | |
| 143 | SBC02:0100 | F/SBC01 <-- VV | | 100 | 0101 00000 | 11 01 000000 | 11 00 1100C | 000000001000 110 011 0100 0 001000010 |
| | * ALU IS A PLUS NOT B PLUS D(C), B IS 0 * | | | | | | | |
| | *P2, D+R(SRC) MINUS 1 PLUS D(C), * | | | | | | | |
| | * D(C)+ALU07, * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | | J/SBC03 --> | 102 144 80 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|-----------|---------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| .CASE 147 | 114 OF BFET03 ROLB01:0561 | F/FET03 | <-- | 700 | 3 | 11 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+ 2 R(DF) PLUS PS(C), | | | | | | | | | |
| | * D(C)+COUT07, | | | | | | | | | |
| | *P2 U, IR+DATA, | | | | | | | | | |
| | *P3, R(DF)(LO)+D (A ADDR), | | | | | | | | | |
| | * MD(D)+DATA, RESET STATE, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | | | |
| | * J/FET03 | | | | | | | | | |
| | | J/FET03 | --> | 00 | 700 | 3 | 11 | | | |
| | | J/SER01 | --> | 01 | 701 | 385 | 160 | | | |
| | | J/FET01 | --> | 10 | 702 | 1 | 2 | | | |
| | | J/SER02 | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |
| .CASE 148 | 115 OF BFET03 ASRB01:0562 | F/FET03 | <-- | 700 | 3 | 11 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+R(DF) (A), SR+R(DF) (A), | | | | | | | | | |
| | * D(C)+ALU07, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/ASRB02 | | --> | VV | | | | | | |
| | ***** | | | | | | | | | |
| 149 | ASRB02:0104 | F/RORB01 F/ASRB01 | <-- <-- VV | 560 | 146 | 80 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+D (EXTEND) (RIGHT 1), | | | | | | | | | |
| | *P3, R(DF)(LO)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUTR(SR00), | | | | | | | | | |
| | * J/ASRB03 | | | | | | | | | |
| | | J/ASRB03 | --> | 1110 | 36 | 150 | 82 | | | |
| | | J/ASRB04 | --> | 1111 | 37 | 151 | 82 | | | |
| | ***** | | | | | | | | | |

561
 0001 00 00 10 10 000 101 0100 1
 00010 100110 10000 111000000

562
 1111 00 00 10 10 000 011 0110 0
 00000 000000 11000 001000100

104
 1111 00 00 01 10 000 000 0100 0
 00010 001110 00000 000011110

F08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 82

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|-----------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 150 | 1 OF BASRB02 ASRB03:0036 | F/ASRB02 | <-- | 104 | 149 | 81 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DF) (B),D(C)+CIN, | | | | | | | | | |
| | *P3, R(DF)(LO)+D (B ADDR), | | | | | | | | | |
| | * RESET STATE, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FETO1 | | | | | | | | | |
| | | J/FETO3 | --> | 00 | 700 | 3 | 11 | | | |
| | | J/SERO1 | --> | 01 | 701 | 385 | 160 | | | |
| | | J/FETO1 | --> | 10 | 702 | 1 | 2 | | | |
| | | J/SERO2 | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |
| .CASE 151 | 2 OF BASRB02 ASRB04:0037 | F/ASRB02 | <-- | 104 | 149 | 81 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DF) (A),D(C)+CIN, | | | | | | | | | |
| | *P3, R(DF)(LO)+D (A ADDR), | | | | | | | | | |
| | * RESET STATE, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FETO1 | | | | | | | | | |
| | | J/FETO3 | --> | 00 | 700 | 3 | 11 | | | |
| | | J/SERO1 | --> | 01 | 701 | 385 | 160 | | | |
| | | J/FETO1 | --> | 10 | 702 | 1 | 2 | | | |
| | | J/SERO2 | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |

36
 1010 00 00 00 00 000 000 0100 1
 00000 001110 10000 111000010

37
 1111 00 00 10 10 000 000 0100 1
 00000 000110 10000 111000010

22

G08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 83

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|-------------------------------|---------------------------------------|-----------------------|------------|-----------|----------|----------|---------------------------------|
| .CASE 152 | 116 OF BFET03 ASLB01:0563 | F/FET03 | <-- | 700 | 3 | 11 | | |
| | ***** | | | 563 | | | | 000000111000 |
| | *P2, D+ 2 R(DF),D(C)-COUT07, | | | | | | | 1001 00 00 10 10 000 101 0100 1 |
| | *P2, U, IR+DATA, | | | | | | | 00010 100110 10000 111000000 |
| | *P3, R(DF)(LO)+D (A ADDR), | | | | | | | |
| | * MD(D)+DATA, RESET STATE, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), | | | | | | | |
| | * J/FET03 | | | | | | | |
| | | J/FET03 | --> | 00 | 700 | 3 | 11 | |
| | | J/SER01 | --> | 01 | 701 | 385 | 160 | |
| | | J/FET01 | --> | 10 | 702 | 1 | 2 | |
| | | J/SER02 | --> | 11 | 703 | 387 | 162 | |
| | ***** | | | | | | | |
| .TOC " | MEMORY SINGLE OPERAND - WORD" | | | | | | | |
| .CASE 153 | 9 OF BDST41 CLR02:0430 | F/DST41 F/ASR05 | <-- <-- | 400 422 | 69 164 | 48 87 | | |
| | ***** | | | 430 | | | | 000001001000 |
| | * PSZ01 SAME AS | | | | | | | 0011 00 00 00 00 000 010 0100 1 |
| | *BRA05 | | | | | | | 10010 000000 11000 000000011 |
| | *P2, D+D, D(C)+ALU00, | | | | | | | |
| | *P3, U, DAT0, | | | | | | | |
| | *ENABLE, KJ, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | |
| | ***** | | | | | | | |

H08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 84

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|----------|---------------------------------|---------------------------------------|-----------------------|-------------------------|---------|----------|------------------------|--------|
| .CASE 10 | OF BDST41 | | | | | | | |
| 154 | COM03:0431 | F/DST41 F/ASR05 | <-- <-- | 400 69 48 422 164 87 | | | | |
| | ***** | | | | | | | |
| | * ALU IS NOT A PSZ01 SAME AS | | | | | | | |
| | *BRA05 | | | | | | | |
| | ***** | | | | | | | |
| | *P2, D+NOT SR, | | | | | | | |
| | *P3, U,DATO, | | | | | | | |
| | *ENABLE, KJ | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/BRA05 | | --> | 3 283 126 | | | | |
| | ***** | | | | | | | |
| .CASE 11 | OF 3DST41 | | | | | | | |
| 155 | INC03:0432 | F/DST41 F/ASR05 | <-- <-- | 400 69 48 422 164 87 | | | | |
| | ***** | | | | | | | |
| | * ALU IS A PLUS B PSZ01 SAME AS | | | | | | | |
| | *BRA05 | | | | | | | |
| | ***** | | | | | | | |
| | *P2, D+SR PLUS 1,D(C)+PS(C), | | | | | | | |
| | *P3, U,DATO, | | | | | | | |
| | *ENABLE, KJ | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/BRA05 | | --> | 3 283 126 | | | | |
| | ***** | | | | | | | |
| .CASE 12 | OF BDST41 | | | | | | | |
| 156 | DEC03:0433 | F/DST41 F/ASR05 | <-- <-- | 400 69 48 422 164 87 | | | | |
| | ***** | | | | | | | |
| | * PSZ01 SAME AS | | | | | | | |
| | *BRA05 | | | | | | | |
| | ***** | | | | | | | |
| | *P2, D+SR MINUS 1,D(C)+PS(C), | | | | | | | |
| | *P3, U,DATO, | | | | | | | |
| | *ENABLE, KJ | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/BRA05 | | --> | 3 283 126 | | | | |
| | ***** | | | | | | | |

```

431 0000 00 00 00 00 00001001000
    10010 000000 11000 000000011
  
```

```

432 1001 11 00 00 00 00001001000
    10010 000000 11000 000000011
  
```

```

433 1101 11 00 00 00 00001001000
    10010 000000 11000 000000011
  
```

| BOX NO. .CASE | TAG:ADDRESS 13 OF BDST41 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------------|-----------------------------------|--|--------------------------|------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 157 | NEG03:0434 | F/DST41 F/ASR05 | <-- <-- | 400 422 | 69 164 | 48 87 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, SR+0, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/NEG04 | | --> | VV | | | | | | |
| 158 | NEG04:0106 | F/NEG03 | <-- | VV | | | | | | |
| | ***** | | | | | | | | | |
| | * PSZ01 SAME AS | | | | | | | | | |
| | *BRA05 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+SR MINUS MD,D(C)+COUT15, | | | | | | | | | |
| | *P3, U,DATO, | | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | |
| .CASE | 14 OF BDST41 | | | | | | | | | |
| 159 | ADC03:0435 | F/DST41 F/ASR05 | <-- <-- | 400 422 | 69 164 | 48 87 | | | | |
| | ***** | | | | | | | | | |
| | * PSZ01 SAME AS | | | | | | | | | |
| | *BRA05 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+SR PLUS PS(C),D(C)+COUT15, | | | | | | | | | |
| | *P3, U,DATO, | | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | |

434
0011 00 00 00 00 00000001000
00000 000000 11000 000 000 0010 0
001000110

106
1101 11 10 00 00 00001001000
10010 000000 11000 000 110 0100 1
000000011

435
0001 11 01 00 00 00001001000
10010 000000 11000 000 110 0100 1
000000011

JOB

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 86

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------------|------------|------------|-------------|--------------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE | 15 OF BDST41 | | | | | | | | | |
| 160 | SBC05:0436 | F/DST41 F/ASR05 | <-- <-- | 400 422 | 69 164 | 48 87 | | | | |
| | ***** | | | 436 | | | | 000000001000 | | |
| | * ALU IS A PLUS NOT B PLUS D(C), A IS | | | 0101 | 00 00 | 10 10 | 000 100 | 0100 0 | | |
| | * R(DF), B IS R(DF) | | | 00000 | 000000 | 11000 | 001001000 | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+MINUS 1 PLUS D(C), | | | | | | | | | |
| | * D(C)+ALU15, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/SBC07 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 161 | SBC07:0110 | F/SBC05 | <-- VV | | | | | | | |
| | ***** | | | 110 | | | | 000001001000 | | |
| | * ALU IS A PLUS NOT E PLUS D(C), B IS 0 | | | 0101 | 11 01 | 00 00 | 000 110 | 0100 1 | | |
| | * PSZ01 SAME AS | | | 10010 | 000000 | 11000 | 000000011 | | | |
| | *BRA05 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+SR MINUS 1 PLUS D(C), | | | | | | | | | |
| | * D(C)+COUT15, | | | | | | | | | |
| | *P3 U DATO, | | | | | | | | | |
| | *ENABLE, KJ | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | |
| | ***** | | | | | | | | | |
| .CASE | 16 OF BDST41 | | | | | | | | | |
| 162 | TST02:0437 | F/DST41 F/ASR05 | <-- <-- | 400 422 | 69 164 | 48 87 | | | | |
| | ***** | | | 437 | | | | 000000001000 | | |
| | * RELEASE BUS CIN IS ZERO | | | 1010 | 11 10 | 00 00 | 000 000 | 0100 1 | | |
| | *-----* | | | 00000 | 000000 | 10000 | 111000010 | | | |
| | *P2, D+MD, D(C)+CIN, | | | | | | | | | |
| | *P3, RESET STATE, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FET01 | | | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | | | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | | | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | | | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |

K08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 87

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-------------------------------|---------------------------------------|-----------------------|-------------------------|---------|---------|----------|---------------------------------|
| .CASE | 2 OF BDST41 | | | | | | | |
| 163 | ROLO3:0421 | F/DST41 F/ASR05 | <-- <-- | 400 69 48 422 164 87 | | | | |
| | ***** | | | | | | | 421 |
| | * PSZ01 SAME AS | | | | | | | 00001001000 |
| | *BRA05 | | | | | | | 0001 11 10 00 00 000 110 0100 1 |
| | *-----* | | | | | | | 10010 000000 11000 000000011 |
| | *P2, D+SR PLUS MD PLUS PS(C), | | | | | | | |
| | * D(C)+COUT15, | | | | | | | |
| | *P3 U DATO, | | | | | | | |
| | *ENABLE, KJ | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/BRA05 | --> | | 3 283 126 | | | | |
| .CASE | 3 OF BDST41 | | | | | | | |
| 164 | ASR05:0422 | F/DST41 F/ASR05 | <-- <-- | 400 69 48 422 164 87 | | | | |
| | ***** | | | | | | | 422 |
| | *-----* | | | | | | | 000000001000 |
| | *P2, D+MD, SR+MD, D(C)+ALU15, | | | | | | | 1010 11 10 00 00 000 100 0110 0 |
| | *NEXT, | | | | | | | 00000 000000 11000 100010000 |
| | * J/ASR06 | --> VV | | | | | | |
| .CASE | 1 OF BDST41 | | | | | | | |
| 165 | ASR06:0420 | F/DST41 F/ASR05 | <-- <-- VV | 400 69 48 | | | | |
| | ***** | | | | | | | 420 |
| | *-----* | | | | | | | 000000001000 |
| | *P2, D+D RIGHT 1, | | | | | | | 1111 00 11 01 10 110 000 0100 0 |
| | *P3, R(DST)+D (B ADDR), | | | | | | | 00000 011110 00000 001001110 |
| | *NEXT, BUTR(SR00), | | | | | | | |
| | * J/ASR07 | --> | | 1110 116 166 88 | | | | |
| | * J/ASR08 | --> | | 1111 117 167 88 | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|--|---------------------------------------|-------------------------|------|------------------|----------------|--------------|-------------------------------|
| .CASE 166 | ASR07:0116 ***** * PSZ01 SAME AS *BRA05 *-----* *P2, D+R(DST) (B),D(C)+CIN, *P3 U,DATO, *ENABLE, KJ *DEFER, SET CC, *NEXT, * J/BRA05 ***** | <-- | 420 165 87 | 116 | 1010 01 11 00 00 | 110 000 0100 1 | 000001001000 | 000000011 |
| .CASE 167 | ASR08:0117 ***** * PSZ01 SAME AS *BRA05 *-----* *P2, D+R(DST) (A),D(C)+CIN, *P3 U,DATO, *ENABLE, KJ *DEFER, SET CC, *NEXT, * J/BRA05 ***** | <-- | 420 165 87 | 117 | 1111 00 00 11 01 | 110 000 0100 1 | 000001001000 | 000000011 |
| .CASE 168 | ASL03:0423 ***** * PSZ01 SAME AS *BRA05 *-----* *P2, D+SR PLUS MD,D(C)+COUT15, *P3 U,DATO, *ENABLE, KJ *DEFER, SET CC, *NEXT, * J/BRA05 ***** | <-- <-- | 400 69 48 422 164 87 | 423 | 1001 11 10 00 00 | 000 110 0100 1 | 000001001000 | 000000011 |

M08

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 89

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--------------------------------------|-----------------------------------|--|--------------------------|-------------------|------------------|----------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .TOC " MEMORY SINGLE OPERAND - BYTE" | | | | | | | | | | |
| .CASE 9 OF BDST42 | | | | | | | | | | |
| 169 | CLRB02:0530 | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 120 121 | 70 183 185 | 49 93 93 | | | | |
| | ***** | | | | | | | | | |
| | * PSZ01 SAME AS * | | | | | | | | | |
| | *BRA05 * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+0, D(C)+ALU00, | | | | | | | | | |
| | *P3, U, DATOB, | | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | |
| | ***** | | | | | | | | | |
| .CASE 10 OF BDST42 | | | | | | | | | | |
| 170 | COMB02:0531 | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 120 121 | 70 183 185 | 49 93 93 | | | | |
| | ***** | | | | | | | | | |
| | * PSZ01 SAME AS * | | | | | | | | | |
| | *BRA05 * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+NOT R(DST) (A), | | | | | | | | | |
| | *P3, U, DATOB, | | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | |
| | ***** | | | | | | | | | |
| .CASE 11 OF BDST42 | | | | | | | | | | |
| 171 | INCB02:0532 | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 120 121 | 70 183 185 | 49 93 93 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DST) PLUS 1, D(C)+PS(C), | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | | | |
| | * J/BYTE01 | | | | | | | | | |
| | * J/BYTE01 | | --> | 10 | 32 | 253 | 116 | | | |
| | * J/BYTE02 | | --> | 11 | 33 | 254 | 116 | | | |
| | ***** | | | | | | | | | |

530
0011 00 00 00 00 000 010 0100 1
10101 000000 11000 000000011

531
0000 00 00 11 01 110 000 0100 1
10101 000000 11000 000000011

532
1001 11 00 11 01 110 001 0100 1
00000 000000 10011 000011010

N08

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | EXTENSION | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT | CLOCKS |
|---------|-------------------------------------|-----------|---------------------------------------|-----------------------|-------------------|------------------|----------------|-----------|------|--------|
| .CASE | 12 OF BDST42 | | | | | | | | | |
| 172 | DEC802:0533 | | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 120 121 | 70 183 185 | 49 93 93 | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DST) MINUS 1,D(C)+PS(C), | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | | | |
| | * J/BYTE01 | | | | | | | | | |
| | | | J/BYTE01 | --> | 10 | 32 | 253 | 116 | | |
| | | | J/BYTE02 | --> | 11 | 33 | 254 | 116 | | |
| | ***** | | | | | | | | | |
| .CASE | 13 OF BDST42 | | | | | | | | | |
| 173 | NEGB03:0534 | | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 120 121 | 70 183 185 | 49 93 93 | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, SR+0, | | | | | | | | | |
| | *NEXT, J/NEGB04 | | | | | | | | | |
| | | | | --> | VV | | | | | |
| 174 | NEGB04:0111 | | F/NEGB03 | <-- | VV | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+SR MINUS R(DST),D(C)+COUT07, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | | | |
| | * J/BYTE01 | | | | | | | | | |
| | | | J/BYTE01 | --> | 10 | 32 | 253 | 116 | | |
| | | | J/BYTE02 | --> | 11 | 33 | 254 | 116 | | |
| | ***** | | | | | | | | | |
| | | 533 | | | 1101 | 11 00 | 11 01 | 110 001 | 0100 | 1 |
| | | | | | 00000 | 000000 | 10011 | 000011010 | | |
| | | 534 | | | 0011 | 00 00 | 00 00 | 000 000 | 0010 | 0 |
| | | | | | 00000 | 000000 | 11000 | 001001001 | | |
| | | 111 | | | 1101 | 01 11 | 00 00 | 110 101 | 0100 | 1 |
| | | | | | 00000 | 000000 | 10011 | 000011010 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|--------------------|--|---------------------------------------|-----------------------|---------------------------------------|---------|----------|--|
| .CASE 14 OF BDST42 | | | | | | | |
| 175 | ADCB02:0535 | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 70 49 120 183 93 121 185 93 | | | |
| | ***** * ALU IS A PLUS B PLUS PS(C), B IS 0 * *-----* | | | | | | 535 0001 11 01 11 01 110 101 0100 1 0000 000000 10011 000011010 |
| | *P2, D+R(DST) PLUS PS(C), | | | | | | |
| | * D(C)+COUT07, | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | |
| | * J/BYTE01 | | | | | | |
| | | J/BYTE01 | --> | 10 32 253 116 | | | |
| | | J/BYTE02 | --> | 11 33 254 116 | | | |
| ***** | | | | | | | |
| .CASE 15 OF BDST42 | | | | | | | |
| 176 | SBCB05:0536 | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 70 49 120 183 93 121 185 93 | | | |
| | ***** *P2, D+NOT D,D(C)+ALU15, * *-----* | | | | | | 536 0000 00 00 01 01 000 100 0100 0 0000 000000 11000 001001100 |
| | *NEXT, J/SBCB06 | | --> | VV | | | |
| ***** | | | | | | | |
| 177 | SBCB06:0114 | F/SBCB05 | <-- | VV | | | |
| | ***** *-----* | | | | | | 114 0101 11 01 11 01 110 101 0100 1 0000 000000 10011 000011010 |
| | *P2, D+R(DST) MINUS 1 PLUS D(C), | | | | | | |
| | * D(C)+COUT07, | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | |
| | * J/BYTE01 | | | | | | |
| | | J/BYTE01 | --> | 10 32 253 116 | | | |
| | | J/BYTE02 | --> | 11 33 254 116 | | | |
| ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE | 16 OF BDST42 | | | | | | | |
| 178 | TSTB02:0537 | F/DST42 <-- | 410 70 49 | | | | | |
| | | F/ASRB08 <-- | 120 183 93 | | | | | |
| | | F/ASRB10 <-- | 121 185 93 | | | | | |
| | ***** | | | | | | | |
| | * RELEASE BUS | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+R(DST) (B),D(C)+CIN, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | | J/FETO3 * --> | 00 700 3 11 | | | | | |
| | | J/SER01 * --> | 01 701 385 160 | | | | | |
| | | J/FETO1 * --> | 10 702 1 2 | | | | | |
| | | J/SER02 * --> | 11 703 387 162 | | | | | |
| | ***** | | | | | | | |
| .CASE | 2 OF BDST42 | | | | | | | |
| 179 | ROLB02:0521 | F/DST42 <-- | 410 70 49 | | | | | |
| | | F/ASRB08 <-- | 120 183 93 | | | | | |
| | | F/ASRB10 <-- | 121 185 93 | | | | | |
| | ***** | | | | | | | |
| | * ALU IS A PLUS B PLUS PS(C) | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+ 2 R(DST) PLUS PS(C), | | | | | | | |
| | * D(C)+COUT07, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | |
| | * J/BYTE01 | | | | | | | |
| | | J/BYTE01 * --> | 10 32 253 116 | | | | | |
| | | J/BYTE02 * --> | 11 33 254 116 | | | | | |
| | ***** | | | | | | | |
| .CASE | 3 OF BDST42 | | | | | | | |
| 180 | ASRB05:0522 | F/DST42 <-- | 410 70 49 | | | | | |
| | | F/ASRB08 <-- | 120 183 93 | | | | | |
| | | F/ASRB10 <-- | 121 185 93 | | | | | |
| | ***** | | | | | | | |
| | *P3 U,DATIBP, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/ASRB06 | * --> | 115 181 93 | | | | | |
| | ***** | | | | | | | |

537
 1010 01 11 00 00 110 000 0100 1
 00000 000000 10000 111000010

521
 0001 01 11 11 01 110 101 0100 1
 00000 000000 10011 000011010

522
 0000 00 00 00 00 000 000 0000 0
 10100 000000 11000 001001101

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|---|--|--------------------------|------------|------------|---------------|-----------------|----------------|---|--------|
| | | | | | | | | RIF | COUT | |
| 181 | ASRB06:0115 ***** *P3 MD+DATA *NEXT, BUTR(000 ADDRESS), * J/ASRB07 * J/ASRB09 ***** | <-- --> --> | | 522 180 92 | 115 | 0000 00000 | 11 10 100000 | 00 00 10011 | 000000001000 000 000 0000 0 001001010 | 0 |
| .CASE 182 | 1 OF BASRB06 ASRB07:0112 ***** *P2, D+MD, D(C)+ALU07, * J/ASRB08 ***** | <-- VV --> VV | | | 112 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000000001000 000 011 0100 0 001010000 | 0 |
| 183 | ASRB08:0120 ***** *P2, D+D SIGN EXTENDED, D(C)+ALU00, *NEXT, * J/ASRB11 ***** | <-- VV --> | | 520 186 94 | 120 | 1111 00010 | 00 00 000000 | 01 01 11000 | 000000001000 000 010 0100 0 101010000 | 0 |
| .CASE 184 | 2 OF BASRB06 ASRB09:0113 ***** *P2, D+MD, D(C)+ALU15, *NEXT, * J/ASRB10 ***** | <-- --> VV | | 115 181 93 | 113 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000000001000 000 100 0100 0 001010001 | 0 |
| 185 | ASRB10:0121 ***** *P2, D+D RIGHT 8, D(C)+ALU00, *NEXT, * J/ASRB11 ***** | <-- VV --> | | 520 186 94 | 121 | 1111 00110 | 00 00 000000 | 01 01 11000 | 000000001000 000 010 0100 0 101010000 | 0 |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|-------------------------------|---------------------------------------|-----------------------|-------------------|------------------|----------------|----------|-------------------|------|--------|
| .CASE | 1 OF BOST42 | | | | | | | | | |
| 186 | ASRB11:0520 | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 120 121 | 70 183 185 | 49 93 93 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+D RIGHT 1,D(C)+D(C), | | | | | | | | | |
| | *P3, R(DST)+D (B ADDR), | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | | | |
| | * J/BYTE01 | | | | | | | | | |
| | | J/BYTE01 | --> | 10 | 32 | 253 | 116 | | | |
| | | J/BYTE02 | --> | 11 | 33 | 254 | 116 | | | |
| | ***** | | | | | | | | | |
| .CASE | 4 OF BOST42 | | | | | | | | | |
| 187 | ASLB02:0523 | F/DST42 F/ASRB08 F/ASRB10 | <-- <-- <-- | 410 120 121 | 70 183 185 | 49 93 93 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+ 2 R(DST),D(C)+COUT07, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(ODD ADDRESS), | | | | | | | | | |
| | * J/BYTE01 | | | | | | | | | |
| | | J/BYTE01 | --> | 10 | 32 | 253 | 116 | | | |
| | | J/BYTE02 | --> | 11 | 33 | 254 | 116 | | | |
| | ***** | | | | | | | | | |

520
 1111 00 11 01 10 110 111 0100 1
 00000 011110 10011 000011010

523
 1001 01 11 11 01 110 101 0100 1
 00000 000000 10011 000011010

F09

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 95

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|---|---------------------------------------|-----------------------|--------|---------|---------|----------|-------------------------------|
| .TOC | "MOVE EXECUTES" | | | | | | | |
| .TOC | MOV * WORD * SMD" | | | | | | | |
| .CASE 188 | 34 OF BFET03 MOV01:0441 | F/FET03 <-- | 700 3 11 | 441 | | | | 000000001000 |
| | * EXECUTE MOV R-R, MOVE SOURCE DATA TO D * | | | | 1111 | 10 00 | 10 11 | 000 001 0100 1 |
| | *LOAD C BIT WITH OLD VALUE OF PS(C) SAVE * | | | | 00010 | 101110 | 10000 | 111000000 |
| | *PREFETCHED INSTRUCTION IN IR AND MD * | | | | | | | |
| | *STORE SOURCE DATA IN DESTINATION COPY OF * | | | | | | | |
| | *PREFETCHED INSTRUCTION INTO MD SET * | | | | | | | |
| | *CONDITION CODES DURING NEXT * | | | | | | | |
| | *MICROINSTRUCTION TEST FOR SERVICE AND * | | | | | | | |
| | *RESET * | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+R(SF) (A),D(C)+PS(C), * | | | | | | | |
| | *P2, U,IR+DATA, * | | | | | | | |
| | *P3, R(DF)+D (B ADDR),MD+DATA (BC), * | | | | | | | |
| | * RESET STATE, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, BUT(FOV # SERVICE), * | | | | | | | |
| | * J/FET03 * | | --> | 00 700 | 3 | 11 | | |
| | * J/SER01 * | | --> | 01 701 | 385 | 160 | | |
| | * J/FET01 * | | --> | 10 702 | 1 | 2 | | |
| | * J/SER02 * | | --> | 11 703 | 387 | 162 | | |
| | ----- | | | | | | | |
| .CASE 189 | 130 OF BFET03 MOV07:0601 | F/FET03 <-- | 700 3 11 | 601 | | | | 000001001111 |
| | * PSZ01 SAME AS * | | | | 1010 | 00 01 | 10 10 | 000 001 0101 1 |
| | *BRA05 * | | | | 10010 | 000000 | 11000 | 000000011 |
| | ----- | | | | | | | |
| | *P1, BA+R(DF), CURRENT MODE, * | | | | | | | |
| | *ENABLE, MAINTENANCE, * | | | | | | | |
| | *P2, D+R(SF) (B),D(C)+PS(C), * | | | | | | | |
| | *P3, U,DATO, * | | | | | | | |
| | *ENABLE, KJ, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | * J/BRA05 * | | --> | 3 283 | 126 | | | |
| | ----- | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UPF | EXTENSION RIF COUT CLOCKS |
|-----------|--|---------------------------------------|-----------------------|------|---------|---------|----------|---|
| .CASE 190 | 131 OF BFET03 MOV12:0602 | F/FET03 | <-- | 700 | 3 | 11 | | |
| | ***** *-----* | | | 602 | | | | 000000001111 |
| | *P1 BA+R(DF) CURRENT MODE, *ENABLE, MAINTENANCE, *P2, D+R(DF) PLUS 2, *P3, R(DF)+D (A ADDR), *NEXT, * J/MOV16 | | --> VV | | | | | 1001 11 11 10 10 000 000 0101 0 00000 000110 11000 001010100 |
| 191 | MOV16:0124 | F/MOV12 | <-- VV | | | | | |
| | ***** * PSZ01 SAME AS *BRA05 *-----* | | | 124 | | | | 000001001000 |
| | *P2, D+R(SF) (A),D(C)+PS(C), *P3, U,DAT0, *ENABLE, KJ, *DEFER, SET CC, *NEXT, * J/BRA05 | | --> | 3 | 283 | 126 | | 1111 00 00 10 11 000 001 0100 1 10010 000000 11000 000000011 |
| .CASE 192 | 132 OF BFET03 MOV19:0603 | F/FET03 | <-- | 700 | 3 | 11 | | |
| | ***** *-----* | | | 603 | | | | 000000001011 |
| | *P1, BA+R(DF) CURRENT MODE, *P2, D+R(DF) PLUS 2, *P3, R(DF)+D (A ADDR), *P3, U,DATI, *NEXT, * J/MOV23 | | --> | 566 | 238 | 110 | | 1001 11 11 10 10 000 000 0101 0 10110 000110 11000 101110110 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-------------------|---|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 197 | 134 OF BFET03 MOV36:0605 | F/FET03 <-- | | 700 | 3 | 11 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DF) MINUS 2, | | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOV40 | --> | | 144 | 232 | 109 | | | | |
| | ***** | | | | | | | | | |
| .CASE 198 | 135 OF BFET03 MOV41:0606 | F/FET03 <-- | | 700 | 3 | 11 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+MD, MD+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOV45 | --> | | 164 | 245 | 113 | | | | |
| | ***** | | | | | | | | | |
| .CASE 199 | 136 OF BFET03 MOV54:0607 | F/FET03 <-- | | 700 | 3 | 11 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+MD, MD+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOV46 | --> | | 146 | 233 | 109 | | | | |
| | ***** | | | | | | | | | |
| .TOC .CASE 200 | MOV * BYTE * SMO" 42 OF BFET03 MOV02:0451 | F/FET03 <-- | | 700 | 3 | 11 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(SF) (A), D(C)+ALU07, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOV03 | --> | | 130 | 201 | 99 | | | | |
| | ***** | | | | | | | | | |

```

605      000000001000
        1101  11 11  10 10  000 000  0100 0
        00000 000110 11000 001100100

606      000000001000
        1010  11 10  00 00  000 000  0100 0
        00000 100000 11000 001110100

607      000000001000
        1010  11 10  00 00  000 000  0100 0
        00000 100000 11000 001100110

451      000000001000
        1111  00 00  10 11  000 011  0100 0
        00000 000000 11000 001011000
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | | |
|----------------------------|---|--|--------------------------|-----------|---------------|-----------------|----------------|----------------------|---------------|-------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COOT CLOCK | |
| 201 | MOV03:0130 ***** *-----* *P2, D+D SIGN EXTENDED, D(C)+PS(C), * *P3, R(DF)+D (B ADDR), RESET STATE, * *DEFER, SET CC, * *NEXT, BUTR(SERVICE), * * J/FETO1 * * J/FETO3 * --> 00 700 3 11 * J/SERO1 * --> 01 701 385 160 * J/FETO1 * --> 10 702 1 2 * J/SERO2 * --> 11 703 387 162 ***** | 451 200 98 | | 130 | 1111 00010 | 00 00 001110 | 01 01 10000 | 000 001 111000010 | 0100 1 | 00000001000 |
| .CASE 138 OF BFETO3 202 | MOV09:0611 ***** *-----* *P1, BA+R(DF), CURRENT MODE, * *ENABLE, MAINTENANCE, * *P2, D+R(SF) (B), D(C)+PS(C), * *NEXT, * * J/MOV62 * --> 166 250 115 ***** | 700 3 11 | | 611 | 1010 00000 | 00 01 000000 | 10 10 11000 | 000 001 001110110 | 0101 0 | 00000001111 |
| .CASE 139 OF BFETO3 203 | MOV14:0612 ***** *-----* *P1, BA+R(DF), CURRENT MODE, * *ENABLE, MAINTENANCE, * *P2, D+R(DF) PLUS (1 OR 2), * *P3, R(DF)+D (A ADDR), * *NEXT, * * J/MOV04 * --> 131 204 100 ***** | 700 3 11 | | 612 | 1001 00000 | 11 11 000110 | 10 10 11000 | 000 000 001011001 | 0101 0 | 00000001111 |

K09

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 100

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|-----------|------------------------------|--|--------------------------|-----------|------------|------------|-------------|------------|----------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS |
| 204 | MOV04:0131 | F/MOV14 | 612 203 99 | 131 | 1111 | 00 00 | 10 11 | 000 001 | 0100 0 |
| | ***** | | | | 00000 | 000000 | 11000 | 001110110 | |
| | *P2, D+R(SF) (A),D(C)+PS(C), | | | | | | | | |
| | *NEXT, J/MOV62 | --> | 166 250 115 | | | | | | |
| .CASE 205 | 140 OF BFET03 MOV21:0613 | F/FET03 | 700 3 11 | 613 | 1001 | 11 11 | 10 10 | 000 000 | 0101 0 |
| | ***** | | | | 10110 | 000110 | 11000 | 101110111 | |
| | *P1, BA+R(DF), MT MODE, | | | | | | | | |
| | *ENABLE, MAINTENANCE, | | | | | | | | |
| | *P2, D+R(DF) PLUS 2, | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| | *P3, U, DATI, | | | | | | | | |
| | *NEXT, J/MOV25 | --> | 567 239 111 | | | | | | |
| .CASE 206 | 141 OF BFET03 MOV34:0614 | F/FET03 | 700 3 11 | 614 | 1101 | 11 11 | 10 10 | 000 000 | 0100 0 |
| | ***** | | | | 00000 | 000110 | 11000 | 110001001 | |
| | *P2, D+R(DF) MINUS (1 OR 2), | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| | *NEXT, J/MOV09 | --> | 611 202 99 | | | | | | |
| .CASE 207 | 142 OF BFET03 MOV38:0615 | F/FET03 | 700 3 11 | 615 | 1101 | 11 11 | 10 10 | 000 000 | 0100 0 |
| | ***** | | | | 00000 | 000110 | 11000 | 001100100 | |
| | *P2, D+R(DF) MINUS 2, | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| | *NEXT, J/MOV40 | --> | 144 232 109 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|----------------|-----------------------------|---|-----------------------|-------------------|----------------|----------------|----------|---------------------------------|
| .CASE 208 | 143 OF BFET03 MOV43:0616 | F/FET03 <-- | | 700 | 3 | 11 | | |
| | ***** | | | | | | | 616 000000001000 |
| | *-----* | | | | | | | 1010 11 10 00 00 000 000 0100 0 |
| | *P2, D+MD, MD+DATA, | | | | | | | 00000 100000 11000 001110100 |
| | *NEXT, J/MOV45 | --> | | 164 | 245 | 113 | | |
| .CASE 209 | 144 OF BFET03 MOV56:0617 | F/FET03 <-- | | 700 | 3 | 11 | | |
| | ***** | | | | | | | 617 000000001000 |
| | *-----* | | | | | | | 1010 11 10 00 00 000 000 0100 0 |
| | *P2, D+MD, MD+DATA, | | | | | | | 00000 100000 11000 001100110 |
| | *NEXT, J/MOV46 | --> | | 146 | 233 | 109 | | |
| .TOC .CASE 210 | 2 OF BSRC17 MOV5:0621 | F/SRC17 <-- F/SRC24 <-- F/SRC29 <-- | | 466 752 753 | 21 37 38 | 23 34 35 | | |
| | ***** | | | | | | | 621 000000001000 |
| | *-----* | | | | | | | 1010 11 10 00 10 000 001 0100 1 |
| | *P2, D+MD, D(C)+PS(C), | | | | | | | 00000 000110 10000 111000010 |
| | *P3, R(DF)+D (A ADDR), | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | * J/FETO3 | --> | | 00 | 700 | 3 | 11 | |
| | * J/SERO1 | --> | | 01 | 701 | 385 | 160 | |
| | * J/FETO1 | --> | | 10 | 702 | 1 | 2 | |
| | * J/SERO2 | --> | | 11 | 703 | 387 | 162 | |
| | ***** | | | | | | | |

M09

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 102

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|-----------|----------------------------|---------------------------------------|-----------------------|------|--------------|---------|-----------|------------------------|--------|
| .CASE 211 | 10 OF BSRC18 MOV08:0671 | F/SRC18 <-- | 462 19 22 | 671 | | | | 000001001101 | |
| | * PSZ01 SAME AS | | | | 1010 11 10 | 10 10 | 000 001 | 0101 1 | |
| | *BRAOS | | | | 10010 000000 | 11000 | 000000011 | | |
| | *P1 BA+R(DF), MT MODE, | | | | | | | | |
| | *ENABLE, MAINTENANCE | | | | | | | | |
| | *P2, D+MD, D(C)+PS(C), | | | | | | | | |
| | *P3, U, DATO, | | | | | | | | |
| | *ENABLE, KJ | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/BRAOS | --> | 3 283 126 | | | | | | |
| .CASE 212 | 11 OF BSRC18 MOV13:0672 | F/SRC18 <-- | 462 19 22 | 672 | | | | 000000001101 | |
| | * PSZ01 SAME AS | | | | 1001 11 11 | 10 10 | 000 000 | 0101 0 | |
| | *BRAOS | | | | 00000 000110 | 11000 | 001011100 | | |
| | *P1 BA+R(DF), MT MODE, | | | | | | | | |
| | *ENABLE, MAINTENANCE | | | | | | | | |
| | *P2, D+R(DF) PLUS 2, | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/MOV17 | --> VV | | | | | | | |
| 213 | MOV17:0134 | F/MOV13 <-- VV | | 134 | | | | 000001001000 | |
| | * PSZ01 SAME AS | | | | 1010 11 10 | 00 00 | 000 001 | 0100 1 | |
| | *BRAOS | | | | 10010 000000 | 11000 | 000000011 | | |
| | *P2, D+MD, D(C)+PS(C), | | | | | | | | |
| | *P3, U, DATO, | | | | | | | | |
| | *ENABLE, KJ | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/BRAOS | --> | 3 283 126 | | | | | | |

B10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 104

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSB | BUSA | EXTENSION | | |
|-----------|----------------------------------|--------------------|------------|------|-------|--------|-------|-------------|-----------|------|-----|
| | | | | | | | | | OFST | ADDR | BOX |
| .CASE | | | | | BUS | SP | UBF | UPF | | | |
| 217 | MOV42:0676 | F/SRC18 | <-- | 462 | 19 | 22 | | | | | |
| | | | | 676 | | | | 00000001011 | | | |
| | | | | | 1001 | 11 11 | 10 01 | 111 000 | 0101 | 0 | |
| | | | | | 10110 | 000110 | 11000 | 001011101 | | | |
| | *P1, BA+PC CURRENT MODE, | | | | | | | | | | |
| | *P2, D+PC PLUS 2, | | | | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | | | | |
| | *P3, U, DATI, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/MOV47 | | --> | VV | | | | | | | |
| 219 | MOV47:0135 | F/MOV42 | <-- | VV | | | | | | | |
| | | | | 135 | | | | 00000001000 | | | |
| | | | | | 1010 | 11 10 | 00 00 | 110 000 | 0100 | 0 | |
| | | | | | 00000 | 110110 | 11000 | 001110100 | | | |
| | *P2, D+MD, | | | | | | | | | | |
| | *P3, R(SRC)+D (A ADDR), MD+DATA, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/MOV45 | | --> | 164 | 245 | 113 | | | | | |
| .CASE 219 | MOV55:0677 | F/SRC18 | <-- | 462 | 19 | 22 | | | | | |
| | | | | 677 | | | | 00000001011 | | | |
| | | | | | 1001 | 11 11 | 10 01 | 111 000 | 0101 | 0 | |
| | | | | | 10110 | 000110 | 11000 | 001011110 | | | |
| | *P1, BA+PC CURRENT MODE, | | | | | | | | | | |
| | *P2, D+PC PLUS 2, | | | | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | | | | |
| | *P3, U, DATI, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/MOV58 | | --> | VV | | | | | | | |
| 220 | MOV58:0136 | F/MOV55 | <-- | VV | | | | | | | |
| | | | | 136 | | | | 00000001000 | | | |
| | | | | | 1010 | 11 10 | 00 00 | 110 000 | 0100 | 0 | |
| | | | | | 00000 | 110110 | 11000 | 001100110 | | | |
| | *P2, D+MD, | | | | | | | | | | |
| | *P3, R(SRC)+D (A ADDR), MD+DATA, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/MOV46 | | --> | 146 | 233 | 109 | | | | | |

C10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 105

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------------------------------------|--------------|---------------------------------------|-----------------------|-------------------|-----------------|-----------------|-------------------------------|
| .TOC " MOV * BYTE * -SMO" | | | | | | | |
| .CASE 10 OF BSRC17 | | | | | | | |
| 221 | MOV06:0631 | F/SRC17 F/SRC24 F/SRC29 | <-- <-- <-- | 466 752 753 | 21 37 38 | 23 34 35 | |
| ***** | | | | | | | |
| *-----* | | | | | | | |
| *P2, D+D SIGN EXTENDED, D(C)+PS(C), * | | | | | | | |
| *P3, R(DF)+D (B ADDR), RESET STATE, * | | | | | | | |
| *DEFER, SET CC, * | | | | | | | |
| *NEXT, BUTR(SERVICE), * | | | | | | | |
| * J/FETO1 * | | | | | | | |
| * J/FETO3 --> 00 700 3 11 * | | | | | | | |
| * J/SERO1 --> 01 701 385 160 * | | | | | | | |
| * J/FETO1 --> 10 702 1 2 * | | | | | | | |
| * J/SERO2 --> 11 703 387 162 * | | | | | | | |
| ***** | | | | | | | |
| .CASE 2 OF BSRC39 | | | | | | | |
| 222 | MOV10:0151 | F/SRC39 F/SRC40 F/MOV35 | <-- <-- <-- | 12 13 154 | 34 35 226 | 32 33 107 | |
| ***** | | | | | | | |
| * PSZ01 SAME AS * | | | | | | | |
| *BRA05 * | | | | | | | |
| *-----* | | | | | | | |
| *P1, BA+R(DF), CURRENT MODE, * | | | | | | | |
| *ENABLE, MAINTENANCE, * | | | | | | | |
| *P2, D+R(SRC) (B), D(C)+PS(C), * | | | | | | | |
| *P3, U, DATOB, * | | | | | | | |
| *ENABLE, KJ, * | | | | | | | |
| *DEFER, SET CC, * | | | | | | | |
| *NEXT, * | | | | | | | |
| * J/BRA05 --> 3 283 126 * | | | | | | | |
| ***** | | | | | | | |
| 631 1111 00 00 01 01 000 001 0100 1 | | | | | | | |
| 00010 001110 10000 111000010 | | | | | | | |
| 151 1010 01 10 10 10 110 001 0101 1 | | | | | | | |
| 10101 000000 11000 000000011 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR 90X PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--------------------------------|---------------------------------------|-----------------------|-------------------------------------|---------|----------|--|
| .CASE | 3 OF BSRC39 | | | | | | |
| 223 | MOV15:0152 | F/SRC39 F/SRC40 F/MOV35 | <-- <-- <-- | 12 34 32 13 35 33 154 226 107 | | | 152 000000001111 1001 11 11 10 10 000 000 0101 0 00000 000110 11000 001011111 |
| | *-----* | | | | | | |
| | *P1, BA+R(DF), CURRENT MODE, | | | | | | |
| | *ENABLE, MAINTENANCE, | | | | | | |
| | *P2, D+R(DF) PLUS (1 OR 2), | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | |
| | *NEXT, | | | | | | |
| | * J/MOV18 | | --> VV | | | | |
| 224 | MOV18:0137 | F/MOV15 | <-- VV | | | | 137 000001001000 1010 01 10 00 00 110 001 0100 1 10101 000000 11000 000000011 |
| | *-----* | | | | | | |
| | * PSZ01 SAME AS | | | | | | |
| | *BRA05 | | | | | | |
| | *-----* | | | | | | |
| | *P2, D+R(SRC) (B), D(C)+PS(C), | | | | | | |
| | *P3, U, DATOB, | | | | | | |
| | *ENABLE, KJ, | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/BRA05 | | --> | 3 283 126 | | | |
| .CASE | 4 OF BSRC39 | | | | | | |
| 225 | MOV22:0153 | F/SRC39 F/SRC40 F/MOV35 | <-- <-- <-- | 12 34 32 13 35 33 154 226 107 | | | 153 000000001011 1001 11 11 10 10 000 000 0101 0 10110 000110 11000 101110101 |
| | *-----* | | | | | | |
| | *P1, BA+R(DF), CURRENT MODE, | | | | | | |
| | *P2, D+R(DF) PLUS 2, | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | |
| | *P3, U, DATI, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/MOV26 | | --> | 565 237 110 | | | |
| | *-----* | | | | | | |

E10

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|-----------------------|-------------------------------------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE | 5 OF BSRC39 | | | | | | | | | |
| 226 | MOV35:0154 | F/SRC39 <-- F/SRC40 <-- F/MOV35 <-- | | 12 34 32 13 35 33 154 226 107 | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DF) MINUS (1 OR 2), | | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOV10 | | | --> 151 222 105 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE | 6 OF BSRC39 | | | | | | | | | |
| 227 | MOV39:0155 | F/SRC39 <-- F/SRC40 <-- F/MOV35 <-- VV | | 12 34 32 13 35 33 | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DF) MINUS 2, | | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOV40 | | | --> 144 232 109 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE | 7 OF BSRC39 | | | | | | | | | |
| 228 | MOV44:0156 | F/SRC39 <-- F/SRC40 <-- F/MOV35 <-- | | 12 34 32 13 35 33 154 226 107 | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P1, BA+PC CURRENT MODE, | | | | | | | | | |
| | *P2, D+PC PLUS 2, | | | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | | | |
| | *P3, U,DATI, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOV59 | | | --> 140 229 108 | | | | | | |
| | ***** | | | | | | | | | |

```

154
1101 11 11 10 10 000 000 0100 0
0000 000110 11000 001101001

155
1101 11 11 10 10 000 000 0100 0
0000 000110 11000 001100100

156
1001 11 11 10 01 111 000 0101 0
10110 000110 11000 001100000
    
```


G10

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 109

| BOX NO. | TAG: ADDRESS | SHARED CODE" | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|---------|--------------|--------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|---------------------------------|
| 232 | MOV40:0144 | | F/MOV36 <-- | | 605 | 197 | 98 | | | |
| | | | F/MOV38 <-- | | 615 | 207 | 100 | | | |
| | | | F/MOV37 <-- | | 675 | 216 | 103 | | | |
| | | | F/MOV39 <-- | | 155 | 227 | 107 | | | |
| | | | ***** | | | | | | | 144 |
| | | | *-----* | | | | | | | 0000 00 00 10 10 000 000 0001 0 |
| | | | *P1, BA+R(DF), CURRENT MODE, | | | | | | 000000001011 | |
| | | | *P3, U, DATI, | | | | | | 10110 000000 01001 101110100 | |
| | | | *NEXT, BUTR(SMO # BYTE), | | | | | | | |
| | | | * J/MOV24 * --> | 100 | 564 | 236 | 110 | | | |
| | | | * J/MOV26 * --> | 101 | 565 | 237 | 110 | | | |
| | | | * J/MOV23 * --> | 110 | 566 | 238 | 110 | | | |
| | | | * J/MOV25 * --> | 111 | 567 | 239 | 111 | | | |
| | | | ***** | | | | | | | |
| | | | F/MOV54 <-- | | 607 | 199 | 98 | | | |
| | | | F/MOV56 <-- | | 617 | 209 | 101 | | | |
| | | | F/MOV58 <-- | | 136 | 220 | 104 | | | |
| | | | F/MOV60 <-- | | 141 | 231 | 108 | | | |
| 233 | MOV46:0146 | | ***** | | | | | | | 146 |
| | | | *-----* | | | | | | | 1001 10 11 10 10 110 000 0100 0 |
| | | | *P2, D+R(DF) PLUS MD(D), | | | | | | 000000001000 | |
| | | | *P3, R(DST X)+D (B ADDR), | | | | | | 00010 011110 11000 001101000 | |
| | | | *NEXT, J/MOV48 * --> VV | | | | | | | |
| 234 | MOV48:0150 | | F/MOV46 <-- VV | | | | | | | |
| | | | ***** | | | | | | | 150 |
| | | | *-----* | | | | | | | 0000 00 00 11 01 110 000 0001 0 |
| | | | *P1, BA+R(DST X), CURRENT MODE, | | | | | | 000000001011 | |
| | | | *P3, U, DATI, | | | | | | 10110 000000 11000 001110000 | |
| | | | *NEXT, J/MOV49 * --> | 160 | 235 | 110 | | | | |
| | | | ***** | | | | | | | |

H10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|-------------------|---------------------------------|---------------------------------------|-----------------------|----------------------------|---------|---------|----------|--------------------|----------------|
| 235 | MOV49:0160 | F/MOV48 | <-- | 150 234 109 | 160 | 0000 | 11 10 | 00 00 | 000 000 0000 0 |
| | ***** | | | | 00000 | 100000 | 11000 | 001110001 | 000000001000 |
| | *P3, MD+DATA, | | | | | | | | |
| | *NEXT, | J/MOV27 | --> | 161 240 111 | | | | | |
| | ***** | | | | | | | | |
| .CASE 1 OF BMOV40 | | | | | | | | | |
| 236 | MOV24:0564 | F/MOV20 F/MOV40 | <-- <-- | 673 214 103 144 232 109 | 564 | 1010 | 11 10 | 00 00 | 110 000 0100 0 |
| | ***** | | | | 00000 | 110110 | 11000 | 001110001 | 000000001000 |
| | *P2, D+MD, | | | | | | | | |
| | *P3, R(SRC)+D (A ADDR),MD+DATA, | | | | | | | | |
| | *NEXT, | J/MOV27 | --> | 161 240 111 | | | | | |
| | ***** | | | | | | | | |
| .CASE 2 OF BMOV40 | | | | | | | | | |
| 237 | MOV26:0565 | F/MOV20 F/MOV40 | <-- <-- | 673 214 103 144 232 109 | 565 | 0000 | 11 10 | 00 00 | 000 000 0000 0 |
| | ***** | | | | 00000 | 100000 | 11000 | 001110001 | 000000001000 |
| | *P3, MD+DATA, | | | | | | | | |
| | *NEXT, | J/MOV27 | --> | 161 240 111 | | | | | |
| | ***** | | | | | | | | |
| .CASE 3 OF BMOV40 | | | | | | | | | |
| 238 | MOV23:0566 | F/MOV20 F/MOV40 | <-- <-- | 673 214 103 144 232 109 | 566 | 1010 | 11 10 | 00 00 | 000 000 0100 0 |
| | ***** | | | | 00000 | 100000 | 11000 | 001110001 | 000000001000 |
| | *P2, D+MD,MD+DATA, | | | | | | | | |
| | *NEXT, | J/MOV27 | --> | 161 240 111 | | | | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|---|---|---------------------------------|--|---------|---------|----------|---|
| 239 | MOV25:0567 | F/MOV20 F/MOV40 | <-- <-- | 673 214 103 144 232 109 | | | | |
| | | | | 567 | | | | 00000001000 1010 11 10 00 00 000 000 0100 0 00000 100000 11000 001110001 |
| | *P2, D+MD, MD+DATA, | | | | | | | |
| | *NEXT, J/MOV27 | | --> VV | | | | | |
| 240 | MOV27:0161 | F/MOV49 F/MOV24 F/MOV26 F/MOV23 F/MOV25 | <-- <-- <-- <-- <-- | 160 235 110 564 236 110 565 237 110 566 238 110 | | | | |
| | | | | 161 | | | | 00000001000 1010 11 10 00 01 110 000 0100 0 00000 010010 01001 111000100 |
| | *P2, D+MD, | | | | | | | |
| | *P3, R(DST I)+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(SMD # BYTE), | | | | | | | |
| | J/MOV29 | | --> | 100 704 241 111 | | | | |
| | J/MOV31 | | --> | 101 705 242 112 | | | | |
| | J/MOV30 | | --> | 110 707 244 112 | | | | |
| | UNDEFINED CASE | | | | | | | |
| .CASE 241 | MOV29:0704 | F/MOV27 | <-- VV | | | | | |
| | * THIS REQUIRES R(SRC) AND R(DST) TO HAVE | | | 704 | | | | 000001001101 1010 01 10 11 01 110 001 0101 1 10010 000000 11000 000000011 |
| | *THE SAME RIF FIELD PSZ01 SAME AS | | | | | | | |
| | *BRA05 | | | | | | | |
| | *P1, BA+R(DST I), MT MODE, | | | | | | | |
| | *ENABLE, MAINTENANCE, | | | | | | | |
| | *P2, D+R(SRC) (B), D(C)+PS(C), | | | | | | | |
| | *P3, U, DATO, | | | | | | | |
| | *ENABLE, KJ | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, J/BRA05 | | --> | 3 283 126 | | | | |

K10

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 113

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--------------------------------|--------------------|-----------------------|------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| | | F/MOV41 | <-- | 606 | 198 | 98 | | | | |
| | | F/MOV43 | <-- | 616 | 208 | 101 | | | | |
| | | F/MOV47 | <-- | 135 | 218 | 104 | | | | |
| 245 | MOV45:0164 | F/MOV59 | <-- | 140 | 229 | 108 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(DF) PLUS MD(D), | | | | | | | | | |
| | *P3, R(DST X)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUTR(SMD # BYTE), | | | | | | | | | |
| | * J/MOV51 | | | | | | | | | |
| | | J/MOV51 | --> | 100 | 764 | 246 | 113 | | | |
| | | J/MOV53 | --> | 101 | 765 | 247 | 114 | | | |
| | | J/MOV50 | --> | 110 | 766 | 248 | 114 | | | |
| | | J/MOV52 | --> | 111 | 767 | 249 | 114 | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BMOV45 | | | | | | | | | |
| 246 | MOV51:0764 | F/MOV45 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * PSZ01 SAME AS | | | | | | | | | |
| | *BRA05 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P1 BA+R(DST X), MT MODE, | | | | | | | | | |
| | *ENABLE, MAINTENANCE, | | | | | | | | | |
| | *P2, D+R(SRC) (B), D(C)+PS(C), | | | | | | | | | |
| | *P3, U, DATO, | | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | |
| | ***** | | | | | | | | | |

164
 1001 10 11 10 10 110 000 0100 0
 00010 011110 01001 111110100

764
 1010 01 10 11 01 110 001 0101 1
 10010 000000 11000 000000011

N10

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 116

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF COOT | EXTENSION UPF | CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------|---------|---------------|---------------|--------|
| .CASE | 1 OF BBICB03 | | | | | | | |
| | | F/BICB03 <-- | 734 104 65 | | | | | |
| | | F/BISB03 <-- | 735 105 65 | | | | | |
| | | F/INCB02 <-- | 532 171 89 | | | | | |
| | | F/DECB02 <-- | 533 172 90 | | | | | |
| | | F/NEGB04 <-- | 111 174 90 | | | | | |
| | | F/ADCB02 <-- | 535 175 91 | | | | | |
| | | F/SBCB06 <-- | 114 177 91 | | | | | |
| | | F/ROLB02 <-- | 521 179 92 | | | | | |
| | | F/ASRB11 <-- | 520 186 94 | | | | | |
| 253 | BYTE01:0032 | F/ASLB02 <-- | 523 187 94 | | | | | |
| | ***** | | | | | | | |
| | *PAUSE PERIOD FOR DATO'S TO COMPLETE IF | | | | | | | |
| | *EXECUTION RESULT IS TO BE WRITTEN INTO | | | | | | | |
| | *MEMORY (RM, MM, M, MOV) PSZ01 SAME | | | | | | | |
| | *AS | | | | | | | |
| | *BRA05 | | | | | | | |
| | -----* | | | | | | | |
| | *P3 U, DATOB, | | | | | | | |
| | *ENABLE, KJ, | | | | | | | |
| | *NEXT, BU(DIAGNOSE), | | | | | | | |
| | * J/BRA05 | --> | 3 283 126 | | | | | |
| | ***** | | | | | | | |
| .CASE | 2 OF BBICB03 | | | | | | | |
| | | F/BICB03 <-- | 734 104 65 | | | | | |
| | | F/BISB03 <-- | 735 105 65 | | | | | |
| | | F/INCB02 <-- | 532 171 89 | | | | | |
| | | F/DECB02 <-- | 533 172 90 | | | | | |
| | | F/NEGB04 <-- | 111 174 90 | | | | | |
| | | F/ADCB02 <-- | 535 175 91 | | | | | |
| | | F/SBCB06 <-- | 114 177 91 | | | | | |
| | | F/ROLB02 <-- | 521 179 92 | | | | | |
| | | F/ASRB11 <-- | 520 186 94 | | | | | |
| 254 | BYTE02:0033 | F/ASLB02 <-- | 523 187 94 | | | | | |
| | ***** | | | | | | | |
| | * SWAPPING BYTES AND DATOB HAVE SAME | | | | | | | |
| | *CODE IN BC FIELD PSZ01 SAME AS | | | | | | | |
| | *BRA05 | | | | | | | |
| | -----* | | | | | | | |
| | *P2, D+D SWAPPED XOR D,D(C)+D(C), | | | | | | | |
| | *P3 U, DATOB, | | | | | | | |
| | *ENABLE, KJ, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/BRA05 | --> | 3 283 126 | | | | | |
| | ***** | | | | | | | |

32

```

0000 00 00 00 00 000 000 0000 0
10101 000000 11011 000000011
000001001000

```

33

```

0110 11 01 01 01 000 111 0100 0
10101 000000 11000 000000011
000001001000

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|-----------|--|---------------------------------------|-----------------------|------|---------|---------|----------|--------------------|--------|
| .CASE 255 | 16 OF BOTH01 JSR01:0057 | F/OTH01 | <-- | 417 | 285 | 127 | | | |
| | | | | 57 | | | | 000000001000 | |
| | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | | | | | 00000 | 000000 | 00101 | 110101000 | |
| | *NEXT, BUTR(DM), J/ILLO1 | J/ILLO1 | --> | 1000 | 650 | 352 | 149 | | |
| | | UNDEFINED CASE | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| .CASE 256 | 170 OF BFET03 JMP02:0651 | F/FET03 | <-- | 700 | 3 | 11 | | | |
| | | | | 651 | | | | 000000001000 | |
| | | | | | 1111 | 00 00 | 10 10 | 000 000 | 0010 0 |
| | | | | | 00000 | 000000 | 01110 | 101000001 | |
| | *P2, SR+R(DF) (A), *NEXT, BUTR(JSR), J/JMP23 | J/JMP23 | --> | 01 | 501 | 278 | 124 | | |
| | | J/JMP20 | --> | 11 | 503 | 274 | 122 | | |
| .CASE 257 | 171 OF BFET03 JMP03:0652 | F/FET03 | <-- | 700 | 3 | 11 | | | |
| | | | | 652 | | | | 000000001000 | |
| | | | | | 1111 | 00 00 | 10 10 | 000 000 | 0010 0 |
| | | | | | 00000 | 000000 | 11000 | 001111000 | |
| | *P2, SR+R(DF) (A), *NEXT, J/JMP04 | | --> | 170 | 258 | 118 | | | |

D11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 119

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|----------------------------|------------------------------|---------------------------------------|-----------------------|----------------|--------------------|---------|----------|-------------------------------|
| .CASE 174 OF BFET03 261 | JMP07:0655 | F/FET03 | <-- | 700 3 11 | 655 | | | 00000001000 |
| | *-----* | | | | 1101 11 11 10 10 | | | 000 000 0100 0 |
| | *P2, D+R(DF) MINUS 2, | | | | 00000 000110 11000 | | | 001111001 |
| | *P3, R(DF)+D (A ADDR), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/JMP08 | | --> VV | | | | | |
| 262 | JMP08:0171 | F/JMP07 | <-- VV | | 171 | | | 00000001011 |
| | *-----* | | | | 0000 00 00 10 10 | | | 000 000 0001 0 |
| | *P1, BA+R(DF), CURRENT MODE, | | | | 10110 000000 11000 | | | 010000010 |
| | *P3, U, DATI, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/JMP17 | | --> | 202 271 121 | | | | |
| .CASE 175 OF BFET03 263 | JMP09:0656 | F/FET03 | <-- | 700 3 11 | 656 | | | 00000001011 |
| | *-----* | | | | 1001 11 11 10 01 | | | 111 000 0101 0 |
| | *P1, BA+PC, CURRENT MODE, | | | | 10110 000110 11000 | | | 001111100 |
| | *P2, D+PC PLUS 2, | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | |
| | *P3, U, DATI, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/JMP10 | | --> VV | | | | | |
| 264 | JMP10:0174 | F/JMP09 | <-- VV | | 174 | | | 00000001000 |
| | *-----* | | | | 0000 11 10 00 00 | | | 000 000 0000 0 |
| | *P3, MD+DATA, | | | | 00000 100000 01110 | | | 001000001 |
| | *NEXT, BUTR(JSR), | | | | | | | |
| | * J/JMP11 | | --> | 01 101 265 120 | | | | |
| | * J/JMP12 | | --> | 11 103 266 120 | | | | |

E11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 120

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|-----------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE 265 | 1 OF BJMP10 JMP11:0101 | F/JMP10 <-- | 174 264 119 | 101 | | | | 000000001000 |
| | ***** | | | | 1001 | 10 11 | 10 10 | 111 000 0100 0 |
| | ----- | | | | 00010 | 001110 | 10000 | 111000010 |
| | *P2, D+R(DF) PLUS MD(D), | | | | | | | |
| | *P3, PC+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | J/FET01 | | | | | | | |
| | J/FET03 | --> | 00 700 3 11 | | | | | |
| | J/SER01 | --> | 01 701 385 160 | | | | | |
| | J/FET01 | --> | 10 702 1 2 | | | | | |
| | J/SER02 | --> | 11 703 387 162 | | | | | |
| | ***** | | | | | | | |
| .CASE 266 | 2 OF BJMP10 JMP12:0103 | F/JMP10 <-- | 174 264 119 | 103 | | | | 000000001000 |
| | ***** | | | | 1001 | 11 10 | 10 10 | 000 000 0010 0 |
| | ----- | | | | 00000 | 000000 | 11000 | 101000011 |
| | *P2, SR+R(DF) PLUS MD, | | | | | | | |
| | *NEXT, J/JMP20 | --> | 503 274 122 | | | | | |
| | ***** | | | | | | | |
| .CASE 267 | 176 OF BFET03 JMP13:0657 | F/FET03 <-- | 700 3 11 | 657 | | | | 000000001011 |
| | ***** | | | | 1001 | 11 11 | 10 01 | 111 000 0101 0 |
| | ----- | | | | 10110 | 000110 | 11000 | 001111110 |
| | *P1, BA+PC CURRENT MODE, | | | | | | | |
| | *P2, D+PC PLUS 2, | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | |
| | *P3, U,DATI, | | | | | | | |
| | *NEXT, J/JMP14 | --> | 176 268 121 | | | | | |
| | ***** | | | | | | | |

F11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 121

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUF CLOCKS UPF |
|---------|--|---------------------------------------|----------------------------|------|---------------|-----------------|----------------|---|
| 268 | JMP14:0176 ***** *-----* *P3, MD+DATA, *NEXT, J/JMP15 ***** | <-- | 657 267 120 | 176 | 0000 00000 | 11 10 100000 | 00 00 11000 | 00000001000 000 000 0000 0 010000000 |
| 269 | JMP15:0200 ***** *-----* *P2, D+R(DF) PLUS MD(D), *P3, R(DST X)+D (B ADDR), *NEXT, J/JMP16 ***** | <-- VV | | 200 | 1001 00010 | 10 11 011110 | 10 10 11000 | 000000001000 110 000 0100 0 010000001 |
| 270 | JMP16:0201 ***** *-----* *P1, BA+R(DST X), CURRENT MODE, *P3, U, DATI, *NEXT, J/JMP17 ***** | <-- VV | | 201 | 0000 10110 | 00 00 000000 | 11 01 11000 | 000000001011 110 000 0001 0 010000010 |
| 271 | JMP17:0202 ***** *-----* *P3, MD+DATA, *NEXT, BUTR(JSR), * J/JMP18 * J/JMP19 ***** | <-- VV | 653 259 118 171 262 119 | 202 | 0000 00000 | 11 10 100000 | 00 00 01110 | 000000001000 000 000 0000 0 001000101 |
| | | --> | 01 105 272 122 | | | | | |
| | | --> | 11 107 273 122 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|---------------------------|---|-----------------------|-------------------|-------------------|-------------------|----------|---------------------------------|
| .CASE 272 | 1 OF BJMP17 JMP18:0105 | F/JMP17 <-- | | 202 | 271 | 121 | | |
| | ***** | | | | | | | 105 000000001000 |
| | *-----* | | | | | | | 1010 11 10 00 01 111 000 0100 0 |
| | *P2, D+MD, | | | | | | | 00000 000110 10000 111000010 |
| | *P3, PC+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FET01 | | | | | | | |
| | * J/FET03 | * --> | 00 | 700 | 3 | 11 | | |
| | * J/SER01 | * --> | 01 | 701 | 385 | 160 | | |
| | * J/FET01 | * --> | 10 | 702 | 1 | 2 | | |
| | * J/SER02 | * --> | 11 | 703 | 387 | 162 | | |
| | ***** | | | | | | | |
| .CASE 273 | 2 OF BJMP17 JMP19:0107 | F/JMP17 <-- | | 202 | 271 | 121 | | |
| | ***** | | | | | | | 107 000000001000 |
| | *-----* | | | | | | | 1010 11 10 00 00 000 000 0010 0 |
| | *P2, SR+MD, | | | | | | | 00000 000000 11000 101000011 |
| | *NEXT, J/JMP20 | * --> VV | | | | | | |
| .CASE 274 | 2 OF BJMP02 JMP20:0503 | F/JMP02 <-- F/JMP04 <-- F/JMP06 <-- | | 651 170 654 | 256 258 260 | 117 118 118 | | |
| | ***** | | | | | | | 503 000010001000 |
| | *-----* | | | | | | | 1101 11 11 10 00 111 000 0100 0 |
| | *P2, D+SP MINUS 2, | | | | | | | 00000 000110 11000 010000011 |
| | *P3, SP+D (A ADDR), | | | | | | | |
| | *NEXT, J/JMP21 | * --> | 203 | 275 | 123 | | | |
| | ***** | | | | | | | |

H11

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 123

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|--|--------------------------|------|----------------------------|----------------|-------------|-------------------------------------|
| 275 | JMP21:0203 ***** * *-----* *P1, BA+SP, CURRENT MODE, *P2, D+R(SF) (B), *P3, U, DATO, *ENABLE, KJ, *NEXT, * J/JMP24 ***** | <-- F/JMP20 503 274 122 | | 203 | 1010 00 01 10010 000000 | 10 00 | 111 000 | 0101 0 010000100 |
| 276 | JMP24:0204 ***** * A PAUSE WHILE D IS *WRITTEN *-----* *NEXT, * J/JMP22 ***** | <-- VV F/JMP21 VV | | 204 | 0000 00 00 00000 000000 | 00 00 11000 | 000 000 | 0000 0 010000110 |
| 277 | JMP22:0206 ***** * *-----* *P2, D+PC (A), *P3, R(SF)+D (B ADDR), *NEXT, BUTR(SERVICE), * J/BRA04 * J/BRA04 * J/BRA03 ***** | <-- VV F/JMP24 VV --> 10 6 281 125 --> 11 7 282 125 | | 206 | 1111 00 01 00000 001110 | 10 01 10000 | 111 000 | 0100 0 000000100 000000110 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------------|---|---------------------------------------|-----------------------|-------------------|-------------------|-------------------|----------|---------------------------------|
| .CASE | 1 OF BJMP02 | | | | | | | |
| 278 | JMP23:0501 | F/JMP02 F/JMP04 F/JMP06 | <-- <-- <-- | 651 170 654 | 256 258 260 | 117 118 118 | | |
| | ***** | | | 501 | | | | 000000001000 |
| | *P2, D+SR, | * | | | | | | 1111 00 11 00 00 111 000 0100 0 |
| | *P3, PC+D (B ADDR), | * | | | | | | 00000 001110 10000 111000010 |
| | *NEXT, BUTR(SERVICE), | * | | | | | | |
| | * J/FET01 | * | | | | | | |
| | * J/FET03 | * --> | | 00 700 | 3 | 11 | | |
| | * J/SER01 | * --> | | 01 701 | 385 | 160 | | |
| | * J/FET01 | * --> | | 10 702 | 1 | 2 | | |
| | * J/SER02 | * --> | | 11 703 | 387 | 162 | | |
| | ***** | | | | | | | |
| .TOC "BRANCH" | | | | | | | | |
| .CASE | 239 OF BFET03 | | | | | | | |
| 279 | BRA01:0757 | F/FET03 | <-- | 700 | 3 | 11 | | |
| | ***** | | | 757 | | | | 000000001000 |
| | *#OVERVIEW-IMPLEMENTATION BRANCH THE | * | | | | | | 1010 10 00 00 00 000 011 0100 0 |
| | *SUCCESS OR FAILURE OF A BRANCH IS | * | | | | | | 00010 010001 10110 000000010 |
| | *DETERMINED BY A ROM WHICH DECODES THE | * | | | | | | |
| | *CURRENT CONDITION CODES. THIS DECODE | * | | | | | | |
| | *STARTS WHEN THE IR IS LOADED IN FET02. | * | | | | | | |
| | *THE OUTPUT OF THIS ROM IS TESTED IN | * | | | | | | |
| | *BRA01 BY BUTR(BRANCH). THE INSTRUCTION | * | | | | | | |
| | *WAS LOADED INTO MD BY FET02 AND LOADED | * | | | | | | |
| | *INTO RES BY BRA01. RES IS CONSTRUCTED | * | | | | | | |
| | *SUCH THAT LOADING IT IN THIS WAY CAUSES | * | | | | | | |
| | *THE LOW ORDER BIT OF THE SHIFT REGISTER | * | | | | | | |
| | *IS LOADED WITH A ZERO IN BRA02. #0-I END | * | | | | | | |
| | *-----* | | | | | | | |
| | *P2, D+MD(D), D(C)+ALU07, RES+MD(D), | * | | | | | | |
| | *NEXT, BUTR(BRANCH), | * | | | | | | |
| | * J/BRA02 | * --> | | 10 2 | 280 | 125 | | |
| | * J/BRA05 | * --> | | 11 3 | 283 | 126 | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|--------------------------------------|---------------------------------------|-----------------------|-------------|------------|------------|----------|---|
| .CASE | 1 OF BBRA01 | | | | | | | |
| 280 | BRA02:0002 | F/BRA01 F/S0B08 | <-- <-- | 757 4075 | 279 331 | 124 143 | | 2 00000001000 1001 00 11 01 00 111 000 1010 0 00010 000000 10000 000000110 |
| | *-----* | | | | | | | |
| | *P3, | | | | | | | |
| | * SR+2 (D SIGN EXTENDED) | | | | | | | |
| | * PLUS PC, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/BRA04 | | | | | | | |
| | * J/BRA04 | | --> | 10 | 6 | 281 | 125 | |
| | * J/BRA03 | | --> | 11 | 7 | 282 | 125 | |
| .CASE | 1 OF BJMP22 | | | | | | | |
| 281 | BRA04:0006 | F/JMP22 F/BRA02 | <-- <-- VV | 206 | 277 | 123 | | 6 00000001011 1001 11 11 00 00 000 000 0101 0 10000 000000 11000 010001000 |
| | * NO SERVICE FLAG ON, DO INSTRUCTION | | | | | | | |
| | *FETCH | | | | | | | |
| | *-----* | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | |
| | *P2, D+SR PLUS 2, | | | | | | | |
| | *P3, U, DATI CLKIR, | | | | | | | |
| | *NEXT, J/BRA06 | | --> | 210 | 284 | 126 | | |
| .CASE | 2 OF BJMP22 | | | | | | | |
| 282 | BRA03:0007 | F/JMP22 F/BRA02 | <-- <-- | 206 2 | 277 280 | 123 125 | | 7 00000001000 1111 00 11 00 00 111 000 0100 0 00000 001110 11000 111000011 |
| | * SERVICE REQUEST PRESENT, RE-STORE | | | | | | | |
| | *BRANCH ADDRESS INTO PC AND GO TO | | | | | | | |
| | *SERVICE - | | | | | | | |
| | *SER02 | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, D+SR, | | | | | | | |
| | *P3, PC+D (B ADDR), | | | | | | | |
| | *NEXT, J/SER02 | | --> | 703 | 387 | 162 | | |

K11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 126

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|---|---------------------------------------|-----------------------|-------------|------------|------------|----------|---------------------------------|------|--------|
| 283 | BRA05:0003 | F/BRA01 F/S0B08 | <-- <-- | 757 4075 | 279 331 | 124 143 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *SELECT, EMIT | | | | | | | 000000001000 | | |
| | *P3, RESET STATE | | | | | | | 0000 00 00 00 01 000 000 0000 0 | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | 11001 000000 10000 111000010 | | |
| | * J/FET01 | | | | | | | | | |
| | | J/FET03 | --> | 00 | 700 | 3 | 11 | | | |
| | | J/SER01 | --> | 01 | 701 | 385 | 160 | | | |
| | | J/FET01 | --> | 10 | 702 | 1 | 2 | | | |
| | | J/SER02 | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |
| 284 | BRA06:0210 | F/BRA04 | <-- | 6 | 281 | 125 | | | | |
| | ***** | | | | | | | | | |
| | * JAM FROM HERE IS ERROR ON INSTRUCTION * | | | | | | | | | |
| | * FETCH IN A BRANCH TAKEN WITH NO * | | | | | | | | | |
| | * SERVICE REQUEST PENDING PUPP OF 171 * | | | | | | | | | |
| | * IMPLIES PC-2 IS LOCATION OF * | | | | | | | | | |
| | * ERROR * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2 U, IR+DATA | | | | | | | | | |
| | *P3, PC+D (A ADDR), MD+DATA | | | | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), | | | | | | | | | |
| | * J/FET03 | | --> | 700 | 3 | 11 | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--------------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| | .TOC "OTHER BASE INSTRUCTIONS" | | | | | | |
| | .TOC "DECODE FOR OTHER INSTRUCTIONS" | | | | | | |
| | .CASE 8 OF BDST27 | | | | | | |
| 285 | OTH01:0417 | F/DST27 <-- | 762 67 47 | | | | |
| | | F/DST28 <-- | 763 68 48 | | | | |
| | ***** | | | | | | |
| | * FOR RTI, RTT, FLPT | | | | | | |
| | ----- | | | | | | |
| | *P2, D+MD, SR+MD, D(C)+PS(C), | | | | | | |
| | *NEXT, BUT(INSTR 5), | | | | | | |
| | * J/40 | | | | | | |
| | * J/RSVD01 | * --> | 00000 40 1193 384 | | | | |
| | * J/FASTX1 | * --> | 00001 41 1192 384 | | | | |
| | * J/EIS01 | * --> | 00010 42 2331 771 | | | | |
| | * J/FIS01 | * --> | 00011 43 1191 384 | | | | |
| | * J/SXT01 | * --> | 00100 44 296 132 | | | | |
| | * UNDEFINED CASE | | | | | | |
| | * J/XOR01 | * --> | 00110 46 293 130 | | | | |
| | * J/XOR02 | * --> | 00111 47 294 131 | | | | |
| | * J/SO01 | * --> | 01000 50 325 141 | | | | |
| | * J/MARK00 | * --> | 01001 51 333 143 | | | | |
| | * UNDEFINED CASE | | | | | | |
| | * J/MFAT00 | * --> | 01011 53 571 220 | | | | |
| | * UNDEFINED CASE | | | | | | |
| | * J/EMT01 | * --> | 01101 55 351 149 | | | | |
| | * J/TRAP01 | * --> | 01110 56 350 148 | | | | |
| | * J/JSR01 | * --> | 01111 57 255 117 | | | | |
| | * J/RSVD02 | * --> | 10000 60 1194 384 | | | | |
| | * J/WAIT01 | * --> | 10001 61 338 144 | | | | |
| | * J/RTI01 | * --> | 10010 62 315 138 | | | | |
| | * J/BPT01 | * --> | 10011 63 349 148 | | | | |
| | * J/IOT01 | * --> | 10100 64 348 148 | | | | |
| | * UNDEFINED CASE | | | | | | |
| | * J/RTS01 | * --> | 10110 66 308 136 | | | | |
| | * J/RES01 | * --> | 10111 67 341 145 | | | | |
| | * J/SCC00 | * --> | 11000 70 302 135 | | | | |
| | * J/SWB01 | * --> | 11001 71 286 128 | | | | |
| | * J/SWB03 | * --> | 11010 73 289 129 | | | | |
| | * J/HALT01 | * --> | 11011 74 345 147 | | | | |
| | * UNDEFINED CASE | | | | | | |
| | * J/RTT01 | * --> | 11101 76 312 137 | | | | |
| | * UNDEFINED CASE | | | | | | |
| | * UNDEFINED CASE | | | | | | |
| | ***** | | | | | | |

417
 1010 11 10 00 00 00000001000
 00000 000000 00010 000100000

N11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 129

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|-------------------|--|--------------------|------------|------|-----|------|------|---------------------------------|
| | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| .CASE 289 | SWB03:0073 | F/OTH01 <-- | | 417 | 285 | 127 | | |
| | ***** | | | | | | | 000000001000 |
| | * GOES TO DST ENTRY POINT FROM INSTR 1 | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | *BRANCH | | | | | | | 00000 000000 00101 111100000 |
| | ***** | | | | | | | |
| | *NEXT, BUTR(DM), | | | | | | | |
| | * J/740 | | | | | | | |
| | * J/SXT05 | * --> | 0000 | 740 | 300 | 134 | | |
| | * J/DST11 | * --> | 0001 | 741 | 46 | 38 | | |
| | * J/DST12 | * --> | 0010 | 742 | 47 | 39 | | |
| | * J/DST13 | * --> | 0011 | 743 | 48 | 40 | | |
| | * J/DST14 | * --> | 0100 | 744 | 49 | 40 | | |
| | * J/DST15 | * --> | 0101 | 745 | 50 | 41 | | |
| | * J/DST16 | * --> | 0110 | 746 | 51 | 41 | | |
| | * J/DST17 | * --> | 0111 | 747 | 52 | 42 | | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| .CASE 1 OF BDST19 | | | | | | | | |
| | F/DST19 <-- | | 526 | 57 | 44 | | | |
| | F/DST25 <-- | | 642 | 72 | 50 | | | |
| 290 | SWB04:0720 | F/DST26 <-- | | 643 | 73 | 51 | | |
| | ***** | | | | | | | 000000001000 |
| | * P2, D+MD, | | | | | | | 1010 11 10 00 00 000 000 0100 0 |
| | *NEXT, J/SWB05 | | | | | | | 00000 000000 11000 010001011 |
| | ***** | | | | | | | |
| 291 | SWB05:0213 | F/SWB04 <-- VV | | | | | | |
| | ***** | | | | | | | 000000001000 |
| | * D(C) GETS 0 | | | | | | | 1001 11 01 01 01 000 000 1100 1 |
| | ***** | | | | | | | 00101 000000 11000 010001100 |
| | * P2, D+D SWAPPED PLUS 0, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, J/SWB06 | * --> | 214 | 292 | 130 | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|-------------------------------------|--------------------|-----------------------|------|---------|---------|----------|--------------|--------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 292 | SMB06:0214 | F/SWB05 <-- | 213 291 129 | 214 | | | | 000001001000 | | |
| | * PSZ01 SAME AS | * | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | *BRA05 | * | | | 10010 | 000000 | 11000 | 000000011 | | |
| | *P3 U, DATO, | * | | | | | | | | |
| | *ENABLE, KJ, | * | | | | | | | | |
| | *NEXT, | * | | | | | | | | |
| | * J/BRA05 | * --> | 3 283 126 | | | | | | | |
| .TOC | XOR | | | | | | | | | |
| .CASE | 7 OF BOTH01 | | | | | | | | | |
| 293 | XOR01:0046 | F/OTH01 <-- | 417 285 127 | 46 | | | | 000000001000 | | |
| | *-----* | * | | | 0110 | 00 00 | 10 11 | 000 001 | 0100 1 | |
| | *P2, D+R(SF) XOR R(DF), D(C)+PS(C), | * | | | 00000 | 001110 | 10000 | 111000010 | | |
| | *P3, R(DF)+D (B ADDR), RESET STATE, | * | | | | | | | | |
| | *DEFER, SET CC, | * | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | * | | | | | | | | |
| | * J/FET01 | * | | | | | | | | |
| | * J/FET03 | * --> | 00 700 3 11 | | | | | | | |
| | * J/SER01 | * --> | 01 701 385 160 | | | | | | | |
| | * J/FET01 | * --> | 10 702 1 2 | | | | | | | |
| | * J/SER02 | * --> | 11 703 387 162 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|--|--------------------|------------|-------|--------|-------|-----------|---------------------------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 294 | XOR02:0047 | F/OTH01 <-- | | 417 | 285 | 127 | | |
| | * GOES TO DST ENTRY POINT FROM INSTR 1 | | | 47 | | | | 000000001000 |
| | * BRANCH | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | *-----* | | | 00000 | 000000 | 00101 | 111100000 | |
| | *NEXT, BUTR(DM), | | | | | | | |
| | J/740 | | | | | | | |
| | J/SXT05 | --> | 0000 | 740 | 300 | 134 | | |
| | J/DST11 | --> | 0001 | 741 | 46 | 38 | | |
| | J/DST12 | --> | 0010 | 742 | 47 | 39 | | |
| | J/DST13 | --> | 0011 | 743 | 48 | 40 | | |
| | J/DST14 | --> | 0100 | 744 | 49 | 40 | | |
| | J/DST15 | --> | 0101 | 745 | 50 | 41 | | |
| | J/DST16 | --> | 0110 | 746 | 51 | 41 | | |
| | J/DST17 | --> | 0111 | 747 | 52 | 42 | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| 295 | XOR03:0407 | F/DST21 <-- | | 524 | 55 | 43 | | |
| | * PSZ01 SAME AS | | | | | | | 000001001000 |
| | * BRA05 | | | 407 | | | | 0110 11 10 10 11 000 001 0100 1 |
| | *-----* | | | 10010 | 000000 | 11000 | 000000011 | |
| | *P2, D+R(SF) XOR MD,D(C)+PS(C), | | | | | | | |
| | *P3, U, DATO, | | | | | | | |
| | *ENABLE, KJ, | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, J/BRA05 | --> | 3 | 283 | 126 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|--------------|-------------------------|--|--------------------------|--------------------|------------|------------|-------------|-----------|---------------------------------|--------|--|
| | | | | | | | | RIF | COUT | | |
| .CASE 296 | SXT01:0044 | F/OTH01 | <-- | 417 | 285 | 127 | | | | | |
| | ***** | | | | | | | 44 | 00000001000 | | |
| | *-----* | | | | | | | | 0011 00 00 00 00 000 010 0010 0 | | |
| | *-----* | | | | | | | | 00000 000000 11000 010001110 | | |
| | *P2, SR+0, | | | | | | | | | | |
| | *SETUP, TEST PS(N), | | | | | | | | | | |
| | *NEXT, J/SXT02 | | --> VV | | | | | | | | |
| .CASE 297 | SXT02:0216 | F/SXT01 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 216 | 00000001000 | | |
| | *-----* | | | | | | | | 0000 00 00 00 00 000 010 0000 0 | | |
| | *-----* | | | | | | | | 00000 000000 01100 100110100 | | |
| | *NEXT, BUTM(PS(N)), | | | | | | | | | | |
| | * J/SXT03 | | --> VV | | | | | | | | |
| .CASE 298 | SXT03:0464 | F/SXT02 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 464 | 00000001000 | | |
| | *-----* | | | | | | | | 1111 00 10 00 00 110 001 0100 1 | | |
| | *-----* | | | | | | | | 00000 011110 00101 111100000 | | |
| | *P2, D+SR, D(C)+PS(C), | | | | | | | | | | |
| | *P3, R(SRC)+D (B ADDR), | | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | | |
| | *NEXT, BUTR(DM), | | | | | | | | | | |
| | * J/740 | | | | | | | | | | |
| | J/SXT05 | | --> | 0000 | 740 | 300 | 134 | | | | |
| | J/DST11 | | --> | 0001 | 741 | 46 | 38 | | | | |
| | J/DST12 | | --> | 0010 | 742 | 47 | 39 | | | | |
| | J/DST13 | | --> | 0011 | 743 | 48 | 40 | | | | |
| | J/DST14 | | --> | 0100 | 744 | 49 | 40 | | | | |
| | J/DST15 | | --> | 0101 | 745 | 50 | 41 | | | | |
| | J/DST16 | | --> | 0110 | 746 | 51 | 41 | | | | |
| | J/DST17 | | --> | 0111 | 747 | 52 | 42 | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | UNDEFINED CASE | | * | | | | | | | | |
| | ***** | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|-------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------------|
| .CASE | 1 OF BSRC21 | | | | | | |
| | | F/SRC21 <-- | 661 23 24 | | | | |
| | | F/SRC32 <-- | 662 24 25 | | | | |
| | | F/SRC33 <-- | 663 25 26 | | | | |
| | | F/SRC34 <-- | 664 26 27 | | | | |
| | | F/SRC35 <-- | 665 27 28 | | | | |
| | | F/SRC36 <-- | 666 28 29 | | | | |
| | | F/SRC37 <-- | 667 29 30 | | | | |
| | | F/SRC30 <-- | 772 32 31 | | | | |
| | | F/SRC31 <-- | 773 33 32 | | | | |
| | | F/SWB03 <-- | 73 289 129 | | | | |
| | | F/XOR02 <-- | 47 294 131 | | | | |
| | | F/SXT03 <-- | 464 298 132 | | | | |
| 300 | SXT05:0740 | F/SXT04 <-- | 465 299 133 | | | | |
| | ***** | | | | | | |
| | * MODE 0 | | | | | | 740 0000 00 00 00 00 00000001000 |
| | -----* | | | | | | 00000 001110 10000 111000010 |
| | *P3, R(DF)+D (B ADDR), | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | |
| | * J/FET01 | | | | | | |
| | | J/FET03 * --> | 00 700 3 11 | | | | |
| | | J/SER01 * --> | 01 701 385 160 | | | | |
| | | J/FET01 * --> | 10 702 1 2 | | | | |
| | | J/SER02 * --> | 11 703 387 162 | | | | |
| | ***** | | | | | | |
| .CASE | 6 OF BDST41 | | | | | | |
| 301 | SXT06:0427 | F/DST41 <-- | 400 69 48 | | | | |
| | | F/ASR05 <-- | 422 164 87 | | | | |
| | ***** | | | | | | |
| | * NOT MODE 0 BRA05 IS SAME AS | | | | | | 427 1111 00 00 11 00 110 000 0100 0 |
| | *PSZ01 | | | | | | 10010 000000 11000 000000011 |
| | -----* | | | | | | |
| | *P2, D+R(SRC) (A), | | | | | | |
| | *P3, U,DATO, | | | | | | |
| | *ENABLE, KJ, | | | | | | |
| | *NEXT, | | | | | | |
| | | J/BRA05 * --> | 3 283 126 | | | | |
| | ***** | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|------|--------------|---------|-----------|-------------------------------|
| .TOC | SET AND CLEAR CONDITION CODES" | | | | | | | |
| .CASE | 25 OF BOTH01 | | | | | | | |
| 302 | SCC00:0070 F/OTH01 | <-- | 417 285 127 | 70 | 0000 00 00 | 00 00 | 000 100 | 00000001000 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+4, J/SCC01 | * --> VV | | | 00000 000000 | 11100 | 000010100 | |
| 303 | SCC01:4024 F/SCC00 | <-- VV | | 4024 | 1111 00 00 | 01 01 | 000 010 | 0100 0 00000001000 0100 0 |
| | *P2, D+D RIGHT 4,D(C)+ALU00, J/SCC02 | * --> VV | | | 01000 000000 | 11000 | 000010110 | |
| 304 | SCC02:4026 F/SCC01 | <-- VV | | 4026 | 1000 00 00 | 10 01 | 000 000 | 0000 0 00000001000 0000 0 |
| | *SELECT, PS(CC), J/SCC03 | * --> VV | | | 11001 000000 | 11000 | 000011000 | |
| 305 | SCC03:4030 F/SCC02 | <-- VV | | 4030 | 0000 11 10 | 00 00 | 000 000 | 0000 0 00000001000 0000 0 |
| | *SCC03 IS DOCUMENTED IN THE CPU *DIAGNOSTICS AS BEING 4030 | | | | 00000 100000 | 10011 | 010010001 | |
| | *P3, MD+PS, BUTR(D(C)), J/SCC04 | * --> | 01 4221 306 136 | | | | | |
| | J/SCC05 | * --> | 11 4223 307 136 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF COUT | EXTENSION UBF UPF | CLOCKS |
|---------------|-----------------------------------|---------------------------------------|-----------------------|--------------|---------|---------------|---------------------------------|--------|
| .CASE 306 | 1 OF BSCC03 SCC04:4221 | F/SCC03 | <-- | 4030 305 135 | | | | |
| | * CLEAR | | | | | | 000000001000 | |
| | *J/SCC11 | | | | | | 0000 000000 11100 000110101 | 0100 0 |
| | *P2, D+NOT SR AND MD, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+4, | | --> | 4065 323 140 | | | | |
| | * J/RTI09 | | | | | | | |
| .CASE 307 | 2 OF BSCC03 SCC05:4223 | F/SCC03 | <-- | 4030 305 135 | | | | |
| | * SET | | | | | | 000000001000 | |
| | *J/SCC11 | | | | | | 1110 11 10 00 00 000 100 0100 0 | |
| | *P2, D+SR OR MD, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+4, | | --> | 4065 323 140 | | | | |
| | * J/RTI09 | | | | | | | |
| .TOC CASE 308 | RTS 23 OF BOTH01 RTS01:0066 | F/OTH01 | <-- | 417 285 127 | | | | |
| | *P2, D+R(DF) (A), | | | | | | 000000001000 | |
| | *P3, PC+D (B ADDR), | | | | | | 1111 00 11 10 10 111 100 0100 0 | |
| | *NEXT, BUT(GO TO),PAGE+4, | | --> VV | | | | 00000 001110 11100 000011100 | |
| | * J/RTS02 | | | | | | | |
| 309 | RTS02:4034 | F/RTS01 | <-- VV | | | | | |
| | *P1, BA+SP CURRENT MODE, | | | | | | 000010001011 | |
| | *P2, D+SP PLUS 2, | | | | | | 1001 11 11 10 00 111 000 0101 0 | |
| | *P3, SP+D (A ADDR), | | | | | | 10110 000110 11011 000011101 | |
| | *P3, U,DATI, | | | | | | | |
| | *NEXT, BUT(DIAGNOSE), | | --> | 4035 310 137 | | | | |
| | * J/RTS03 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------------|--|---------------------------------------|--|------|---------------|-----------------|----------------|----------------------|------------------------|
| 310 | RTS03:4035 ***** *-----* *P3, MD+DATA, *NEXT, BUT(GO TO),PAGE+0, * J/RTS04 ***** | <-- | 4034 309 136 | 4035 | 0000 00000 | 11 10 100000 | 00 00 11100 | 000 000 011000000 | 000000001000 0000 0 |
| 311 | RTS04:0300 ***** *-----* *P2, D+MD, *P3, R:(DF)+D (A ADDR), *NEXT, BUTR(SERVICE), * J/FET01 * J/FET03 * J/SER01 * J/FET01 * J/SER02 ***** | <-- VV | | 300 | 1010 00000 | 11 10 000110 | 00 10 10000 | 000 000 111000010 | 000000001000 0100 0 |
| .TOC .CASE | RTI AND RTT 30 OF BOTH01 | | | | | | | | |
| 312 | RTT01:0076 ***** *-----* * RETURN+RTT02, *NEXT, BUT(GO TO),PAGE+1, * J/FLG01 ***** | <-- | 417 285 127 | 76 | 0100 00000 | 00 00 000000 | 01 00 11100 | 000 001 010101100 | 000000001000 0000 0 |
| | | | ***** 1254 564 216 ***** VV 4040 313 137 | | | | | | |
| 313 | RTT02:4040 ***** *-----* *P3, MD+TMASK (BC), *NEXT, J/RTT03 ***** | <-- | 4042 314 138 | 4040 | 0000 00010 | 10 00 100000 | 01 00 11000 | 000 000 000100010 | 000000001000 0000 0 |

| BOX NO. | TAG: ADDRESS | EXTENSION | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT | CLOCKS |
|-----------|---|-----------|---------------------------------------|--|------|---------|---------|----------|-----------|--------|--------------|
| 314 | RTT03:4042 ***** *-----* * RETURN+RTI01, *NEXT, BUT(GO TO),PAGE+1, * J/FLGSO1 ***** | F/RTT02 | <-- | 4040 313 137 | 4042 | 0000 | 00 00 | 01 10 | 010 001 | 0000 0 | 000000001000 |
| | | | | ***** 1260 568 218 ***** VV 62 315 138 | | | | 11100 | 010110000 | | |
| .CASE 315 | 19 OF BOTH01 RTI01:0062 ***** *-----* *P1, BA+SP,CURRENT MODE, *P2, D+SP PLUS 2, *P3, SP+D (A ADDR), *P3, U,DATI, *NEXT, BUT(GO TO),PAGE+4, * J/RTI02 ***** | F/OTH01 | <-- | 417 285 127 | 62 | 1001 | 11 11 | 10 00 | 111 100 | 0101 0 | 000010001011 |
| | | | | | | 10110 | 000110 | 11100 | 000100100 | | |
| 316 | RTI02:4044 ***** *-----* *P3, MD+DATA, *NEXT, J/RTI03 ***** | F/RTI01 | <-- VV | | 4044 | 0000 | 11 10 | 00 00 | 000 000 | 0000 0 | 000000001000 |
| | | | | | | 00000 | 100000 | 11000 | 000100101 | | |
| 317 | RTI03:4045 ***** *-----* *P2, D+MD, *P3, PC+D (A ADDR), *NEXT, J/RTI04 ***** | F/RTI02 | <-- VV | | 4045 | 1010 | 11 10 | 00 01 | 111 000 | 0100 0 | 000000001000 |
| | | | | | | 00000 | 000110 | 11000 | 000101100 | | |
| | | | | 4054 318 139 | | | | | | | |

K12

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | SOURCE/DESTINATION | | | MICROFICHE | ADDR | ALU | BUSB | BUSB | BUSB | BUSB | EXTENSION | CLOCK |
|---------|--------------|--|--------------------|------|------|------------|-------|--------|-------|-----------|------|--------------|-----------|-------|
| | | | OFST | ADDR | BOX | | | | | | | | | |
| 318 | RTI04:4054 | F/RTI03 F/LDCPW1 F/UNDEFINED F/LOG27 F/MOV52 | <-- | 4045 | 317 | 138 | | | | | | | | |
| | | | <-- | 377 | 1889 | 610 | | | | | | | | |
| | | | <-- | -1 | -1 | -1 | 2 | 1 | 1 | | | | | |
| | | | <-- | 3625 | 974 | 321 | | | | | | | | |
| | | | <-- | 767 | 249 | 114 | | | | | | | | |
| | | | | | | | 4054 | | | | | 000010001011 | | |
| | | | | | | | 1001 | 11 | 11 | 10 | 00 | 111 000 | 0101 | 0 |
| | | | | | | | 10110 | 000110 | 11000 | 000101101 | | | | |
| | | *P1, BA+SP CURRENT MODE, *P2, D+SP PLUS 2, *P3, SP+D (A ADDR), *P3, U,DATI, *NEXT, J/RTI05 | | | | | | | | | | | | |
| | | | --> | VV | | | | | | | | | | |
| 319 | RTI05:4055 | F/RTI04 | <-- | VV | | | | | | | | | | |
| | | | | | | | 4055 | | | | | 000000001000 | | |
| | | | | | | | 0000 | 11 | 10 | 00 | 00 | 000 000 | 0000 | 0 |
| | | | | | | | 00000 | 100000 | 11000 | 000110100 | | | | |
| | | *P3, MD+DATA, *NEXT, J/RTI06 | | | | | | | | | | | | |
| | | | --> | VV | | | | | | | | | | |
| 320 | RTI06:4064 | F/RTI05 | <-- | VV | | | | | | | | | | |
| | | | | | | | 4064 | | | | | 000000001000 | | |
| | | | | | | | 1010 | 11 | 10 | 00 | 00 | 000 000 | 0100 | 0 |
| | | | | | | | 00000 | 000000 | 01110 | 011010010 | | | | |
| | | *P2, D+MD *NEXT, BUTR(PS15), * J/RTI07 * J/RTI08 | | | | | | | | | | | | |
| | | | --> | 10 | 4322 | 321 | 140 | | | | | | | |
| | | | --> | 11 | 4323 | 322 | 140 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|-----------|--|--------------------|------------|------|--------|------|----------|-----------|
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF COUT | CLOCKS |
| .CASE 321 | RTI07:4322 | F/RTI06 <-- | | 4064 | 320 | 139 | | |
| | * IF KERNEL MODE, RTI AND RTT MUST HAVE * *0 IN BIT * *11 * -----* | | | | | | | |
| | *SELECT, PS, *NEXT, * J/RTI09 * --> | | | 4065 | 323 | 140 | | |
| .CASE 322 | RTI08:4323 | F/RTI06 <-- | | 4064 | 320 | 139 | | |
| | * IF USER * *MODE * -----* | | | | | | | |
| | *SELECT, PS(LO), *NEXT, * J/RTI09 * --> VV | | | | | | | |
| | -----* | | | | | | | |
| | F/SCC04 <-- | | | 4221 | 306 | 136 | | |
| | F/SCC05 <-- | | | 4223 | 307 | 136 | | |
| | F/RTI07 <-- | | | 4322 | 321 | 140 | | |
| 323 | RTI09:4065 | F/RTI08 <-- VV | | | | | | |
| | * IF KERNEL MODE PS+D, IF USER MODE * *PS(LO)+D IF COMPLETING SET OR CLEAR * *CC'S THEN * *PS(CC)+D * -----* | | | | | | | |
| | * NEXT, DATTB, * BUT(GO TO), PAGE+D, * * J/RTI10 * --> | | | 301 | 324 | 141 | | |
| | -----* | | | | | | | |

4322
 1000 00 00 10 01 010 010 0000 0
 11001 000000 11000 000110101

4323
 1000 00 00 10 01 010 000 0000 0
 11001 000000 11000 000110101

4065
 0000 00 00 00 00 000 000 0000 0
 11010 000000 11100 011000001

M12

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 141

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|---|--|--------------------------|---|------------|------------|-------------|------------|------|-------|
| | | | | | | | | RIF UPF | COUT | |
| 324 | RTI10:0301 | F/RTI09 F/STCPW29 F/LOG03N | <-- <-- <-- | 4065 323 140 4157 1832 593 3556 942 314 | | | | | | |
| | ***** | | | | | | | | | |
| | * NULL TO ALLOW PS TO | | | | | | | | | |
| | *SETTLE | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/RES02 | | --> | 307 342 146 | | | | | | |
| | ***** | | | | | | | | | |
| .TOC " | SOB" | | | | | | | | | |
| .CASE | 9 OF BOTH01 | | | | | | | | | |
| 325 | SOB01:0050 | F/OTH01 | <-- | 417 285 127 | | | | | | |
| | ***** | | | | | | | | | |
| | *#OVERVIEW-IMPLEMENTATION SOB THE | | | | | | | | | |
| | *TECHNIQUE USED TO TEST FOR ZERO USED IN | | | | | | | | | |
| | *SOB WAS DONE TO SAVE BRANCH TARGETS. IT | | | | | | | | | |
| | *WORKS AS FOLLOWS. 1 IS SUBTRACTED FROM | | | | | | | | | |
| | *THE SOURCE REGISTER AND BIT<00> OF THE | | | | | | | | | |
| | *RESULT IS PUT INTO D(C). NOW TO THE | | | | | | | | | |
| | *CONTENTS OF THE SOURCE REGISTER IS ADDED | | | | | | | | | |
| | *NOT 0 PLUS D(C). COUT15 IS PUT INTO | | | | | | | | | |
| | *D(C). NOW IF D(C) IS 0 THE CONTENTS OF | | | | | | | | | |
| | *THE SOURCE REGISTER WAS 0, OTHERWISE IT | | | | | | | | | |
| | *WAS NOT. IF THE BRANCH IS TO BE TAKEN | | | | | | | | | |
| | *THEN THE SUCCESSFUL BRANCH FLOW IS USED | | | | | | | | | |
| | *TO COMPLETE THE INSTRUCTION. #0-I END | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, MD+77, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/SOB02 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 326 | SOB02:0302 | F/SOB01 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+SR AND MD (BC), | | | | | | | | | |
| | *P3, R(DST)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+4, | | | | | | | | | |
| | * J/SOB03 | | --> | 4070 327 142 | | | | | | |
| | ***** | | | | | | | | | |

301 0000 00 00 00 00 000 000 0000 0
00000 000000 11000 011000111

50 0000 10 00 00 00 111 111 0000 0
00010 100000 11000 011000010

302 1011 10 11 00 00 110 100 0100 0
00010 011110 11100 000111000

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--------------|--|--|--------------------------|-------------|---------------------------------|----------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COOT | |
| 327 | SOB03:4070 ***** *P2, D+R(SF) MINUS 1, D(C)+ALU00, * *P3, R(SF)+D (A ADDR), * *NEXT, * * J/SOB04 * --> VV ***** | <-- | | 302 326 141 | 4070 | | | 00000000 | 1000 | |
| | | | | | 1101 11 00 10 11 | 000 010 0100 0 | | | | |
| | | | | | 00000 000110 11000 000111001 | | | | | |
| 328 | SOB04:4071 ***** *P2, D+R(SF) PLUS NOT 0 PLUS D(C), * * D(C)+COUT15, * *NEXT, * * J/SOB05 * --> VV ***** | <-- VV | | | 4071 | | | 00000000 | 1000 | |
| | | | | | 0101 10 00 10 11 | 000 110 0100 0 | | | | |
| | | | | | 00001 000000 11000 000111100 | | | | | |
| 329 | SOB05:4074 ***** *P2, D+NOT R(DST) (A), D(C)+D(C), * *P3, R(DST)+D (A ADDR), * *NEXT, BUTR(D(C)), * * J/SOB07 * --> 01 4261 332 143 * J/SOB06 * --> 11 4263 330 142 ***** | <-- VV | | | 4074 | | | 00000000 | 1000 | |
| | | | | | 0000 00 00 11 01 110 111 0100 0 | | | | | |
| | | | | | 00000 010110 10011 010110001 | | | | | |
| .CASE 330 | 2 OF BS0B05 SOB06:4263 ***** *P2, D+R(DST) PLUS 1, D(C)+D(C), * *NEXT, * * J/SOB08 * --> 4075 331 143 ***** | <-- VV | | | 4263 | | | 00000000 | 1000 | |
| | | | | | 1001 11 00 11 01 110 111 0100 0 | | | | | |
| | | | | | 00000 000000 11000 000111101 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------------------------|---|--|--------------------------|------|---------------|-----------------|----------------|----------------------|-----------|--------|--------|
| | | | | | | | | RIF | COUT | CLOCKS | |
| 331 | SOB08:4075 ***** *NEXT, BUT(GO TO),PAGE+0, * J/BRA02 ***** | F/SOB06 <-- | 4263 330 142 | 4075 | 0000 00000 | 00 00 000000 | 00 00 11100 | 000 000 000000010 | 0000 0000 | 0000 0 | 0000 0 |
| .CASE 332 | 1 OF BS0B05 SOB07:4261 ***** *NEXT, BUT(GO TO),PAGE+0, * J/BRA05 ***** | F/SOB05 <-- | 4074 329 142 | 4261 | 0000 00000 | 00 00 000000 | 00 00 11100 | 000 000 000000011 | 0000 0000 | 0000 0 | 0000 0 |
| .TOC " MARK" .CASE 333 | 10 OF BOTH01 MARK00:0051 ***** *P2, D+D,D(C)+ALU07, *NEXT, J/MARK01 ***** | F/OTH01 <-- | 417 285 127 | 51 | 1111 00000 | 00 00 000000 | 01 01 11000 | 000 011 011000011 | 0000 0000 | 0100 0 | 0000 0 |
| 334 | MARK01:0303 ***** *P3, * D+PC PLUS (D SIGN EXTE * ND LEFT 1), *NEXT, BUT(GO TO),PAGE+4, * J/MARK02 ***** | F/MARK00 <-- VV | 4104 335 144 | 303 | 1001 00010 | 00 11 000000 | 01 00 11100 | 111 100 001000100 | 0000 0000 | 0100 0 | 0000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|------------------------|--|--|--------------------------|------|---------------|-----------------|----------------|----------------------|----------|--------|--------|
| | | | | | | | | RIF | COUT | | |
| 335 | MARK02:4104 ***** *SELECT, * EMIT AND *ENABLE CLKIR, *NEXT, * J/MARK03 ***** | <-- | 303 334 143 | 4104 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 100 001000101 | 00000000 | 1000 | 0000 0 |
| 336 | MARK03:4105 ***** *P2, IR+000205, *NEXT, * J/MARK04 ***** | <-- VV | | 4105 | 0000 11010 | 00 00 000000 | 00 10 11000 | 000 101 001001000 | 00000000 | 1000 | 0000 0 |
| 337 | MARK04:4110 ***** *P2, SP+D (A ADDR), *NEXT, BUT(GO TO),PAGE+0, * J/RTS01 ***** | <-- VV | | 4110 | 0000 00000 | 00 00 000110 | 00 00 11100 | 111 000 000110110 | 00001000 | 1000 | 0000 0 |
| .TOC = .CASE 338 | WAIT 18 OF BOTH01 WAIT01:0061 ***** *#OVERVIEW-FUNCTION WAIT A PASSIVE *RELEASE OF THE BUS WILL NOT BREAK OUT OF *THE WAIT INSTRUCTION. #0-F END PASSIVE *RELEASE RETURNS TO *WAIT *-----* *NEXT, BUT(GO TO),PAGE+4, * J/WAIT02 ***** | <-- | 417 285 127 | 61 | 0000 00000 | 00 00 000000 | 00 00 11100 | 000 100 100000010 | 00000000 | 1000 | 0000 0 |
| | | --> | 66 308 136 | | | | | | | | |
| | | --> | 4402 339 145 | | | | | | | | |

D13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 145

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|-----------------------------------|--|-----------------------|------------|--------------|------------|------------|-------------------|------|--------|
| .CASE | 1 OF BWAIT02 | | | | | | | | | |
| 339 | WAIT02:4402 | F/WAIT01 F/WAIT02 | <-- <-- | 61 4402 | 338 339 | 144 145 | | | | |
| | ***** | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/WAIT02 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | | J/WAIT02 J/WAIT03 | * --> * --> | 10 11 | 4402 4403 | 339 340 | 145 145 | | | |
| | ***** | | | | | | | | | |
| .CASE | 2 OF BWAIT02 | | | | | | | | | |
| 340 | WAIT03:4403 | F/WAIT01 F/WAIT02 | <-- <-- VV | 61 | 338 | 144 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P3, MD+DATA (BC), RETURN+WAIT01, | | | | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+0, | | | | | | | | | |
| | * J/SER03 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | | | --> | | | | | | | |
| | | | | 322 | 388 | 163 | | | | |
| | | | | ***** | | | | | | |
| | | | | VV | | | | | | |
| | | | | 51 | 338 | 144 | | | | |
| .TOC " | RESET" | | | | | | | | | |
| .CASE | 24 OF BOTH01 | | | | | | | | | |
| 341 | RES01:0067 | F/OTH01 | <-- | 417 | 285 | 127 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *SELECT, EMIT | | | | | | | | | |
| | *NEXT, BUTR(PS15), | | | | | | | | | |
| | * J/RES03 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | | J/RES03 J/RES02 | * --> * --> | 10 11 | 306 307 | 343 342 | 146 146 | | | |
| | ***** | | | | | | | | | |

```

4402      0000 00 00 00 00 00000001000
         00000 000000 10000 100000010
4403      0000 10 00 01 10 001 000 0000 0
         00010 100000 11100 011010010
67        0000 00 00 00 01 000 000 0000 0
         11001 000000 01110 011000110
    
```

E13

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|--|---------------------------------------|--------------------------------|------|------------------|--------------|-----------------|-------------------------------|
| .CASE 342 | RES02:0307 | F/RES01 <-- | 67 341 145 | 307 | | | | 000000001000 |
| | * ALSO USED BY RTI10 TO COMPLETE * *RTI * | | | | 0000 00 00 00 00 | 0000 000000 | 10000 111000010 | 0000 0000 0000 0 |
| | *NEXT, BUTR(SERVICE), * J/FET01 * | | | | | | | |
| | * J/FET03 * --> | | 00 700 3 11 | | | | | |
| | * J/SER01 * --> | | 01 701 385 160 | | | | | |
| | * J/FET01 * --> | | 10 702 1 2 | | | | | |
| | * J/SER02 * --> | | 11 703 387 162 | | | | | |
| .CASE 343 | RES03:0306 | F/RES01 <-- | 67 341 145 | 306 | | | | 000000001000 |
| | * RETURN+BRAS * *NEXT, BUT(GO TO),PAGE+3, * | | | | 0000 00 00 00 00 | 000000 11100 | 000000110 | 011 011 0000 0 |
| | * J/RES04 * --> | | ***** 3006 344 147 ***** | | | | | |
| | | | VV 3 283 126 | | | | | |

F13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 147

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|------------------|--|--------------------------|-----------------|------------|-------------|-----------|-------------|
| | | | | | | | RIF | COOT CLOCKS |
| | F/RES03 | 306 343 146 | | | | | | |
| * | SUBROUTINE RES04 | | | | | | | |
| | RETURN/BRA05 | 3 283 126 | | | | | | |

G13

```

344 RES04:3006
*****
* INIT ROUTINE WILL INITIALIZE STACK *
* LIMIT, MMRO, AND UNIBUS THEN GO TO *
* BRA05 *
*-----*
* P3, MD+120030, *
* NEXT, *
* J/INIT00 * --> 3420 834 284
*****
.TOC " HALT"
.CASE 28 OF BOTH01
345 HALT01:0074 F/OTH01 <-- 417 285 127
*****
*-----*
* NEXT, BUTR(PS15), *
* J/HALT02 *
* J/HALT02 * --> 10 132 346 147
* J/HALT03 * --> 11 133 347 148
*****
.CASE 1 OF BHALT01
346 HALT02:0132 F/HALT01 <-- VV
*****
* GO TO CONSOLE IF KERNEL MODE *
*-----*
* NEXT, BUT(GO TO),PAGE+1, *
* J/CON99 * --> 1040 382 159
*****

```

```

3006 000000001000
      1010 10 00 00 00 011 000 0000 0
      00010 100000 11000 100010000

```

```

74 000000001000
     0000 00 00 00 00 000 000 0000 0
     00000 000000 01110 001011010

```

```

132 000000001000
     0000 00 00 00 00 000 001 0000 0
     00000 000000 11100 000100000

```


| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------------|
| .TOC " 351 | EMT" 14 OF BOTH01 EMT01:0055 | F/OTH01 <-- | 417 285 127 | 55 | | | 000000001000 |
| | ***** | | | | | | 0000 10 00 00 00 011 000 0000 0 |
| | *-----* | | | | | | 00010 100000 11000 001010111 |
| | *P3, MD+30 (BC), | | | | | | |
| | *NEXT, J/TRPOO | --> | 127 357 151 | | | | |
| | ***** | | | | | | |
| .TOC " 352 | ILLEGAL INSTRUCTIONS" 1 OF BJSR01 ILLO1:0650 | F/JSR01 <-- | 57 255 117 | 650 | | | 000000001000 |
| | ***** | | | | | | 0000 10 00 00 00 000 100 0000 0 |
| | *-----* | | | | | | 00010 100000 11000 001010111 |
| | *P3, MD+4 (BC), | | | | | | |
| | *NEXT, J/TRPOO | --> | 127 357 151 | | | | |
| | ***** | | | | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| 353 | YTRP00:0304 | F/YZ03 | <-- | 1155 497 195 | | | |
| | ***** *OVERVIEW-FUNCTION SHARED TRAP FLOW THE * *SHARED TRAP FLOW REPLACES THE CURRENT PS * *AND PC WITH THE PS AND PC POINTED TO BY * *THE TRAP VECTOR (WHICH IS INTERPERTED AS * *A VIRTUAL ADDRESS IN KERNEL SPACE) * *PASSED TO IT. IT ALSO PUSHES THE * *REPLACED PS AND PC ON THE STACK * *SPECIFIED BY THE NEW PS. THE PREVIOUS * *MODE BITS OF THE NEW PS ARE MODIFIED SO * *THAT THEY ARE EQUAL TO THE CURRENT MODE * *BITS OF THE REPLACED PS. WHEN THE SHARED * *TRAP FLOW IS USED FOR YELLOW ZONE * *ERRORS, YELLOW ZONE ERRORS ARE * *INHIBITED. WHEN THE SHARED TRAP IS USED * *FOR RED ZONE AND ERROR ON ERROR'S * *CHECKING OF STACK OVERFLOWS IS * *INHIBITED. AT THE END OF THE SHARED TRAP * *FLOW THE ERROR TRAP IN PROGRESS BIT * *(WHAMI<09>) IS CLEARED. AT THE END OF * *THE SHARED TRAP FLOW CONTROL IS PASSED * *WHICH CASE CONTROL IS PASSED * *-----* *SELECT, * * * EMIT AND * *ENABLE CLKIR, * *NEXT, * * * J/YTRP01 * --> VV ***** 354 YTRP01:0305 F/YTRP00 <-- VV ***** *P3, IR+100706, * *NEXT, * * * J/TRP02 * --> ***** 304 0000 00 00 00 01 000 100 0000 0 11001 000000 11000 011000101 305 1000 00 00 01 11 000 110 0000 0 11010 000000 11000 011001110 316 359 152 | | | | | | |

K13

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|-----------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|-------------------------------|------------------------|
| 355 | NTRP00:0310 ***** * ENTRY POINT FOR NO KJ * TRAPS *-----* *P3, *SELECT, * EMIT AND CLKIR * *ENABLE, *NEXT, * J/NTRP01 ***** | <-- | 327 526 204 | 310 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 100 011001010 | 000000001000 0000 0 |
| 356 | NTRP01:0312 ***** * BECAUSE IR<2:0> = 0 THE KJ CANNOT BE * ENABLED *-----* *P2, IR+700, *NEXT, * J/TRP02 ***** | <-- VV --> VV | | 312 | 0000 11010 | 00 00 000000 | 01 11 11000 | 000 000 011001110 | 000000001000 0000 0 |
| .CASE 357 | 2 OF BINTRO3 TRP00:0127 ***** * ENTRY POINT FOR KJ * TRAPS *-----* *P3, *SELECT, * EMIT AND CLKIR * *ENABLE, *NEXT, * J/TRP01 ***** | <-- | 325 392 164 | 127 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 100 011001100 | 000000001000 0000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|----------------------------|------|---------------|-----------------|----------------|---|
| 358 | TRP01:0314 ***** * BECAUSE IR<2:0> = 6 THE KJ CAN BE * *ENABLED * -----* *P2, IR+706, * *NEXT, * * J/TRP02 * ***** | <-- | 127 357 151 | 314 | 0000 11010 | 00 00 000000 | 01 11 11000 | 000000001000 000 110 0000 0 011001110 |
| 359 | TRP02:0316 ***** * D GETS VECTOR(WHICH POINTS TO NEW PC) * *VECTOR IS PUT INTO * *R(VECT) * -----* *P2, D+MD, * *P3, R(VECT)+D (A ADDR), * *NEXT, BUT(GO TO),PAGE+4, * * J/TRP03A * ***** | <-- <-- <-- VV | 305 354 150 312 356 151 | 316 | 1010 00000 | 11 10 010110 | 00 00 11100 | 000000001000 110 100 0100 0 001001001 |
| 360 | TRP03A:4111 ***** *P3, R(VECT SAV)+D, * *NEXT, * * J/TRP03 * ***** | <-- VV | | 4111 | 0000 00000 | 00 10 011100 | 00 00 11000 | 000000001000 101 000 0000 0 001001100 |
| 361 | TRP03:4114 ***** * FETCH NEW * *PC * -----* *P1, BA+R(VECT), KERNEL MODE, * *P2, D+R(VECT) PLUS 2, * *P3, R(VECT)+D (A ADDR), * *P3 U,DATI NOINT, * *NEXT, * * J/TRP04 * ***** | <-- VV <-- | | 4114 | 1001 10001 | 11 11 010110 | 11 00 11000 | 000000001010 110 000 0101 0 001001101 |
| | | | 4115 362 153 | | | | | |

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PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|---------|---|--|--------------------------|-----------|---------------|-----------------|----------------|----------------------|----------------------------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS |
| 362 | TRP04:4115 ***** * MD GETS NEW *PC *-----* *P3, MD+DATA, *NEXT, * J/TRP05A ***** | <-- | 4114 361 152 | 4115 | 0000 0000 | 11 10 100000 | 00 00 11000 | 000 000 001001110 | 000000001000 0000 0000 0000 0 |
| 363 | TRP05A:4116 ***** *SELECT, PS, *NEXT, * J/TRP05 ***** | <-- VV | | 4116 | 1000 11001 | 00 00 000000 | 10 01 11000 | 010 010 001001111 | 000000001000 0000 0 |
| 364 | TRP05:4117 ***** * D GETS NEW PC D(C) GETS NEW PC<0> FOR *TESTING IN TRP06 R(VECT) GETS NEW PC MD *GETS OLD PS FETCH NEW *PS *-----* *P1, BA+R(VECT), KERNEL MODE, *P2, D+MD, D(C)+ALU00, *P3, R(VECT)+D (A ADDR), MD+DATA, *P3, U, DATI NOINT, *NEXT, * J/TRP06 ***** | <-- VV | | 4117 | 1010 10001 | 11 10 110110 | 11 00 11000 | 110 010 001010000 | 000000001010 0101 0 |
| | | --> | 4120 365 154 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | | | | |
|---------|--|--|--------------------------|------|------------|------------|-------------|-----------|-------|-----------|----------|------|----------|----------|------|
| | | | | | | | | RIF | COUT | CLOCKS | | | | | |
| 365 | TRP06:4120 | F/TRP05 | <-- | 4117 | 364 | 153 | | | | | | | | | |
| | ***** | | | | | | | 4120 | | | 00000000 | 1000 | | | |
| | * SR GETS OLD PS MD GETS NEW PS TEST TO | | | | | | 1010 | 11 | 10 | 00 | 00 | 000 | 000 | 0010 | 0 |
| | *SEE IF NEW PC WAS ODD, IF IT WAS GO TO | | | | | | 00000 | 100000 | 10011 | 110011001 | | | | | |
| | *WCS01 | | | | | | | | | | | | | | |
| | ----- | | | | | | | | | | | | | | |
| | *P2, SR+MD | | | | | | | | | | | | | | |
| | *P3, MD+DATA | | | | | | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | | | | | | |
| | * J/TRP07 | | | | | | | | | | | | | | |
| | | J/TRP07 | --> | 01 | 4631 | 366 | 154 | | | | | | | | |
| | | J/WCS01 | --> | 11 | 4633 | 379 | 158 | | | | | | | | |
| | ***** | | | | | | | | | | | | | | |
| .CASE | 1 OF BTRP06 | | | | | | | | | | | | | | |
| 366 | TRP07:4631 | F/TRP06 | <-- | 4120 | 365 | 154 | | | | | | | | | |
| | | F/WCS05 | <-- | 4431 | 381 | 158 | | | | | | | | | |
| | ***** | | | | | | | 4631 | | | | | 00000000 | 1000 | |
| | *FIX D GETS NEW PS D(C) GETS NEW CURRENT | | | | | | 1010 | 11 | 10 | 00 | 00 | 000 | 100 | 0100 | 0 |
| | *MODE | | | | | | 00000 | 000000 | 11000 | 001010010 | | | | | |
| | ----- | | | | | | | | | | | | | | |
| | *P2, D+MD, D(C)+ALU15, | | | | | | | | | | | | | | |
| | *NEXT, J/TRP08 | | | | | | | | | | | | | | |
| | | | --> | VV | | | | | | | | | | | |
| 367 | TRP08:4122 | F/TRP07 | <-- | VV | | | | | | | | | | | |
| | ***** | | | | | | | 4122 | | | | | | 00000000 | 1000 |
| | * THIS IS A DATTB TO LOAD PS, NOTE THAT | | | | | | 1111 | 00 | 00 | 00 | 00 | 000 | 111 | 1100 | 0 |
| | *PREVIOUS MODE FIELD IS WRONG D GETS OLD | | | | | | 11010 | 000000 | 11000 | 001010100 | | | | | |
| | *PS | | | | | | | | | | | | | | |
| | ----- | | | | | | | | | | | | | | |
| | *P2, PS+D | | | | | | | | | | | | | | |
| | *P3, D+SR(P3), D(C)+D(C), | | | | | | | | | | | | | | |
| | *NEXT, J/TRP09 | | | | | | | | | | | | | | |
| | | | --> | 4124 | 368 | 155 | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|--|--------------------------|------|---------------|-----------------|----------------|---|
| 368 | TRP09:4124 ***** *P3, *SELECT, PS(HI), *NEXT, * J/TRP10A ***** | F/TRP08 <-- | 4122 367 154 | 4124 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 010 0000 0 001010101 |
| 369 | TRP10A:4125 ***** *P2, SR+SP MINUS 2, *NEXT, * J/TRP10 ***** | F/TRP09 <-- VV | | 4125 | 1101 00000 | 11 11 000000 | 10 00 11000 | 000010001000 111 000 0010 0 001011100 |
| 370 | TRP10:4134 ***** * OLD PS IS PUSHED ON *STACK *-----* *P1, BA+SR,CURRENT MODE, *ENABLE, KJ, *P2, SR+SR MINUS 2, *P3, U,DATO, *NEXT, * J/TRP12 ***** | F/TRP10A <-- VV | | 4134 | 1101 10010 | 11 11 000000 | 00 00 11000 | 000001001011 000 000 1011 0 001011110 |
| 371 | TRP12:4136 ***** * D(15)+D(C) WHICH IS THE NEW STATUS (SEE *TRP07) D<13>+D<14> WHICH IS OLD *STATUS *-----* *P3, D+D RIGHT 1 (P3), *NEXT, * J/TRP13 ***** | F/TRP10 <-- VV | | 4136 | 1111 00000 | 00 00 000000 | 01 10 11000 | 000000001000 000 000 1100 0 001100000 |
| | | | 4140 372 156 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCK |
|---------|---|--------------------|-------------------|------|---------------|-----------------|----------------|----------------------|--------------|--------|
| | | | | | | | | OFST | COORD | |
| 372 | TRP13:4140 ***** * THIS WRITES PS<15> AND *PS<13> *-----* *P3, DATTB, *NEXT, J/TRP14 ***** | <-- | 4136 371 155 | 4140 | 0000 11010 | 00 00 000000 | 00 00 11000 | 000 000 001100010 | 000000001000 | 0000 0 |
| 373 | TRP14:4142 ***** * PUSH OLD PC ON *STACK *-----* *P1 BA+SR, CURRENT MODE, *ENABLE, KJ, *P2, D+PC (B), *P3, U, DATO, *NEXT, J/TRP15A ***** | <-- VV | | 4142 | 1010 10010 | 00 11 000000 | 00 00 11000 | 111 000 000011001 | 000001001011 | 0101 0 |
| 374 | TRP15A:4031 ***** * TRP15A MUST BE IN LOC 4031 NULL FOR *DATO *-----* *NEXT, J/TRP15 ***** | <-- VV | | 4031 | 0000 00000 | 00 00 000000 | 00 00 11000 | 000 000 001100100 | 000000001000 | 0000 0 |
| 375 | TRP15:4144 ***** *P2, D+SR, *P3, SP+D (A ADDR), *NEXT, BUTR(IR15), * J/TRP16 *-----* * J/TRP16 * UNDEFINED CASE ***** | <-- VV | | 4144 | 1111 00000 | 00 00 000110 | 00 00 00001 | 111 000 100010111 | 000010001000 | 0100 0 |
| | | --> | 0111 4427 376 157 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---------------------------|---------------------------------------|-----------------------|--------------|------------|------------|----------|---|
| .CASE | 1 OF BTRP15 | | | | | | | |
| 376 | TRP16:4427 | F/TRP15 F/TRP17 | <-- <-- | 4144 4437 | 375 377 | 156 157 | | |
| | *SF=7 | | | | | | | 4427 1111 00 01 11 00 00000001000 00000 001110 11100 011010000 |
| | *P2, D+R(VECT) | | | | | | | |
| | *P3, R(SF)+D (B ADDR) | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | |
| | * J/TRP15 | | --> | 320 | 378 | 157 | | |
| .CASE | 4 OF BTRP15 | | | | | | | |
| 377 | TRP17:4437 | F/TRP15 F/TRP17 | <-- <-- | 4144 4437 | 375 377 | 156 157 | | |
| | * CLEAR YELLOW ZONE FLAG, | | | | | | | 4437 0100 00 01 01 00 000 000 0000 0 11011 000000 11000 100010111 |
| | *NEXT, J/TRP16 | | --> | 4427 | 376 | 157 | | |
| 378 | TRP18:0320 | F/TRP16 | <-- | 4427 | 376 | 157 | | |
| | *P2, D+WHAMI AND NOT 2, | | | | | | | 320 0111 11 11 11 00 101 000 0100 0 00000 010010 10000 111000010 |
| | *P3, WHAMI+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | * J/FETO3 | | --> | 00 | 700 | 3 | 11 | |
| | * J/SERO1 | | --> | 01 | 701 | 385 | 160 | |
| | * J/FETO1 | | --> | 10 | 702 | 1 | 2 | |
| | * J/SERO2 | | --> | 11 | 703 | 387 | 162 | |

E14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. .CASE | TAG: ADDRESS 2 OF BTRP06 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------------|---|--|--------------------------|-------------------------------------|------------|------------|-------------|---|--------------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 379 | WCS01:4633 | F/TRP06 F/WCS05 | <-- <-- | 4120 365 154 4431 381 158 | | | | | | |
| | ***** * PREPARATION TO TEST TO SEE IF WCS/ECS * IS ENABLED IN * WCS03 *-----* | | | | | | | 4633 | 000000001000 | |
| | *P2, D+WHAMI, D(C)+ALU07, *NEXT, * J/WCS02 | | | | | | | 1111 00 00 11 00 101 011 0100 0 00000 000000 11000 001100101 | | |
| 380 | WCS02:4145 | F/WCS01 | <-- VV <-- VV | | | | | | | |
| | ***** * D GETS NEW * PS *-----* | | | | | | | | | |
| | *P2, D+MD, D(C)+D(C), *NEXT, BUTR(D(C)), * J/WCS05 | | | | | | | | | |
| | | J/WCS05 J/WCS0DDPC01 | --> --> | 01 4431 381 158 11 4433 1223 392 | | | | | | |
| .CASE 381 | 1 OF BWCS02 WCS05:4431 | F/WCS02 | <-- VV | | | | | | | |
| | ***** * WCS/ECS NOT ENABLED, RETORED D AND * RETURN TO TRAP * FLOW *-----* | | | | | | | | | |
| | *P2, D+R(VECT), *NEXT, * J/TRP07 | | | | | | | | | |
| | | | --> | 4631 366 154 | | | | 4431 | 000000001000 | |
| | ***** | | | | | | | 1111 00 00 11 00 110 000 0100 0 00000 000000 11000 110011001 | | |

F14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 159

| BOX NO. | TAG: ADDRESS "CONSOLE" | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---------------------------|--|--------------------------|---|------------------|-------------|-----------|------|--------|
| | | | | | | | RIF | COUT | |
| 382 | CON99:1040 | F/HALT02 F/PST23 F/UB12 | <-- <-- <-- | 132 346 147 1655 439 177 1721 555 213 | 1040 | | 00000000 | 1000 | |
| | *P3, MD+200 (BC), | | | | 0000 10 00 00 10 | 000 000 | 0000 0 | | |
| | *NEXT, | | | | 00010 100000 | 11000 | 000000000 | | |
| | * J/CON99B | | --> VV | | | | | | |
| 383 | CON99B:1000 | F/CON99 F/JDEF03 | <-- <-- | 1040 382 159 1735 1227 393 | 1000 | | 00000000 | 1000 | |
| | *P2, SR+R(CNTL), | | | | 1010 01 11 00 00 | 111 000 | 0010 0 | | |
| | *NEXT, | | | | 00000 000000 | 11000 | 000000100 | | |
| | * J/CON99C | | --> VV | | | | | | |
| 384 | CON99C:1004 | F/CON99B | <-- VV | | 1004 | | 00000000 | 1000 | |
| | *P2, D+SR OR MD(D), | | | | 1110 10 11 00 00 | 111 000 | 0100 0 | | |
| | *P3, R(CNTL)+D, | | | | 00010 011100 | 11000 | 110110100 | | |
| | *NEXT, | | | | | | | | |
| | * J/CSRO1 | | --> | 1664 980 323 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--------------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| | .TOC "SERVICE (INCLUDING INTERRUPT)" | | | | | | |
| | ::#0-I END | | | | | | |
| | .CASE 2 OF BCMP01 | | | | | | |
| | F/FET02 | <-- | 1 | 2 | 10 | | |
| | F/CMP01 | <-- | 442 | 74 | 52 | | |
| | F/BIT01 | <-- | 443 | 75 | 52 | | |
| | F/BIC01 | <-- | 444 | 76 | 53 | | |
| | F/BIS01 | <-- | 445 | 77 | 53 | | |
| | F/ADD01 | <-- | 446 | 78 | 54 | | |
| | F/SUB01 | <-- | 456 | 79 | 54 | | |
| | F/CMPB01 | <-- | 452 | 80 | 55 | | |
| | F/BITB01 | <-- | 453 | 81 | 55 | | |
| | F/BICB01 | <-- | 454 | 82 | 56 | | |
| | F/BISB01 | <-- | 455 | 83 | 56 | | |
| | F/CLR01 | <-- | 550 | 117 | 70 | | |
| | F/COM01 | <-- | 551 | 118 | 70 | | |
| | F/INC01 | <-- | 552 | 119 | 71 | | |
| | F/DEC01 | <-- | 553 | 120 | 71 | | |
| | F/ADC01 | <-- | 555 | 123 | 72 | | |
| | F/TST01 | <-- | 557 | 127 | 73 | | |
| | F/ROLO1 | <-- | 541 | 129 | 74 | | |
| | F/ASLO1 | <-- | 543 | 134 | 76 | | |
| | F/CLRB01 | <-- | 570 | 135 | 76 | | |
| | F/COMB01 | <-- | 571 | 136 | 77 | | |
| | F/INCB01 | <-- | 572 | 137 | 77 | | |
| | F/DECB01 | <-- | 573 | 138 | 78 | | |
| | F/ADCB01 | <-- | 575 | 141 | 79 | | |
| | F/TSTB01 | <-- | 577 | 145 | 80 | | |
| | F/ROLB01 | <-- | 561 | 147 | 81 | | |
| | F/ASLB01 | <-- | 563 | 152 | 83 | | |
| | F/MOVB01 | <-- | 441 | 188 | 95 | | |
| | F/BRA06 | <-- | 210 | 284 | 126 | | |
| | F/MFAT15 | <-- | 2034 | 583 | 223 | | |

385 SER01:0701

```

*****
*#OVERVIEW-FUNCTION SERVICE DISPATCH *
*SERVICE DISPATCH DETERMINES THE HIGHEST *
*PRIORITY EVENT THAT CAUSED SERVICE TO BE *
*REQUESTED AND THEN PASSES CONTROL TO THE *
*ROUTINE THAT HANDLES THAT EVENT EACH *
*EVENT THAT CAUSES SERVICE TO BE *
*REQUESTED SETS A FLAG THAT LATER READ BY *
*SERVICE DISPATCH TO DETERMINE WHICH *
*EVENT REQUESTED SERVICE. IF ANY OF *
*THESE FLAGS ARE SET, ANY OF THE BUT'S *
*WHICH TEST SERVICE WILL BE TRUE. A BUT *
*ON SERVICE IS DONE AT THE END OF EVERY *
*MACRO INSTRUCTION AND AT THE END OF THE *
*SHARED TRAP FLOW. #0-F END *
*#OVERVIEW-IMPLEMENTATION SERVICE *
*DISPATCH THERE ARE TWO ENTRY POINTS TO *
*SERVICE DISPATCH. SER01 BACKS UP THE PC *
*AND ABORTS THE HFP. SER02 DOES NOT *
*BACK UP THE PC. SER01 IS USED WHEN *
*SERVICE IS REQUESTED AT THE END OF A *
*MACRO INSTRUCTION *
*-----*
*P2, D+PC MINUS 2, *
*P3, PC+D (A ADDR), *
```

```

701 000000001000
1101 11 11 10 01 111 000 0100 0
00000 000110 11000 011010001
```

*NEXT,

*

J/SERO2A

*

-->

H14
321 386 161

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | | | | | | | | | | | |
|---------|----------------------|--------------------|------------|------|-----|------|------|-----------|------|-----|------|-------|------|-----|----|-----|-----|------|--------|--|
| | | | | | | | | OFST | ADDR | BOX | PAGE | COORD | CARD | BUS | SP | UBF | RIF | COUT | CLOCKS | |
| 386 | SER02A:0321 | F/SER01 <-- | | 701 | 385 | 160 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *SELECT, FPP(ABORT), | | | | | | | | | | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | | | | | | | | | | |
| | * J/SER02 * --> | | | 703 | 387 | 162 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |

321
 0000 00 00 00 00 001 001 0000 0
 11001 000000 11000 111000011

BOX NO. TAG:ADDRESS .CASE 4 OF BCMP01

SOURCE/DESTINATION OFST ADDR BOX PAGE MICROFICHE COORD CARD ADDR ALU BUS BUSB SP BUSA UBF EXTENSION RIF COUT CLOCKS UPF

Table with columns for instruction type (F/), instruction name, and source/destination addresses (OFST, ADDR, BOX, PAGE). Includes instructions like F/FET02, F/CMP01, F/BIT01, etc.

387 SER02:0703

*

* RETURN+SER04,
*NEXT, BUT(GO TO),PAGE+0,
* J/SER03
***** -->

322 388 163

VV
21 394 165

703
0000 00 00 00 10 001 000 0000 0
00000 000000 11100 011010010

K14

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------|---------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|--------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | |
| | | F/WAIT03 | <-- | 4403 | 340 | 145 | | | | | | |
| | | F/SER02 | <-- | 703 | 387 | 162 | | | | | | |
| | | F/SER02F | <-- | 4723 | 1317 | 428 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE SER03 | | * | | | | | | | | | |
| | | RETURN/WAIT01 | * --> | 61 | 338 | 144 | | | | | | |
| | | RETURN/SER04 | * --> | 21 | 394 | 165 | | | | | | |
| | | RETURN/SER04 | * --> | 21 | 394 | 165 | | | | | | |
| ***** | | | | | | | | | | | | |

L14

388

SERO3:0322

```
*****  
*  
*-----*  
*SELECT,   EMIT,   *  
*NEXT,    BUTR(INTERRUPT IS HIGHEST), *  
*          J/SERO4 *  
*          J/SERO4 * -->  
*          J/INTRO1 * -->  
*****
```

```
01 21 394 165  
11 23 389 164
```

322

```
0000 00 00 00 01 00000001000  
11001 000000 10110 000010001 0000 0
```



```

389  INTRO1:0023
*****
*P3,      MD+40000,
*NEXT,
*          J/INTRO1A          * --> VV
*****
390  INTRO1A:0323      F/INTRO1      <-- VV
*****
*-----*
*          ALLOW BUS GRANT,
*NEXT,
*          J/INTRO2          * --> VV
*****
391  INTRO2:0324      F/INTRO1A      <-- VV
*****
*  GET
*VECTOR
*-----*
*P2,      RES+MD,
*P3,      MD+VECTOR ADDRESS,
*NEXT,
*          J/INTRO3          * --> VV
*****
392  INTRO3:0325      F/INTRO2      <-- VV
*****
*-----*
*NEXT,      BUT(INTERRUPT VALID),
*          J/INTRO4
*          J/INTRO4          * -->
*          J/TRPOD          * -->
*****

```

```

01 125 393 165
11 127 357 151

```

```

23      000000001000
0100 10 00 00 00 000 000 0000 0
00010 100000 11000 011010011

```

```

323     000000001000
0100 00 01 10 00 000 000 0000 0
11011 000000 11000 011010100

```

```

324     000000001000
0000 11 10 00 00 000 000 0000 0
00000 110001 11000 011010101

```

```

325     000000001000
0000 00 00 00 00 000 000 0000 0
00000 000000 10001 001010101

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|------|---------|---------|----------|---|
| 393 | 1 OF BINTRO3 INTRO4:0125 | F/INTRO3 | <-- | 325 | 392 | 164 | | 125 0000 00 00 00 01 000 000 0000 0 11001 000000 11111 00000000 |
| | * MAY WANT TO REPORT THESE * * * * | | | | | | | |
| | *NYI | | | | | | | |
| | *-----* | | | | | | | |
| | *SELECT, EMIT, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * BUT(RETURN) | | --> | VV | | | | |
| 394 | 1 OF BSERO3 SER04:0021 | F/SERO3 | <-- | 322 | 388 | 163 | | 21 0100 10 00 00 00 000 000 0000 0 00010 100000 11000 011010110 |
| | *P3, MD+40000, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/SER05 | | --> | VV | | | | |
| 395 | SER05:0326 | F/SER04 | <-- | VV | | | | 326 0000 11 10 00 00 000 001 0000 0 00000 010001 11100 000000101 |
| | * DONE TO INITIALIZE RES WITHOUT DOING | | | | | | | |
| | *BUT CLEAR | | | | | | | |
| | *FLAGS | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, RES+MD, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/SER06 | | --> | VV | | | | |
| 396 | SER06:1005 | F/SER05 | <-- | VV | | | | 1005 0001 10 11 11 11 100 000 0000 0 00010 100000 11000 000001000 |
| | * USED TO MASK ON UPPER BITS OF SERVICE | | | | | | | |
| | *REGISTER | | | | | | | |
| | *-----* | | | | | | | |
| | *P3, MD+17740, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/SER07 | | --> | 1010 | 397 | 166 | | |

C15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 166

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|----------------------------|--|--------------------------|--------------|--------------|------------|-------------|-----------|----------|--------|
| | | | | | | | | RIF | COUT | |
| 397 | SER07:1010 | F/SER06 | <-- | 1005 396 165 | | | | | | |
| | ***** | | | | 1010 | | | | 00000000 | 1000 |
| | *SELECT, KBUS(STATUS), | | * | | 0100 | 01 00 | 00 00 | 000 000 | 0000 | 0 |
| | *NEXT, | | * | | 11001 | 000000 | 11000 | 000001001 | | |
| | * J/SER08 | | * --> VV | | | | | | | |
| 398 | SER08:1011 | F/SER07 | <-- VV | | | | | | | |
| | ***** | | | | 1011 | | | | 00000000 | 1000 |
| | *SETUP, TEST MASKED PS(T), | | * | | 1010 | 11 10 | 00 00 | 000 000 | 0010 | 0 |
| | *P2, SR+MD, | | * | | 00000 | 100000 | 11000 | 000001100 | | |
| | *P3, MD+KBUS(STATUS), | | * | | | | | | | |
| | *NEXT, | | * | | | | | | | |
| | * J/SER09 | | * --> VV | | | | | | | |
| 399 | SER09:1014 | F/SER08 | <-- VV | | | | | | | |
| | ***** | | | | 1014 | | | | 00000000 | 1000 |
| | *NEXT, BUTM(MASKED PS(T)), | | * | | 0000 | 00 00 | 00 00 | 000 000 | 0000 | 0 |
| | * J/SER10 | | * --> VV | | 00000 | 000000 | 01100 | 000100110 | | |
| | ***** | | | | | | | | | |
| .CASE 400 | 1 OF BSER09 | | | | | | | | | |
| 400 | SER10:1046 | F/SER09 | <-- VV | | | | | | | |
| | ***** | | | | 1046 | | | | 00000000 | 1000 |
| | * RETURN+SER11, | | * | | 0001 | 00 00 | 00 01 | 110 001 | 0000 | 0 |
| | *NEXT, BUT(GO TO),PAGE+1, | | * | | 00000 | 000000 | 11100 | 001011100 | | |
| | * J/DISPO1 | | * | | | | | | | |
| | ***** --> | | | | | | | | | |
| | | | | | ***** | | | | | |
| | | | | | 1134 485 191 | | | | | |
| | | | | | ***** | | | | | |
| | | | | | VV | | | | | |
| | | | | | 1016 401 167 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|--|
| 402 | JAM01:0777 | | | 777 | 0000 00000 | 00 00 000000 | 00 00 11100 | 00000001000 000 001 0000 0 000010000 |
| | ***** *#OVERVIEW-FUNCTION JAM DISPATCH JAM * *DISPATCH DETERMINES THE HIGHEST PRIORITY * *EVENT THAT CAUSED A JAM IN THE MACHINE * *AND THEN PASSES CONTROL TO THE ROUTINE * *THAT SERVICES THAT EVENT. A JAM IS A * *HARDWARE FORCED TRANSFER OF CONTROL TO * *LOCATION 777, WHICH IS THE BEGINNING OF * *THE JAM DISPATCH ROUTINE. EACH OF THE * *EVENTS WHICH CAUSE A JAM, WITH THE * *EXCEPTION OF INTERNAL ADDRESS, ALSO SET * *A FLAG WHICH IS LATER READ BY JAM * *DISPATCH TO DETERMINE WHICH EVENT CAUSED * *THE JAM. IN GENERAL THOSE EVENTS (EXCEPT * *INTERNAL ADDRESS) WHICH CAUSE A JAM * *CANNOT BE RECOVERED FROM AND THEREFORE * *CAUSE THE MACRO INSTRUCTION CURRENTLY * *BEING EXECUTED TO BE ABORTED. #0-F END * *#OVERVIEW-IMPLEMENTATION JAM DISPATCH * *THE FIRST THING JAM DISPATCH CHECKS IS * *TO SEE IF A POWER UP OCCURED. IF ONE * *THE MACHINE * *-----* *NEXT, BUT(GO TO),PAGE+1, * * J/JAM01A * --> VV ***** 403 JAM01A:1020 F/JAM01 <-- VV ***** *SELECT, NULL UCON, * *NEXT, * * J/JAM01B * --> VV ***** 404 JAM01B:1024 F/JAM01A <-- VV ***** * TEST INIT, * *NEXT, * * J/JAM02 * --> 1025 405 169 ***** | | | | | | | |
| | | | | 1020 | 0000 11001 | 00 00 000000 | 00 00 11000 | 00000001000 000 000 0000 0 000010100 |
| | | | | 1024 | 0000 00000 | 00 00 000000 | 00 00 111 | 00000001000 000 111 0000 0 000010101 |

F15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 169

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|-------------------------------------|--------------------|------|------|------|------|-----------------------|------|---------|---------|----------|-----------|------|-------|
| | | | | | | | | | | | | RIF | COUT | |
| 405 | JAM02:1025 | F/JAM01B | <-- | 1024 | 404 | 168 | | 1025 | | | | 00000000 | 1000 | |
| | *NEXT, BUTM(INIT), | | | | | | | | 0000 | 00 00 | 00 00 | 000 111 | 0000 | 0 |
| | * J/JAM02A | | --> | | | | | | 00000 | 000000 | 01100 | 000011110 | | |
| .CASE | 1 OF BJAM02 | | | | | | | | | | | | | |
| 406 | JAM02A:1036 | F/JAM02 | <-- | | | | | 1036 | | | | 00000000 | 1000 | |
| | *P3, DBUF LATCH+D, | | | | | | | | 0100 | 00 00 | 00 00 | 000 100 | 0000 | 0 |
| | *NEXT, J/JAM02C | | --> | | | | | | 11011 | 000000 | 11000 | 000011000 | | |
| 407 | JAM02C:1030 | F/JAM02A | <-- | | | | | 1030 | | | | 00000000 | 1000 | |
| | *SELECT, EMIT, | | | | | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 | 0 |
| | *NEXT, J/JAM02D | | --> | | | | | | 11001 | 000000 | 11000 | 000011001 | | |
| 408 | JAM02D:1031 | F/JAM02C | <-- | | | | | 1031 | | | | 00000000 | 1000 | |
| | *P3, MD+40000, | | | | | | | | 0100 | 10 00 | 00 00 | 000 000 | 0000 | 0 |
| | *NEXT, J/JAM02E | | --> | | | | | | 00010 | 100000 | 11000 | 000011100 | | |
| 409 | JAM02E:1034 | F/JAM02D | <-- | | | | | 1034 | | | | 00000000 | 1000 | |
| | *P2, RES+MD, | | | | | | | | 0000 | 11 10 | 00 00 | 000 000 | 0000 | 0 |
| | *NEXT, BUTR(INTERNAL ADDRESS ONLY), | | | | | | | | 00000 | 010001 | 10100 | 000101101 | | |
| | * J/IA01 | | --> | 01 | 1055 | 584 | 224 | | | | | | | |
| | * J/JAM05 | | --> | 11 | 1057 | 412 | 170 | | | | | | | |

H15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 171

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | |
|--------------|-----------------------------|--|--------------------------------|-----------------|------------|-------------|------------------------|
| | | | | ADDR ALU BUS | BUSB SP | BUSA UBF | RIF COUT CLOCKS UPF |
| 414 | JAM27:3012 | F/JAM28 | 3611 413 170 | 3012 | | | 000000001000 |
| | *P3, MD+155777 | | | 1101 | 10 10 | 11 11 | 111 111 0000 0 |
| | *NEXT, BUTR(RESET RES), | | | 00010 | 100000 | 11010 | 000001011 |
| | * J/JAM25 | --> VV | | | | | |
| 415 | JAM25:3013 | F/JAM27 F/NOSWPOS | 3012 414 171 3046 479 188 | 3013 | | | 000000001000 |
| | * AFTER INIT GO TO POWER UP | | | 0001 | 00 00 | 01 01 | 110 011 0000 0 |
| | *ROUTINE | | | 00000 | 000000 | 11100 | 100010000 |
| | *-----* | | | | | | |
| | * RETURN+PST01 | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | |
| | * J/INIT00 | --> | ***** 3420 834 284 ***** | | | | |
| | | | VV 1056 426 174 | | | | |
| .CASE 416 | 1 OF BJAM05 JAM15:1205 | F/JAM05 | 1057 412 170 | 1205 | | | 000000001000 |
| | *P2, D+PC MINUS 2 | | | 1101 | 11 11 | 10 01 | 111 000 0100 0 |
| | *P3, PC+D (A ADDR), | | | 00000 | 000110 | 11000 | 010000111 |
| | *NEXT, J/JAM16 | --> VV | | | | | |
| .CASE 417 | 2 OF BJAM05 JAM16:1207 | F/JAM05 | 1057 412 170 | 1207 | | | 000000001000 |
| | *P2, D+WHAMI | | | 1111 | 00 00 | 11 00 | 101 001 0100 0 |
| | *NEXT, BUT(GO TO),PAGE+1, | | | 00000 | 000000 | 11100 | 000011101 |
| | * J/JAM17 | --> | 1035 418 172 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | CLOCK | |
|--------------|---|--|------------------------------------|-----------|---------------------|-----------------|------------------|---------------------|--------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | | RIF UPF |
| 418 | JAM17:1035 ***** *P2, D+D RIGHT 1,D(C)+ALU00, *NEXT, * J/JAM18 ***** | <-- | 1207 417 171 | 1035 | 1111 00 00 00000 | 01 10 000000 | 000 010 11000 | 0100 0 000100001 | 000000001000 |
| 419 | JAM18:1041 ***** *P2, D+WHAMI OR 2,D(C)+D(C), *P3, WHAMI+D (A ADDR), *NEXT, BUTR(D(C)), * J/JAM06 * J/JAM06 * J/EOEO1 ***** | <-- VV --> VV --> VV --> | 01 1431 420 172 11 1433 519 202 | 1041 | 1110 11 11 00000 | 11 00 010010 | 101 111 10011 | 0100 0 100011001 | 000000001000 |
| .CASE 420 | 1 OF BJAM18 JAM06:1431 ***** *SELECT, EMIT, *NEXT, * J/JAM07 ***** | <-- VV --> VV | | 1431 | 0000 00 00 11001 | 00 01 000000 | 000 000 11000 | 0000 0 000100100 | 000000001000 |
| 421 | JAM07:1044 ***** *P3, MD+177000, *NEXT, * J/JAM08 ***** | <-- VV --> VV | | 1044 | 1111 10 11 00010 | 10 00 100000 | 000 000 11000 | 0000 0 000100101 | 000000001000 |
| 422 | JAM08:1045 ***** *SELECT, KBUS(JAM), *NEXT, * J/JAM09 ***** | <-- VV --> | 1050 423 173 | 1045 | 1100 00 00 11001 | 00 00 000000 | 000 000 11000 | 0000 0 000101000 | 000000001000 |

K15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|--------------------|------------|-------|--------|-------|-----------|-----------------------------|
| .TOC | POWER UP | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF | COUT CLOCKS |
| 426 | PST01:1056 | | | | | | UPF | |
| | ***** | | | 1056 | | | | 000000001000 |
| | *#OVERVIEW-FUNCTION #POWER UP THE POWER * | | | 0011 | 00 00 | 00 00 | 111 000 | 0100 0 |
| | *UP ROUTINE DETERMINES WHETHER THE * | | | 00000 | 010010 | 11000 | 000110000 | |
| | *MACHINE WILL RUN (TRAP TO 24) BOOT (TRAP * | | | | | | | |
| | *TO 777224) OR GO TO THE CONSOLE LOOP. * | | | | | | | |
| | *IT DOES THIS BY CHECKING FOR THE * | | | | | | | |
| | *PRESENCE OF THE CONSOLE, POSITION OF THE * | | | | | | | |
| | *SLIDE SWITCH, WHETHER THE CONSOLE IS * | | | | | | | |
| | *LOCKED OR NOT, AND THE CONDITION OF THE * | | | | | | | |
| | *BACK-UP BATTERY IF THERE IS ONE. IF NO * | | | | | | | |
| | *CONSOLE IS PRESENT THEN THE MACHINE * | | | | | | | |
| | *TRAPS TO 24. IF THE CONSOLE IS PRESENT * | | | | | | | |
| | *BUT IS LOCKED, THEN THE MACHINE TRAPS TO * | | | | | | | |
| | *24 UNLESS THE BACK-UP BATTERY IS BAD, IN * | | | | | | | |
| | *WHICH CASE THE MACHINE WILL BOOT (TRAP * | | | | | | | |
| | *TO 777224). IF THE CONSOLE IS PRESENT * | | | | | | | |
| | *AND THE SLIDE IS IN THE HALT POSITION * | | | | | | | |
| | *THEN THE MACHINE WILL GO TO THE CONSOLE * | | | | | | | |
| | *LOOP. IF THE CONSOLE IS PRESENT AND THE * | | | | | | | |
| | *SLIDE SWITCH IS IN THE RUN POSITION THE * | | | | | | | |
| | *MACHINE WILL TRAP TO 24. IF THE CONSOLE * | | | | | | | |
| | *THE BOOT * | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+D, * | | | | | | | |
| | *P3, R(SW)+D, * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | * J/PST01A * | | --> VV | | | | | |
| 427 | PST01A:1060 F/PST01 | | <-- VV | | | | | |
| | ***** | | | 1060 | | | | 000000001000 |
| | *SELECT, CONSOLE DATA, * | | | 0100 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | *NEXT, * | | | 11001 | 000000 | 11000 | 000110001 | |
| | * J/PST02 * | | --> VV | | | | | |
| 428 | PST02:1061 F/PST01A | | <-- VV | | | | | |
| | ***** | | | 1061 | | | | 000000001000 |
| | *P3, MD+DATA, * | | | 0000 | 11 10 | 00 00 | 000 000 | 0000 0 |
| | * J/PST03 * | | --> | 1064 | 429 | 175 | | |
| | ***** | | | | | | | 000000001000 |
| | | | | | | | | 0000 100000 11000 000110100 |

L15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 175

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|----------|---|--|--------------------------|-------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 429 | PST03:1064 | F/PST02 | <-- | 1061 428 174 | 1064 | | | 00000000 | 1000 | |
| | *P2, D+MD, | | | | 1010 | 11 10 | 00 00 | 000 000 | 0100 | 0 |
| | *NEXT, | | | | 00000 | 000000 | 11000 | 000110101 | | |
| | * J/PST04 | | --> VV | | | | | | | |
| 430 | PST04:1065 | F/PST03 | <-- VV | | 1065 | | | 00000000 | 1000 | |
| | * SR<2:0> GETS CONSOLE | | | | 1111 | 00 00 | 01 10 | 000 000 | 0010 | 0 |
| | *DATA<7:5> | | | | 01000 | 000000 | 11000 | 000111000 | | |
| | *P2, SR+D RIGHT 5, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST05 | | --> VV | | | | | | | |
| 431 | PST05:1070 | F/PST04 | <-- VV | | 1070 | | | 00000000 | 1000 | |
| | * JAM<9>=BATTERY BACKUP POWER GOOD BRANCH | | | | 1100 | 00 00 | 00 00 | 000 000 | 0000 | 0 |
| | *ON PANEL | | | | 11001 | 000000 | 00000 | 100111110 | | |
| | *LOCK | | | | | | | | | |
| | *SELECT, JAM REG, | | | | | | | | | |
| | *NEXT, BUTR(SR0), | | | | | | | | | |
| | * J/PST06 | | --> | 1110 1476 432 175 | | | | | | |
| | * J/PST07 | | --> | 1111 1477 437 177 | | | | | | |
| CASE 432 | 1 OF BPST05 | | | | | | | | | |
| | PST06:1476 | F/PST05 | <-- VV | | 1476 | | | 00000000 | 1000 | |
| | * PANEL | | | | 0000 | 11 10 | 00 00 | 000 000 | 0000 | 0 |
| | *LOCKED | | | | 00000 | 100000 | 11000 | 000111010 | | |
| | *P3, MD+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST08 | | --> | 1072 433 176 | | | | | | |

M15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|--------------|--|--|------------------------------------|------|---------------|-----------------|----------------|----------------------|------|-------|
| | | | | | | | | RIF | COUT | |
| 433 | PST08:1072 ***** *P2, D+MD, *NEXT, * J/PST09 ***** | <-- | 1476 432 175 | 1072 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000 000 000111100 | 0100 | 0 |
| 434 | PST09:1074 ***** *P2, D+D RIGHT 2,D(C)+ALU07, *NEXT, * J/PST10 ***** | <-- VV | | 1074 | 1111 00000 | 00 00 000000 | 01 11 11000 | 000 011 000111101 | 0100 | 0 |
| 435 | PST10:1075 ***** * EITHER BOOT(BACKUP POWER FAILED) OR *TRAP TO 24(BACKUP POWER *OK) *-----* *SELECT, EMIT, *NEXT, BUTR(D(C)), * J/PST11 * J/PST12 ***** | <-- VV | | 1075 | 0000 11001 | 00 00 000000 | 00 01 10011 | 000 000 101000001 | 0000 | 0 |
| .CASE 436 | 1 OF BPST10 PST11:1501 ***** * BACKUP POWER WAS BAD, GO TO *BOOT *-----* *NEXT, * J/BOOT04 ***** | <-- VV | 01 1501 436 176 11 1503 441 178 | 1501 | 0000 00000 | 00 00 000000 | 00 00 11000 | 000 000 110101011 | 0000 | 0 |
| | | --> | 1653 456 181 | | | | | | | |

B16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUS SP | RUSA LBF | EXTENSION | | CLOCKS |
|------------------|---------------------------|--|--------------------------|--------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 441 | PST12:1503 | F/PST10 | <-- | 1075 | 435 | 176 | | | | |
| | ***** | | | | | | | | | |
| | *TRAP TO 24 FOR POWER UP* | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P3, MD+24, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST13 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 442 | PST13:1076 | F/PST12 F/BOOT05 | <-- <-- | 1503 1120 | 441 457 | 178 181 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+MD, SR+MD,* | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST14 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 443 | PST14:1077 | F/PST13 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * PSW WAS INITIALIZED TO | | | | | | | | | |
| | *0 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | | |
| | *P2, SR+SR, PLUS 2, | | | | | | | | | |
| | *P3, U, DATI, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST15 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 444 | PST15:1100 | F/PST14 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * MD GETS POWER UP | | | | | | | | | |
| | *PC | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST16A | | --> | 1102 | 445 | 179 | | | | |
| | ***** | | | | | | | | | |

```

1503      0000 10 00 00 00 010 100 0000 0
          00010 100000 11000 000111110

1076      1010 11 10 00 00 000 000 0110 0
          00000 000000 11000 000111111

1077      1001 11 11 00 00 000 000 0011 0
          10110 000000 11000 001000000

1100      0000 11 10 00 00 000 000 0000 0
          00000 100000 11000 001000010
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---------------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 445 | PST16A:1102 | F/PST15 | <-- | 1100 | 444 | 178 | | | | |
| | *P2, D+MD, | | | 1102 | 1010 | 11 10 | 00 00 | 000 000 | 0100 | 0 |
| | *NEXT, | | | | 00000 | 000000 | 11000 | 001000 | 100 | |
| | * J/PST16 | | --> VV | | | | | | | |
| 446 | PST16:1104 | F/PST16A | <-- VV | | | | | | | |
| | * CURRENT MODE IS KERNEL PC IS LOADED | | | 1104 | 0000 | 00 11 | 00 00 | 111 000 | 0001 | 0 |
| | *FOR POWER | | | | 10110 | 001110 | 11000 | 001000 | 101 | |
| | *UP | | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | | |
| | *P3, PC+D (B ADDR), | | | | | | | | | |
| | *P3, U, DATI, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST17A | | --> VV | | | | | | | |
| 447 | PST17A:1105 | F/PST16 | <-- VV | | | | | | | |
| | * MD GETS POWER UP | | | 1105 | 0000 | 11 10 | 00 00 | 000 000 | 0000 | 0 |
| | *PSW | | | | 00000 | 100000 | 11000 | 001000 | 110 | |
| | *P3, MD+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/PST17 | | --> VV | | | | | | | |
| 448 | PST17:1106 | F/PST17A | <-- VV | | | | | | | |
| | *SELECT, PSW, | | | 1106 | 1000 | 00 00 | 10 01 | 010 010 | 0000 | 0 |
| | *NEXT, | | | | 11001 | 000000 | 11000 | 001000 | 111 | |
| | * J/PST18 | | --> | 1107 | 449 | 180 | | | | |

E16

PROGRAM FLOWS

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | CLOCKS | |
|----------|---|--|------------------------------------|-------------|---------------|-----------------|----------------|----------------------|-----------------------|
| | | | | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | | RIF UPF |
| 453 | BOOT02:1114 ***** *P3, MD+135777, *NEXT, * J/BOOT03 ***** | <-- F/BOOT01 | 1112 452 180 | 1114 | 1011 00010 | 10 10 100000 | 11 11 11000 | 111 111 001001101 | 00000001000 0000 0 |
| 454 | BOOT03:1115 ***** * RETURN+BOOT03A, *NEXT, BUT(GO TO),PAGE+3, * J/INIT00 ***** | <-- F/BOOT02 --> VV | 3420 834 284 VV 1116 455 181 | 1115 | 0001 00000 | 00 00 000000 | 10 01 1100 | 110 011 100010000 | 00000001000 0000 0 |
| 455 | BOOT03A:1116 ***** *P2, D+D, *P3, R(SW)+D, *NEXT, * J/BOOT04 ***** | --> VV | | 1116 | 0011 00000 | 00 00 010010 | 00 00 11000 | 111 000 110101011 | 00000001000 0100 0 |
| CASE 456 | 2 OF BPST07 BOOT04:1653 ***** *SELECT, EMIT, *NEXT, * J/BOOT05 ***** | <-- F/PST07 | 1477 437 177 | 1653 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 000 001010000 | 00000001000 0000 0 |
| 457 | BOOT05:1120 ***** *P3, MD+173224, *NEXT, * J/PST13 ***** | <-- F/BOOT04 --> VV | 1076 442 178 | 1120 | 1111 00010 | 10 01 100000 | 10 10 11000 | 010 100 000111110 | 00000001000 0000 0 |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | CLOCKS |
|---------|---------------------------|----------------------------|---------------|--------------|------------|------------|------|---------------------------------|--------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT UPF | |
| 468 | CONDIAG11:3500 | F/CONDIAG10 F/CONDIAG11 | <-- <-- | 3503 3500 | 467 468 | 184 185 | | | |
| | ***** | | | 3500 | | | | 000000001000 | |
| | *P2, D+2 X R(DISPLAY), | | | | | | | 1001 01 11 11 01 101 000 0100 0 | |
| | *P3, R(DISPLAY)+D, | | | | | | | 00000 010110 10101 101000000 | |
| | *NEXT, BUT(COUNT IS -1), | | | | | | | | |
| | * J/CONDIAG11 | | --> | 0 3500 | 468 | 185 | | | |
| | * J/CONDIAG12 | | --> | 1 3501 | 464 | 185 | | | |
| | ***** | | | | | | | | |
| 469 | CONDIAG12:3501 | F/CONDIAG10 F/CONDIAG11 | <-- <-- VV | 3503 3501 | 467 468 | 184 185 | | | |
| | ***** | | | 3501 | | | | 000000001000 | |
| | *SELECT, CONSOLE DATA, | | | | | | | 0100 00 00 00 00 000 000 0000 0 | |
| | *NEXT, J/CONDIAG13 | | --> VV | | | | | 11001 000000 11000 000011110 | |
| | ***** | | | | | | | | |
| 470 | CONDIAG13:3036 | F/CONDIAG12 | <-- VV | 3036 | | | | 000000001000 | |
| | *SR+37 | | | | | | | 1010 11 10 00 00 000 000 0010 0 | |
| | *-----* | | | | | | | 00000 100000 11000 000100010 | |
| | *P2, SR+MD | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | |
| | *NEXT, J/CONDIAG14 | | --> VV | | | | | | |
| | ***** | | | | | | | | |
| 471 | CONDIAG14:3042 | F/CONDIAG13 | <-- VV | 3042 | | | | 000000001000 | |
| | *P2, SR+SR AND MD | | | | | | | 1011 11 10 00 00 000 100 0010 0 | |
| | *NEXT, BUT(GO TO) PAGE+4, | | | | | | | 00000 000000 11100 001101000 | |
| | * J/CONDIAG15 | | --> | 4150 | 472 | 186 | | | |
| | ***** | | | | | | | | |

J16

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|-----------------------------|--|--------------------------|---------------|------------|------------|-------------|-----------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| 472 | CONDIAG15:4150 | F/CONDIAG14 | <-- | 3042 471 185 | | | | | |
| | ***** | | | 4150 | | | | 00000000 | 1000 |
| | *P2, D+SR OR R(DISPLAY) | | * | | 1110 | 01 11 | 00 00 | 101 011 | 0100 0 |
| | *P3, R(DISPLAY)+D (B ADDR), | | * | | 00000 | 011110 | 11100 | 000100011 | |
| | *NEXT, BUT(GO TO),PAGE+3, | | * | | | | | | |
| | * J/CONDIAG16A | | * --> VV | | | | | | |
| 473 | CONDIAG16A:3043 | F/CONDIAG15 | <-- VV | | | | | | |
| | ***** | | | 3043 | | | | 00000000 | 1000 |
| | * CLEAR CSR, | | * | | 0100 | 00 00 | 00 00 | 110 000 | 0000 0 |
| | *NEXT, J/CONDIAG16 | | * --> VV | | 11011 | 000000 | 11000 | 10100010 | |
| .CASE | 1 OF BCONDIAG09 | | | | | | | | |
| 474 | CONDIAG16:3502 | F/CONDIAG09 F/CONDIAG16A | <-- <-- VV | 3027 466 184 | | | | | |
| | ***** | | | 3502 | | | | 00000000 | 1000 |
| | * RETURN+CONDIAG07 | | * | | 0011 | 00 00 | 00 10 | 101 001 | 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+1, | | * | | 00000 | 000000 | 11100 | 101000101 | |
| | * J/SBRA01 | | * | | | | | | |
| | ***** --> | | | 1505 1132 367 | | | | | |
| | | | | VV | | | | | |
| | | | | 3025 464 184 | | | | | |

K16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 187

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF UBF | EXTENSION COUT UPF | CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------|---------|--------------|--------------------|----------------------|
| 475 | NOSWP01:3615 F/JAM04 | <-- | 3007 411 170 | | | | | |
| | ***** | | | | | | 000000001000 | |
| | *#OVERVIEW-FUNCTION NO SWEEP POWER UP THE | | | 0011 | 00 00 | 01 00 | 101 001 | 0000 0 |
| | *NO SWEEP POWER UP, WHEN INVOKED, WILL | | | 00000 | 000000 | 11100 | 001010001 | |
| | *CAUSE THE MACHINE TO SKIP THE | | | | | | | |
| | *INITIALIZATION OF CACHE, WCS, AND THE | | | | | | | |
| | *WAIT FOR THE POWER FAIL LOGIC. IT IS | | | | | | | |
| | *MEANT TO BE USED WHEN, IN THE PROCESS OF | | | | | | | |
| | *LOOKING FOR THE CAUSE, FOR A MACHINE | | | | | | | |
| | *FAILURE, IT IS NECESSARY TO SINGLE | | | | | | | |
| | *MICROSTEP THROUGH THE POWER UP | | | | | | | |
| | *INITIALIZATION TO GET TO CONSOLE. THE | | | | | | | |
| | *SECTIONS OF INITIALIZATION MENTIONED | | | | | | | |
| | *ABOVE ARE SKIPPED BECAUSE TO GO THROUGH | | | | | | | |
| | *THEM WOULD REQUIRE MANY THOUSANDS OF | | | | | | | |
| | *MICROSTEPS. #0-F END | | | | | | | |
| | *#OVERVIEW-IMPLEMENTATION NO SWEEP POWER | | | | | | | |
| | *UP THE DIRECTIONS FOR INVOKING NO SWEEP | | | | | | | |
| | *POWER UP ARE GIVEN BELOW. 1. TURN OFF | | | | | | | |
| | *THE MACHINE (USE KEY SWITCH). 2. PUT | | | | | | | |
| | *CONSOLE SLIDE SWITCH IN HALT POSITION. | | | | | | | |
| | *3. PUT CLOCK IN SINGLE MICROSTEP MODE. | | | | | | | |
| | *4. JUMPER BUS DIN<14> TO GROUND. | | | | | | | |
| | ***** | | | | | | | |
| | * RETURN+NOSWP02 | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/PWRSUB01 | | | | | | | |
| | ***** --> | | 1121 480 189 | | | | | |
| | | | VV | | | | | |
| | | | 3045 476 187 | | | | | |
| 476 | NOSWP02:3045 | | | | | | | |
| | ***** | | | | | | 000000001000 | |
| | *NEXT, BUTR(SR2), | | | | | | 0000 00 00 | 00 00 000 000 0000 0 |
| | * J/NOSWP03 | | | | | | 00000 000000 | 00000 110101011 |
| | * J/NOSWP03 | --> | 1011 3653 477 188 | | | | | |
| | * J/NOSWP04 | --> | 1111 3657 478 188 | | | | | |
| | ***** | | | | | | | |

L16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 188

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|-----------|-----------------|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|------|--------|--|
| | | | | | | | | RIF | COUT | CLOCKS | |
| .CASE 477 | 1 OF BNOSWP02 | | | | | | | | | | |
| | NOSWP03:3653 | F/NOSWP02 | <-- | 3045 | 476 | 187 | | | | | |
| | ***** | | | | | | | | | | |
| | *SELECT, EMIT, | | | | | | | | | | |
| .CASE 478 | 2 OF BNOSWP02 | | | | | | | | | | |
| | NOSWP04:3657 | F/NOSWP02 | <-- | 3045 | 476 | 187 | | | | | |
| | ***** | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| 479 | NOSWP05:3046 | F/NOSWP03 | <-- | 3653 | 477 | 188 | | | | | |
| | ***** | | | | | | | | | | |
| | *P3, MD+155577, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | J/JAM25 | | --> | 3013 | 415 | 171 | | | | | |
| | ***** | | | | | | | | | | |

```

3653          000000001000
0000 00 00 00 01 000 000 0000 0
11001 000000 11000 000100110

3657          000000001000
0000 00 00 00 00 000 000 0000 0
00000 000000 11000 110001101

3046          000000001000
1101 10 10 11 01 111 111 0000 0
00010 100000 11000 000001011
    
```

M16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 189

| BOX NO. .TOC | TAG: ADDRESS PWRSUB | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|--------------------|------------------------|------------------|--------------------|------|-----|--------------------------|--------------------|------------|-------------|-----------|-----|------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | COUT |
| | | F/JAM03 | <-- | 1037 | 410 | 170 | | | | | | |
| | | F/CONDIAG01 | <-- | 3613 | 458 | 182 | | | | | | |
| | | F/NOSWPO1 | <-- | 3615 | 475 | 187 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE PWRSUB01 | | * | | | | | | | | | |
| | | RETURN/JAM04 | * --> | 3007 | 411 | 170 | | | | | | |
| | | RETURN/CONDIAG02 | * --> | 3021 | 459 | 182 | | | | | | |
| | | RETURN/NOSWPO2 | * --> | 3045 | 476 | 187 | | | | | | |
| ***** | | | | | | | | | | | | |

B01

```
480 PWRSUB01:1121
*****
*#OVERVIEW-IMPLEMENTATION PWRSUB PWRSUB *
*READS BUS DIN AND MOVES BUS DIN<14:13> *
*DOWN TO SHIFT REGISTER<2:1> SO THAT JAM, *
*CONDIAG, AND NOSMP CAN TEST FOR JUMPERS. *
*#0-I END *
*-----*
*P3, MD+DATA, *
*NEXT, *
* J/PWRSUB02A * --> VV
*****
481 PWRSUB02A:1124 F/PWRSUB01 <-- VV
*****
*P2, D+D, *
*P3, R(DST)+D (A ADDR), *
*NEXT, *
* J/PWRSUB02B * --> VV
*****
482 PWRSUB02B:1126 F/PWRSUB02A <-- VV
*****
*P2, RES+R(DST), *
*NEXT, *
* J/PWRSUB02 * -->
*****
```

```
1121 0000 11 10 00 00 000000001000
      00000 100000 11000 001010100 0000 0
```

```
1124 0011 00 00 00 01 000000001000
      00000 010110 11000 001010110 0100 0
```

```
1126 0000 01 11 00 00 000000001000
      00000 010001 11000 001011000 0000 0
```

1130 483 190

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UPF | EXTENSION | | |
|---------|-------------------------|--|--------------------------|--------------|--------------|------------|-------------|--------------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 483 | PWRSUB02:1130 | F/PWRSUB02B | <-- | 1126 482 189 | 1130 | | | 000000001000 | | |
| | *P2, D+MD,D(C)+D(C), | | * | | 1010 11 10 | 00 00 | 000 111 | 0100 0 | | |
| | *NEXT, | | * | | 00000 000000 | 11000 | 001011010 | | | |
| | * J/PWRSUB03 | | * --> VV | | | | | | | |
| 484 | PWRSUB03:1132 | F/PWRSUB02 | <-- VV | | 1132 | | | 000000001000 | | |
| | *P2, SR+NOT D RIGHT 12, | | * | | 0000 00 00 | 01 01 | 000 000 | 0010 0 | | |
| | *NEXT, | | * | | 01110 000000 | 11111 | 000000000 | | | |
| | * BUT(RETURN) | | * --> VV | | | | | | | |

DO1

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 191

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UPF | EXTENSION RIF COUT CLOCKS |
|---------|------------------------------|-------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|
| | .TOC "DISPATCHER FOR ERRORS" | | | | | | | |
| | F/SER10 | <-- | 1046 400 166 | | | | | |
| | F/JAM10 | <-- | 1051 424 173 | | | | | |
| ***** | | | | | | | | |
| * | SUBROUTINE DISPO1 | * | | | | | | |
| | RETURN/SER11 | * --> | 1016 401 167 | | | | | |
| | RETURN/JAM11 | * --> | 1054 425 173 | | | | | |
| ***** | | | | | | | | |

E01

```

485 DISPO1:1134
*****
*#OVERVIEW-IMPLEMENTATION DISPATCHER FOR
*ERRORS DISPATCH IS USED BY JAM DISPATCH
*AND SERVICE DISPATCH TO FIND THE LOWEST
*ORDER BIT SET IN THE JAM AND SERVICE
*REGISTERS IN BUS CONTROL. FIRST DISPATCH
*OR'S THE MASK IN MD WITH THE SHIFT
*REGISTER AND PLACES THE RESULT INTO D.
*JAM DISPATCH USES 177000 FOR A MASK AND
*SERVICE DISPATCH USES 177760. JAM
*DISPATCH CLEARS THE COUNTER EXPLICITLY
*BY LOADING IT WITH 0. BUT(SERVICE)
*CLEARS THE COUNTER FOR SERVICE DISPATCH.
*THE COUNTER IS INCREMENTED EVERY TIME D
*IS RIGHT SHIFTED UNTIL ITS' LOW ORDER
*BIT IS 1. THEN THE COUNTER IS PUT INTO
*THE LOW ORDER BYTE OF THE SHIFT
*REGISTER. JAM DISPATCH OR SERVICE
*DISPATCH THEN DO A BUT(CASE). NOTE THAT
*IF NO ERROR BITS ARE SET IN THE JAM OR
*SERVICE REGISTERS, THE SHIFTING WILL
*UPPER
*-----*
*P2,          D+SR OR MD,D(C)+ALU00,
*NEXT,
*              J/DISPO2
*              --> VV
*****

```

```

1134
1110 11 10 00 00 000 010 0100 0
00000 000000 11000 000000001

```

```

486 DISPO2:1001
*****
*SELECT,      EMIT,
*NEXT,        BUTR(D(C)),
*              J/DISPO3
*              J/DISPO3
*              J/DISPO4
*****

```

```

<-- 1134 485 191
<-- 1211 487 192
--> 01 1211 487 192
--> 11 1213 488 192

```

```

1001
0000 00 00 00 01 000 000 0000 0
11001 000000 10011 010001001

```

F01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 192

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| 487 | DISP03:1211 | F/DISP02 | <-- | 1001 | 486 | 191 | | |
| | ***** | | | 1211 | | | | 000000001000 |
| | * DONE ONLY TO INCREMENT COUNT NO | | | | 1111 | 00 00 | 01 10 | 000 010 0100 0 |
| | *BRANCH IS TO BE | | | | 00000 | 000000 | 10101 | 000000001 |
| | *DONE | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+D RIGHT 1,D(C)+ALU00, | | | | | | | |
| | *NEXT, BUT(COUNT IS -1), | | | | | | | |
| | * J/DISP02 | | | | | | | |
| | ***** | | | | | | | |
| | BRANCHING-BUT USED WITH TAG NOT IDENTIFIED AS .CASE | | | | | | | |
| | | | -- BOX | 487 | | | | |
| 488 | DISP04:1213 | F/DISP02 | <-- | 1001 | 486 | 191 | | |
| | ***** | | | 1213 | | | | 000000001000 |
| | *P2, D+COUNTER, | | | | 1111 | 00 00 | 01 01 | 000 000 0100 0 |
| | *NEXT, J/DISP05 | | --> VV | | 00011 | 000000 | 11000 | 001011110 |
| | ***** | | | | | | | |
| 489 | DISP05:1136 | F/DISP04 | <-- VV | | | | | |
| | ***** | | | 1136 | | | | 000000001000 |
| | *P2, SR+D(HI) # D(HI), | | | | 1111 | 00 00 | 01 01 | 000 000 0010 0 |
| | *NEXT, BUT(RETURN) | | --> VV | | 00100 | 000000 | 11111 | 000000000 |
| | ***** | | | | | | | |

GO1

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 193

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .TOC | "SERVICE FLAGS - ERRORS AND OTHER FLAGS - INDIVIDUAL T BIT" | SUPPORT" | | | | | | |
| .CASE | 2 OF BSER09 | | | | | | | |
| 490 | TBIT01:1047 | F/SER09 | <-- | 1014 | 399 | 166 | | |
| | ***** | | | | | | | |
| | *#OVERVIEW-IMPLEMENTATION T-BIT THE T-BIT | | | | | | | |
| | *FLOW FIRST SETS THE T-BIT MASK IN THE | | | | | | | |
| | *FLAG REGISTER SO THAT WHEN SERVICE IS | | | | | | | |
| | *CHECKED AT THE END OF THE SHARED TRAP | | | | | | | |
| | *FLOW SO THAT NO ANOTHER T-BIT TRAP WILL | | | | | | | |
| | *NOT OCCUR UNTIL THE FIRST WORD IN THE | | | | | | | |
| | *SUBROUTINE IS EXECUTED. NOTE THAT WHEN | | | | | | | |
| | *OTHER ERRORS ARE PENDING (LIKE YELLOW | | | | | | | |
| | *ZONE) THE FIRST INSTRUCTION EXECUTED MAY | | | | | | | |
| | *NOT BE IN THE T-BIT SUBROUTINE. THE MD | | | | | | | |
| | *IS LOADED WITH 14 AND THE SHARED TRAP | | | | | | | |
| | *FLOW IS USED TO MAKE THE TRAP OCCUR. | | | | | | | |
| | *#0-I END | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT02, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| 492 | TBIT03:1142 | F/TBIT02 | <-- | VV | | | | |
| | ***** | | | | | | | |
| | * SET T BIT MASK | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | * RETURN+TBIT04, | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |
| | *----- | | | | | | | |
| | *P3, MD+TMASK (BC), | | | | | | | |
| | *NEXT, J/TBIT03 | | | | | | | |
| | * --> VV | | | | | | | |
| | ***** | | | | | | | |
| | ----- | | | | | | | |

I01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 195

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---|--------------------|---------------|-----------------------|------|---------|---------|----------|-----------|--------|--------|
| | | OFST | ADDR BOX PAGE | | | | | | RIF | COUT | CLOCKS |
| 496 | YZ02:1154 | | | | 1154 | | | | 00000000 | 1000 | |
| | * MOVE TO PAGE 0 AND SAVE ONE | | | | | 0000 | 10 00 | 00 00 | 000 100 | 0000 0 | |
| | *WORD | | | | | 00010 | 100000 | 11000 | 001101101 | | |
| | *P3, MD+4, | | | | | | | | | | |
| | *NEXT, J/YZ03 | | | --> VV | | | | | | | |
| 497 | YZ03:1155 | F/YZ02 | | <-- VV | | | | | 00000000 | 1000 | |
| | *P2, PAGE+0, | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, BUT(GO TO), | | | | | 00000 | 000000 | 11100 | 011000100 | | |
| | * J/YTRPO0 | | | --> | 304 | 353 | 150 | | | | |
| .TOC " | POWER FAIL" | | | | | | | | | | |
| .CASE | 3 OF BSER11 | | | | | | | | | | |
| 498 | PF01:1662 | F/SER11 | | <-- | 1016 | 401 | 167 | | 00000000 | 1000 | |
| | *#OVERVIEW-IMPLEMENTATION POWER FAIL | | | | | 0100 | 00 01 | 00 00 | 000 000 | 0000 0 | |
| | *POWER FAIL CLEARS THE POWER FAIL FLAG | | | | | 11011 | 000000 | 11000 | 001110000 | | |
| | *THEN USES THE SHARED TRAP FLOW TO MAKE | | | | | | | | | | |
| | *THE TRAP OCCUR. #0-I END | | | | | | | | | | |
| | * CLEAR POWER FAIL FLAG, | | | | | | | | | | |
| | *NEXT, J/PFO4 | | | --> VV | | | | | | | |
| 499 | PFO4:1160 | F/PFO1 | | <-- VV | | | | | 00000000 | 1000 | |
| | * TRAP TO | | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 0 | |
| | *24 | | | | | 11001 | 000000 | 11000 | 010100111 | | |
| | *SELECT, EMIT, | | | | | | | | | | |
| | * J/ETRPO4 | | | --> | 1247 | 561 | 215 | | | | |

L01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 198

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | | |
|-----------|--------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|--------------|--------|-----------|--------|
| | | | | | | | | RIF | COUT | | | |
| .CASE 506 | 1 OF BSCPE07 SCPE09:1336 | F/SCPE07 | <-- | 1353 | 505 | 197 | 1336 | | 000000001000 | | | |
| | * TRAP BUT NO | | | | | | | 0001 | 00 01 | 01 01 | 000 011 | 0000 0 |
| | *LOG | | | | | | | 00000 | 000000 | 11100 | 101011100 | |
| | *-----* | | | | | | | | | | | |
| | * RETURN+ETRPOS, | | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | | | | |
| | * J/LOG01 | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | | | --> | 3534 | 926 | 310 | | | | | | |
| | | | | | | | | | | | | |
| | | | | 1250 | 562 | 215 | | | | | | |
| .CASE 507 | 2 OF BSCPE03 SCPE05:1703 | F/SCPE03 | <-- | 1164 | 502 | 197 | 1703 | | 000000001000 | | | |
| | * NO TRAP, CLEAR OUT | | | | | | | 0100 | 00 00 | 10 00 | 000 000 | 0000 0 |
| | *ERROR | | | | | | | 11011 | 000000 | 11000 | 001110110 | |
| | *-----* | | | | | | | | | | | |
| | * CLEAR JAM REG, | | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | | |
| | * J/SCPE11 | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| 508 | SCPE11:1166 | F/SCPE05 | <-- VV | | | | | | | | | |
| | * CLEAR ERROR TRAP IN PROGRESS | | | | | | | | | | | |
| | *FLAG | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | *P2, D+WHAMI AND NOT 2, | | | | | | | | | | | |
| | *P3, WHAMI+D (A ADDR), | | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | | | |
| | * J/BRA05 | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | | | --> | 3 | 283 | 126 | | | | | | |

| BOX NO. | TAG: ADDRESS | EXTENSION | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | RIF | COUT | CLOCKS |
|-----------|--|-----------|--------------------|------------|------|-----|------|------|-----|------|--------|
| | | | OFST | COORD | ALU | BUS | SP | UBF | UPF | | |
| 516 | SDEF02:1202 | F/SDEF01 | <-- | 1665 | 515 | 200 | | | | | |
| | ***** | | | | | | | | | | |
| | * TEST FLAG07 SERVICE REQUEST TARGETS - 0 * | | | | | | | | | | |
| | *-- | | | | | | | | | | |
| | *SDEF03 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | * TEST SERVICE REQUEST, | | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | | |
| | * J/SDEF03 | | | | | | | | | | |
| | * --> 01 1731 517 201 | | | | | | | | | | |
| | * J/SVCDEF | | | | | | | | | | |
| | * --> 11 1733 1230 393 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| .CASE 517 | 1 OF BSDEF02 | F/SDEF02 | <-- VV | | | | | | | | |
| | SDEF03:1731 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *1 - SVCDEF | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | | |
| | * J/FET01 | | | | | | | | | | |
| | * --> 702 1 2 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| .TOC = | ERROR FLAGS" | | | | | | | | | | |
| .TOC = | ODD ADDRESS" | | | | | | | | | | |
| .CASE 518 | 3 OF BJAM11 | F/JAM11 | <-- | 1054 | 425 | 173 | | | | | |
| | 0A01:1322 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *#OVERVIEW+IMPLEMENTATION ODD ADDRESS ODD * | | | | | | | | | | |
| | *ADDRESS LOGS THEN PASSES CONTROL TO * | | | | | | | | | | |
| | *ETRP01 WHICH USES THE SHARED TRAP FLOW TO * | | | | | | | | | | |
| | *MAKE A TRAP TO 4 OCCUR. #0-I END TRAP * | | | | | | | | | | |
| | *TO 4 LOG * | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | * RETURN+ETRP01, | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | | | |
| | * J/LOG01 | | | | | | | | | | |
| | * --> | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | 3534 926 310 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | VV | | | | | | | | | | |
| | 1244 558 214 | | | | | | | | | | |

| ADDR | ALU | BUSB | BUSA | RIF | COUT | CLOCKS |
|------|-------|--------|-------|-----------|------|--------|
| | BUS | SP | UBF | UPF | | |
| 1202 | 0000 | 00 00 | 00 00 | 000 011 | 0000 | 0 |
| | 00000 | 000000 | 10011 | 111011001 | | |
| 1731 | 0000 | 00 00 | 00 00 | 000 000 | 0000 | 0 |
| | 00000 | 000000 | 11100 | 111000010 | | |
| 1322 | 0001 | 00 01 | 01 00 | 100 011 | 0000 | 0 |
| | 00000 | 000000 | 11100 | 101011100 | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA LBF | EXTENSION | | |
|---------|--|---------------------------------------|-----------------------|--------------|------------------------------|----------------|----------|--------------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 519 | EOE01:1433 | F/JAM18 | <-- | 1041 419 172 | | | | | | |
| | ***** *#OVERVIEW-IMPLEMENTATION ERROR ON ERROR * *EOE SETS THE EOE HAS OCCURED BIT * *(WHAMI<02>) THEN USES THE RED ZONE FLOW * *TO MAKE A TRAP TO 4 OCCUR. ONCE THE EOE * *HAS OCCURED FLAG IS SET A MED OPERATION * *IS NEEDED TO CLEAR IT. THIS IS DONE SO * *THAT THE FACT THAT AN ERROR ON ERROR HAS * *OCCURED WILL NOT BE LOST. #0-I END * *-----* | | | 1433 | | | | 000000001000 | | |
| | | | | | 0000 00 00 00 01 | 000 000 0000 0 | | | | |
| | | | | | 11001 000000 11000 010000100 | | | | | |
| | *SELECT, EMIT, * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/EOE02 * | | --> | VV | | | | | | |
| 520 | EOE02:1204 | F/EOE01 | <-- | VV | | | | | | |
| | ***** *P3, MD+4, * *NEXT, * * J/EOE03 * *-----* | | | 1204 | | | | 000000001000 | | |
| | | | | | 0000 10 00 00 00 | 000 100 0000 0 | | | | |
| | | | | | 00010 100000 11000 010000110 | | | | | |
| 521 | EOE03:1206 | F/EOE02 | <-- | VV | | | | | | |
| | ***** * SET EOE HAS OCCURED FLAG CAN BE CLEARED * *ONLY BY MACRO LEVEL MED * *INSTRUCTION * *-----* | | | 1206 | | | | 000000001000 | | |
| | | | | | 1110 11 10 11 00 | 101 000 0100 0 | | | | |
| | | | | | 00000 010010 11000 011010011 | | | | | |
| | *P2, D+WHAMI OR MD, * | | | | | | | | | |
| | *P3, WHAMI+D (A ADDR), * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/RZ01 * | | --> | 1323 522 203 | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUSB | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COOT UPF | CLOCKS |
|---------|---|---------------------------------------|-----------------------|---------------|---------------|-----------------|----------------|------------------------|-----------------------|
| 522 | RZ01:1323 4 OF B1AM11 F/JAM11 | <-- | 1054 425 173 | 1323 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 000 010001000 | 00000001000 0000 0 |
| | <pre> ***** *OVERVIEW+IMPLEMENTATION RED ZONE RED * *ZONE RESETS THE KERNEL STACK POINTER TO * *4, THEN LOGS, THEN USES THE SHARED TRAP * *FLOW TO MAKE A TRAP TO 4 OCCUR. THE * *NTAPOD ENTRY POINT TO SHARED TRAP FLOW * *IS USED SO THAT NO FURTHER STACK * *VIOLATIONS WILL OCCUR WHILE PROCESSING * *THE TRAP. THERE IS A SLIGHT HACK HERE, * *BUT IT IS COMPATIBLE WITH THE 11/40. THE * *STACK THAT IS SET TO 4 IS THE CURRENT * *STACK. REALLY IT SHOULD BE THE STACK IN * *THE SPACE SPECIFIED BY THE PS STORED IN * *MEMORY LOCATION 6. IN ACTUAL PRACTICE * *THE PS IN MEMORY LOCATION 6 ALWAYS * *SPECIFIES KERNEL. BECAUSE RED ZONE * *ERRORS CAN OCCUR ONLY IN KERNEL THERE IS * *NEVER A PROBLEM BECAUSE THE CORRECT * *STACK IS SET TO 4. HOWEVER, IF SOME * *PROGRAM DECIDED TO HANDLE RED ZONE * *ERRORS WITH A HANDLER IN USER SPACE THE * *WRONG * *-----* *SELECT, EMIT, * *NEXT, * * J/RZ08 * --> VV ***** 523 RZ08:1210 F/RZ01 <-- VV ***** *P3, MD+4, * *NEXT, * * J/RZ09 * --> VV ***** 524 RZ09:1212 F/RZ08 <-- VV ***** *P2, D+MD, * *P3, R6+D (A ADDR), * *NEXT, BUT(GO TO),PAGE+4, * * J/RZ11 * --> ***** 4152 525 204 </pre> | | | | | | | | |

G02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 206

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|------------|---|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|--|
| | | | | | | | | RIF | COUT | CLOCKS | |
| .TOC "530" | SSYN TIMEOUT" | | | | | | | | | | |
| .CASE | 8 OF BJAM11 | | | | | | | | | | |
| | SST01:1327 | F/JAM11 | <-- | 1054 | 425 | 173 | | | | | |
| | ***** | | | | | | | | | | |
| | * TRAP TO 4 LOG | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | * RETURN+ETRP01, | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | | | |
| | * J/LOG01 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | | | --> | 3534 | 926 | 310 | | | | | |
| | ***** | | | | | | | | | | |
| | | | | VV | | | | | | | |
| | | | | 1244 | 558 | 214 | | | | | |
| .TOC "531" | MEMORY PARITY ERROR" | | | | | | | | | | |
| .CASE | 9 OF BJAM11 | | | | | | | | | | |
| | MPE01:1330 | F/JAM11 | <-- | 1054 | 425 | 173 | | | | | |
| | ***** | | | | | | | | | | |
| | * TRAP TO 114 LOG | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | * RETURN+ETRPOS, | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | | | |
| | * J/LOG01 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | | | --> | 3534 | 926 | 310 | | | | | |
| | ***** | | | | | | | | | | |
| | | | | VV | | | | | | | |
| | | | | 1250 | 562 | 215 | | | | | |
| .TOC "532" | DEFAULT" | | | | | | | | | | |
| .CASE | 10 OF BJAM11 | | | | | | | | | | |
| | JDEF01:1331 | F/JAM11 | <-- | 1054 | 425 | 173 | | | | | |
| | ***** | | | | | | | | | | |
| | * CLEAR EOE **MUST CHECK FOR WCS ENABLE | | | | | | | | | | |
| | *AND GO TO CONSOLE IF THERE N Y | | | | | | | | | | |
| | *I | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+WHAMI AND NOT 2, | | | | | | | | | | |
| | *P3, WHAMI+D (A ADDR), | | | | | | | | | | |
| | *NEXT, BUT(TRACK), | | | | | | | | | | |
| | * J/JDEF02 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | | | --> | 1605 | 1226 | 392 | | | | | |

```

1327
0001 00 01 01 00 100 011 0000 0
0000 000000 11100 101011100
    
```

```

1330
0001 00 01 01 01 000 011 0000 0
0000 000000 11100 101011100
    
```

```

1331
0111 11 11 11 00 101 000 0100 0
0000 010010 11001 110000101
    
```

H02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 207

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|---------|---|--|--------------------------|-------------|------------|------------|-------------|-------------------------------------|--------------|
| 533 | ILLEGAL INTERNAL ADDRESS ERROR" 6 OF BJAM11 IIAA01:1325 | F/JAM11 | <-- | 1054 | 425 | 173 | | | |
| | ***** *#OVERVIEW-FUNCTION ILLEGAL INTERNAL * *ADDRESS REFERENCE BECAUSE REFERENCES TO * *INTERNAL ADDRESSES CAUSE UNRECOVERABLE * *CHANGE TO THE DATA PATH, SOME FLOWS * *WHICH DO BUS CYCLES COULD PUT THE * *MACHINE IN AN UNDEFINED STATE. TO * *PREVENT THIS VARIOUS MECHANISMS ARE USED * *TO CAUSE AN ERROR TRAP WHEN THIS OCCURS. * *DATI CLKIR, DATI NOINT, AND ANY BUS * *CYCLE DONE BY A FLOATING POINT OR EIS * *INSTRUCTION MUST RESULT IN A TRAP TO 4 * *WHEN AN INTERNAL ADDRESS IS REFERRED TO. * *#0-F END #OVERVIEW-IMPLEMENTATION * *ILLEGAL INTERNAL ADDRESS REFERENCE * *ILLEGAL INTERNAL ADDRESS REFERENCE FIRST * *SETS THE ERROR TRAP IN PROGRESS BIT * *(WHAMI<01>). IT DOES THIS BECAUSE IT * *MAY BE ENTERED FROM ONE OF TWO PLACES. * *IF IT IS ENTERED FROM JAM DISPATCH THIS * *STEP IS UNNECESSARY. IF IT IS ENTERED * *FROM THE INTERNAL ADDRESS * *-----* | | | | | | | 1325 | 000000001000 |
| | | | | 1110 | 11 11 | 11 00 | 101 010 | 0100 0 | |
| | | | | 00000 | 010010 | 1000 | 010010000 | | |
| 534 | D+WHAMI OR 2 D(C)+ALU00, WHAMI+D (A ADDR), J/IIAA02 | J/IIAA01 | <-- VV | | | | | | |
| | ***** * TEST FOR LOGGING * *ENABLED * *-----* | | | | | | | 1220 | 000000001000 |
| | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | | | | 00000 | 000000 | 10011 | 010000001 | | |
| | BUTR(D(C)), J/IIAA03 | J/IIAA03 | --> | 01 | 1201 | 535 | 208 | | |
| | | J/IIA13 | --> | 11 | 1203 | 544 | 210 | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|-----------|-----------------------------|---------------------------------------|-----------------------|------------------------------|---------|---------|----------|--------------------|--------|
| .CASE 535 | 1 OF BIIAA02 IIAA03:1201 | F/IIAA02 | <-- | 1220 534 207 | 1201 | | | 000000001000 | |
| | * TEST FOR LOG FIRST | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | *ENABLED | | | | 00000 | 000000 | 01101 | 001111010 | |
| | *NEXT, BUTR(D15), | | | | | | | | |
| | J/IIAA05 | J/IIAA05 | --> | 10 1172 536 208 | | | | | |
| | | J/IIAA04 | --> | 11 1173 537 208 | | | | | |
| .CASE 536 | 1 OF BIIAA03 IIAA05:1172 | F/IIAA03 F/IIA13 | <-- <-- | 1201 535 208 1203 544 210 | 1172 | | | 000000001000 | |
| | * RETURN+IIAA06, | | | | 0001 | 00 01 | 00 10 | 010 011 | 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | 00000 | 000000 | 11100 | 101011100 | |
| | * J/LOG01 | | | | | | | | |
| | | | --> | 3534 926 310 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| .CASE 537 | 2 OF BIIAA03 IIAA04:1173 | F/IIAA03 F/IIA13 | <-- <-- | 1201 535 208 1203 544 210 | 1173 | | | 000000001000 | |
| | * RETURN+ETRPO1, | | | | 0001 | 00 01 | 01 00 | 100 011 | 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | 00000 | 000000 | 11100 | 101011100 | |
| | * J/LOG01 | | | | | | | | |
| | | | --> | 3534 926 310 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| .CASE 538 | IIAA06:1222 | | | 1244 558 214 | 1222 | | | 000000001000 | |
| | *SELECT, EMIT, | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 0 |
| | *NEXT, | | | | 11001 | 000000 | 11000 | 010010100 | |
| | * J/IIAA07 | | --> | 1224 539 209 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--------------------|-----------------------|------|---------------|-----------------|----------------|-----------------------------------|--------|-------|
| | | | | | | | | RIF | COUT | |
| 539 | IIAA07:1224 ***** *P3, MD+40, *NEXT, J/IIA08 ***** | <-- | 1222 538 208 | 1224 | 0000 00010 | 10 00 100000 | 00 00 11000 | 000000001000 100 000 010010101 | 0000 0 | 0 |
| 540 | IIAA08:1225 ***** *P2, SR+CSP(0), *NEXT, J/IIA10 ***** | <-- VV | | 1225 | 1010 01111 | 10 00 000000 | 00 00 11000 | 000000001000 000 000 010010110 | 0010 0 | 0 |
| 541 | IIA10:1226 ***** * SET ILLEGAL INTERNAL ADDRESS ACCESS *BIT ----- *P2, D+SR OR MD, *NEXT, J/IIA11 ***** | <-- VV | | 1226 | 1110 00000 | 11 10 000000 | 00 00 11000 | 000000001000 000 000 010010111 | 0100 0 | 0 |
| 542 | IIA11:1227 ***** * DBUF LATCH+D, *NEXT, J/IIA12 ***** | <-- VV | 1230 543 210 | 1227 | 0100 11011 | 00 00 000000 | 00 00 11000 | 000000001000 000 100 010011000 | 0000 0 | 0 |

M02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 212

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|---------|--------------------------------|--|--------------------------|-----------|------------|------------|-------------|--------------|---------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCK |
| 548 | UB03: 1234 | | | 1234 | | | | 000000001000 | |
| | * MASK FOR CLEAR FLAG | | | | 1000 | 10 00 | 00 00 | 000 000 | 0000 0 |
| | * ROUTINE | | | | 00010 | 100000 | 11000 | 010011110 | |
| | * P3, MD+100000, | | | | | | | | |
| | * NEXT, J/UB04 | | --> VV | | | | | | |
| 549 | UB04: 1236 | F/UB03 | <-- VV | 1236 | | | | 000000001000 | |
| | * GO TO CLEAR FLG | | | | 0001 | 00 01 | 01 00 | 000 001 | 0000 0 |
| | * ROUTINE | | | | 00000 | 000000 | 11100 | 010110001 | |
| | * RETURN+UB05, | | | | | | | | |
| | * NEXT, BUT(GO TO), PAGE+1, | | | | | | | | |
| | * J/FLGCO1 | | --> | | | | | | |
| | | | | | ***** | | | | |
| | | | | | 1261 | 569 | 219 | | |
| | | | | | ***** | | | | |
| | | | | | | VV | | | |
| | | | | | 1240 | 550 | 212 | | |
| 550 | UB05: 1240 | | | 1240 | | | | 000000001000 | |
| | * P2, D+WHAMI, | | | | 1111 | 00 00 | 11 00 | 101 000 | 0100 0 |
| | * NEXT, J/UB06 | | --> VV | | 00000 | 000000 | 11000 | 010100001 | |
| 551 | UB06: 1241 | F/UB05 | <-- VV | 1241 | | | | 000000001000 | |
| | * D(C) GETS UBREAK TRAP | | | | 1111 | 00 00 | 01 10 | 000 010 | 0100 0 |
| | * BIT | | | | 00110 | 000000 | 11000 | 010100010 | |
| | * P2, D+D RIGHT 9, D(C)+ALU00, | | | | | | | | |
| | * NEXT, J/UB07 | | --> | | | | | | |
| | | | | | 1242 | 552 | 213 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|--|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------------|
| .CASE 556 | UB13:1723 | F/UB11 | <-- | 1243 | 554 | 213 | | |
| | *NEXT, BUT(GO TO),PAGE+6,* | J/XCSUB01 | --> | 6000 | 1225 | 392 | | |
| | | | | 1723 | | | | 000000001000 |
| | | | | | | | | 0000 00 00 00 00 000 110 0000 0 |
| | | | | | | | | 00000 000000 11100 00000000 |
| .CASE 557 | UB09:1453 | F/UB07 | <-- | 1242 | 552 | 213 | | |
| | *SELECT, EMIT,* | J/ETRP01 | --> VV | | | | | |
| | | | | 1453 | | | | 000000001000 |
| | | | | | | | | 0000 00 00 00 01 000 000 0000 0 |
| | | | | | | | | 11001 000000 11000 010100100 |
| .TOC 558 | ETRP01:1244 | F/UB09 | <-- VV | 1230 | 543 | 210 | | |
| | *OVERVIEW-IMPLEMENTATION ERROR TRAPS - | | | 1244 | | | | 000000001000 |
| | *VECTOR GENERATION THE FOLLOWING WORDS | | | | | | | 0000 10 00 00 00 000 100 0000 0 |
| | *ARE SHARED BY FLOWS THAT NEED TO | | | | | | | 00010 100000 11000 010100101 |
| | *GENERATE VECTORS FOR THE SHARED TRAP | | | | | | | |
| | *FLOW. IT REQUIRES THAT EMIT BE | | | | | | | |
| | *SELECTED. #0-I END TRAP | | | | | | | |
| | *4 | | | | | | | |
| | *P3, MD+4 (BC), | | | | | | | |
| | *NEXT, J/ETRP02 | | --> VV | | | | | |
| | | F/ETRP01 | <-- | 1244 | 558 | 214 | | |
| | | F/ETRP03 | <-- | 1246 | 560 | 215 | | |
| | | F/ETRP04 | <-- | 1247 | 561 | 215 | | |
| | | F/ETRP05 | <-- | 1250 | 562 | 215 | | |
| | | F/ETRP06 | <-- | 1252 | 563 | 215 | | |
| .CASE 559 | ETRP02:1245 | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0,* | J/TRP00 | --> | 127 | 357 | 151 | | |
| | | | | 1245 | | | | 000000001000 |
| | | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | | | | | | | | 00000 000000 11100 001010111 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|---------|---|--|------------------------------|------|---------------|-----------------|----------------|----------------------|----------|-----------|---|
| | | | | | | | | RIF | COUT | | |
| 560 | ETRP03: 1246 ***** * TRAP *10 ----- *P3, MD+10 (BC), *NEXT, * J/ETRP02 ***** | --> | 1245 559 214 | 1246 | 0000 00010 | 10 00 100000 | 00 00 11000 | 001 000 010100101 | 00000000 | 1000 0 | 0 |
| 561 | ETRP04: 1247 ***** * TRAP *24 ----- *P3, MD+24 (BC), *NEXT, * J/ETRP02 ***** | <-- | 1160 499 195 | 1247 | 0000 00010 | 10 00 100000 | 00 00 11000 | 010 100 010100101 | 00000000 | 1000 0 | 0 |
| 562 | ETRP05: 1250 ***** * TRAP *114 ----- *P3, MD+114 (BC), *NEXT, * J/ETRP02 ***** | <-- <-- | 1200 514 200 3047 529 205 | 1250 | 0000 00010 | 10 00 100000 | 00 01 11000 | 001 100 010100101 | 00000000 | 1000 0 | 0 |
| 563 | ETRP06: 1252 ***** * TRAP TO *250 ----- *P3, MD+250 (BC), *NEXT, * J/ETRP02 ***** | --> | 1245 559 214 | 1252 | 0000 00010 | 10 00 100000 | 00 10 11000 | 101 000 010100101 | 00000000 | 1000 0 | 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|-----------------|---------------------------------------|-----------------------|--------------|---------|----------|------------------------|--------|
| .TOC | "FLAG ROUTINES" | | | | | | | |
| .TOC | "BASE" | | | | | | | |

| | | | | | | | | |
|----------|-----|------|-----|-----|--|--|--|--|
| F/RTT01 | <-- | 76 | 312 | 137 | | | | |
| F/TBIT01 | <-- | 1047 | 490 | 193 | | | | |
| F/UB02 | <-- | 1232 | 547 | 211 | | | | |
| F/MFAT02 | <-- | 2004 | 573 | 221 | | | | |
| F/IA114D | <-- | 3250 | 688 | 251 | | | | |
| F/CSR06A | <-- | 1265 | 983 | 325 | | | | |

* SUBROUTINE FLG01

| | | | | | | | | |
|---------------|-------|------|-----|-----|--|--|--|--|
| RETURN/RTT02 | * --> | 4040 | 313 | 137 | | | | |
| RETURN/TBIT02 | * --> | 1140 | 491 | 193 | | | | |
| RETURN/UB03 | * --> | 1234 | 548 | 212 | | | | |
| RETURN/MFAT03 | * --> | 2005 | 574 | 221 | | | | |
| RETURN/IA114E | * --> | 3251 | 689 | 251 | | | | |
| RETURN/CSR06B | * --> | 1266 | 984 | 325 | | | | |

564

FLG01:1254

```

*****
*#OVERVIEW-IMPLEMENTATION FLAG ROUTINES *
*THE FOLLOWING ROUTINES ARE SHARED BY *
*FLOWS THAT HAVE NEED TO SET AND CLEAR *
*THE FLAGS. THEY ARE SUBROUTINES, I. E. *
*THE END IN A BUT(RETURN). THE SUBROUTINE *
*FLG GETS THE FLAGS AND PUTS THEM INTO *
*R(SRC). R(SRC) IS A TEMPORARY LOCATION *
*IN THE SCRATCH PADS USED BY THE BASE *
*MACHINE FOR OPREAND CALCULATION. THE *
*FLAG ROUTINES CAN NOT BE USED IF R(SRC) *
*IS TO BE USED FOR SOME THING ELSE. FLG *
*IS USED PRIOR TO USING FLGS OR FLGC. *
*FLGS IS USED TO SET A FLAG. THIS IS *
*DONE BY OR'ING THE MASK FOUND IN THE MD *
*WITH R(SRC) AND WRITTING THE RESULT INTO *
*THE FLAG REGISTER. THE RESULT IS ALSO *
*WRITTEN INTO R(SRC) SO THAT IT KEEPS AN *
*UP TO DATE COPY OF THE FLAGS IN CASE *
*THEY NEED TO BE MODIFIED AGAIN. THIS *
*MODIFICATION CAN THEN BE DONE WITHOUT *
*USING FLG *
*-----*
*SELECT, KPROC(FLAGS), *
*NEXT, *
* J/FLG02 *
*****

```

```

1254 0000 00 00 11 01 000 001 0000 0
      11001 000000 11000 010101101

```

--> 1255 565 217

| BOX NO. | TAG: ADDRESS .TOC " SET" | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-----------------------------|-------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|
| | F/RTT03 | <-- | 4042 314 138 | | | | | |
| | F/TBIT03 | <-- | 1142 492 193 | | | | | |
| | F/MFAT04 | <-- | 2020 575 221 | | | | | |
| | F/IA114F | <-- | 3262 690 251 | | | | | |
| | F/CSR06C | <-- | 1270 985 325 | | | | | |
| ***** | | | | | | | | |
| * | SUBROUTINE FLG501 | * | | | | | | |
| | RETURN/RTI01 | * --> | 62 315 138 | | | | | |
| | RETURN/TBIT04 | * --> | 1144 493 194 | | | | | |
| | RETURN/MFAT09 | * --> | 2024 577 222 | | | | | |
| | RETURN/IA114 | * --> | 3263 691 252 | | | | | |
| | RETURN/CSR06 | * --> | 1271 986 325 | | | | | |
| ***** | | | | | | | | |

H03

568 FLGS01:1260

```
*****  
*-----*  
*P2,      D+R(SRC) OR MD,D(C)+D(C), *  
*P3,      R(SRC)+D (A ADDR),        *  
*NEXT,    J/FLGC02                  *  
*****
```

-->

1262 570 219

1260
1110 11 10 11 00 110 111 0100 0
00000 010110 11000 010110010

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | CLOCKS |
|---------|-------------------|--------------------|------------|------|-----|------|------|--------------|--------|
| .TOC " | " CLEAR" | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS | SP | UBF | RIF COOT UPF | |
| | F/UB04 | <-- | | 1236 | 549 | 212 | | | |
| ***** | | | | | | | | | |
| * | SUBROUTINE FLGCO1 | * | | | | | | | |
| | RETURN/UB05 | * --> | | 1240 | 550 | 212 | | | |
| ***** | | | | | | | | | |

J03

```
569 FLGC01:1261
*****
*
* CLEAR
*-----*
*P2,      D+R(SRC) AND NOT MD,D(C)+D(C), *
*P3,      R(SRC)+D (A ADDR),             *
*NEXT,
*          J/FLGC02                       * --> VV
*****
*          F/FLGS01                       <--
570 FLGC02:1262      F/FLGC01             <-- VV
*****
* REWRITE
* FLAGS
*-----*
*          FLAGS+D,
*NEXT,
*          BUT(RETURN)                    * --> VV
*****
```

1261
0111 11 10 11 00 110 111 0100 0
00000 010110 11000 010110010

1260 568 218

1262
0000 00 00 00 01 000 001 0000 0
11011 000000 11111 000000000

K03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 220

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---|---------------------|------|-----|-----------------------|------|---------|---------|----------|-----------|-----|------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF | COUT |
| 571 | MFAT00:0053 | F/0TH01 | <-- | 417 | 285 | 127 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *#OVERVIEW-FUNCTION MFPI AND MTPI THE * | | | | | | | | | | | |
| | *FOLLOWING FLOW IMPLEMENTS THE MFPI AND * | | | | | | | | | | | |
| | *MTPI INSTRUCTIONS. ALSO MFPI IS * | | | | | | | | | | | |
| | *INTERPERTED AS MFPI AND MTPD IS * | | | | | | | | | | | |
| | *INTERPERTED AS MTPI. THIS FLOW WORKS * | | | | | | | | | | | |
| | *BASICALLY THE SAME AS THE FLOW IN THE * | | | | | | | | | | | |
| | *11/40, THAT IS, IT BUILDS AN APPROPRIATE * | | | | | | | | | | | |
| | *MOVE INSTRUCTION, LOADS IT INTO THE IR, * | | | | | | | | | | | |
| | *AND GOES TO THE MOVE FLOW. THE * | | | | | | | | | | | |
| | *CONSTRUCTED MOVE INSTRUCTION PROCEEDS AS * | | | | | | | | | | | |
| | *A NORMAL MOVE INSTRUCTION EXCEPT THAT * | | | | | | | | | | | |
| | *THE SOURCE CALCULATION IS DONE IN THE * | | | | | | | | | | | |
| | *PREVIOUS SPACE FOR MFPI AND THE * | | | | | | | | | | | |
| | *DESTINATION CALCULATION IS DONE IN * | | | | | | | | | | | |
| | *PREVIOUS SPACE FOR MTPI. THERE IS ONE * | | | | | | | | | | | |
| | *EXCEPTION AROUND MFPI. IF THE SRC * | | | | | | | | | | | |
| | *REGISTER IS 6 AND THE SOURCE MODE IF 4 * | | | | | | | | | | | |
| | *(AUTO DECREMENT) AND THE CURRENT AND * | | | | | | | | | | | |
| | *PREVIOUS SPACE ARE THE SAME, THEN THE * | | | | | | | | | | | |
| | *DECREMENTATION OF THE REGISTER IS DONE * | | | | | | | | | | | |
| | *ADDRESS, INSTEAD OF BEFORE. * | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | *P2, | D+MD,D(C)+ALU07, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | | |
| | * | J/MFIX00 | --> | VV | | | | | | | | |
| | ***** | | | | | | | | | | | |
| 572 | MFIX00:0331 | F/MFAT00 | <-- | VV | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *P2, | SR+D SIGN EXTENDED, | | | | | | | | | | |
| | *NEXT, | BUT(GO TO),PAGE+2, | | | | | | | | | | |
| | * | J/MFAT02 | --> | | 2004 | 573 | 221 | | | | | |
| | ***** | | | | | | | | | | | |

53 000000001000
 1010 11 10 00 00 000 011 0100 0
 00000 000000 11000 011011001

331 000000001000
 1111 00 00 01 01 000 010 0010 0
 00010 000000 11100 000000100

L03

| BOX NO. | TAG: ADDRESS | F/MFIX00 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|----------------------|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|--|
| 573 | MFAT02:2004 | | 331 572 220 | | 2004 | 0010 00000 | 00 00 000000 | 00 00 11100 | 00000001000 101 001 0000 0 010101100 |
| | * GET FLAG | | | | | | | | |
| | * REGISTER | | | | | | | | |
| | *P3, RETURN+MFAT03 | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | | |
| | * J/FLG01 | | | | | | | | |
| | | | 1254 564 216 | | | | | | |
| | | | VV | | | | | | |
| | | | 2005 574 221 | | | | | | |
| 574 | MFAT03:2005 | | | | 2005 | 0000 00010 | 10 01 100000 | 00 00 10011 | 00000001000 000 000 0000 0 000010000 |
| | * MASK FOR MFPI FLAG TEST WHETHER THIS | | | | | | | | |
| | *FLAG SHOULD BE | | | | | | | | |
| | *SET | | | | | | | | |
| | *P3, MD+2000 (BC), | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | |
| | * J/MFAT04 | | | | | | | | |
| | | J/MFAT04 | 00 2020 575 221 | | | | | | |
| | | J/MFAT05 | 01 2022 576 222 | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| | | UNDEFINED CASE | | | | | | | |
| .CASE | 1 OF BMFAT03 | | | | | | | | |
| 575 | MFAT04:2020 | F/MFAT03 F/MFAT05 | 2005 574 221 2022 576 222 | | 2020 | 0010 00000 | 00 00 000000 | 00 10 11100 | 00000001000 100 001 0000 0 010110000 |
| | * SET FLAG ROUTINE SET MF | | | | | | | | |
| | *FLAG | | | | | | | | |
| | *P3, RETURN+MFAT09 | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | | |
| | * J/FLG01 | | | | | | | | |
| | | | 1260 568 218 | | | | | | |
| | | | VV | | | | | | |
| | | | 2024 577 222 | | | | | | |

N03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 223

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COOT | |
| 580 | MFAT11:2523 | F/MFAT09 | <-- | 2024 | 577 | 222 | | | | |
| | *P3, MD+165000 (BC), | | | 2523 | 1110 | 10 10 | 10 00 | 000 000 | 0000 | 0 |
| | *NEXT, J/MFAT12 | | --> VV | | 00010 | 100000 | 11000 | 000010110 | | |
| 581 | MFAT12:2026 | F/MFAT17 F/MFAT11 | <-- <-- VV | 2025 | 579 | 222 | | | | |
| | * BUILD MOV | | | 2026 | 0110 | 11 10 | 01 01 | 000 000 | 1100 | 0 |
| | * INSTRUCTION | | | | 00000 | 000000 | 11000 | 000010111 | | |
| | *P3, D+D XOR MD, | | | | | | | | | |
| | *NEXT, J/MFAT14 | | --> VV | | | | | | | |
| 582 | MFAT14:2027 | F/MFAT12 | <-- VV | 2027 | 0100 | 00 00 | 00 01 | 000 100 | 0000 | 0 |
| | *P3, DBUF LATCH+D AND | | | | 11011 | 000000 | 11000 | 000011100 | | |
| | *ENABLE CLKIR, | | | | | | | | | |
| | *NEXT, J/MFAT15 | | --> VV | | | | | | | |
| 583 | MFAT15:2034 | F/MFAT14 | <-- VV | 2034 | 0000 | 00 00 | 00 00 | 000 000 | 0000 | 0 |
| | *P2, DATTB | | | | 11010 | 000000 | 11100 | 111000000 | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | |
| | * J/FET03 | | --> | 700 | 3 | 11 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|-------|---------|---------|-----------|-------------------------------|
| 584 | IA01:1055 | F/JAM02E | <-- | 1034 | 409 | 169 | | |
| | ***** | | | 1055 | | | | 00000001000 |
| | *#OVERVIEW-FUNCTION INTERNAL REGISTERS | | | 1111 | 00 00 | 11 00 | 101 010 | 0010 0 |
| | *#DATA TRANSFERS TO AND FROM INTERNAL | | | 00000 | 000000 | 11100 | 000011101 | |
| | *#REGISTERS ARE SERVICED BY 2 SUBROUTINES, | | | | | | | |
| | *#IA (INTERNAL ADDRESS) AND MET) | | | | | | | |
| | *#(MAINTENANCE EXAMINE AND DEPOSIT). | | | | | | | |
| | *#INTERNAL REGISTERS ARE THOSE REGISTERS | | | | | | | |
| | *#WHICH ARE NOT ACCESSABLE THROUGH THE | | | | | | | |
| | *#UNIBUS. EXAMPLES OF THESE REGISTERS ARE | | | | | | | |
| | *#THE PSM AND MHAMI REGISTER. TRANSFERS TO | | | | | | | |
| | *#AND FROM THESE REGISTERS ARE: | | | | | | | |
| | *#ACCOMPLISHED BY MICROCODE WITH VERY | | | | | | | |
| | *#LITTLE HARDWARE ASSIST. THERE ARE TWO | | | | | | | |
| | *#TYPES OF INTERNAL REGISTERS, INTERNAL | | | | | | | |
| | *#UNIBUS REGISTERS AND INTERNAL CPU | | | | | | | |
| | *#REGISTERS. THESE SETS ARE NOT | | | | | | | |
| | *#NECESSARILY MUTUALLY EXCLUSIVE. INTERNAL | | | | | | | |
| | *#UNIBUS REGISTERS ARE THOSE REGISTERS | | | | | | | |
| | *#WHICH ARE NOT PHYSICALLY ON THE UNIBUS | | | | | | | |
| | *#BUT ARE ACCESSED AT THE MACRO LEVEL BY | | | | | | | |
| | *#TRANSFERS TO OR FROM A UNIBUS ADDRESS. | | | | | | | |
| | *#AN EXAMPLE OF AN INTERNAL | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, SR+MHAMI | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+2, | | | | | | | |
| | * J/IA05 | | --> | VV | | | | |
| | ***** | | | | | | | |
| 585 | IA05:2035 | F/IA01 | <-- | VV | | | | |
| | ***** | | | 2035 | | | | 00000001000 |
| | * TEST FOR TRAP IN PROGRESS, NOTE THAT | | | 0000 | 00 00 | 00 00 | 000 101 | 0000 0 |
| | *#SR<3> IS NOT MASKED OUT AS THIS IS THE | | | 00000 | 000000 | 00000 | 001100101 | |
| | *#GE WHICH MUST ALWAYS BE ZERO IN THIS | | | | | | | |
| | *#PART OF THE | | | | | | | |
| | *#FLOW | | | | | | | |
| | *-----* | | | | | | | |
| | *SETUP, TEST FOR FP INSTRUCTION, | | | | | | | |
| | *NEXT, BUTR(SR1), | | | | | | | |
| | * J/IA06 | | --> | 0101 | 2145 | 586 | 225 | |
| | * J/IA220 | | --> | 0111 | 2147 | 608 | 230 | |
| | * UNDEFINED CASE | | | | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|-----------|---|---------------------------------------|-----------------------|------------------------------------|---------|---------|----------|---|
| .CASE 586 | 1 OF BIA05 IA06:2145 | F/IA05 | <-- | 2035 | 585 | 224 | | 2145 0000 00 00 00 00 000 101 0000 0 00000 000000 01100 011100110 |
| | * TRAP NOT IN PROGRESS TEST FOR FP * INSTRUCTION IN * IR *-----* | | | | | | | |
| | *NEXT, BUTM(FP), * J/IA207 | | --> VV | | | | | |
| .CASE 587 | 1 OF BIA06 IA207:2346 | F/IA06 | <-- VV | | | | | 2346 1010 01 11 00 00 111 100 0100 0 00000 000000 11000 000100000 |
| | *P2, D+R(CNTL),D(C)+ALU15, *NEXT, J/IA207A | | --> VV | | | | | |
| 588 | IA207A:2040 | F/IA207 | <-- VV | | | | | 2040 0000 00 00 00 00 000 000 0000 0 00000 000000 10011 011101001 |
| | *NEXT, BUTR(D(C)), * J/IA207B * J/IA207C | | --> | 01 2351 589 225 11 2353 590 226 | | | | |
| .CASE 589 | 1 OF BIA207A IA207B:2351 | F/IA207A | <-- VV | | | | | 2351 0001 00 00 00 00 100 000 0000 0 11001 000000 11000 000100001 |
| | * DECODE UB INT, *NEXT, J/IA208 | | --> | 2041 | 591 | 226 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UPF | EXTENSION RIF COOT | CLOCKS |
|---------|------------------------|--|-----------------------|------|---------|---------|----------|--------------------|--------|
| 590 | IA207C:2353 | F/IA207A | <-- | 2040 | 588 | 225 | | | |
| | * DECODE UB INT NO KT, | | | 2353 | 0001 | 00 00 | 00 00 | 100 010 | 0000 0 |
| | * NEXT, J/IA208 | | --> VV | | 11001 | 000000 | 11000 | 000100001 | |
| 591 | IA208:2041 | F/IA207B F/IA207C | <-- VV | 2351 | 589 | 225 | | | |
| | * MD GETS ENTRY | | | 2041 | 0000 | 11 10 | 00 00 | 000 000 | 0000 0 |
| | * POINT | | | | 00000 | 100000 | 11000 | 000100100 | |
| | * P3, MD+DATA, | | | | | | | | |
| | * NEXT, J/IA209 | | --> VV | | | | | | |
| 592 | IA209:2044 | F/IA208 | <-- VV | 2044 | 1010 | 11 10 | 00 00 | 000 010 | 0100 0 |
| | * P2, D+MD,D(C)+ALU00, | | | | 00000 | 000000 | 11000 | 000100101 | |
| | * NEXT, J/IA210 | | --> VV | | | | | | |
| 593 | IA210:2045 | F/IA209 | <-- VV | 2045 | 0000 | 00 00 | 00 00 | 000 010 | 0000 0 |
| | * RETURN REG GETS | | | | 00000 | 000000 | 11101 | 000100110 | |
| | * D | | | | | | | | |
| | * RETURN+D, | | | | | | | | |
| | * NEXT, PAGE+2 | | | | | | | | |
| | * J/IA211 | | --> | 2046 | 594 | 227 | | | |

E04

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 594 | IA211:2046 | F/IA210 | <-- | 2045 | 593 | 226 | | | | |
| | ***** | | | | | | | | | |
| | * DBUF LATCH CONTAINS D AT TIME IF | | | | | | | | | |
| | *JAM | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *SELECT, DBUF LATCH, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/IA212 | | --> VV | | | | | | | |
| 595 | IA212:2047 | F/IA211 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *P3, MD+DBUF LATCH, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/IA213A | | --> VV | | | | | | | |
| 596 | IA213A:2064 | F/IA212 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *SELECT, EMIT, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/IA213 | | --> VV | | | | | | | |
| 597 | IA213:2065 | F/IA213A | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * FOR WCS REGISTERS | | | | | | | | | |
| | *FLOW | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P2, D+MD, SR+MD, D(C)+D(C), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * BUT(RETURN) | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |

| | | | | | | | | | | |
|------|-------|--------|-------|-----------|-----|------|---|----------|------|--|
| 2046 | | | | | | | | 00000000 | 1000 | |
| | 0100 | 00 00 | 00 00 | 000 | 100 | 0000 | 0 | | | |
| | 11001 | 000000 | 11000 | 000100111 | | | | | | |
| 2047 | | | | | | | | 00000000 | 1000 | |
| | 0000 | 11 10 | 00 00 | 000 | 000 | 0000 | 0 | | | |
| | 00000 | 100000 | 11000 | 000110100 | | | | | | |
| 2064 | | | | | | | | 00000000 | 1000 | |
| | 0000 | 00 00 | 00 01 | 000 | 000 | 0000 | 0 | | | |
| | 11001 | 000000 | 11000 | 000110101 | | | | | | |
| 2065 | | | | | | | | 00000000 | 1000 | |
| | 1010 | 11 10 | 00 00 | 000 | 111 | 0110 | 0 | | | |
| | 00000 | 000000 | 11111 | 000000000 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--------------|--|----------|------|-----------------------|------|---------|---------|----------|-----------|-----|-------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF | |
| | | F/IA07 | <-- | 3120 | 610 | 231 | | | | | | |
| | | F/IA11 | <-- | 3130 | 614 | 232 | | | | | | |
| | | F/IA16 | <-- | 3000 | 618 | 233 | | | | | | |
| | | F/IA30 | <-- | 3014 | 624 | 235 | | | | | | |
| | | F/IA21 | <-- | 3030 | 640 | 240 | | | | | | |
| 598 | IA100:3055 | ***** | | | | | | | | | | |
| | | * DATI'S WITH HOT BOX ALREADY SELECTED * | | | | | | | | | | |
| | | * RETURN * | | | | | | | | | | |
| | | * HERE * | | | | | | | | | | |
| | | *-----* | | | | | | | | | | |
| | | *P3, MD+DATA, | * | | | | | | | | | |
| | | *NEXT, | * | | | | | | | | | |
| | | * J/IA101 | * --> VV | | | | | | | | | |
| | | ***** | | | | | | | | | | |
| 599 | IA101:3056 | F/IA100 | <-- VV | | | | | | | | | |
| | | ***** | | | | | | | | | | |
| | | *P2, D+MD, | * | | | | | | | | | |
| | | *NEXT, | * | | | | | | | | | |
| | | * J/IA102 | * --> VV | | | | | | | | | |
| | | ***** | | | | | | | | | | |
| | | F/IA101 | <-- | 3056 | 599 | 228 | | | | | | |
| | | F/IA20 | <-- | 3010 | 622 | 234 | | | | | | |
| | | F/IA600 | <-- | 3476 | 632 | 238 | | | | | | |
| | | F/IA70 | <-- | 3523 | 638 | 239 | | | | | | |
| | | F/IA34G | <-- | 3174 | 661 | 245 | | | | | | |
| | | F/IA39D | <-- | 3212 | 671 | 247 | | | | | | |
| | | F/IA15 | <-- | 3100 | 679 | 249 | | | | | | |
| | | F/WCSRADR | <-- | 3110 | 1209 | 388 | | | | | | |
| | | F/WCSRDDAT07 | <-- | 3651 | 1214 | 389 | | | | | | |
| 600 | IA102:3057 | ***** | | | | | | | | | | |
| | | * DATI'S WITH DATA LEFT IN DREG RETURN * | | | | | | | | | | |
| | | * HERE * | | | | | | | | | | |
| | | *-----* | | | | | | | | | | |
| | | *P3, DBUF LATCH+D, | * | | | | | | | | | |
| | | *NEXT, | * | | | | | | | | | |
| | | * J/IA50A | * --> | 3063 | 602 | 229 | | | | | | |
| | | ***** | | | | | | | | | | |

3055
 0000 11 10 00 00 000 000 0000 0
 00000 100000 11000 000101110

3056
 1010 11 10 00 00 000 000 0100 0
 00000 000000 11000 000101111

3057
 0100 00 00 00 00 000 100 0000 0
 11011 000000 11000 000110011

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | SOURCE/DESTINATION | | | MICROFICHE | ADDR | ALU | BUSB | BUS A | EXTENSION | | CLOCK |
|---------|-------------------------------|--------------------|--------------------|------|------|------------|------|-----|------|-------|-----------|-----|-------|
| | | | OFST | ADDR | BOX | | | | | | PAGE | RIF | |
| | | F/IA08 | <-- | 3122 | 611 | 231 | | | | | | | |
| | | F/IA09 | <-- | 3123 | 612 | 232 | | | | | | | |
| | | F/IA10 | <-- | 3121 | 613 | 232 | | | | | | | |
| | | F/IA12 | <-- | 3132 | 615 | 232 | | | | | | | |
| | | F/IA13 | <-- | 3133 | 616 | 233 | | | | | | | |
| | | F/IA14 | <-- | 3131 | 617 | 233 | | | | | | | |
| | | F/IA17 | <-- | 3002 | 619 | 233 | | | | | | | |
| | | F/IA18 | <-- | 3003 | 620 | 234 | | | | | | | |
| | | F/IA19 | <-- | 3001 | 621 | 234 | | | | | | | |
| | | F/IA31 | <-- | 3245 | 652 | 243 | | | | | | | |
| | | F/IA32 | <-- | 3247 | 653 | 243 | | | | | | | |
| | | F/IA33 | <-- | 3033 | 654 | 243 | | | | | | | |
| | | F/IA38G | <-- | 3202 | 667 | 247 | | | | | | | |
| | | F/IA40 | <-- | 3041 | 672 | 248 | | | | | | | |
| | | F/IA86 | <-- | 3060 | 676 | 248 | | | | | | | |
| | | F/IA87A | <-- | 3216 | 678 | 249 | | | | | | | |
| 601 | IA103:3062 | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | * DATO'S AND DATOB'S RETURN * | | | | | | | | | | | | |
| | *HERE * | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P3, DATTB, * | | | | | | | | | | | | |
| | *NEXT, * | | | | | | | | | | | | |
| | * J/IA50A * | --> | VV | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | | F/IA102 | <-- | 3057 | 600 | 228 | | | | | | | |
| | | F/IA103 | <-- | 3062 | 601 | 229 | | | | | | | |
| | | F/IA78 | <-- | 3105 | 639 | 240 | | | | | | | |
| | | F/WCSWRADRO2 | <-- | 3645 | 1208 | 388 | | | | | | | |
| | | F/WCSWRDATO4 | <-- | 3655 | 1218 | 390 | | | | | | | |
| | | F/WCSWRSTO1 | <-- | 3115 | 1219 | 391 | | | | | | | |
| 602 | IA50A:3063 | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | *SELECT, CUA, * | | | | | | | | | | | | |
| | *NEXT, * | | | | | | | | | | | | |
| | * J/IA216 * | --> | VV | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| 603 | IA216:3065 | F/IA50A | <-- | VV | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| | *P3, MD+DATA, * | | | | | | | | | | | | |
| | * J/IA217 * | --> | | 3066 | 604 | 230 | | | | | | | |
| | ***** | | | | | | | | | | | | |

3062
 0000 00 00 00 00 000 000 0000 0
 11010 000000 11000 000110011

3063
 0000 00 00 01 01 000 000 0000 0
 11001 000000 11000 000110101

3065
 0000 11 10 00 00 000 000 0000 0
 00000 100000 11000 000110110

H04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 230

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|----------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|----------------------|--------|--------|
| | | | | | | | | RIF | COUT | |
| 604 | IA217:3066 ***** *P2, D+MD *NEXT, BUT(TRACK), * J/IA218A ***** | F/IA216 <-- | 3065 603 229 | 3066 | 1010 00000 | 11 10 000000 | 00 00 11001 | 000 000 000110111 | 0100 0 | 0 |
| 605 | IA218A:3067 ***** * CLEAR JAM REG, * NEXT, * J/IA218 ***** | F/IA217 <-- VV | | 3067 | 0100 11011 | 00 00 000000 | 10 00 11000 | 000 000 000111010 | 0000 0 | 0 |
| 606 | IA218:3072 ***** * RETURN+D, * NEXT, PAGE+3, * J/IA219 ***** | F/IA218A <-- VV | | 3072 | 0000 00000 | 00 00 000000 | 00 00 11101 | 000 011 001000010 | 0000 0 | 0 |
| 607 | IA219:3102 ***** * SELECT, DBUF LATCH, * NEXT, * BUT(RETURN) ***** | F/IA218 <-- VV | | 3102 | 0100 11001 | 00 00 000000 | 00 00 11111 | 000 100 000000000 | 0000 0 | 0 |
| CASE 608 | 2 OF BIA05 IA220:2147 ***** * TRAP WAS IN PROGRESS WHEN IA WAS * ENTERED, GO DO EOE * TRAP ----- * NEXT, BUT(GO TO),PAGE+1, * J/JAM16 ***** | F/IA05 <-- | 2035 585 224 | 2147 | 0000 00000 | 00 00 000000 | 00 00 11100 | 000 001 010000111 | 0000 0 | 0 |
| | | --> | 1207 417 171 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS | |
|---------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------|--------|--------------|--|
| 609 | IA221:2347 F/IA06 ***** * FP INSTRUCTION WAS IN IR WHEN IA WAS * * ENTERED, GO DO IIAA * * TRAP * -----* * NEXT, BUT(GO TO), PAGE+1, * * J/IIAA01 * ***** | <-- | 2145 586 225 | 2347 | 0000 | 00 00 | 00 00 | 000 001 | 0000 0 | 000000001000 | |
| 610 | IA07:3120 ***** * #OVERVIEW-IMPLEMENTATION PAR BECAUSE OF * * SPECIAL HARDWARE ON THE CACHE KT BOARD * * WHEN THE MACRO SELECT, PAR IS USED THE * * PAR ADDRESSED BY THE PHYSICAL ADDRESS IS * * PLACED ON BUS DIN. ALSO WRITTING A PAR * * WITH A DATTB WILL CAUSE THE PAR * * ADDRESSED BY THE PHYSICAL ADDRESS TO BE * * WRITTEN. SERVICE FOR THIS REGISTER * * CONSISTS ONLY OF SELECTING PAR ON CACHE * * KT AND PASSING CONTROL TO TO IA100 OR * * IA103. FOR BYTE OPERATIONS ONLY THE * * APPROPRIATE BYTE IS ENABLED TO BE * * WRITTEN. #0-I END PAR * -----* * SELECT, PAR(R), * * NEXT, * * J/IA100 * ***** | --> | 1325 533 207 | 3120 | 1001 | 00 00 | 11 00 | 000 000 | 0000 0 | 000000001000 | |
| 611 | IA08:3122 ***** * DATOBE * -----* * SELECT, PAR(RWL), * * NEXT, * * J/IA103 * ***** | --> | 3055 598 228 | 3122 | 1001 | 00 01 | 11 00 | 000 000 | 0000 0 | 000000001000 | |
| | | --> | 3062 601 229 | | 11001 | 000000 | 11000 | 000110010 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-------------|--|--|--------------------------|------|----------------------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COU | |
| 612 | IA09:3123 ***** * *DATOB0 *-----* *SELECT, PAR(RWH), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3123 | 1001 00 10 11001 000000 | 11 00 | 000 000 | 00000000 | 1000 | 0000 0 |
| 613 | IA10:3121 ***** * *DATO *-----* *SELECT, PAR(RW), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3121 | 1001 00 11 11001 000000 | 11 00 | 000 000 | 00000000 | 1000 | 0000 0 |
| .TOC 614 | PDR IA11:3130 ***** *#OVERVIEW-IMPLEMENTATION PDR HARDWARE *FOR PDR REFERENCES IS SIMILAR TO THAT *FOR PAR REFERENCES AND FUNCTIONS IN THE *SAME WAY. #0-I END PDR *DATI *-----* *SELECT, PDR(R), *NEXT, * J/IA100 ***** | --> 3055 598 228 | | 3130 | 1001 00 00 11001 000000 | 10 00 | 000 000 | 00000000 | 1000 | 0000 0 |
| 615 | IA12:3132 ***** * *DATOBE *-----* *SELECT, PDR(RWL), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3132 | 1001 00 01 11001 000000 | 10 00 | 000 000 | 00000000 | 1000 | 0000 0 |

K04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 233

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|--|--------------------------|-------------|----------------------------|------------|-------------|-------------------------------------|
| 616 | IA13:3133 ***** * *DATOBO *-----* *SELECT, PDR(RWH), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3133 | 1001 00 10 11001 000000 | 10 00 | 10 00 | 000 000 0000 0 000110010 |
| 617 | IA14:3131 ***** * *DATO *-----* *SELECT, PDR(RW), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3131 | 1001 00 11 11001 000000 | 10 00 | 11000 | 000 000 0000 0 000110010 |
| 618 | MMRO IA16:3000 ***** *#OVERVIEW-IMPLEMENTATION MMRO MMRO IS *IMPLEMENTED BY USING UCON TO MOVE DATA *TO AND FROM IT. MMRO IS PHYSICALLY *LOCATED ON THE CACHE-KT BOARD #0-I END *DATI *-----* *SELECT, MMRO(R), *NEXT, * J/IA100 ***** | --> 3055 598 228 | | 3000 | 1001 00 00 11001 000000 | 01 00 | 11000 | 000 000 0000 0 000101101 |
| 619 | IA17:3002 ***** * *DATOBE *-----* *SELECT, MMRO(RWL), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3002 | 1001 00 01 11001 000000 | 01 00 | 11000 | 000 000 0000 0 000110010 |

TOC
618

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-------------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|--|
| 620 | IA18:3003 ***** * *DATO80 *-----* *SELECT, MMRO(RWH), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3003 | 1001 11001 | 00 10 000000 | 01 00 11000 | 00000001000 000 000 0000 0 000110010 |
| 621 | IA19:3001 ***** * *DATO *-----* *SELECT, MMRO(RW), *NEXT, * J/IA103 ***** | --> 3062 601 229 | | 3001 | 1001 11001 | 00 11 000000 | 01 00 11000 | 00000001000 000 000 0000 0 000110010 |
| .TOC 622 | MMRI IA20:3010 F/IA99 ***** *#OVERVIEW-IMPLEMENTATION MMRI (READ *ONLY, OTHER OPERATIONS NOP) MMRI DOES *NOT EXIST ON THE MACHINE, BUT MACRO *LEVEL READS OF IT READ A ZERO. A MACRO *LEVEL WRITE OF IT IS A NOP #0-I END *DATI *-----* *P2, D+0, *NEXT, * J/IA102 ***** | <-- 3011 623 234 | | 3010 | 0011 00000 | 00 00 000000 | 00 00 11000 | 00000001000 000 000 0100 0 000101111 |
| 623 | IA99:3011 ***** * *DATO+B *-----* *NEXT, * J/IA20 ***** | --> 3010 622 234 | | 3011 | 0000 00000 | 00 00 000000 | 00 00 11000 | 00000001000 000 000 0000 0 000001000 |

M04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 235

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS | |
|---------|--|---------------------------------------|-----------------------|------|--------------|---------|-----------|------------------------|--------------|--------------|
| 624 | IA90:3014 F/IA76 ***** *#OVERVIEW-IMPLEMENTATION MMR2 (READ * *ONLY, OTHER OPERATIONS NOP) MMR2 IS READ * *BY USING UCON. WRITES TO IT ARE NOP'S. * *MMR2 IS PHYSIALLY LOCATED ON THE * *CACHE-KT BOARD. #0-I END * *DATI * *-----* | <-- | 3015 625 235 | 3014 | 0001 00 00 | 00 00 | 00 00 | 010 000 | 0000 0 | 000000001000 |
| | *SELECT, MMR2 * J/IA100 ***** | --> | 3055 598 228 | | 11001 000000 | 11000 | 000101101 | | | |
| 625 | IA76:3015 ***** *#DAT0+B * *-----* | | | 3015 | 0000 00 00 | 00 00 | 000 000 | 0000 0 | 000000001000 | |
| | *NEXT, * J/IA90 ***** | --> | 3014 624 235 | | 00000 000000 | 11000 | 000001100 | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COOT CLOCKS UPF | |
|---------|--|---------------------------------------|---|--------------|---|----------|---|--|
| 626 | IA60:3070 ***** *#OVERVIEW-FUNCTION CPU ERROR (READ ONLY, *OTHER OPERATIONS NOP) THE CPU ERROR *REGISTER WAS IMPLEMENTED SO THAT 11/70 *SOFTWARE COULD BE RUN ON THIS MACHINE *WITH MINIMUM CHANGE THE FORMAT OF THIS *CPU ERROR REGISTER IS SLIGHTLY *DIFFERENT THAN THAT IN THE 11/70, BUT *IS THOUGHT TO BE COMPATIBLE. BELOW IS *THE FORMAT OF THE CPU ERROR REGISTER IS *SHOWN BELOW. ***** ***** **15*14*13*12*11*10*09*08*07*06*05*04*03*0 *2*01*00* ***** ***** * * * * * * * * * * *MICROBREAK***** * * * * * * * * * * ODD ADDRESS *ERROR***** * * * * * * * * * * ** * * * * UNUSED AND ** * * * * *-----* *P3, MD+176, *NEXT, * J/IA60A --> VV ***** 627 IA60A:3103 F/IA60 <-- VV ***** *P2, SR+CSP(0),D+CSP(0), *NEXT, * J/IA60B --> VV ***** 628 IA60B:3106 F/IA60A <-- VV ***** *P2, D+D RIGHT 5,D(C)+ALU00, *NEXT, * J/IA60F --> 3107 629 237 ***** | 3070 | 0000 10 00 00 01 111 110 0000 0 00010 100000 11000 001000011 | 3103 | 1010 10 00 00 00 000 000 0110 0 01111 000000 11000 001000110 | 3106 | 1111 00 00 01 10 000 010 0100 0 01000 000000 11000 001000111 | 000000001000 000000001000 000000001000 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--------------------------------------|--|--------------------------|-------------------------------|------------|------------|-------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| 629 | IA60F:3107 | F/IA609 F/HOTSYNC | <-- <-- | 3106 628 236 4565 1297 421 | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+D RIGHT 4 AND MD,D(C)+D(C), * | | | | | | | | | |
| | *NEXT, BUTR(SRO), * | | | | | | | | | |
| | * J/IA60D * | | | | | | | | | |
| | * J/IA60E * | | | | | | | | | |
| | ***** | | | | | | | | | |
| .CASE | 2 OF BIA60F | | | | | | | | | |
| | | F/IA60F | <-- | 3107 629 237 | | | | | | |
| | | F/IA60H | <-- | 3112 631 237 | | | | | | |
| | | F/CLRNZWS | <-- | 2120 1379 450 | | | | | | |
| | | F/BIS04 | <-- | 405 109 67 | | | | | | |
| | | F/DST06 | <-- | 516 44 37 | | | | | | |
| | | F/SRC15 | <-- | 4022 17 21 | | | | | | |
| | | F/STEXP4 | <-- | 620 1755 570 | | | | | | |
| | | F/IA111 | <-- | 3225 682 250 | | | | | | |
| 630 | IA60E:3477 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *P3, MD+200, * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/IA60H * | | | | | | | | | |
| | ***** | | | | | | | | | |
| 631 | IA60H:3112 | F/IA60E | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+D OR MD,D(C)+D(C), * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/IA60D * | | | | | | | | | |
| | ***** | | | | | | | | | |

3107
 1011 11 10 01 01 000 111 0100 0
 01000 000000 00000 100111110

3477
 0000 10 00 00 10 000 000 0000 0
 00010 100000 11000 001001010

3112
 1110 11 10 01 01 000 111 0100 0
 00000 000000 11000 100111110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|--|---------------------------------------|-----------------------|---------------|---------|----------|---------------------------------|
| | | F/IA60F | <-- | 3107 629 237 | | | |
| | | F/IA60H | <-- | 3112 631 237 | | | |
| | | F/CLRNZWS | <-- | 2120 1379 450 | | | |
| | | F/BIS04 | <-- | 405 109 67 | | | |
| | | F/DST06 | <-- | 516 44 37 | | | |
| | | F/SRC15 | <-- | 4022 17 21 | | | |
| | | F/STEXP4 | <-- | 620 1755 570 | | | |
| | | F/IA111 | <-- | 3225 682 250 | | | |
| 632 | IA60D:3476 | | | | | | |
| | ***** | | | | | | |
| | *P2, D+D PLUS D(C), | | | | | | 3476 000000001000 |
| | *NEXT, | | | | | | 0100 11 01 01 01 000 000 0100 0 |
| | * | | | | | | 00000 000000 11000 000101111 |
| | J/IA102 | --> | 3057 600 228 | | | | |
| | ***** | | | | | | |
| .TOC | MEMORY SYSTEM ERROR REGISTER" | | | | | | |
| 633 | IA65:3104 | | | | | | |
| | ***** | | | | | | |
| | *#OVERVIEW-FUNCTION MEMORY SYSTEM | | | | | | 3104 000000001000 |
| | *ERROR (READ ONLY, OTHER OPERATIONS NOP) | | | | | | 1010 10 00 00 00 000 000 0110 0 |
| | *THE MEMORY SYSTEM ERROR REGISTER WAS | | | | | | 01110 000000 11000 001001011 |
| | *IMPLEMENTED ON THIS MACHINE TO MINIMIZE | | | | | | |
| | *THE AMOUNT OF CHANGE TO 11/70 SOFTWARE | | | | | | |
| | *FOR IT TO RUN ON THIS MACHINE. THIS | | | | | | |
| | *REGISTER DOES NOT REALLY EXIST ON THIS | | | | | | |
| | *MACHINE BUT IS CONSTRUCTED FROM LOGGED | | | | | | |
| | *DATA WHEN IT IS REFERENCED. | | | | | | |
| | *DATI | | | | | | |
| | ----- | | | | | | |
| | *P2, SR+CSP(1),D+CSP(1), | | | | | | |
| | *NEXT, | | | | | | |
| | * | | | | | | |
| | J/IA66A | --> | VV | | | | |
| | ***** | | | | | | |
| 634 | IA66A:3113 | F/IA65 | <-- | VV | | | |
| | ***** | | | | | | |
| | *P2, D+D RIGHT 6,D(C)+ALU07, | | | | | | 3113 000000001000 |
| | *NEXT, | | | | | | 1111 00 00 01 11 000 011 0100 0 |
| | * | | | | | | 01000 000000 11000 001010110 |
| | J/IA67 | --> | 3126 635 239 | | | | |
| | ***** | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BCX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|---|---------------------------------------|------------------------------------|------|---------------|-----------------|----------------|---------------------------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 635 | IA67:3126 ***** *P3, MD+340, *NEXT, J/IA68 ***** | <-- | 3113 634 238 | 3126 | 0000 00010 | 10 00 100000 | 00 11 11000 | 000000001000 001010111 | 000000001000 | 0000 0 |
| 636 | IA68:3127 ***** *P2, SR+SR AND MD, *NEXT, BUTR(D(C)), J/IA69 ***** * J/IA69 * J/IA70 ***** | <-- VV --> VV | 01 3521 637 239 11 3523 638 239 | 3127 | 1011 00000 | 11 10 000000 | 00 00 10011 | 000000001000 101010001 | 000000001000 | 0010 0 |
| .CASE 637 | 1 OF BIA68 IA69:3521 ***** *P3, MD+100000, *NEXT, J/IA70 ***** | <-- VV | | 3521 | 1000 00010 | 10 00 100000 | 00 00 11000 | 000000001000 101010011 | 000000001000 | 0000 0 |
| .CASE 638 | 2 OF BIA68 IA70:3523 ***** *P2, D+SR OR MD, *NEXT, J/IA102 ***** | <-- --> | 3127 636 239 3057 600 228 | 3523 | 1110 00000 | 11 10 000000 | 00 00 11000 | 000000001000 000101111 | 000000001000 | 0100 0 |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS | |
|-------------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|----------------------|------------------------|--|
| 639 | IA78:3105 ***** * DATO, ENABLE * * LOGGING * ----- * P2, D+WHAMI OR 1 * * P3, WHAMI+D (A ADDR), * * NEXT, * * J/IA50A * ***** | --> | 3063 602 229 | 3105 | 1110 00000 | 11 00 010010 | 11 00 11000 | 101 000 000110011 | 000000001000 0100 0 | |
| .TOC 640 | PSW IA21:3030 ***** * OVERVIEW-FUNCTION PSW (DATO'S AND * * DATOB'S DO NOT CHANGE T-BIT) THE PSW, * * BESIDES BEING CHANGED BY TRAPS, HAS AN * * I/O PAGE ADDRESS (777776). ANY * * INSTRUCTION THAT CAN OPERATE ON THIS * * LOCATION CAN CHANGE THE PSW, EXCEPT FOR * * THE T-BIT, WHICH CAN BE CHANGED ONLY BY * * A TRAP. #0-F END * * DATI * ----- * SELECT, PSW, * * NEXT, * * J/IA100 * ***** | --> | 3055 598 228 | 3030 | 1000 11001 | 00 00 000000 | 10 01 11000 | 010 010 000101101 | 000000001000 0000 0 | |
| 641 | IA22A:3032 ***** * DATOBE * ----- * NEXT, * * J/IA22 * ***** | --> VV | | 3032 | 0000 00000 | 00 00 000000 | 00 00 11000 | 000 000 000011001 | 000000001000 0000 0 | |
| 642 | IA22:3031 ***** * DATO * * XMD+TMASK * ----- * P3, MD+20, * * NEXT, * * J/IA24 * ***** | <-- VV | | 3031 | 0000 00010 | 10 00 100000 | 00 00 11000 | 010 000 001100110 | 000000001000 0000 0 | |
| | | --> | 3146 643 241 | | | | | | | |

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11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALLU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|---------------------------------------|-----------------------|------|------------------|---------|-----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 643 | IA24:3146 ***** * SR GETS * * TMASK * *-----* *P2, SR+MD, * *NEXT, * * J/IA25A * ***** | <-- | 3031 642 240 | 3146 | | | | 00000000 | 1000 | |
| | | | | | 1010 11 10 00 00 | 000 000 | 0010 0 | | | |
| | | | | | 00000 000000 | 11000 | 001100111 | | | |
| 644 | IA25A:3147 ***** *SELECT, PSW, * *NEXT, * * J/IA25 * ***** | <-- VV | | 3147 | | | | 00000000 | 1000 | |
| | | | | | 1000 00 00 10 01 | 010 010 | 0000 0 | | | |
| | | | | | 11001 000000 | 11000 | 001101010 | | | |
| 645 | IA25:3152 ***** * XMD GETS OLD * *PSW * *-----* *P3, MD+DATA, * *NEXT, * * J/IA26 * ***** | <-- VV | | 3152 | | | | 00000000 | 1000 | |
| | | | | | 0000 11 10 00 00 | 000 000 | 0000 0 | | | |
| | | | | | 00000 100000 | 11000 | 001101100 | | | |
| 646 | IA26:3154 ***** * D<4> GETS OLD T-BIT, OTHER BITS EQUAL * *0 * *-----* *P2, D+SR AND MD, D(C)+D(C), * *NEXT, * * J/IA27A * ***** | <-- VV | | 3154 | | | | 00000000 | 1000 | |
| | | | | | 1011 11 10 00 00 | 000 111 | 0100 0 | | | |
| | | | | | 00000 000000 | 11000 | 001101101 | | | |
| | | | 3155 647 242 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--------------|--|--|--------------------------|------------------------------------|------------|---------------|-----------------|----------------|----------------------|-----------------------|
| | | | | | | | | RIF | COUT | |
| 647 | IA27A:3155 ***** *SELECT, DBUF LATCH, *NEXT, * J/IA27 ***** | <-- | | 3154 646 241 | 3155 | 0100 11001 | 00 00 000000 | 00 00 11000 | 000 100 001101110 | 00000001000 0000 0 |
| 648 | IA27:3156 ***** * XMD GETS NEW PSW, DBUF LATCH WAS LOADED *BY *JAM02 ----- *P3, MD+DBUF LATCH, *NEXT, * J/IA28 ***** | <-- VV | | | 3156 | 0000 00000 | 11 10 100000 | 00 00 11000 | 000 000 001110010 | 00000001000 0000 0 |
| 649 | IA28:3162 ***** * TEST TO SEE IF T-BIT WAS SET OR CLEAR *IN OLD PSW TABLE *CU ----- *NEXT, BUTR(D(14-0)), * J/IA29 * J/IA30 ***** | <-- VV | | | 3162 | 0000 00000 | 00 00 000000 | 00 00 01101 | 000 000 001110101 | 00000001000 0000 0 |
| | | | | 01 3165 650 242 11 3167 651 243 | | | | | | |
| .CASE 650 | 1 OF BIA28 IA29:3165 ***** * CLEAR D<4>, LEAVE REST OF D UNCHANGED *TEST FOR DATO OR DATOB TABLE *CV ----- *P2, D+SR OR MD, D(C)+D(C), *NEXT, BUTR(D(C)), * J/IA31 * J/IA32 ***** | <-- VV | | | 3165 | 1110 00000 | 11 10 000000 | 00 00 10011 | 000 111 010100101 | 00000001000 0100 0 |
| | | | | 01 3245 652 243 11 3247 653 243 | | | | | | |

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PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUSB BUSA EXTENSION | ALU BUS SP UBF | RIF COUT CLOCKS |
|-----------|----------------------------------|---------------------------------------|-----------------------|------------------------------|---------------------------------|-----------------|
| .CASE 651 | 2 OF BIA28 IA30:3167 | F/IA28 | <-- | 3162 649 242 | 3167 | 000000001000 |
| | * SET D<4> TABLE | | | | 0010 11 10 00 00 000 111 0100 0 | |
| | *CV | | | | 00000 000000 10011 010100101 | |
| | *P2, D+NOT SR AND MD, D(C)+D(C), | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | |
| | * J/IA31 | | | | | |
| | * J/IA31 | | --> | 01 3245 652 243 | | |
| | * J/IA32 | | --> | 11 3247 653 243 | | |
| .CASE 652 | 1 OF BIA29 IA31:3245 | F/IA29 F/IA30 | <-- <-- VV | 3165 650 242 | 3245 | 000000001000 |
| | * DATOBE | | | | 1000 00 00 10 01 010 000 0000 0 | |
| | * J/IA103 | | --> | 3062 601 229 | 11001 000000 11000 000110010 | |
| .CASE 653 | 2 OF BIA29 IA32:3247 | F/IA29 F/IA30 | <-- <-- | 3165 650 242 3167 651 243 | 3247 | 000000001000 |
| | * DATO | | | | 1000 00 00 10 01 010 010 0000 0 | |
| | * J/IA103 | | --> | 3062 601 229 | 11001 000000 11000 000110010 | |
| .CASE 654 | IA33:3033 | | | | 3033 | 000000001000 |
| | * DATOBO | | | | 0000 00 00 00 01 000 010 0000 0 | |
| | * J/IA103 | | --> | 3062 601 229 | 11001 000000 11000 000110010 | |

J05

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|---------|--|--|--------------------------|-----------|---------------|-----------------|----------------|----------------------|------------------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS |
| 659 | IA34E:3172 ***** *P2, SR+MD, *P3, MD+DATA, *NEXT, * J/IA34F ***** | <-- | 3166 658 244 | 3172 | 1010 00000 | 11 10 100000 | 00 00 11000 | 000 000 001111011 | 000000001000 0010 0 |
| 660 | IA34F:3173 ***** * HIGH BYTE OF CCR IS MASKED *OUT ----- *P2, D+SR AND MD,D(C)+D(C), *NEXT, * J/IA34G ***** | <-- VV --> VV | | 3173 | 1011 00000 | 11 10 000000 | 00 00 11000 | 000 111 001111100 | 000000001000 0100 0 |
| 661 | IA34G:3174 ***** * CCR<0> IS ADDED TO D, D<0> WAS *CLEARED IN *IA34F ----- *P2, D+D PLUS D(C), *NEXT, * J/IA102 ***** | <-- VV --> | 3057 600 228 | 3174 | 0100 00000 | 11 01 000000 | 01 01 11000 | 000 000 000101111 | 000000001000 0100 0 |
| 662 | IA38:3135 ***** * DATO+B CCR<0> IS STORED IN *WHAMI<13> ----- *P2, SR+D,D+D,D(C)+ALU00, *NEXT, * J/IA38A ***** | --> | 3176 663 246 | 3135 | 1111 00000 | 00 00 000000 | 01 01 11000 | 000 010 001111110 | 000000001000 0110 0 |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|-----------|--------------|--|--------------------------|------|------------|------------|-------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| 663 | IA38A:3176 | F/IA38 | <-- | 3135 | 662 | 245 | | | | |
| | ***** | | | | | | | | | |
| | *P3, | MD+20000, | | | | | | | | |
| | *NEXT, | BUTR(D(C)), | | | | | | | | |
| | * | J/IA38C | | | | | | | | |
| | | J/IA38C | --> | 01 | 3531 | 664 | 246 | | | |
| | | J/IA38D | --> | 11 | 3533 | 665 | 246 | | | |
| ***** | | | | | | | | | | |
| .CASE 664 | 1 OF BIA38A | F/IA38A | <-- VV | | | | | | | |
| | IA38C:3531 | F/IA38A | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, | D+WHAMI AND NOT MD, | | | | | | | | |
| | *P3, | WHAMI+D (A ADDR), | | | | | | | | |
| | | J/IA38E | --> | 3201 | 666 | 246 | | | | |
| ***** | | | | | | | | | | |
| .CASE 665 | 2 OF BIA38A | F/IA38A | <-- | 3176 | 663 | 246 | | | | |
| | IA38D:3533 | F/IA38A | <-- | 3176 | 663 | 246 | | | | |
| | ***** | | | | | | | | | |
| | *P2, | D+WHAMI OR MD, | | | | | | | | |
| | *P3, | WHAMI+D (A ADDR), | | | | | | | | |
| | | J/IA38E | --> VV | | | | | | | |
| ***** | | | | | | | | | | |
| 666 | IA38E:3201 | F/IA38C | <-- | 3531 | 664 | 246 | | | | |
| | | F/IA38D | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *SELECT, | CCR(RW), | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | | J/IA38G | --> | 3202 | 667 | 247 | | | | |
| ***** | | | | | | | | | | |

```

3176          000000001000
0010 10 00 00 00 000 000 0000 0
00010 100000 10011 101011001

3531          000000001000
0111 11 10 11 00 101 000 0100 0
00000 010010 11000 010000001

3533          000000001000
1110 11 10 11 00 101 000 0100 0
00000 010010 11000 010000001

3201          000000001000
1001 00 01 00 00 000 000 0000 0
11001 000000 11000 010000010
    
```

L05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 247

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--|------------------------------|------|---------------|-----------------|----------------|----------------------|--------|--------------|
| | | | | | | | | RIF | COUT | |
| 667 | IA38G:3202 ***** *P2, D+SR, *NEXT, * J/IA103 ***** | <-- 3201 666 246 --> 3062 601 229 | | 3202 | 1111 00000 | 00 00 000000 | 00 00 11000 | 000 000 000110010 | 0100 0 | 000000001000 |
| 668 | IA39:3040 ***** *STACK LIMIT (WORD ONLY, MAY NOT BE *CORRECT) ----- *P3, MD+177400, *NEXT, * J/IA39B ***** | | | 3040 | 1111 00010 | 10 11 100000 | 11 00 11000 | 000 000 010000011 | 0000 0 | 000000001000 |
| 669 | IA39B:3203 ***** *SELECT, SLR, *NEXT, * J/IA39C ***** | <-- VV --> VV | | 3203 | 1001 11001 | 00 10 000000 | 00 00 11000 | 000 000 010000110 | 0000 0 | 000000001000 |
| 670 | IA39C:3206 ***** *P2, SR+MD *P3, MD+DATA, *NEXT, * J/IA39D ***** | <-- <-- --> VV | 3203 669 247 3215 674 248 | 3206 | 1010 00000 | 11 10 100000 | 00 00 11000 | 000 000 010001010 | 0010 0 | 000000001000 |
| 671 | IA39D:3212 ***** *P2, D+SR AND MD, *NEXT, * J/IA102 ***** | <-- VV --> | | 3212 | 1011 00000 | 11 10 000000 | 00 00 11000 | 000 000 000101111 | 0100 0 | 000000001000 |

M05

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|-------------|---|--|--------------------------|------|------------|--------------|-------------|-------------------|-------------|--------|
| | | | | | | | | RIF | COUT | |
| 672 | IA40:3041 ***** * *DAT0+B *-----* *SELECT, SLR(RW), * J/IA103 ***** | --> | 3062 601 229 | 3041 | 1001 11001 | 00 10 00000C | 00 00 11000 | 000 000 000110010 | 00000001000 | 0000 0 |
| .TOC 673 | " HITMISS REGISTER" IA41:3050 F/IA85 ***** *HITMISS (READ ONLY, OTHER OPERATIONS *WILL NOP) *-----* *P3, MD+377, *NEXT, * J/IA41B ***** | <-- | 3051 675 248 | 3050 | 0000 00010 | 10 00 100000 | 00 11 11000 | 111 111 010001101 | 00000001000 | 0000 0 |
| 674 | IA41B:3215 F/IA41 ***** *SELECT, HITTAG, *NEXT, * J/IA39C ***** | --> VV | 3206 670 247 | 3215 | 0001 11001 | 01 00 000000 | 00 00 11000 | 010 000 010000110 | 00000001000 | 0000 0 |
| 675 | IA85:3051 ***** * *DAT0+B *-----* *NEXT, * J/IA41 ***** | --> | 3050 673 248 | 3051 | 0000 00000 | 00 00 000000 | 00 00 11000 | 000 000 000101000 | 00000001000 | 0000 0 |
| .TOC 676 | " UBREAK REGISTER" IA86:3060 ***** *UBREAK (NYI) *DATI *-----* *NEXT, * J/IA103 ***** | --> | 3062 601 229 | 3060 | 0000 00000 | 00 00 000000 | 00 00 11000 | 000 000 000110010 | 00000001000 | 0000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|----------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|------------------------|-----------------------|
| 677 | IA87:3061 ***** * *DAT0+B *-----* *P3, DBUF LATCH+D, *NEXT, * J/IA87A ***** | --> VV | | 3061 | 0100 11011 | 00 00 000000 | 00 00 11000 | 000 100 010001110 | 00000001000 0000 0 |
| 678 | IA87A:3216 ***** *P2, UBREAK+DBUF LATCH, *NEXT, * J/IA103 ***** | <-- VV | | 3216 | 0100 11001 | 01 00 000000 | 00 01 11000 | 000 100 000110010 | 00000001000 0000 0 |
| .TOC 679 | " SWITCH REGISTER" IA15:3100 ***** * *DAT1 *-----* * D+R(SW), *NEXT, * J/IA102 ***** | --> | 3062 601 229 | | | | | | |
| .TOC 680 | " DISPLAY REGISTER" IA89:3101 ***** *DISPLAY REGISTER *DAT0+B *-----* *P3, R(CADRS)+D, *NEXT, * J/IA110 ***** | --> | 3057 600 228 | 3100 | 1111 00000 | 00 00 000000 | 11 00 11000 | 111 000 000101111 | 00000001000 0100 0 |
| | | | 3221 681 250 | 3101 | 0000 00000 | 00 00 010010 | 00 01 11000 | 111 000 010010001 | 00000001000 0000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---------------------------|--------------------|--|------|--------------|-------|-----------|-----------------|
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 686 | IA114B:3244 | F/IA113 | 3242 685 250 | 3244 | 0011 10 00 | 00 00 | 000 000 | 00000001000 |
| | *P3, CSP(12)+030000, | | | | 00101 100000 | 11000 | 010100110 | 0000 0 |
| | *NEXT, J/IA114C | --> VV | | | | | | |
| 687 | IA114C:3246 | F/IA114B | | 3246 | 0100 10 00 | 00 00 | 000 000 | 00000001000 |
| | *P3, CSP(13)+040000, | | | | 00100 100000 | 11000 | 010101000 | 0000 0 |
| | *NEXT, J/IA114D | --> VV | | | | | | |
| 688 | IA114D:3250 | F/IA114C | | 3250 | 0011 00 01 | 01 01 | 001 001 | 00000001000 |
| | *P2, RETURN+IA114E, | | | | 00000 000000 | 11100 | 010101100 | 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | --> | ***** 1254 564 216 ***** VV 3251 689 251 | | | | | |
| 689 | IA114E:3251 | | | 3251 | 0000 10 10 | 00 00 | 000 000 | 00000001000 |
| | *P3, MD+4000, | | | | 00010 100000 | 11000 | 010110010 | 0000 0 |
| | *NEXT, J/IA114F | --> VV | | | | | | |
| 690 | IA114F:3262 | F/IA114E | | 3262 | 0011 00 01 | 01 10 | 011 001 | 00000001000 |
| | *P2, RETURN+IA114, | | | | 00000 000000 | 11100 | 010110000 | 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | |
| | * J/FLG01 | --> | ***** 1260 568 218 ***** VV 3263 691 252 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|----------|------------------------|---------------------------------------|-----------------------|---------|---------|---------|----------|-----------|--------|-------|
| | | | | | | | | RIF | COUT | |
| 691 | IA114:3263 | | | 3263 | | | | 00000000 | 1000 | |
| | *P3, MD+100 (BC), | | | | 0000 | 10 00 | 00 01 | 000 000 | 0000 0 | |
| | *NEXT, BUTR(D(C)), | | | | 00010 | 100000 | 10011 | 100001001 | | |
| | * J/IA115 | | | | | | | | | |
| | | J/IA115 | --> | 01 3411 | 692 | 252 | | | | |
| | | J/IA116 | --> | 11 3413 | 697 | 253 | | | | |
| CASE 692 | 1 OF BIA114 | | | | | | | | | |
| | IA115:3411 | F/IA114 | <-- VV | 3411 | | | | 00000000 | 1000 | |
| | *P2, SR+MD, | | | | 1010 | 11 10 | 00 00 | 000 000 | 0010 0 | |
| | *NEXT, J/IA115A | | --> VV | | 00000 | 000000 | 11000 | 010110100 | | |
| 693 | IA115A:3264 | F/IA115 | <-- VV | 3264 | | | | 00000000 | 1000 | |
| | *P2, SR+SR OR R(CNTL), | | | | 1110 | 01 11 | 00 00 | 111 000 | 0010 0 | |
| | *NEXT, J/IA115D | | --> VV | | 00000 | 000000 | 11000 | 010110110 | | |
| 694 | IA115D:3266 | F/IA115A | <-- VV | 3266 | | | | 00000000 | 1000 | |
| | *P2, SR+SR AND NOT 1, | | | | 0111 | 11 00 | 00 00 | 000 000 | 0010 0 | |
| | *NEXT, J/IA115E | | --> VV | | 00000 | 000000 | 11000 | 010111010 | | |
| 695 | IA115E:3272 | F/IA115D | <-- VV | 3272 | | | | 00000000 | 1000 | |
| | *P2, D+SR AND NOT 2, | | | | 0111 | 11 11 | 00 00 | 111 000 | 0100 0 | |
| | *P3, R(CNTL)+D, | | | | 00000 | 011100 | 11000 | 010111011 | | |
| | *NEXT, J/IA115C | | --> | 3273 | 696 | 253 | | | | |

F06

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|--|---------------------------------------|---------------------------------------|-----------------------|-------------|------------|--------------|-------------------|--------------------|--------|
| 698 | MED01:0333 INTERNAL CPU REGISTERS" | F/XFC18 1466 1190 383 | <-- | 333 | 1001 10110 | 11 11 000110 | 10 01 11100 | 111 011 010111100 | 0101 0 |
| <p>***** *OVERVIEW-FUNCTION INTERNAL CPU * *REGISTERS THE OPERATION CODE FOR THE MED * *INSTRUCTION IS 076600. MED IS</p> <p style="text-align: center;">*</p> <p>*DATA IS MOVE THROUGH RD. THAT IS, THOSE * *MED CODES THAT READ AN INTERNAL CPU * *REGISTER LEAVE THE DATA IN RD. THOSE * *THAT WRITE AN INTERNAL CPU REGISTER * *WRITE THE CONTENTS OF RD. THE FOLLOWING * *FLOW (MED) IMPLEMENTS BOTH THE MED * *INSTRUCTION AND THE CONSOLE MAINT BUTTON * *THE FLOW IS INVOKED BY PASSING CONTROL * *TO IT ALONG WITH A MED CODE. A TABLE OF * *MED CODES AND THEIR OPERATIONS IS *</p> <p>-----*</p> <p>*P1, BA+PC * *P2, D+PC PLUS 2, * *P3, PC+D, * *P3, U, DATI, * *NEXT, BUT(GO TO), PAGE+3, * * J/MED02 * --> VV</p> <p>*****</p> | | | | | | | | | |
| 699 | MED02:3274 | F/MED01 F/INT05 1426 1082 353 | <-- <-- | 333 698 254 | 3274 | 0000 00000 | 11 10 00 00 11000 | 000 000 010111110 | 0000 0 |
| <p>***** * MD GETS OPERATION CODE CONSOLE ENTERS * *HERE, OP CODE SHOULD BE IN DBUF * *LATCH * *-----*</p> <p>*P3, MD+DATA, * *NEXT, * * J/MED03 * --></p> <p>*****</p> | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|------|---------------|-----------------|----------------|----------------------|----------|----------------|
| | | | | | | | | RIF | COUT | |
| 700 | MED03:3276 ***** *P2, SR+MD, *NEXT, * J/MED04 ***** | <-- | 3274 699 254 | 3276 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000 000 011000010 | 00000000 | 1000 0010 0 |
| 701 | MED04:3302 ***** *SELECT, EMIT, *NEXT, * J/MED05 ***** | <-- VV | | 3302 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 000 011000011 | 00000000 | 1000 0000 0 |
| 702 | MED05:3303 ***** * BA GETS OPERATION CODE FOR DECODING BY *ROM ON *CACHKT *-----* *P1, BA+SR,CURRENT MODE, *P3, MD+7, *NEXT, * J/MED06 ***** | <-- VV | | 3303 | 0000 00000 | 11 10 100000 | 00 00 11000 | 000 111 011000110 | 00000000 | 1011 0001 0 |
| 703 | MED06:3306 ***** *P2, D+SR AND MD,SR+SR AND MD, *NEXT, * J/MED10A ***** | <-- VV | | 3306 | 1011 00000 | 11 10 000000 | 00 00 11000 | 000 000 011000111 | 00000000 | 1000 0110 0 |
| 704 | MED10A:3307 ***** *P3, MD+6 (3C), *NEXT, * J/MED10 ***** | <-- VV | 3312 705 256 | 3307 | 0000 00010 | 10 00 100000 | 00 00 11000 | 000 110 011001010 | 00000000 | 1000 0000 0 |

H06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------------|--|--------------------------|------|------------|------------|-------------|-----------|--------|--------------|
| | | | | | | | | RIF | COUT | |
| 705 | MED10:3312 | F/MED10A | <-- | 3312 | | | | | | 000000001000 |
| | *P3, | | | | 0100 | 00 00 | 00 01 | 000 100 | 0000 0 | |
| | * DBUF LATCH+D AND | | | | 11011 | 000000 | 11000 | 011001110 | | |
| | *ENABLE CLKIR, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MED11 | | --> VV | | | | | | | |
| 706 | MED11:3316 | F/MED10 | <-- VV | 3316 | | | | | | 000000001000 |
| | *P2, | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | * IR+DBUF LATCH, | | | | 11010 | 000000 | 11000 | 011010010 | | |
| | *NEXT, | | | | | | | | | |
| | * J/MED12A | | --> VV | | | | | | | |
| 707 | MED12A:3322 | F/MED11 | <-- VV | 3322 | | | | | | 000000001000 |
| | *P2, | | | | 0110 | 11 10 | 00 00 | 000 000 | 1100 0 | |
| | * D+SR XOR MD, | | | | 00000 | 000000 | 11000 | 011010011 | | |
| | *NEXT, | | | | | | | | | |
| | * J/MED12B | | --> VV | | | | | | | |
| 708 | MED12B:3323 | F/MED12A | <-- VV | 3323 | | | | | | 000000001000 |
| | *P2, | | | | 0011 | 00 00 | 00 00 | 000 000 | 0010 0 | |
| | * SR+0, | | | | 00000 | 000000 | 01101 | 110000001 | | |
| | * BUTR(D(14-00) IS 0), | | | | | | | | | |
| | * J/MED12C | | --> | | | | | | | |
| | * J/MED12D | | --> | | | | | | | |
| | | | | | 01 3601 | 709 | 257 | | | |
| | | | | | 11 3603 | 710 | 257 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|-----------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|------------------------|------------------------|
| .CASE 709 | MED12C:3601 ***** *P2, SR+NOT SR, *NEXT, J/MED120 ***** | <-- | 3323 708 256 | 3601 | 0000 00000 | 00 00 000000 | 00 00 11000 | 000 000 110000011 | 000000001000 0010 0 |
| .CASE 710 | MED12D:3603 ***** *NEXT, DECODE CP INT, * J/MED15 ***** | <-- | 3323 708 256 | 3603 | 0001 11001 | 00 00 000000 | 00 00 11000 | 100 011 011011110 | 000000001000 0000 0 |
| 711 | MED13:3324 ***** *P3, MD+DATA, *NEXT, J/MED14 ***** | <-- | 3336 714 258 | 3324 | 0000 00000 | 11 10 100000 | 00 00 11000 | 000 000 011010101 | 000000001000 0000 0 |
| 712 | MED14:3325 ***** *P2, D+MD,D(C)+D(C), *NEXT, J/MED14A ***** | <-- VV | | 3325 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000 111 011010110 | 000000001000 0100 0 |
| 713 | MED14A:3326 ***** *P2, RETURN+D, PAGE+3, *NEXT, J/MED16 ***** | <-- VV | | 3326 | 0000 00000 | 00 00 000000 | 00 00 11101 | 000 011 011100010 | 000000001000 0000 0 |
| | | | 3342 715 258 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|---|--------------------------|--|------------------------------|------------|-------------|--------------|------|--------|
| | | | | | | | | RIF | COUT | |
| 714 | MED15:3336 ***** *P2, D+R(CNTL),D(C)+ALU15, *NEXT, * J/MED13 ***** | <-- | | 3603 710 257 | | | | | | |
| | | | | 3336 | 1010 01 11 00 00 | | | 000000001000 | | 0100 0 |
| | | | | | 00000 000000 11000 011010100 | | | | | |
| 715 | MED16:3342 ***** * TEST FOR CONSOLE MODE TABLE *CW ----- *P2, D+RD,D(C)+D(C), *NEXT, BUTR(D(C)), * J/MED18 * J/MED18 * J/MED17 ***** | <-- | | 3324 711 257 3326 713 257 | | | | | | |
| | | | | 3342 | 1111 00 00 10 00 | | | 000000001000 | | 0100 0 |
| | | | | | 00000 000000 10011 010000101 | | | | | |
| .CASE | 2 OF BMED16 | | | 01 3205 717 258 11 3207 716 258 | | | | | | |
| 716 | MED17:3207 ***** * CONSOLE *MODE ----- *P2, D+R(TMPSW), *NEXT, * J/MED18 ***** | <-- | | 3342 715 258 3207 716 258 3404 824 281 | | | | | | |
| | | | | 3207 | 1111 00 00 11 01 101 000 | | | 000000001000 | | 0100 0 |
| | | | | | 00000 000000 11000 010000101 | | | | | |
| .CASE | 1 OF BMED16 | | | | | | | | | |
| 717 | MED18:3205 ***** *P3, DBUF LATCH+D, *NEXT, * BUT(RETURN) ***** | <-- | | 3342 715 258 3207 716 258 3404 824 281 | | | | | | |
| | | | | 3205 | 0100 00 00 00 00 000 100 | | | 000000001000 | | 0000 0 |
| | | | | | 11011 000000 11111 000000000 | | | | | |

K06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 259

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|-----------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 718 | MED19A:2066 | F/MED23A <-- | | 2070 | 732 | 263 | | | | |
| | | F/MED25A <-- | | 2071 | 736 | 264 | | | | |
| | | F/MED31A <-- | | 2100 | 750 | 267 | | | | |
| | | F/MED33A <-- | | 2101 | 754 | 267 | | | | |
| | ***** | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, * | | | | | | | | | |
| | * J/MED19 * | --> VV | | | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 719 | 2 OF BMED32 | F/MED32 <-- | | 3224 | 751 | 267 | | | | |
| | MED19:3637 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | * TABLE * | | | | | | | | | |
| | *CX * | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *NEXT, BUTR(D(C)), * | | | | | | | | | |
| | * J/MED20 * | | | | | | | | | |
| | * J/MED21 * | --> | 01 3265 | 720 | 259 | | | | | |
| | ***** | --> | 11 3267 | 721 | 259 | | | | | |
| .CASE 720 | 1 OF BMED19 | F/MED19 <-- VV | | | | | | | | |
| | MED20:3265 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *P3, RO+D, * | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, * | | | | | | | | | |
| | * J/BRAOS * | --> | 3 283 | 126 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 721 | 2 OF BMED19 | F/MED19 <-- | | 3637 | 719 | 259 | | | | |
| | MED21:3267 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *P3, R(TMPSW)+D, * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/MED85 * | --> | 3343 | 722 | 260 | | | | | |
| | ***** | | | | | | | | | |

2066
0000 00 00 00 00 000 011 0000 0
00000 000000 11100 110011111

3637
0000 00 00 00 00 000 000 0000 0
00000 000000 10011 010110101

3265
0000 00 00 00 00 100 000 0000 0
00000 000110 11100 000000011

3267
0000 00 00 00 01 101 000 0000 0
00000 010010 11000 011100011

L06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 260

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---------------------------|--------------------|------------|------|------|------|------|---------------------------------|
| | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | UPF | |
| 722 | MED85:3343 | F/MED21 | <-- | 3267 | 721 | 259 | | |
| | ***** | | | | | | | 3343 000000001000 |
| | *P2, SR+0 | | * | | | | | 0011 00 00 00 00 000 001 0010 0 |
| | *NEXT, BUT(GO TO),PAGE+1, | | * | | | | | 00000 000000 11100 10000000 |
| | * J/DIS06 | | * --> | 1400 | 1058 | 346 | | |
| | ***** | | | | | | | |
| | | F/MED70 | <-- | 3160 | 797 | 276 | | |
| | | F/MED72 | <-- | 3170 | 802 | 277 | | |
| | | F/MED73 | <-- | 3171 | 803 | 277 | | |
| | | F/MED74 | <-- | 3320 | 805 | 277 | | |
| | | F/MED200 | <-- | 3720 | 807 | 278 | | |
| | | F/MED201 | <-- | 3721 | 808 | 278 | | |
| | | F/CAREAD02 | <-- | 3415 | 832 | 283 | | |
| 723 | MEDX1:3346 | | | | | | | |
| | ***** | | | | | | | 3346 000000001000 |
| | *P3, MD+DATA (BC), | | * | | | | | 0000 10 00 00 00 000 000 0000 0 |
| | *NEXT, | | * | | | | | 00010 100000 11000 011101010 |
| | * J/MEDX2 | | * --> VV | | | | | |
| | ***** | | | | | | | |
| 724 | MEDX2:3352 | F/MEDX1 | <-- VV | | | | | |
| | ***** | | | | | | | 3352 000000001000 |
| | *P2, D+MD,D(C)+D(C), | | * | | | | | 1010 11 10 00 00 000 111 0100 0 |
| | *NEXT, | | * | | | | | 00000 000000 11000 110011111 |
| | * J/MED19 | | * --> | 3637 | 719 | 259 | | |
| | ***** | | | | | | | |

M06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 261

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|-------------|-----------------------|--------------------|------|-----|-----------------------|--------------|---------|----------|-----------|-----|-------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | |
| | | F/MED26A | <-- | 3716 | 738 | 264 | | | | | | |
| | | F/MED26B | <-- | 3717 | 739 | 264 | | | | | | |
| | | F/MED27A | <-- | 2074 | 741 | 265 | | | | | | |
| | | F/MED28A | <-- | 3736 | 743 | 265 | | | | | | |
| | | F/MED28B | <-- | 3737 | 744 | 265 | | | | | | |
| | | F/MED29A | <-- | 2076 | 746 | 266 | | | | | | |
| | | F/MED34A | <-- | 3436 | 756 | 268 | | | | | | |
| | | F/MED34B | <-- | 3437 | 757 | 268 | | | | | | |
| | | F/MED35A | <-- | 2104 | 759 | 268 | | | | | | |
| | | F/MED36A | <-- | 3416 | 761 | 269 | | | | | | |
| | | F/MED36B | <-- | 3417 | 762 | 269 | | | | | | |
| | | F/MED37A | <-- | 2105 | 764 | 269 | | | | | | |
| | | F/MED54 | <-- | 3304 | 781 | 273 | | | | | | |
| | | F/MED55 | <-- | 3305 | 782 | 273 | | | | | | |
| | | F/MED56 | <-- | 3310 | 783 | 273 | | | | | | |
| | | F/MED57 | <-- | 3311 | 784 | 273 | | | | | | |
| | | F/MED58 | <-- | 3314 | 785 | 273 | | | | | | |
| | | F/MED59 | <-- | 3315 | 786 | 274 | | | | | | |
| | | F/MED60 | <-- | 3330 | 787 | 274 | | | | | | |
| | | F/MED61 | <-- | 3331 | 788 | 274 | | | | | | |
| | | F/MED62 | <-- | 3334 | 789 | 274 | | | | | | |
| | | F/MED63 | <-- | 3335 | 790 | 274 | | | | | | |
| | | F/MED64 | <-- | 3370 | 791 | 274 | | | | | | |
| | | F/MED65 | <-- | 3371 | 792 | 275 | | | | | | |
| | | F/MED66 | <-- | 3374 | 793 | 275 | | | | | | |
| | | F/MED67 | <-- | 3375 | 794 | 275 | | | | | | |
| | | F/MED68 | <-- | 3360 | 795 | 275 | | | | | | |
| | | F/MED69 | <-- | 3361 | 796 | 275 | | | | | | |
| | | F/MED208 | <-- | 3725 | 812 | 279 | | | | | | |
| | | F/MED209 | <-- | 3730 | 813 | 279 | | | | | | |
| | | F/MED76A | <-- | 3372 | 815 | 279 | | | | | | |
| | | F/MED204 | <-- | 3376 | 818 | 280 | | | | | | |
| | | F/MED78 | <-- | 3377 | 820 | 280 | | | | | | |
| 725 | MEDZ1:3005 | F/CAWRT02 | <-- | 3414 | 830 | 282 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *P2 | D+R(CNTL),D(C)+ALU15, | * | | | | | | | | | |
| | *NEXT, | BUT(DIAGNOSE), | * | | | | | | | | | |
| | * | J/MEDZ2 | * --> | 3353 | 726 | 262 | | | | | | |
| | ***** | | | | | | | | | | | |

3005 000000001000
 1010 01 11 00 00 111 100 0100 0
 00000 000000 11011 011101011

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCK |
|-----------|------------------------------------|--------------------|------------|-------|--------|-------|----------|-----------|----------|-------|
| | | | | | | | | OFST | ADDR | |
| 726 | MED22:3353 | F/MEDZ1 | <-- | 3005 | 725 | 261 | | | | |
| | ***** | | | | | | | | | |
| | *SELECT, EMIT | | | 3353 | | | | | 00000000 | 1000 |
| | *NEXT, BUTR(CONSOLE), | | | 0000 | 00 | 00 | 00 | 01 | 000 | 000 |
| | * J/MEDZ3 | | | 11001 | 000000 | 01111 | 101000 | 110 | | 0 |
| | * J/MEDZ3 | | --> | 10 | 3506 | 727 | 262 | | | |
| | * J/MEDZ4 | | --> | 11 | 3507 | 728 | 262 | | | |
| | ***** | | | | | | | | | |
| .CASE 727 | 1 OF BMEDZ2 | F/MEDZ2 | <-- VV | | | | | | | |
| | MED23:3506 | | | 3506 | | | | | 00000000 | 1000 |
| | *NEXT, BUT(GO TO),PAGE+0, | | | 0000 | 00 | 00 | 00 | 00 | 000 | 000 |
| | * J/BRAOS | | --> | 3 | 283 | 126 | | | 00000000 | 11 |
| | ***** | | | | | | | | | |
| .CASE 728 | 2 OF BMEDZ2 | F/MEDZ2 | <-- | 3353 | 726 | 262 | | | | |
| | MED24:3507 | | | 3507 | | | | | 00000000 | 1000 |
| | *NEXT, BUT(GO TO),PAGE+1, | | | 0000 | 00 | 00 | 00 | 00 | 000 | 001 |
| | * J/EOSIA | | --> | 1460 | 1111 | 360 | | | 00000000 | 10000 |
| | ***** | | | | | | | | | |
| .TOC 729 | A SCRATCH PAD | | | | | | | | | |
| | MED22:3004 | | | 3004 | | | | | 00000000 | 1000 |
| | *ASP EXAMINE | | | 1111 | 00 | 00 | 10 | 10 | 000 | 111 |
| | *P2, D+ASPL BOTTOM (DF),D(C)+D(C), | | | 00000 | 000000 | 00000 | 11001111 | 10 | | 0 |
| | *NEXT, BUTR(SRD), | | | | | | | | | |
| | * J/MED22A | | --> | 1110 | 3636 | 730 | 263 | | | |
| | * J/MED22A | | | | | | | | | |
| | * UNDEFINED CASE | | | | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|------------------------------------|--------------------|------------|-------------------|-----|------|----------|-----------|
| .CASE | ! OF BMED22 | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | RIF COUT | CLOCKS |
| 730 | MED22A:3636 | F/MED22 | <-- | 3004 729 262 | | | | |
| | ***** | | | | | | | |
| | *P2, D+ASPL6,D(C)+D(C), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/MED19 | | --> | 3637 719 259 | | | | |
| | ***** | | | | | | | |
| 731 | MED23:3200 | | | | | | | |
| | ***** | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+2, | | | | | | | |
| | * J/MED23A | | --> VV | | | | | |
| | ***** | | | | | | | |
| 732 | MED23A:2070 | F/MED23 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | *P2, D+ASPL TOP (DF),D(C)+D(C), | | | | | | | |
| | *NEXT, BUT(DIAGNOSE), | | | | | | | |
| | * J/MED19A | | --> | 2066 718 259 | | | | |
| | ***** | | | | | | | |
| 733 | MED24:3204 | | | | | | | |
| | ***** | | | | | | | |
| | *P2, D+ASPH BOTTOM (DF),D(C)+D(C), | | | | | | | |
| | *NEXT, BUTR(SR1), | | | | | | | |
| | * J/MED24A | | | | | | | |
| | * J/MED24A | | --> | 1101 3635 734 263 | | | | |
| | * UNDEFINED CASE | | | | | | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BMED24 | | | | | | | |
| 734 | MED24A:3635 | F/MED24 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | *P2, D+ASPH6,D(C)+D(C), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/MED19 | | --> | 3637 719 259 | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|--|
| 735 | MED25:3020 ***** *NEXT, BUT(GO TO),PAGE+2, * J/MED25A ***** | --> VV | | 3020 | 0000 00000 | 00 00 000000 | 00 00 11100 | 00000001000 000 010 0000 0 000111001 |
| 736 | MED25A:2071 F/MED25 ***** *P2, D+ASPH TOP (DF),D(C)+D(C), *NEXT, BUT(DIAGNOSE), * J/MED19A ***** | <-- VV --> | 2066 718 259 | 2071 | 1111 00000 | 00 00 000000 | 11 10 11011 | 10000001000 000 111 0100 0 000110110 |
| 737 | MED26:3024 ***** *ASP DEPOSIT ----- *NEXT, BUTR(SRO), * J/MED26A * J/MED26A * UNDEFINED CASE ***** | --> | 1110 3716 738 264 | 3024 | 0000 00000 | 00 00 000000 | 00 00 00000 | 00000001000 000 000 0000 0 111001110 |
| .CASE 738 | 1 OF BMED26 MED26A:3716 F/MED26 ***** *P3, ASPL6+D, *NEXT, J/MEDZ1 ***** | <-- VV --> | | 3716 | 0000 00000 | 00 00 000110 | 00 00 11000 | 00000001000 111 000 0000 0 000000101 |
| 739 | MED26B:3717 ***** *P3, R(DF)+D (A ADDR), *NEXT, J/MEDZ1 ***** | --> | 3005 725 261 | 3717 | 0000 00000 | 00 00 000110 | 00 10 11000 | 00000001000 000 000 0000 0 000000101 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSB UBF | EXTENSION | | |
|---------|---------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 740 | MED27:3210 | | | 3210 | | | | 00000000 | 1000 | |
| | *NEXT, BUT(GO TO),PAGE+2, | | | | 0000 | 00 00 | 00 00 | 000 010 | 0000 | 0 |
| | * J/MED27A | --> | VV | | 00000 | 000000 | 11100 | 000111100 | | |
| 741 | MED27A:2074 | F/MED27 | <-- | 2074 | | | | 10000000 | 1000 | |
| | *P3, ASPL TOP (DF)+D, | | | | 0000 | 00 00 | 00 10 | 000 011 | 0000 | 0 |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | 00000 | 000C10 | 11100 | 000000101 | | |
| | * J/MEDZ1 | --> | | 3005 | 725 | 261 | | | | |
| 742 | MED28:3034 | | | 3034 | | | | 00000000 | 1000 | |
| | *NEXT, BUTR(SRO), | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 | 0 |
| | * J/MED28A | | | | 00000 | 000000 | 00000 | 111011110 | | |
| | * J/MED28A | --> | | 1110 | 3736 | 743 | 265 | | | |
| | * J/MED28B | --> | | 1111 | 3737 | 744 | 265 | | | |
| .CASE | 1 OF BMED28 | | | | | | | | | |
| 743 | MED28A:3736 | F/MED28 | <-- | 3736 | | | | 00000000 | 1000 | |
| | *P3, ASPH+D, | | | | 0000 | 00 00 | 00 00 | 111 000 | 0000 | 0 |
| | *NEXT, J/MEDZ1 | --> | | 3005 | 725 | 261 | | 000000101 | | |
| .CASE | 2 OF BMED28 | | | | | | | | | |
| 744 | MED28B:3737 | F/MED28 | <-- | 3737 | | | | 00000000 | 1000 | |
| | *P3, ASPH BOTTOM (DF)+D, | | | | 0000 | 00 00 | 00 10 | 000 000 | 0000 | 0 |
| | *NEXT, J/MEDZ1 | --> | | 3005 | 725 | 261 | | 000000101 | | |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--------------------------------------|---------------------------------------|-----------------------|------|--------------|---------|-----------|-------------------------------|
| 745 | MED29:3214 | | | 3214 | | | | 000000001000 |
| | *NEXT, BUT(GO TO),PAGE+2, * | --> VV | | | 0000 00 00 | 00 00 | 000 010 | 0000 0 |
| | * J/MED29A * | | | | 00000 000000 | 11100 | 000111110 | |
| 746 | MED29A:2076 | F/MED29 | <-- VV | 2076 | | | | 100000001000 |
| | *P3, ASPH TOP (DF)+D, * | | | | 0000 00 00 | 00 10 | 000 011 | 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+3, * | --> | 3005 725 261 | | 00000 010010 | 11100 | 000000101 | |
| | * J/MEDZ1 * | | | | | | | |
| .TOC | " B SCRATCH PAD" | | | | | | | |
| 747 | MED30:3220 | | | 3220 | | | | 000000001000 |
| | *BSP EXAMINE * | | | | 1010 00 00 | 00 00 | 000 111 | 0100 0 |
| | *-----* | | | | 00000 000000 | 00000 | 110011011 | |
| | *P2, D+BSPL BOTTOM (DF),D(C)+D(C), * | | | | | | | |
| | *NEXT, BUTR(SR2), * | | | | | | | |
| | * J/MED30A * | --> | 1011 3633 748 266 | | | | | |
| | * J/MED30A UNDEFINED CASE * | | | | | | | |
| .CASE | 1 OF BMED30 | | | | | | | |
| 748 | MED30A:3633 | F/MED30 | <-- VV | 3633 | | | | 000000001000 |
| | *P2, D+BSPL6,D(C)+D(C), * | | | | 1010 00 10 | 00 00 | 111 111 | 0100 0 |
| | *NEXT, * | | | | 00000 000000 | 11000 | 110011111 | |
| | * J/MED19 * | --> | 3637 719 259 | | | | | |
| 749 | MED31:3044 | | | 3044 | | | | 000000001000 |
| | *NEXT, BUT(GO TO),PAGE+2, * | --> | 2100 750 267 | | 0000 00 00 | 00 00 | 000 010 | 0000 0 |
| | * J/MED31A * | | | | 00000 000000 | 11100 | 001000000 | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|--|---------------------------------------|--|------|---------|---------|----------|---|
| 755 | MED34:3054 ***** *BSP DEPOSIT ***** | | | 3054 | 0000 | 00 00 | 00 00 | 00000001000 0000 000 0000 0 00000 000000 00000 10001110 |
| | *P3, BUTR(SRO), * J/MED34A * * J/MED34A * * J/MED34B * ***** | --> | 1110 3436 756 268 1111 3437 757 268 | | | | | |
| .CASE 756 | 1 OF BMED34 MED34A:3436 ***** *P3, BSPL6+D, *NEXT, * J/MEDZ1 ***** | <-- VV | | 3436 | 0000 | 00 10 | 00 00 | 00000001000 00000 001100 11000 000000101 |
| .CASE 757 | 2 OF BMED34 MED34B:3437 ***** *P3, BSPL BOTTOM (DF)+D, *NEXT, * J/MEDZ1 ***** | <-- | 3054 755 268 | 3437 | 0000 | 00 00 | 00 10 | 00000001000 00000 000100 11000 000000101 |
| 758 | MED35:3234 ***** *NEXT, BUT(GO TO),PAGE+2, * J/MED35A ***** | --> VV | | 3234 | 0000 | 00 00 | 00 00 | 00000001000 00000 000000 11100 001000100 |
| 759 | MED35A:2104 ***** *P3, BSPL TOP (DF)+D, *NEXT, BUT(GO TO),PAGE+3, * J/MEDZ1 ***** | <-- VV | | 2104 | 0000 | 00 00 | 00 10 | 100000001000 00000 000100 11100 000000101 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|----------|----------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|--------------------|--------|
| 760 | MED36:3240 | | | 3240 | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | *NEXT, BUTR(SRO), | | | | 00000 | 000000 | 00000 | 100001110 | |
| | * J/MED36A | --> | 1110 3416 761 269 | | | | | | |
| | * J/MED36B | --> | 1111 3417 762 269 | | | | | | |
| CASE 761 | 1 OF BMED36 MED36A:3416 | F/MED36 | <-- VV | 3416 | 0000 | 00 10 | 00 00 | 111 000 | 0000 0 |
| | *P3, BSPH6+D, | | | | 00000 | 011100 | 11000 | 000000101 | |
| | *NEXT, J/MEDZ1 | --> | 3005 725 261 | | | | | | |
| CASE 762 | 2 OF BMED36 MED36B:3417 | F/MED36 | <-- | 3417 | 0000 | 00 00 | 00 10 | 000 000 | 0000 0 |
| | *P3, BSPH BOTTOM (DF)+D, | | | | 00000 | 010100 | 11000 | 000000101 | |
| | *NEXT, J/MEDZ1 | --> | 3005 725 261 | | | | | | |
| 763 | MED37:3064 | | | 3064 | 0000 | 00 00 | 00 00 | 000 010 | 0000 0 |
| | *NEXT, BUT(GO TO),PAGE+2, | | | | 00000 | 000000 | 11100 | 001000101 | |
| | * J/MED37A | --> | VV | | | | | | |
| 764 | MED37A:2105 | F/MED37 | <-- VV | 2105 | 0000 | 00 00 | 00 10 | 000 011 | 0000 0 |
| | *P3, BSPH TOP (DF)+D, | | | | 00000 | 010100 | 11100 | 000000101 | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | |
| | * J/MEDZ1 | --> | 3005 725 261 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-----------------------------|--------------------|--------------|-----------------------|------|---------|---------|----------|-----------|----------|--------|
| | | OFST | ADDR | | | | | | RIF | COUT | |
| 765 | C SCRATCH PAD MED38:3364 | | | | 3364 | | | | | 00000000 | 1000 |
| | *CSP EXAMINE | | | | | 1010 | 10 00 | 00 00 | 000 111 | 0100 | 0 |
| | *-----* | | | | | 01111 | 000000 | 11000 | 110011111 | | |
| | *P2, D+CSP(0),D(C)+D(C), | | | | | | | | | | |
| | *NEXT, J/MED19 | --> | 3637 719 259 | | | | | | | | |
| 766 | MED39:3365 | | | | 3365 | | | | | 00000000 | 1000 |
| | *P2, D+CSP(1),D(C)+D(C), | | | | | 1010 | 10 00 | 00 00 | 000 111 | 0100 | 0 |
| | *NEXT, J/MED19 | --> | 3637 719 259 | | | 01110 | 000000 | 11000 | 110011111 | | |
| 767 | MED40:3074 | | | | 3074 | | | | | 00000000 | 1000 |
| | *P2, D+CSP(2),D(C)+D(C), | | | | | 1010 | 10 00 | 00 00 | 000 111 | 0100 | 0 |
| | *NEXT, J/MED19 | --> | 3637 719 259 | | | 01101 | 000000 | 11000 | 110011111 | | |
| 768 | MED41:3075 | | | | 3075 | | | | | 00000000 | 1000 |
| | *P2, D+CSP(3),D(C)+D(C), | | | | | 1010 | 10 00 | 00 00 | 000 111 | 0100 | 0 |
| | *NEXT, J/MED19 | --> | 3637 719 259 | | | 01100 | 000000 | 11000 | 110011111 | | |
| 769 | MED42:3144 | | | | 3144 | | | | | 00000000 | 1000 |
| | *P2, D+CSP(4),D(C)+D(C), | | | | | 1010 | 10 00 | 00 00 | 000 111 | 0100 | 0 |
| | *NEXT, J/MED19 | --> | 3637 719 259 | | | 01011 | 000000 | 11000 | 110011111 | | |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--------------------|------|-----|-----------------------|------|---------------|-----------------|----------------|----------------------|---------|--------------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF UPF | |
| 770 | MED43:3145 ***** *P2, D+CSP(5),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | 3637 | 719 | 259 | 3145 | 1010 01010 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 | 000000001000 |
| 771 | MED44:3150 ***** *P2, D+CSP(6),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | 3637 | 719 | 259 | 3150 | 1010 01001 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 | 000000001000 |
| 772 | MED45:3151 ***** *P2, D+CSP(7),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | 3637 | 719 | 259 | 3151 | 1010 01000 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 | 000000001000 |
| 773 | MED46:3254 ***** *P2, D+CSP(10),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | 3637 | 719 | 259 | 3254 | 1010 00111 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 | 000000001000 |
| 774 | MED47:3255 ***** *P2, D+CSP(11),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | 3637 | 719 | 259 | 3255 | 1010 00110 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 | 000000001000 |
| 775 | MED48:3260 ***** *P2, D+CSP(12),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | 3637 | 719 | 259 | 3260 | 1010 00101 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 | 000000001000 |

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PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--------------------|------|------|-----------------------|------|---------|---------------|-----------------|----------------|----------------------|----------------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF UPF | |
| 776 | MED49:3261 ***** *P2, D+CSP(13),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | | 3637 | 719 | 259 | 3261 | 1010 00100 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 1000 |
| 777 | MED50:3270 ***** *P2, D+CSP(14),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | | 3637 | 719 | 259 | 3270 | 1010 00011 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 1000 |
| 778 | MED51:3271 ***** *P2, D+CSP(15),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | | 3637 | 719 | 259 | 3271 | 1010 00010 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 1000 |
| 779 | MED52:3300 ***** *P2, D+CSP(16),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | | 3637 | 719 | 259 | 3300 | 1010 00001 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 1000 |
| 780 | MED53:3301 ***** *P2, D+CSP(17),D(C)+D(C), * *NEXT, * * J/MED19 * --> ***** | | | 3637 | 719 | 259 | 3301 | 1010 00000 | 10 00 000000 | 00 00 11000 | 000 111 110011111 | 0100 0 1000 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|---------------|-----------------|----------------|----------------------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 781 | MED54:3304 ***** *CSP DEPOSIT *-----* *P3, CSP(0)+DATA, *NEXT, * J/MEDZ1 ***** | --> 3005 725 261 | | 3304 | 0000 01111 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 782 | MED55:3305 ***** *P3, CSP(1)+DATA, *NEXT, * J/MEDZ1 ***** | --> 3005 725 261 | | 3305 | 0000 01110 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 783 | MED56:3310 ***** *P3, CSP(2)+DATA, *NEXT, * J/MEDZ1 ***** | --> 3005 725 261 | | 3310 | 0000 01101 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 784 | MED57:3311 ***** *P3, CSP(3)+DATA, *NEXT, * J/MEDZ1 ***** | --> 3005 725 261 | | 3311 | 0000 01100 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 785 | MED58:3314 ***** *P3, CSP(4)+DATA, *NEXT, * J/MEDZ1 ***** | --> 3005 725 261 | | 3314 | 0000 01011 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--------------------|------|-----|-----------------------|------|---------------|-----------------|----------------|----------------------|--------------|--------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF UPF | |
| 786 | MED59:3315 ***** *P3, CSP(5)+DATA, * *NEXT, * * J/MEDZ1 * --> ***** | | 3005 | 725 | 261 | 3315 | 0000 01010 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 787 | MED60:3330 ***** *P3, CSP(6)+DATA, * *NEXT, * * J/MEDZ1 * --> ***** | | 3005 | 725 | 261 | 3330 | 0000 01001 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 788 | MED61:3331 ***** *P3, CSP(7)+DATA, * *NEXT, * * J/MEDZ1 * --> ***** | | 3005 | 725 | 261 | 3331 | 0000 01000 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 789 | MED62:3334 ***** *P3, CSP(10)+DATA, * *NEXT, * * J/MEDZ1 * --> ***** | | 3005 | 725 | 261 | 3334 | 0000 00111 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 790 | MED63:3335 ***** *P3, CSP(11)+DATA, * *NEXT, * * J/MEDZ1 * --> ***** | | 3005 | 725 | 261 | 3335 | 0000 00110 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 791 | MED64:3370 ***** *P3, CSP(12)+DATA, * *NEXT, * * J/MEDZ1 * --> ***** | | 3005 | 725 | 261 | 3370 | 0000 00101 | 10 00 100000 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--------------------|--------------------|------|-----|-----------------------|------|---------|---------|----------|-----------|--------|-------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF | |
| 792 | MED65:3371 | | | | | | | | | | | |
| | *P3, CSP(13)+DATA, | | | | | 3371 | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | | | 00100 | 100000 | 11000 | 000000101 | | |
| | * J/MEDZ1 | --> | 3005 | 725 | 261 | | | | | | | |
| 793 | MED66:3374 | | | | | | | | | | | |
| | *P3, CSP(14)+DATA, | | | | | 3374 | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | | | 00011 | 100000 | 11000 | 000000101 | | |
| | * J/MEDZ1 | --> | 3005 | 725 | 261 | | | | | | | |
| 794 | MED67:3375 | | | | | | | | | | | |
| | *P3, CSP(15)+DATA, | | | | | 3375 | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | | | 00010 | 100000 | 11000 | 000000101 | | |
| | * J/MEDZ1 | --> | 3005 | 725 | 261 | | | | | | | |
| 795 | MED68:3360 | | | | | | | | | | | |
| | *P3, CSP(16)+DATA, | | | | | 3360 | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | | | 00001 | 100000 | 11000 | 000000101 | | |
| | * J/MEDZ1 | --> | 3005 | 725 | 261 | | | | | | | |
| 796 | MED69:3361 | | | | | | | | | | | |
| | *P3, CSP(17)+DATA, | | | | | 3361 | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | | | 00000 | 100000 | 11000 | 000000101 | | |
| | * J/MEDZ1 | --> | 3005 | 725 | 261 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|---------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|-------------------------------|-----------------------|
| 797 | MED70:3160 *MISC. CPU REGISTERS EXAMINE JAM *SELECT, JAM REG, *NEXT, * J/MEDX1 | --> | 3346 723 260 | 3160 | 1100 11001 | 00 00 000000 | 00 00 11000 | 000 000 011100110 | 00000001000 0000 0 |
| 798 | MED71:3161 *SERVICE *SELECT, STATUS REG, *NEXT, * J/MED71A | --> VV | | 3161 | 0100 11001 | 01 00 000000 | 00 00 11000 | 000 000 011101110 | 00000001000 0000 0 |
| 799 | MED71A:3356 *P3, MD+DATA, *NEXT, * J/MED71B | <-- VV | | 3356 | 0000 00000 | 11 10 100000 | 00 00 11000 | 000 000 01110010 | 00000001000 0000 0 |
| 800 | MED71B:3362 *P2, D+MD, *NEXT, * J/MED71C | <-- VV | | 3362 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000 000 011110011 | 00000001000 0100 0 |
| 801 | MED71C:3363 * CLR NPR NOSAK FLOP, *NEXT, * J/MED19 | <-- VV | --> | 3363 | 0100 11011 | 00 00 000000 | 11 00 11000 | 000 000 110011111 | 00000001000 0000 0 |
| | | | 3637 719 259 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|---------------|-----------------|----------------|----------------------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 802 | MED72:3170 ***** *PBA *-----* *SELECT, PBA, *NEXT, * J/MEDX1 ***** | --> 3346 723 260 | | 3170 | 1100 11001 | 01 00 000000 | 00 00 11000 | 000 000 011100110 | 000000001000 | 0000 0 |
| 803 | MED73:3171 ***** *CUA *-----* *SELECT, CUA, * J/MEDX1 ***** | --> 3346 723 260 | | 3171 | 0000 11001 | 00 00 000000 | 01 01 11000 | 000 000 011100110 | 000000001000 | 0000 0 |
| 804 | MED74A:3321 ***** *NOP *-----* *NEXT, * J/MED209 ***** | --> 3730 813 279 | | 3321 | 0000 00000 | 00 00 000000 | 00 00 11000 | 000 000 111011000 | 000000001000 | 0000 0 |
| 805 | MED74:3320 ***** *FLAG *-----* *SELECT, FLAGS, *NEXT, * J/MEDX1 ***** | --> 3346 723 260 | | 3320 | 0000 11001 | 00 00 000000 | 11 01 11000 | 000 001 011100110 | 000000001000 | 0000 0 |
| 806 | MED75:3341 ***** *COUNT *-----* *P2, D+COUNT,D(C)+D(C), *NEXT, * J/MED19 ***** | --> 3637 719 259 | | 3341 | 1111 00011 | 00 00 000000 | 01 00 11000 | 000 111 110011111 | 000000001000 | 0100 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|------|---------------|-----------------|----------------|----------------------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 807 | MED200:3720 ***** *DCS #1 *-----* *SELECT, TRACKING NUA, *NEXT, * J/MEDX1 ***** | --> | 3346 723 260 | 3720 | 0010 11001 | 00 00 000000 | 00 00 11000 | 000 010 011100110 | 000000001000 | 0000 0 |
| 808 | MED201:3721 ***** *DCS #2 *-----* *SELECT, ERROR CODE, *NEXT, * J/MEDX1 ***** | --> | 3346 723 260 | 3721 | 0010 11001 | 00 00 000000 | 00 00 11000 | 000 000 011100110 | 000000001000 | 0000 0 |
| 809 | MED205:3340 ***** *REVISION REGISTER *-----* *SELECT, EMIT, *NEXT, * J/MED206 ***** | --> VV | | 3340 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 000 011110110 | 000000001000 | 0000 0 |
| 810 | MED206:3366 ***** *P3, MD+REV, *NEXT, * J/MED207 ***** | <-- VV | | 3366 | 0000 00010 | 10 00 100000 | 00 00 11000 | 000 000 011110111 | 000000001000 | 0000 0 |
| 811 | MED207:3367 ***** *P2, D+MD,D(C)+D(C), *NEXT, * J/MED19 ***** | <-- VV | | 3367 | 1010 00000 | 11 10 000000 | 00 00 11000 | 000 111 110011111 | 000000001000 | 0100 0 |
| | | --> | 3637 719 259 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|--|
| 812 | MED208:3725 ***** * *NOP *-----* *NEXT, * J/MEDZ1 ***** | --> | 3005 725 261 | 3725 | 0000 0000 | 00 00 000000 | 00 00 11000 | 00000001000 000 000 0000 0 000000101 |
| 813 | MED209:3730 ***** * NOP FOR UNUSED MED *CODES *-----* *NEXT, * J/MEDZ1 ***** | <-- | 3321 804 277 | 3730 | 0000 0000 | 00 00 000000 | 00 00 11000 | 00000001000 000 000 0000 0 000000101 |
| 814 | MED76:3344 ***** *MISC. CPU REGISTERS DEPOSIT FLAGS *-----* *SELECT, FLAGS, *NEXT, * J/MED76A ***** | --> VV | 3005 725 261 | 3344 | 0000 11001 | 00 00 000000 | 11 01 11000 | 00000001000 000 001 0000 0 011111010 |
| 815 | MED76A:3372 ***** * DATTB, *NEXT, * J/MEDZ1 ***** | <-- VV | 3005 725 261 | 3372 | 0000 11010 | 00 00 000000 | 00 00 11000 | 00000001000 000 000 0000 0 000000101 |
| 816 | MED202:3355 ***** *RES *-----* * DBUF LATCH+D, *NEXT, * J/MED203 ***** | --> | 3373 817 280 | 3355 | 0100 11011 | 00 00 000000 | 00 00 11000 | 00000001000 000 100 0000 0 011111011 |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--|--------------------------|------|---------------|-----------------|----------------|----------------------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 817 | MED203:3373 ***** *P3, MD+DATA, *NEXT, J/MED204 ***** | F/MED202 3355 816 279 <-- | | 3373 | 0000 00000 | 11 10 100000 | 00 00 11000 | 000 000 011111110 | 000000001000 | 0000 0 |
| 818 | MED204:3376 ***** *RES+MD, *NEXT, J/MEDZ1 ***** | F/MED203 3005 725 261 <-- VV | | 3376 | 0000 00000 | 11 10 010001 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 819 | MED77:3351 ***** *COUNT ----- *P3, MD+DATA, *NEXT, J/MED78 ***** | F/MED77 3005 725 261 <-- VV | | 3351 | 0000 00000 | 11 10 100000 | 00 00 11000 | 000 000 011111111 | 000000001000 | 0000 0 |
| 820 | MED78:3377 ***** *P2, COUNT+MD, *NEXT, J/MEDZ1 ***** | F/MED77 3005 725 261 <-- VV | | 3377 | 0000 00000 | 11 10 000101 | 00 00 11000 | 000 000 000000101 | 000000001000 | 0000 0 |
| 821 | MED79:3354 ***** *NVA ----- *SELECT, EMIT, *NEXT, J/MED79A ***** | F/MED79A 3400 822 281 --> | | 3354 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 000 100000000 | 000000001000 | 0000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--|--------------------------|-------------|--------------------|------------|----------------|--------------|------|-------|
| | | | | | | | | RIF | COUT | |
| 832 | CAREAD02:3415 ***** *P1, BA+R2 # R3, *NEXT, J/MEDX1 ***** | <-- 3661 831 282 | | 3415 | | | | 000000001000 | | |
| | | | | | 0000 00 11 10 00 | | 001 000 0001 0 | | | |
| | | --> 3346 723 260 | | | 00000 000000 11000 | | 011100110 | | | |
| 833 | MED84:3345 ***** *D REGISTER ----- *P2, D+R0, *NEXT, J/MED19 ***** | --> 3637 719 259 | | 3345 | | | | 000000001000 | | |
| | | | | | 1111 00 00 10 00 | | 100 000 0100 0 | | | |
| | | | | | 00000 000000 11000 | | 110011111 | | | |

JOB

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 284

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD | CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|--------------------------------|-------------------|------------------|--------------------|------|-----|------------------|------|------|---------|---------|----------|-----------|-----|-------|
| | | | OFST | ADDR | BOX | | | | | | | PAGE | RIF | |
| .TOC "INIT TABLE ORGANIZATION" | | | | | | | | | | | | | | |
| | | F/RES04 | <-- | 3006 | 344 | 147 | | | | | | | | |
| | | F/SBC806 | <-- | 114 | 177 | 91 | | | | | | | | |
| | | F/BIS802 | <-- | 635 | 94 | 61 | | | | | | | | |
| | | F/DST17 | <-- | 747 | 52 | 42 | | | | | | | | |
| | | F/DST05 | <-- | 515 | 43 | 37 | | | | | | | | |
| | | F/SRC35 | <-- | 665 | 27 | 28 | | | | | | | | |
| SSzdSO,X <-- 8 36 F/SSzd | | | | | | | | | | | | | | |
| | | F/JAM25 | <-- | 3013 | 415 | 171 | | | | | | | | |
| | | F/BOOT03 | <-- | 1115 | 454 | 181 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |
| * | SUBROUTINE INIT00 | | | | | | | | | | | | | |
| | | RETURN/UNDEFINED | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | | | |
| | | RETURN/TRPO0 | * --> | 127 | 357 | 151 | | | | | | | | |
| | | RETURN/ASRB05 | * --> | 522 | 180 | 92 | | | | | | | | |
| | | RETURN/UNDEFINED | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | | | |
| | | RETURN/SRC34 | * --> | 664 | 26 | 27 | | | | | | | | |
| | | RETURN/DST07 | * --> | 517 | 45 | 37 | | | | | | | | |
| | | RETURN/SRC16 | * --> | 5 | 18 | 21 | | | | | | | | |
| | | RETURN/PST01 | * --> | 1056 | 426 | 174 | | | | | | | | |
| | | RETURN/BOOT03A | * --> | 1116 | 455 | 181 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |

```

834  INIT00:3420
*****
*PARTS OF THE MACHINE ARE INITIALIzed *
*ACCORDING TO BITS SET IN THE SR SR *
*BIT PART INITIALIzed 0 HFP 1 WHAMI *
*2 FLAGS 3 STACK LIMIT REGISTER 4 MMRO *
*5 CACHE CONTROL REGISER 6 PSM 7 CACHE *
*SWEEP 8 GENERAL REGISTERS 9 BASE *
*CONSTANTS 10 WCS 11 TURN ON TRACKING *
*12 JAM REGISTER 13 UNIBUS 14 START MACRO *
*MACHINE 15 RETURN (OR GO TO FETO1) *
*-----*
*P2,          D+MD,SR+MD, *
*NEXT, *
*          J/INIT01 *
*****

```

```

3420          000000001000
1010 11 10 00 00 000 000 0110 0
00000 000000 11000 100001010

```

```

-->          3412 835 285

```

L08

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 285

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | MICROFICHE | | | ADDR | ALU | BUSB | BUS | EXTENSION | | | | |
|---------|-------------------|--------------------|------------|------|-----|------|-----|------|-----|-----------|-------|------|-----|------|
| | | | OFST | ADDR | BOX | | | | | PAGE | COORD | CARD | RIF | COUT |
| | | F/CONDIAG05 | <-- | 3022 | 462 | 183 | | | | | | | | |
| | | F/MED81 | <-- | 3406 | 826 | 281 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |
| * | SUBROUTINE INIT01 | | * | | | | | | | | | | | |
| | | RETURN/CONDIAG06 | * --> | 3023 | 463 | 183 | | | | | | | | |
| | | RETURN/MED19 | * --> | 3637 | 719 | 259 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |

M08

```

835  INIT01:3412
*****
*SELECT,   EMIT,
*NEXT,
*          J/INIT02
***** --> VV
836  INIT02:3421          F/INIT01      <-- VV
*****
*P3,      MD+20000,
*NEXT,
*          J/INIT03
***** --> VV
837  INIT03:3422          F/INIT02      <-- VV
*****
* TEST FOR HFP
*INIT
-----
*P2,      RES+MD(D),
*P3,      MD+10000,
*NEXT,    BUTR(SR),
*          J/INIT04
*          J/INIT04      --> 1110 3016 838 285
*          J/HFPINIT     --> 1111 3017 868 293
*****
.CASE 1 OF BINIT03
      F/INIT03      <-- 3422 837 285
838  INIT04:3016          F/HFPINIT     <-- 3017 868 293
*****
*SELECT,   EMIT,
*P2,      SHIFT SR,
*NEXT,
*          J/INIT05
***** --> 3423 839 286
*****

```

```

3412          000000001000
0000 00 00 00 01 000 000 0000 0
11001 000000 11000 100010001

```

```

3421          000000001000
0010 10 00 00 00 000 000 0000 0
00010 100000 11000 100010010

```

```

3422          000000001000
0001 10 00 00 00 000 000 0000 0
00010 110001 00000 000001110

```

```

3016          000000001000
0000 00 00 00 01 000 000 0010 0
11001 000000 11000 100010011

```

N08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 286

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|---------------------------------|--------------------|-----------------------|------|---------|---------|----------|-----------|-----|-------|
| | | | | | | | | RIF UPF | COU | |
| 839 | INIT05:3423 | F/INIT04 | <-- | 3016 | 838 | 285 | | | | |
| | ***** | | | | | | | | | |
| | * TEST FOR WHAMI | | | | | | | | | |
| | * INIT | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P3, D+MD | | | | | | | | | |
| | *NEXT, BUTR(SRO), | | | | | | | | | |
| | * J/INIT06 | | | | | | | | | |
| | | J/INIT06 | --> | 1110 | 3076 | 840 | 286 | | | |
| | | J/WHI02A | --> | 1111 | 3077 | 869 | 294 | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BINIT05 | | | | | | | | | |
| 840 | INIT06:3076 | F/INIT05 | <-- | 3423 | 839 | 286 | | | | |
| | | F/WHI16 | <-- | 3467 | 889 | 299 | | | | |
| | ***** | | | | | | | | | |
| | *P2, SHIFT SR, D+WHAMI, | | | | | | | | | |
| | *NEXT, J/INIT07 | | | | | | | | | |
| | | J/INIT07 | --> | VV | | | | | | |
| | ***** | | | | | | | | | |
| 841 | INIT07:3424 | F/INIT06 | <-- | VV | | | | | | |
| | ***** | | | | | | | | | |
| | * TEST FOR FLAG | | | | | | | | | |
| | * INIT | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+D RIGHT 4, D(C)+ALU00, | | | | | | | | | |
| | *NEXT, BUTR(SRO), | | | | | | | | | |
| | * J/INIT08 | | | | | | | | | |
| | | J/INIT08 | --> | 1110 | 3116 | 842 | 286 | | | |
| | | J/FGI01 | --> | 1111 | 3117 | 890 | 299 | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BINIT07 | | | | | | | | | |
| 842 | INIT08:3116 | F/INIT07 | <-- | 3424 | 841 | 286 | | | | |
| | | F/FGI04 | <-- | 3474 | 893 | 300 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+D, D(C)+ALU00, SHIFT SR, | | | | | | | | | |
| | *P3, R(DST)+D (A ADDR), | | | | | | | | | |
| | * J/INIT09 | | | | | | | | | |
| | | J/INIT09 | --> | 3425 | 843 | 287 | | | | |
| | ***** | | | | | | | | | |

```

3423
1010 11 10 00 00 000 000 0100 0
00000 000000 00000 000111110
    
```

```

3076
1111 00 00 11 00 101 000 0110 0
00000 000000 11000 100010100
    
```

```

3424
1111 00 00 01 01 000 010 0100 0
01000 000000 00000 001001110
    
```

```

3116
0011 00 00 00 01 110 010 0110 0
00000 010110 11000 100010101
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUS A | EXTENSION | |
|---------|--------------------|--------------------|------------|------|-----|------|-------|-----------|-------|
| | | | | | | | | OFST | COORD |
| 843 | INIT09:3425 | F/INIT08 <-- | | 3116 | 842 | 286 | | | |
| | ***** | | | | | | | | |
| | * TEST FOR SLR | | | | | | | | |
| | *INIT | | | | | | | | |
| | ----- | | | | | | | | |
| | *SELECT, SLR, | | | | | | | | |
| | *NEXT, BUTR(SR0), | | | | | | | | |
| | * J/INIT10 | | | | | | | | |
| | ***** | | | | | | | | |
| | | J/INIT10 --> | 1110 | 3136 | 844 | 287 | | | |
| | | J/SLRINIT --> | 1111 | 3137 | 894 | 300 | | | |
| | ***** | | | | | | | | |
| .CASE | 1 OF BINIT09 | | | | | | | | |
| 844 | INIT10:3136 | F/INIT09 <-- | | 3425 | 843 | 287 | | | |
| | | F/SLRINIT <-- | | 3137 | 894 | 300 | | | |
| | ***** | | | | | | | | |
| | * TEST FOR MMRO | | | | | | | | |
| | *INIT | | | | | | | | |
| | ----- | | | | | | | | |
| | *SELECT, MMRO(RW), | | | | | | | | |
| | *NEXT, BUTR(SR1), | | | | | | | | |
| | * J/INIT11 | | | | | | | | |
| | ***** | | | | | | | | |
| | | J/INIT11 --> | 1101 | 3035 | 845 | 287 | | | |
| | | J/MMROINIT --> | 1111 | 3037 | 895 | 300 | | | |
| | ***** | | | | | | | | |
| .CASE | 1 OF BINIT10 | | | | | | | | |
| 845 | INIT11:3035 | F/INIT10 <-- | | 3136 | 844 | 287 | | | |
| | | F/MMROINIT <-- | | 3037 | 895 | 300 | | | |
| | ***** | | | | | | | | |
| | * TEST FOR CCR | | | | | | | | |
| | *INIT | | | | | | | | |
| | ----- | | | | | | | | |
| | *SELECT, CCR(RW), | | | | | | | | |
| | *NEXT, BUTR(SR2), | | | | | | | | |
| | * J/INIT12 | | | | | | | | |
| | ***** | | | | | | | | |
| | | J/INIT12 --> | 1011 | 3153 | 846 | 288 | | | |
| | | J/CCRINIT --> | 1111 | 3157 | 910 | 304 | | | |
| | ***** | | | | | | | | |

3425
 1001 00 10 00 00 000 000 0000 0
 11001 000000 00000 001011110

3136
 1001 00 11 01 00 000 000 0000 0
 11001 000000 00000 000011101

3035
 1001 00 01 00 00 000 000 0000 0
 11001 000000 00000 001101011

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| .CASE | 1 OF BINIT15 | | | | | | | | | |
| 850 | INIT16:3213 | F/INIT15 | <-- | 3175 | 849 | 288 | | | | |
| | *SELECT, EMIT, | | | 3213 | | | | 00000000 | 1000 | |
| | *NEXT, | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 | 0 |
| | * J/INIT17A | --> VV | | | 11001 | 000000 | 11000 | 100011000 | | |
| 851 | INIT17A:3430 | F/INIT16 | <-- VV | | | | | | | |
| | * TEST FOR MISC. REGISTER | | | 3430 | | | | 00000000 | 1000 | |
| | *INIT | | | | 0011 | 00 00 | 00 00 | 000 010 | 0100 | 0 |
| | *P2, D←D, D(C)←ALU00, | | | | 00000 | 000000 | 00000 | 101010111 | | |
| | *NEXT, BUTR(SR3), | | | | | | | | | |
| | * J/INIT17 | --> | 0111 | 3527 | 852 | 289 | | | | |
| | * J/REGINIT01 | --> | 1111 | 3537 | 896 | 301 | | | | |
| .CASE | 1 OF BINIT17A | | | | | | | | | |
| 852 | INIT17:3527 | F/INIT17A | <-- | 3430 | 851 | 289 | | | | |
| | *P2, SHIFT SR, | F/REGINIT14A | <-- | 3522 | 908 | 304 | | | | |
| | *NEXT, | | | 3527 | | | | 00000000 | 1000 | |
| | * J/INIT18 | --> VV | | | 0000 | 00 00 | 00 00 | 000 000 | 0010 | 0 |
| | * J/INIT18 | | | | 00000 | 000000 | 11000 | 100011001 | | |
| 853 | INIT18:3431 | F/INIT17 | <-- VV | | | | | | | |
| | * TEST FOR BASE CONSTANTS | | | 3431 | | | | 00000000 | 1000 | |
| | *INIT | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 | 0 |
| | *SELECT, EMIT, | | | | 11001 | 000000 | 00000 | 101100111 | | |
| | *NEXT, BUTR(SR3), | | | | | | | | | |
| | * J/INIT19 | --> | 0111 | 3547 | 854 | 290 | | | | |
| | * J/BASINIT01 | --> | 1111 | 3557 | 914 | 305 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|-------------------|---------------------------------------|-----------------------|--------------|-------------|------------|----------|---------------------------------|
| .CASE | 1 OF BINIT18 | | | | | | | |
| 854 | INIT19:3547 | F/INIT18 F/BASINIT03 | <-- <-- | 3431 3525 | 853 916 | 289 306 | | |
| | ***** | | | | | | | |
| | *P2, SHIFT SR, | | | | | | | 3547 |
| | *NEXT, | | | | | | | 0000 00 00 00 00 000 000 0010 0 |
| | * J/INIT20 | | --> VV | | | | | 00000 000000 11000 100011100 |
| 855 | INIT20:3434 | F/INIT19 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | * TEST FOR WCS | | | | | | | 3434 |
| | *INIT | | | | | | | 000000001000 |
| | ----- | | | | | | | 1111 10 01 00 00 000 001 0000 0 |
| | *P3, MD+172001, | | | | | | | 00010 100000 00000 011010111 |
| | *NEXT, BUTR(SR3), | | | | | | | |
| | * J/INIT21 | | --> | 0111 3327 | 856 | 290 | | |
| | * J/WCSINIT01 | | --> | 1111 3337 | 1199 | 386 | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BINIT20 | | | | | | | |
| 856 | INIT21:3327 | F/INIT20 F/WCSINIT08 | <-- <-- | 3434 3713 | 855 1206 | 290 388 | | |
| | ***** | | | | | | | |
| | *SELECT, EMIT, | | | | | | | 3327 |
| | *NEXT, | | | | | | | 0000 00 00 00 01 000 000 0000 0 |
| | * J/INIT22 | | --> VV | | | | | 11001 000000 11000 100011101 |
| 857 | INIT22:3435 | F/INIT21 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | *P2, MD+40000, | | | | | | | 3435 |
| | *NEXT, | | | | | | | 0100 10 00 00 00 000 000 0000 0 |
| | * J/INIT23A | | --> | 3440 858 | 291 | | | 00010 100000 11000 100100000 |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--|------|------------|--------------|-------------|--------------------|--------|--------|
| | | | | | | | | RIF | COUT | |
| 858 | INIT23A:3440 ***** *P2, D+SR, RES+MD, *NEXT, J/INIT23B ***** | <-- F/INIT22 | 3435 857 290 | 3440 | 1111 0000 | 11 10 010001 | 00 00 11000 | 000 000 100100001 | 0100 0 | 0 |
| 859 | INIT23B:3441 ***** *P2, SR+D RIGHT 4, *NEXT, J/INIT23 ***** | <-- VV F/INIT23A | | 3441 | 1111 01000 | 00 00 000000 | 01 01 11000 | 000 000 100100010 | 0010 0 | 0 |
| 860 | INIT23:3442 ***** * TEST FOR TURN ON *TRACKING ----- *P2, D+D, *P3, R(DST)+D (A ADDR), *NEXT, BUTR(SR0), * J/INIT24 * J/INIT23 * J/TRKINIT ***** | <-- VV F/INIT23B | | 3442 | 0011 0000 | 00 00 00000 | 00 01 00000 | 110 000 010101110 | 0100 0 | 0 |
| | | | 1110 3256 861 291 1111 3257 917 306 | | | | | | | |
| .CASE | 1 OF BINIT23 | | | | | | | | | |
| 861 | INIT24:3256 ***** * TEST FOR JAM AND SERVICE REGISTER *INIT ----- *P1, BA+R(DST), CURRENT MODE, *NEXT, BUTR(SR1), * J/INIT25 * J/INIT23 * J/JAMINIT ***** | <-- F/INIT23 <-- F/TRKINIT | 3442 860 291 3257 917 306 | 3256 | 0000 0000 | 00 00 00000 | 11 01 00000 | 110 000 0001011101 | 0001 0 | 0 |
| | | | 1101 3275 862 292 1111 3277 918 306 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|--------------|--------------|------------|------------|---|
| .CASE | 1 OF BINIT24 | | | | | | | |
| 862 | INIT25:3275 | F/INIT24 F/SVSINIT | <-- <-- | 3256 3526 | 861 919 | 291 307 | | |
| | ***** * TEST FOR UB *INIT *-----* | | | | | | | 3275 0000 00 00 00 00 000 000 0000 0 00000 000000 00000 011001011 |
| | *NEXT, BUTR(SR2), * J/INIT26 | | | | | | | |
| | *-----* | J/INIT26 J/UBINIT | *--> *--> | 1011 1111 | 3313 3317 | 863 920 | 292 307 | |
| .CASE | 1 OF BINIT25 | | | | | | | |
| 863 | INIT26:3313 | F/INIT25 F/UBINIT | <-- <-- | 3275 3317 | 862 920 | 292 307 | | |
| | ***** * TEST FOR START MACRO *MACHINE *-----* | | | | | | | 3313 1111 00 00 00 00 000 000 0100 0 00000 000000 00000 011100111 |
| | *P2, D+SR, *NEXT, BUTR(SR3), * J/INIT27 | | | | | | | |
| | *-----* | J/INIT27 J/PWRTST | *--> *--> | 0111 1111 | 3347 3357 | 864 921 | 292 307 | |
| .CASE | 1 OF BINIT26 | | | | | | | |
| 864 | INIT27:3347 | F/INIT26 F/PWRTST05 | <-- <-- | 3313 3643 | 863 925 | 292 308 | | |
| | ***** *P2, SR+D RIGHT 1, *NEXT, * J/INIT28 ***** | | | | | | | 3347 1111 00 00 01 10 000 000 0010 0 00000 000000 11000 100100011 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|----------------------------|---|--|--------------------------|------------------------------|------------|------------|-------------|-----------|------|--------|---|
| | | | | | | | | RIF | COUT | | |
| .TOC "WHAMI INITALIZATION" | | | | | | | | | | | |
| .CASE 2 OF BINITOS | | | | | | | | | | | |
| 869 | WHI02A:3077 | F/INIT05 F/WHI16 | <-- <-- | 3423 839 286 3467 889 299 | | | | | | | |
| | ***** *SELECT, XCS STATUS, *NEXT, * J/WHI02B ***** | | | | | | | | 3077 | | 000000001000 0010 00 00 01 00 000 000 0000 0 11001 000000 11000 100100100 |
| 870 | WHI02B:3444 | F/WHI02A | <-- VV | | | | | | | | |
| | ***** * D<12> MUST = 1 FOR XCS STATUS TO BE *SELECTED *-----* *P3, MD+DATA, *NEXT, * J/WHI02 ***** | | | | | | | | 3444 | | 000000001000 0000 11 10 00 00 000 000 0000 0 00000 100000 11000 100100101 |
| 871 | WHI02:3445 | F/WHI02B | <-- VV | | | | | | | | |
| | ***** *P2, D+MD, *NEXT, * J/WHI03A ***** | | | | | | | | 3445 | | 000000001000 1010 11 10 00 00 000 000 0100 0 00000 000000 11000 100100110 |
| 872 | WHI03A:3446 | F/WHI02 | <-- VV | | | | | | | | |
| | ***** *SELECT, EMIT, *NEXT, * J/WHI03B ***** | | | | | | | | 3446 | | 000000001000 0000 00 00 00 01 000 000 0000 0 11001 000000 11000 100100111 |
| | | | | 3447 873 295 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-----------------------------------|--|--------------------------|-----------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 873 | WHI03B:3447 | F/WHI03A | <-- | 3446 872 294 | 3447 | | | 00000000 | 1000 | |
| | *P3, MD+140000, | | | | 1100 | 10 00 | 00 00 | 000 000 | 0000 | 0 |
| | *NEXT, J/WHI03 | | --> VV | | 00010 | 100000 | 11000 | 100101000 | | |
| 874 | WHI03:3450 | F/WHI03B | <-- VV | | 3450 | | | 00000000 | 1000 | |
| | *P2, D+D LEFT 1, | | | | 1111 | 00 00 | 01 00 | 101 000 | 0100 | 0 |
| | *P3, WHAMI+D (A' ADDR), | | | | 00000 | 010010 | 11000 | 100101010 | | |
| | *NEXT, J/WHI04 | | --> VV | | | | | | | |
| 875 | WHI04:3452 | F/WHI03 | <-- VV | | 3452 | | | 00000000 | 1000 | |
| | *P2, D+WHAMI AND MD, | | | | 1011 | 11 10 | 11 00 | 101 000 | 0100 | 0 |
| | *NEXT, J/WHI05 | | --> VV | | 00000 | 000000 | 11000 | 100110000 | | |
| 876 | WHI05:3460 | F/WHI04 | <-- VV | | 3460 | | | 00000000 | 1000 | |
| | *SELECT, EMIT | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 | 0 |
| | *NEXT, BUTR(D(14-00) IS 0 # D15), | | | | 11001 | 000000 | 01101 | 100111000 | | |
| | * J/WHI06 | | --> | 00 3470 877 296 | | | | | | |
| | * J/WHI08 | | --> | 01 3471 879 296 | | | | | | |
| | * J/WHI07 | | --> | 10 3472 878 296 | | | | | | |
| | * J/WHI09 | | --> | 11 3473 880 296 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|-----------|--------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| .CASE 877 | 1 OF BWHIOS | | | | | | | | |
| | WHI06:3470 | F/WHI05 | <-- | 3460 | 876 | 295 | | | |
| | * DCS | | | | | | | | |
| | * INSTALLED | | | | | | | | |
| | *P3, MD+401, | | | | | | | | |
| | * NEXT, J/WHI10 | | --> | 3461 | 881 | 297 | | | |
| .CASE 878 | 3 OF BWHIOS | | | | | | | | |
| | WHI07:3472 | F/WHI05 | <-- | 3460 | 876 | 295 | | | |
| | * ECS | | | | | | | | |
| | * INSTALLED | | | | | | | | |
| | *P3, MD+101, | | | | | | | | |
| | * NEXT, J/WHI10 | | --> | 3461 | 881 | 297 | | | |
| .CASE 879 | 2 OF BWHIOS | | | | | | | | |
| | WHI08:3471 | F/WHI05 | <-- | 3460 | 876 | 295 | | | |
| | * NO EXTRA CONTROL STORE | | | | | | | | |
| | * INSTALLED | | | | | | | | |
| | *P3, MD+1, | | | | | | | | |
| | * NEXT, J/WHI10 | | --> | 3461 | 881 | 297 | | | |
| .CASE 880 | 4 OF BWHIOS | | | | | | | | |
| | WHI09:3473 | F/WHI05 | <-- | 3460 | 876 | 295 | | | |
| | * WCS | | | | | | | | |
| | * INSTALLED | | | | | | | | |
| | *P3, MD+41, | | | | | | | | |
| | * NEXT, J/WHI10 | | --> | 3461 | 881 | 297 | | | |

3470
 0000 10 00 01 00 000 001 0000 0
 00010 100000 11000 100110001

3472
 0000 10 00 00 00 000 001 0000 0
 00010 100000 11000 100110001

3471
 0000 10 00 00 00 000 001 0000 0
 00010 100000 11000 100110001

3473
 0000 10 00 00 00 100 001 0000 0
 00010 100000 11000 100110001

274

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | |
|---------|---|--|--------------------------|------------------------------|--------------------------|--------------------------|-------------|-----------|------|--------|---|---|
| | | | | | | | | RIF | COUT | CLOCKS | | |
| 881 | WHI10:3461 | F/WHI06 F/WHI07 F/WHI08 F/WHI09 | <-- <-- <-- <-- | 3470 3472 3471 3473 | 877 878 879 880 | 296 296 296 296 | | | | | | |
| | ***** * OPTION BIT SET AND LOGGING *ENABLED *-----* | | | | | | | 3461 | | | | 000000001000 |
| | *P2, D+MD, *P3, WHAMI+D (A ADDR), *NEXT, * J/WHI11 | | | | | | | | | | 1010 11 10 00 00 101 000 0100 0 00000 010010 11000 100110010 | |
| 882 | WHI11:3462 | F/WHI10 | <-- VV | | | | | | | | | |
| | ***** * TEST FOR HFP INSTALLED. HFP WILL PULL *DOWN *D<14>. *-----* | | | | | | | 3462 | | | | 000000001000 |
| | *SELECT, HFP PRESENT, *NEXT, * J/WHI12A | | | | | | | | | | 0000 00 00 00 00 001 010 0000 0 11001 000000 11000 100110011 | |
| 883 | WHI12A:3463 | F/WHI11 | <-- VV | | | | | | | | | |
| | ***** *P3, MD+DATA, *NEXT, * J/WHI12B | | | | | | | 3463 | | | | 000000001000 |
| | *P2, D+MD, *NEXT, * J/WHI12 | | | | | | | | | | 0000 11 10 00 00 000 000 0000 0 00000 100000 11000 100110100 | |
| 884 | WHI12B:3464 | F/WHI12A | <-- VV | | | | | | | | | |
| | ***** *P2, D+MD, *NEXT, * J/WHI12 | | | | | | | 3464 | | | | 000000001000 |
| | ***** | | | | | | | | | | | 1010 11 10 00 00 000 000 0100 0 00000 000000 11000 100110101 |
| | | | --> | 3465 | 885 | 298 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSB UBF | EXTENSION | | CLOCK |
|-----------|---|--|------------------------------------|------|---------------|-----------------|----------------|----------------------|--------|--------------|
| | | | | | | | | RIF | COUT | |
| 885 | WHI12:3465 ***** *P2, D+D LEFT 1,D(C)+ALU15, *NEXT, J/WHI13 ***** | F/WHI12B <-- | 3464 884 297 | 3465 | 1111 00000 | 00 00 000000 | 01 00 11000 | 000 100 100110110 | 0100 0 | 000000001000 |
| 886 | WHI13:3466 ***** *SELECT, EMIT *NEXT, BUTR(D(C)), * J/WHI14 * J/WHI15 ***** | F/WHI12 <-- VV | 01 3451 887 298 11 3453 888 298 | 3466 | 0000 11001 | 00 00 000000 | 00 01 10011 | 000 000 100101001 | 0000 0 | 000000001000 |
| .CASE 887 | 1 OF BWHI13 WHI14:3451 ***** * HFP *INSTALLED ----- *P3, MD+20, *NEXT, J/WHI16 ***** | F/WHI13 <-- VV | | 3451 | 0000 00010 | 10 00 100000 | 00 00 11000 | 010 000 100110111 | 0000 0 | 000000001000 |
| .CASE 888 | 2 OF BWHI13 WHI15:3453 ***** * HFP NOT *INSTALLED ----- *P3, MD+0, *NEXT, J/WHI16 ***** | F/WHI13 <-- | 3466 886 298 | 3453 | 0000 00010 | 10 00 100000 | 00 00 11000 | 000 000 100110111 | 0000 0 | 000000001000 |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|-------------------------|--|--------------------------|------------------------------|------------|-------------|-----------|------|-------|
| | | | | | | | RIF | COUT | |
| 889 | WHI16:3467 | F/WHI14 F/WHI15 | <-- <-- | 3451 887 298 3453 888 298 | | | | | |
| | ***** | | | 3467 | | | 00000000 | 1000 | |
| | *P2, D+WHAMI OR MD, | | | 1110 | 11 10 | 11 00 | 101 000 | 0100 | 0 |
| | *P3, WHAMI+D (A ADDR), | | | 00000 | 010010 | 11000 | 000111110 | | |
| | *NEXT, | | | | | | | | |
| | * J/INIT06 | | --> | 3076 | 840 | 286 | | | |
| | ***** | | | | | | | | |
| .TOC " | " FLAGS INITIALIZATION" | | | | | | | | |
| .CASE | 2 OF BINIT07 | | | | | | | | |
| 890 | FGI01:3117 | F/INIT07 F/FGI04 | <-- <-- | 3424 841 286 3474 893 300 | | | | | |
| | ***** | | | 3117 | | | 00000000 | 1000 | |
| | * TEST FOR FLAGS | | | 0000 | 10 10 | 00 00 | 000 000 | 0000 | 0 |
| | *INIT | | | 00010 | 100000 | 10011 | 101001001 | | |
| | *-----* | | | | | | | | |
| | *P3, MD+4000 | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | |
| | * J/FGI02 | | --> | 01 3511 | 891 | 299 | | | |
| | * J/FGI03 | | --> | 11 3513 | 892 | 300 | | | |
| | ***** | | | | | | | | |
| .CASE | 1 OF BFGI01 | | | | | | | | |
| 891 | FGI02:3511 | F/FGI01 F/FGI03 | <-- <-- | 3117 890 299 3513 892 300 | | | | | |
| | ***** | | | 3511 | | | 00000000 | 1000 | |
| | * HFP NOT | | | 1010 | 11 10 | 00 00 | 000 000 | 0100 | 0 |
| | *ENABLED | | | 00000 | 000000 | 11000 | 100111100 | | |
| | *-----* | | | | | | | | |
| | *P2, D+MD, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/FGI04 | | --> | 3474 | 893 | 300 | | | |
| | ***** | | | | | | | | |

B10

PROGRAM FLOWS

11/60 MICROCODE ON 03-Mar-77 BY ADSYS 020377

PAGE 300

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|---------|----------------------|------------------------|------------|--------------|------------|------------|------|---------------------------------|--------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS | |
| | | | | | | | | UPF | |
| 892 | FGI03:3513 | F/FGI01 F/FGI03 | <-- <-- | 3117 3513 | 890 892 | 299 300 | | | |
| | ***** | | | | | | | 3513 | 000000001000 |
| | * HFP | | | | | | | 0000 000 0000 0 | |
| | *ENABLED | | | | | | | 00010 100000 11000 101001001 | |
| | ***** | | | | | | | | |
| | *P3, MD+14000, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/FGI02 | | --> | 3511 | 891 | 299 | | | |
| 893 | FGI04:3474 | F/FGI02 | <-- | 3511 | 891 | 299 | | | |
| | ***** | | | | | | | 3474 | 000000001000 |
| | * INIT | | | | | | | 0000 00 00 00 01 000 001 0000 0 | |
| | *FLAGS | | | | | | | 11011 000000 11000 001001110 | |
| | ***** | | | | | | | | |
| | * FLAGS+D, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/INIT08 | | --> | 3116 | 842 | 286 | | | |
| | ***** | | | | | | | | |
| .TOC " | SLR INIT" | | | | | | | | |
| .CASE | 2 OF BINIT09 | F/INIT09 F/SLRINIT | <-- <-- | 3425 3137 | 843 894 | 287 300 | | | |
| 894 | SLRINIT:3137 | | | | | | | | |
| | ***** | | | | | | | 3137 | 000000001000 |
| | *P3, SLR+D, | | | | | | | 0000 00 00 00 00 000 000 0000 0 | |
| | *NEXT, | | | | | | | 11010 000000 11000 001011110 | |
| | * J/INIT10 | | --> | 3136 | 844 | 287 | | | |
| | ***** | | | | | | | | |
| .TOC " | MMRO INITIALIZATION" | | | | | | | | |
| .CASE | 2 OF BINIT10 | F/INIT10 F/MMROINIT | <-- <-- | 3136 3037 | 844 895 | 287 300 | | | |
| 895 | MMROINIT:3037 | | | | | | | | |
| | ***** | | | | | | | 3037 | 000000001000 |
| | *P3, MMRO+D, | | | | | | | 0000 00 00 00 00 000 000 0000 0 | |
| | *NEXT, | | | | | | | 11010 000000 11000 000011101 | |
| | * J/INIT11 | | --> | 3035 | 845 | 287 | | | |
| | ***** | | | | | | | | |

C10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NC. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|-----------------------------|--------------------------|--|--------------------------|------------------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COLT | CLOCKS |
| .TOC - MISC. REGISTER INIT" | | | | | | | | | | |
| .CASE 2 OF BINIT17A | | | | | | | | | | |
| 896 | REGINIT01:3537 | F/INIT17A F/REGINIT14A | <-- <-- | 3430 851 289 3522 908 304 | | | | | | |
| | ***** | | | 3537 | | | | 00000000 | 1000 | |
| | *P2, D+R0 (B),D(C)+D(C), | | | | 1010 | 00 10 | 00 00 | 100 111 | 0100 | 0 |
| | *P3, R0+D, | | | | 00000 | 000110 | 11000 | 100111101 | | |
| | *NEXT, | | | | | | | | | |
| | * J/REGINIT02 | | --> VV | | | | | | | |
| 897 | REGINIT02:3475 | F/REGINIT01 | <-- VV | | | | | | | |
| | ***** | | | 3475 | | | | 00000000 | 1000 | |
| | *P2, D+R1 (B),D(C)+D(C), | | | | 1010 | 00 11 | 00 01 | 100 111 | 0100 | 0 |
| | *P3, R1+D, | | | | 00000 | 000110 | 11000 | 101000100 | | |
| | *NEXT, | | | | | | | | | |
| | * J/REGINIT03 | | --> VV | | | | | | | |
| 898 | REGINIT03:3504 | F/REGINIT02 | <-- VV | | | | | | | |
| | ***** | | | 3504 | | | | 00000000 | 1000 | |
| | *P2, D+R2 (B),D(C)+D(C), | | | | 1010 | 00 10 | 00 00 | 101 111 | 0100 | 0 |
| | *P3, R2+D, | | | | 00000 | 000110 | 11000 | 101000101 | | |
| | *NEXT, | | | | | | | | | |
| | * J/REGINIT04 | | --> VV | | | | | | | |
| 899 | REGINIT04:3505 | F/REGINIT03 | <-- VV | | | | | | | |
| | ***** | | | 3505 | | | | 00000000 | 1000 | |
| | *P2, D+R3 (B),D(C)+D(C), | | | | 1010 | 00 11 | 00 01 | 101 111 | 0100 | 0 |
| | *P3, R3+D, | | | | 00000 | 000110 | 11000 | 101001000 | | |
| | *NEXT, | | | | | | | | | |
| | * J/REGINIT05 | | --> | 3510 900 302 | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|---------------|-----------------|----------------|----------------------|--------|--------------|
| | | | | | | | | RIF | COUT | |
| 900 | REGINIT05:3510 ***** *P2, D+R4 (B),D(C)+D(C), * *P3, R4+D, * *NEXT, * * J/REGINIT06 * ***** | <-- | 3505 899 301 | 3510 | 1010 00000 | 00 10 000110 | 00 00 11000 | 110 111 101001010 | 0100 0 | 000000001000 |
| 901 | REGINIT06:3512 ***** *P2, D+R5 (B),D(C)+D(C), * *P3, R5+D, * *NEXT, * * J/REGINIT07 * ***** | <-- VV | | 3512 | 1010 00000 | 00 11 000110 | 00 01 11000 | 110 111 101001100 | 0100 0 | 000000001000 |
| 902 | REGINIT07:3514 ***** *P2, D+R6 (B),D(C)+D(C), * *P3, R6+D, * *NEXT, * * J/REGINIT08 * ***** | <-- VV | | 3514 | 1010 00000 | 00 10 000110 | 00 00 11000 | 111 111 101001101 | 0100 0 | 000000001000 |
| 903 | REGINIT08:3515 ***** *P2, D+R7 (B),D(C)+D(C), * *P3, R7+D, * *NEXT, * * J/REGINIT09 * ***** | <-- VV | 3516 904 303 | 3515 | 1010 00000 | 00 11 000110 | 00 01 11000 | 111 111 101001110 | 0100 0 | 000000001000 |

E10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|---|--|------------------------------------|------|------------------|-------------|-------------|--|
| 904 | REGINIT09:3516 ***** *P2, D+R16 (B),D(C)+D(C), * *P3, R16+D, * *NEXT, * * J/REGINIT10 * --> VV ***** | <-- | 3515 903 302 | 3516 | 1010 00 10 00 00 | 00 10 00 00 | 011 111 | 0100 0 000000001000 00000 000110 11000 101001111 |
| 905 | REGINIT10:3517 ***** *P3, MD+10, * *NEXT, BUTR(D(C)), * * J/REGINIT11 * --> VV * J/REGINIT15 * --> VV ***** | <-- VV | 01 3071 906 303 11 3073 909 304 | 3517 | 0000 10 00 00 00 | 00 00 00 00 | 001 000 | 0000 0 00010 100000 10011 000111001 |
| .CASE 906 | 1 OF BREGINIT10 REGINIT11:3071 ***** *P2, D+WHAMI AND NOT MD, * *P3, WHAMI+D (A ADDR), * *NEXT, * * J/REGINIT12 * --> VV ***** | <-- VV | | 3071 | 0111 11 10 11 00 | 101 000 | 0100 0 | 000000001000 00000 010010 11000 101010000 |
| 907 | REGINIT12:3520 ***** *P3, R(CNTL)+D, * *P2, D+0, * *NEXT, * * J/REGINIT14A * --> VV ***** | <-- VV | | 3520 | 0011 00 11 00 00 | 111 000 | 0100 0 | 000000001000 00000 011100 11000 101010010 |

F10

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | BUSB | BUSA | EXTENSION | | | |
|------------------|-------------------------------------|--|--------------------------|------|-----|------|-------|-----------|--------|-----------|--------------|
| | | | | BUS | SP | UBF | RIF | COUT | CLOCKS | | |
| 908 | REGINIT14A:3522 | F/REGINIT12 | <-- | 3520 | 907 | 303 | 3522 | | | | 000000001000 |
| | *P2, D+0, | | * | | | | 0011 | 00 11 | 00 00 | 101 000 | 0100 0 |
| | *P3, R(ZERO)+D, | | * | | | | 00000 | 011100 | 11000 | 101010111 | |
| | *NEXT, | | * | | | | | | | | |
| | * J/INIT17 | | * --> | 3527 | 852 | 289 | | | | | |
| .CASE 909 | 2 OF BREGINIT10 | F/REGINIT10 | <-- | 3517 | 905 | 303 | 3073 | | | | 000000001000 |
| | REGINIT15:3073 | | | | | | 0111 | 11 10 | 11 00 | 101 000 | 0100 0 |
| | *P2, D+WHAMI AND NOT MD, | | * | | | | 00000 | 010010 | 11111 | 000000000 | |
| | *P3, WHAMI+D (A ADDR), | | * | | | | | | | | |
| | *NEXT, | | * | | | | | | | | |
| | * BUT(RETURN) | | * --> VV | | | | | | | | |
| .TOC " .CASE 910 | CCR INITIALIZATION" | F/INIT11 | <-- | 3035 | 845 | 287 | 3157 | | | | 000000001000 |
| | 2 OF BINIT11 | F/CCRINIT | <-- | 3157 | 910 | 304 | | | | | |
| | CCRINIT:3157 | | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | *P2, CCR+D, | | * | | | | 11010 | 000000 | 11000 | 001101011 | |
| | *NEXT, | | * | | | | | | | | |
| | * J/INIT12 | | * --> | 3153 | 846 | 288 | | | | | |
| .TOC " .CASE 911 | PSW INITIALIZATION" | F/INIT14 | <-- | 3427 | 848 | 288 | 3177 | | | | 000000001000 |
| | 2 OF BINIT14 | F/PSWINIT | <-- | 3177 | 911 | 304 | | | | | |
| | PSWINIT:3177 | | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | *P2, PS+D, | | * | | | | 11010 | 000000 | 11000 | 001111101 | |
| | *NEXT, | | * | | | | | | | | |
| | * J/INIT15 | | * --> | 3175 | 849 | 288 | | | | | |

G10

PROGRAM FLOWS

11/63 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|--|--|--------------------------|--------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| .TOC " | CACHE INITIALITION" | | | | | | | | | |
| .CASE | 2 OF BINIT15 | | | | | | | | | |
| 912 | CAINIT01:3217 | F/INIT15 | <-- | 3175 | 849 | 288 | | | | |
| | *P1, | BA+R(DST) CURRENT MODE | * | | | | | | | |
| | *P2, | D+R(DST) PLUS MD, D(C)+D(C), | * | | | | | | | |
| | *P3, | R(DST)+D (A ADDR), | * | | | | | | | |
| | *P3, | U, INVALDATE, | * | | | | | | | |
| | *NEXT, | BUTR(D(C)), | * | | | | | | | |
| | * | J/CAINIT02 | * | | | | | | | |
| | * | J/CAINIT02 | * --> | 01 | 3211 | 913 | 305 | | | |
| | * | UNDEFINED CASE | * | | | | | | | |
| .CASE | 1 OF BCAINIT01 | | | | | | | | | |
| 913 | CAINIT02:3211 | F/CAINIT01 | <-- VV | | | | | | | |
| | * CACHE IS SWEEP 8 TIMES, DONE AS HOOK | | * | | | | | | | |
| | * FOR FUTURE EXPANSION OF | | * | | | | | | | |
| | * CACHE | | * | | | | | | | |
| | *-----* | | * | | | | | | | |
| | *P2, | D+D, D(C)+ALU15, | * | | | | | | | |
| | *NEXT, | | * | | | | | | | |
| | * | J/CAINIT01 | * --> | 3217 | 912 | 305 | | | | |
| .TOC " | BASE CONSTANTS INITIALIZATION" | | | | | | | | | |
| .CASE | 2 OF BINIT18 | | | | | | | | | |
| 914 | BASINIT01:3557 | F/INIT18 | <-- | 3431 | 853 | 289 | | | | |
| | | F/BASINIT03 | <-- | 3525 | 916 | 306 | | | | |
| | *P3, | | * | | | | | | | |
| | *P3, | CSP(ZERO)+0, | * | | | | | | | |
| | *NEXT, | | * | | | | | | | |
| | * | J/BASINIT02 | * --> | 3524 | 915 | 306 | | | | |
| | * | | * | | | | | | | |

```

3217      000000001011
          1001 11 10 11 01 110 111 0101 0
          10111 010110 10011 010001001
    
```

```

3211      000000001000
          1111 00 00 01 01 000 100 0100 0
          00000 000000 11000 010001111
    
```

```

3557      000000001000
          0000 10 00 00 00 000 000 0000 0
          00001 100000 11000 101010100
    
```

H10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--|---|--|------------------------------|------|---------------|-----------------|----------------|----------------------|----------|-----------|
| | | | | | | | | RIF | COUT | |
| 915 | BASINIT02:3524 ***** *P3, CSP(ONE)+1, *NEXT, * J/BASINIT03 ***** | <-- | 3557 914 305 | 3524 | 0000 00000 | 10 00 100000 | 00 00 11000 | 000 001 101010101 | 00000000 | 1000 0 |
| 916 | BASINIT03:3525 ***** *P3, CSP(TWO)+2, *NEXT, * J/INIT19 ***** | <-- VV | | 3525 | 0000 00011 | 10 00 100000 | 00 00 11000 | 000 010 101100111 | 00000000 | 1000 0 |
| .TOC "" TRACKING INITIALIZATION" | | | | | | | | | | |
| .CASE 2 OF BINIT23 | | | | | | | | | | |
| 917 | TRKINIT:3257 ***** *NEXT, BUT(TRACK), * J/INIT24 ***** | <-- <-- | 3442 860 291 3257 917 306 | 3257 | 0000 00000 | 00 00 000000 | 00 00 11001 | 000 000 010101110 | 00000000 | 1000 0 |
| .TOC "" JAM AND SERVICE REGISTER INITIALIZATION" | | | | | | | | | | |
| .CASE 2 OF BINIT24 | | | | | | | | | | |
| 918 | JAMINIT:3277 ***** *NEXT, CLEAR JAM REG, * J/SVSINIT ***** | <-- <-- | 3256 861 291 3526 919 307 | 3277 | 0100 11011 | 00 00 000000 | 10 00 11000 | 000 000 101010110 | 00000000 | 1000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|-------------------------------|---|--|--|------|---------------|-----------------|----------------|----------------------|--------------|--------|---|
| | | | | | | | | RIF | COUT | CLOCKS | |
| 919 | SVSINIT:3526 ***** * CLEAR SERVICE REG, *NEXT, * J/INIT25 ***** | <-- --> | 3277 918 306 3275 862 292 | 3526 | 0100 11011 | 00 01 000000 | 01 00 11000 | 000 000 010111101 | 000000001000 | 0000 0 | 0 |
| .TOC "" .CASE 2 OF BINIT25 | | | | | | | | | | | |
| 920 | UBINIT:3317 ***** * UNIBUS INIT, *NEXT, * J/INIT26 ***** | <-- <-- --> | 3275 862 292 3317 920 307 3313 863 292 | 3317 | 0100 11011 | 00 01 000000 | 11 00 11000 | 000 000 011001011 | 000000001000 | 0000 0 | 0 |
| .TOC "" .CASE 2 OF BINIT26 | | | | | | | | | | | |
| 921 | PWRTST:3357 ***** * START MACRO MACHINE, *NEXT, * J/PWRTST01 ***** | <-- <-- --> VV | 3313 863 292 3643 925 308 --> VV | 3357 | 0100 11011 | 00 00 000000 | 01 00 11000 | 000 000 101011000 | 000000001000 | 0000 0 | 0 |
| 922 | PWRTST01:3530 ***** *P2, D+0, *P3, R(DST)+D (A ADDR), *NEXT, * J/PWRTST03 ***** | <-- VV --> | 3641 923 308 | 3530 | 0011 00000 | 00 00 010110 | 00 01 11000 | 110 000 110100001 | 000000001000 | 0100 0 | 0 |

J10

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|----------------------|---------------------------------------|--|--------------------------|--------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1 OF BPWRTST04 | | | | | | | | | | |
| 923 | PWRTST03:3641 | F/PWRTST01 F/PWRTST04 | <-- <-- | 3530 3532 | 922 924 | 307 308 | | | | |
| | ***** | | | 3641 | | | | 00000000 | 1000 | |
| | *P2, D+R(DST) PLUS 1,D(C)+ALU07, | * | | 1001 | 11 00 | 11 01 | 110 011 | 0100 | 0 | |
| | *P3, R(DST)+D (A ADDR), | * | | 00000 | 010110 | 11000 | 101011010 | | | |
| | *NEXT, | * | | | | | | | | |
| | * J/PWRTST04 | * --> VV | | | | | | | | |
| ***** | | | | | | | | | | |
| 924 | PWRTST04:3532 | F/PWRTST03 | <-- VV | | | | | | | |
| | ***** | | | 3532 | | | | 00000000 | 1000 | |
| | * WAIT ABOUT 20 USEC. TO SEE IF POWER | * | | 0000 | 00 00 | 00 00 | 000 000 | 0000 | 0 | |
| | *WILL | * | | 00000 | 000000 | 10011 | 110100001 | | | |
| | *FAIL | * | | | | | | | | |
| | ----- | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | * | | | | | | | | |
| | * J/PWRTST03 | * --> | | 01 | 3641 | 923 | 308 | | | |
| | * J/PWRTST05 | * --> | | 11 | 3643 | 925 | 308 | | | |
| ***** | | | | | | | | | | |
| .CASE 2 OF BPWRTST04 | | | | | | | | | | |
| 925 | PWRTST05:3643 | F/PWRTST01 F/PWRTST04 | <-- <-- VV | 3530 | 922 | 307 | | | | |
| | ***** | | | 3643 | | | | 00000000 | 1000 | |
| | *P2, D+SR, | * | | 1111 | 00 00 | 00 00 | 000 000 | 0100 | 0 | |
| | *NEXT, | * | | 00000 | 000000 | 11000 | 011100111 | | | |
| | * J/INIT27 | * --> | | 3347 | 864 | 292 | | | | |
| ***** | | | | | | | | | | |

K10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 309

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

L10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 310

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------------------------------|------------------|-------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .TOC "ERROR LOGGING SUBROUTINE" | | | | | | | | |
| | F/YZ01 | <-- | 1660 495 194 | | | | | |
| | F/SCPE06 | <-- | 1352 504 197 | | | | | |
| | F/SCPE09 | <-- | 1336 506 198 | | | | | |
| | F/SCPE10 | <-- | 1337 509 199 | | | | | |
| | F/OA01 | <-- | 1322 518 201 | | | | | |
| | F/RZ11 | <-- | 4152 525 204 | | | | | |
| | F/SST01 | <-- | 1327 530 206 | | | | | |
| | F/MPE01 | <-- | 1330 531 206 | | | | | |
| | F/IIAA05 | <-- | 1172 536 208 | | | | | |
| | F/IIAA04 | <-- | 1173 537 208 | | | | | |
| | F/CSPE01 | <-- | 1321 545 210 | | | | | |
| | F/UB01 | <-- | 1320 546 211 | | | | | |
| ***** | | | | | | | | |
| * | SUBROUTINE LOG01 | * | | | | | | |
| | RETURN/YZ02 | * --> | 1154 496 195 | | | | | |
| | RETURN/SCPE12 | * --> | 1170 510 199 | | | | | |
| | RETURN/ETRP05 | * --> | 1250 562 215 | | | | | |
| | RETURN/SCPE12 | * --> | 1170 510 199 | | | | | |
| | RETURN/ETRP01 | * --> | 1244 558 214 | | | | | |
| | RETURN/RZ12 | * --> | 327 526 204 | | | | | |
| | RETURN/ETRP01 | * --> | 1244 558 214 | | | | | |
| | RETURN/ETRP05 | * --> | 1250 562 215 | | | | | |
| | RETURN/IIAA06 | * --> | 1222 538 208 | | | | | |
| | RETURN/ETRP01 | * --> | 1244 558 214 | | | | | |
| | RETURN/ETRP05 | * --> | 1250 562 215 | | | | | |
| | RETURN/UB02 | * --> | 1232 547 211 | | | | | |
| ***** | | | | | | | | |

M10

926

LOG01:3534

```

*****
** OVERVIEW-FUNCTION ERROR LOGGING THE
** ERROR LOGGING SUBROUTINE STORES SELECTED
** MACHINE STATE IN THE CSP. THIS
** SUBROUTINE IS INVOKED BY ALL ABORT (JAM)
** CONDITIONS EXCEPT INTERNAL ADDRESS.
** SOME ERROR HANDLING ROUTINES INVOKE
** ERROR LOGGING THEN MODIFY THE LOG. THIS
** ARE NOTED AND EXPLAINED WHERE THEY
** OCCUR. THE CSP LOCATIONS USED FOR
** LOGGING AND THEIR CONTENTS ARE SHOWN
** BELOW. LOG JAM CSP(00)
*****

```

```

**15*14*13*12*11*10*09*08*07*06*05*04*03*0
**2*01*00*

```

```

*****
** * * * * *
** * * * * * ODD ADDRESS ERROR*****
** * * * * *
** * * * * * USED AND 0*****
** * * * * *

```

```

-----
*P3,          D+WHAMI,D(C)+ALUDD,
*NEXT,
*              J/LOG02

```

--> VV

927

LOG02:3535

F/LOG01

```

*****
* TEST LOG
* ENABLE

```

<-- VV

```

-----
*SELECT,     DBUF LATCH,
*NEXT,       BUTR(D(C)),
*              J/LOG02A
*              J/LOG02A
*              J/LOG02B

```

-->

```

01 3241 928 311
11 3243 930 311

```

3534

```

000000001000
1111 00 00 11 00 101 010 0100 0
00000 000000 11000 101011101

```

3535

```

000000001000
0100 00 00 00 00 000 100 0000 0
11001 000000 10011 010100001

```

N10

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|--------------|--------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|--|
| | | | | | | | | RIF | COUT | | |
| .CASE 928 | 1 OF BLOG02 | | | | | | | | | | |
| | LOG02A:3241 | F/LOG02 | <-- | 3535 | 927 | 310 | | | | | |
| | ***** | | | | | | | | | | |
| | * TEST LOG | | | | | | | | | | |
| | *FIRST | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *NEXT, | BUTR(D15), | | | | | | | | | |
| | | J/LOG02C | | | | | | | | | |
| | | J/LOG25 | | | | | | | | | |
| | | | | | 10 | 3252 | 929 | 311 | | | |
| | | | | 11 | 3253 | 972 | 321 | | | | |
| ***** | | | | | | | | | | | |
| .CASE 929 | 1 OF BLOG02A | | | | | | | | | | |
| | LOG02C:3252 | F/LOG02A | <-- VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *NEXT, | J/LOG02B | | | | | | | | | |
| | | | | | | | | | | | |
| ***** | | | | | | | | | | | |
| .CASE 930 | 2 OF BLOG02 | | | | | | | | | | |
| | LOG02B:3243 | F/LOG02 | <-- | 3535 | 927 | 310 | | | | | |
| | ***** | | | | | | | | | | |
| | * LOG DS | | | | | | | | | | |
| | *REGISTER | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P3, | CSP(11)+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | | J/LOG03D | | | | | | | | | |
| | | | | | | | | | | | |
| ***** | | | | | | | | | | | |
| 931 | LOG03D:3536 | F/LOG02B | <-- VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *P3, | DBUF LATCH+D, | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | | J/LOG02E | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

```

3241      0000 00 00 00 00 000 000 0000 0
          00000 000000 01101 010101010
          000000001000

3252      0000 00 00 00 00 000 000 0000 0
          00000 000000 11000 010100011
          000000001000

3243      0000 10 00 00 00 000 000 0000 0
          00110 100000 11000 101011110
          000000001000

3536      0100 00 00 00 00 000 100 0000 0
          11011 000000 11000 101100000
          000000001000
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS | |
|---------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|----------------------|------------------------|--|
| 932 | LOG02E: 3540 * LOG *MHAMI *-----* *P3, CSP(5)+DATA, *NEXT, * J/LOG03A ***** | F/LOG03D <-- | 3536 931 311 | 3540 | 0000 01010 | 10 00 100000 | 00 00 11000 | 000 000 101100001 | 000000001000 0000 0 | |
| 933 | LOG03A: 3541 *SELECT, KPROC(FLAGS), *NEXT, * J/LOG03F ***** | F/LOG02E <-- VV | | 3541 | 0000 11001 | 00 00 000000 | 11 01 11000 | 000 001 101100010 | 000000001000 0000 0 | |
| 934 | LOG03F: 3542 *P3, MD+DATA, *NEXT, * J/LOG03G ***** | F/LOG03A <-- VV | | 3542 | 0000 00000 | 11 10 100000 | 00 00 11000 | 000 000 101100011 | 000000001000 0000 0 | |
| 935 | LOG03G: 3543 *SELECT, EMIT (WRITE FLAGS), *NEXT, * J/LOG03H ***** | F/LOG03F <-- VV | | 3543 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 001 101100100 | 000000001000 0000 0 | |
| 936 | LOG03H: 3544 *P2, SR+MD(D), *NEXT, * J/LOG03I ***** | F/LOG03G <-- VV | 3545 937 313 | 3544 | 1010 00010 | 10 00 000000 | 00 00 11000 | 000 000 101100101 | 000000001000 0010 0 | |

E11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|--------------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 946 | LOG03R:3563 ***** * RESTORE R(VECT SAV) LOG FLAGS * *VECTOR *-----* *P2, D+SR, *P3, R(VECT SAV)+D,CSP(4)+DATA (0), *NEXT, * J/LOG03S ***** | <-- | 3562 945 314 | 3563 | | | | 00000000 | 1000 | |
| | | | | | 1111 00 10 00 00 | 101 000 | 0100 0 | | | |
| | | | | | 01011 111100 11000 | 101110100 | | | | |
| 947 | LOG03S:3564 ***** *SELECT, CACHE DATA, *NEXT, * J/LOG03 ***** | <-- VV | | 3564 | | | | 00000000 | 1000 | |
| | | | | | 0100 00 10 00 00 | 000 000 | 0000 0 | | | |
| | | | | | 11001 000000 11000 | 101110101 | | | | |
| 948 | LOG03:3565 ***** * LOG CACHE *DATA *-----* *P3, CSP(6)+DATA, *NEXT, * J/LOG04 ***** | <-- VV | | 3565 | | | | 00000000 | 1000 | |
| | | | | | 0000 10 00 00 00 | 000 000 | 0000 0 | | | |
| | | | | | 01001 100000 11000 | 101110110 | | | | |
| 949 | LOG04:3566 ***** *P3, DBUF LATCH+D, *NEXT, * J/LOG15 ***** | <-- VV | | 3566 | | | | 00000000 | 1000 | |
| | | | | | 0100 00 00 00 00 | 000 100 | 0000 0 | | | |
| | | | | | 11011 000000 11000 | 101110111 | | | | |
| | | | 3567 950 316 | | | | | | | |

F11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|-------------------|--|--------------------------|--------------|------------|------------|-------------|-----------|--------------|-------|
| | | | | | | | | RIF | COU | |
| 950 | LOG15:3567 | F/LOG04 | <-- | 3566 949 315 | 3567 | | | | 000000001000 | |
| | *SELECT, JAM REG, | | | | 1100 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | 11001 | 000000 | 11000 | 101111000 | | |
| | * J/LOG16 | | --> VV | | | | | | | |
| 951 | LOG16:3570 | F/LOG15 | <-- VV | | 3570 | | | | 000000001000 | |
| | * LOG | | | | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | *JAM | | | | 01111 | 100000 | 11000 | 101111001 | | |
| | *P3, CSP(0)+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LOG17 | | --> VV | | | | | | | |
| 952 | LOG17:3571 | F/LOG16 | <-- VV | | 3571 | | | | 000000001000 | |
| | *SELECT, STATUS, | | | | 0100 | 01 00 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | 11001 | 000000 | 11000 | 101111010 | | |
| | * J/LOG18 | | --> VV | | | | | | | |
| 953 | LOG18:3572 | F/LOG17 | <-- VV | | 3572 | | | | 000000001000 | |
| | * LOG | | | | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | *SERVICE | | | | 01110 | 100000 | 11000 | 101111011 | | |
| | *P3, CSP(1)+DATA, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LOG19A | | --> VV | | | | | | | |
| 954 | LOG19A:3573 | F/LOG18 | <-- VV | | 3573 | | | | 000000001000 | |
| | *SELECT, EMIT, | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 0 | |
| | *NEXT, | | | | 11001 | 000000 | 11000 | 101111100 | | |
| | * J/LOG19B | | --> | 3574 955 317 | | | | | | |

H11

PROGRAM FLOWS

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|------|---------------|-----------------|----------------|----------------------|------------------------------|--------|
| | | | | | BUS | SP | UBF | RIF | COUT | |
| 960 | LOG19:3605 ***** *SELECT, PBA, *NEXT, * J/LOG20 ***** | <-- 3604 959 317 | | 3605 | 1100 11001 | 01 00 000000 | 00 00 11000 | 000 000 110000110 | 000000001000 000000000000 | 0000 0 |
| 961 | LOG20:3606 ***** * LOG *PBA *-----* *P3, CSP(2)+DATA, *NEXT, * J/LOG21 ***** | <-- VV VV | | 3606 | 0000 01101 | 10 00 100000 | 00 00 11000 | 000 000 110000111 | 000000001000 000000000000 | 0000 0 |
| 962 | LOG21:3607 ***** *SELECT, CUA, *NEXT, * J/LOG22 ***** | <-- VV VV | | 3607 | 0000 11001 | 00 00 000000 | 01 01 11000 | 000 000 110001000 | 000000001000 000000000000 | 0000 0 |
| 963 | LOG22:3610 ***** * LOG *CUA *-----* *P3, CSP(3)+DATA, *NEXT, * J/LOG23 ***** | <-- VV VV | 3612 964 319 | 3610 | 0000 01100 | 10 00 100000 | 00 00 11000 | 000 000 110001010 | 000000001000 000000000000 | 0000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCK | |
|---------|--|--------------------|------------|------|-----|------|-------|-----------|--------|----------------|----------------|
| | | | | | | | | OFST | ADDR | | BOX |
| 964 | LOG23:3612 | F/LOG22 | <-- | 3610 | 963 | 318 | | | | | |
| | ***** | | | | | | 3612 | | | 000000001000 | |
| | * NOTE THAT TAG FIELD IS READ ASSERTED * | | | | | | | 0001 | 01 00 | 00 00 | 010 000 0000 0 |
| | *LOW, BUT IS | | | | | | | 11001 | 000000 | 11000 | 110001100 |
| | *INVERTED | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *SELECT, HITTAG, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/LOG24A | | --> VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| 965 | LOG24A:3614 | F/LOG23 | <-- VV | | | | | | | | |
| | ***** | | | | | | 3614 | | | 000000001000 | |
| | *BEFORE LOGGING. VALID IS NOT INVERTED * | | | | | | | 0000 | 11 10 | 00 00 | 000 000 0000 0 |
| | *-----* | | | | | | | 00000 | 100000 | 11000 | 110001110 |
| | *P3, MD+DATA, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/LOG24B | | --> VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| 966 | LOG24B:3616 | F/LOG24A | <-- VV | | | | | | | | |
| | ***** | | | | | | 3616 | | | 000000001000 | |
| | *SELECT, EMIT, | | | | | | 0000 | 00 00 | 00 01 | 000 000 0000 0 | |
| | *NEXT, | | | | | | 11001 | 000000 | 11000 | 110001111 | |
| | * J/LOG24C | | --> VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| 967 | LOG24C:3617 | F/LOG24B | <-- VV | | | | | | | | |
| | ***** | | | | | | 3617 | | | 000000001000 | |
| | *P2, SR+MD, | | | | | | 1010 | 11 10 | 00 00 | 000 000 0010 0 | |
| | *NEXT, | | | | | | 00000 | 000000 | 11000 | 110010000 | |
| | * J/LOG24D | | --> | 3620 | 968 | 320 | | | | | |
| | ***** | | | | | | | | | | |

J11

| BOX NO. | TAG: ADDRESS | F/LOG24C | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|--------------------------------------|----------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | | RIF | COUT | CLOCKS |
| 968 | LOG24D:3620 | F/LOG24C | <-- | 3617 967 319 | 3620 | | | | 00000000 | 1000 | |
| | * MASK TO INVERT TAG | * | | | | 0111 | 10 11 | 11 00 | 000 000 | 0000 | 0 |
| | *FIELD | * | | | | 00010 | 100000 | 11000 | 110010001 | | |
| | *P3, MD+77400, | * | | | | | | | | | |
| | *NEXT, J/LOG24E | * | --> | VV | | | | | | | |
| 969 | LOG24E:3621 | F/LOG24D | <-- | VV | 3621 | | | | 00000000 | 1000 | |
| | *P2, D+SR XOR MD, | * | | | | 0110 | 11 10 | 00 00 | 000 000 | 1100 | 0 |
| | *NEXT, J/LOG24F | * | --> | VV | | 00000 | 000000 | 11000 | 110010010 | | |
| 970 | LOG24F:3622 | F/LOG24E | <-- | VV | 3622 | | | | 00000000 | 1000 | |
| | * DBUF LATCH+D, | * | | | | 0100 | 00 00 | 00 00 | 000 100 | 0000 | 0 |
| | *NEXT, J/LOG24G | * | --> | VV | | 11011 | 000000 | 11000 | 110010011 | | |
| 971 | LOG24G:3623 | F/LOG24F | <-- | VV | 3623 | | | | 00000000 | 1000 | |
| | * LOG HITTAG WITH TAG FIELD ASSERTED | * | | | | 0000 | 10 00 | 00 00 | 000 000 | 0000 | 0 |
| | *HIGH | * | | | | 01000 | 100000 | 11000 | 010101011 | | |
| | *P3, CSP(7)+DATA, | * | | | | | | | | | |
| | *NEXT, J/LOG25 | * | --> | 3253 972 321 | | | | | | | |

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PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSB | BUSB | EXTENSION | CLOCK |
|---------|----------------------------|--------------------|------------|------|-------|--------|-------|-----------|--------------|-------|
| | | | | | | | | | | |
| 972 | LOG25:3253 | F/LOG02A | <-- | 3241 | 928 | 311 | | | | |
| | * CLEAR JAM REG, | | | 3253 | | | | | 000000001000 | |
| | *NEXT, BUT(TRACK), | | | | 0100 | 00 00 | 10 00 | 000 000 | 0000 0 | |
| | * J/LOG25A | --> VV | | | 11011 | 000000 | 11001 | 110010100 | | |
| 973 | LOG25A:3624 | F/LOG25 | <-- VV | | | | | | | |
| | *SELECT, READ WCS STATUS, | | | 3624 | | | | | 000000001000 | |
| | *NEXT, | | | | 0010 | 00 00 | 01 00 | 000 000 | 0000 0 | |
| | * J/LOG27 | --> VV | | | 11001 | 000000 | 11000 | 110010101 | | |
| 974 | LOG27:3625 | F/LOG25A | <-- VV | | | | | | | |
| | * DONE TO SELECT | | | 3625 | | | | | 000000001000 | |
| | *EMIT | | | | 0111 | 11 00 | 11 00 | 101 000 | 0100 0 | |
| | *-----* | | | | 00000 | 010010 | 11010 | 110010110 | | |
| | *P2, D+WHAMI AND NOT 1, | | | | | | | | | |
| | *P3, WHAMI+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), | | | | | | | | | |
| | * J/LOG28 | --> VV | | | | | | | | |
| 975 | LOG28:3626 | F/LOG27 | <-- VV | | | | | | | |
| | *P2, D+R(CNTL),D(C)+ALU15, | | | 3626 | | | | | 000000001000 | |
| | *NEXT, | | | | 1010 | 01 11 | 00 00 | 111 100 | 0100 0 | |
| | * J/LOG29 | --> | 3630 | 976 | 322 | | | | 00000 | |
| | *-----* | | | | 00000 | 000000 | 11000 | 110011000 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|--|--------------|---------------------------------------|-----------------------|--------------|------------|----------|-------------------------------|
| .TOC " BEGINING OF CONSOLE FLOWS " | | | | | | | |
| : THIS FLOW IS NORMALLY ENTERED WHEN A CONSOLE SERVICE CONDITION | | | | | | | |
| : IS DETECTED IN THE SERVICE FLOW. THE SWITCHCODE WHICH IS A | | | | | | | |
| : FIVEBIT CODE UNIQUELY REPRESENTING ONE OF THE TWENTY KEYS ON | | | | | | | |
| : KEYPAD, WOULD HAVE BEEN LATCHED PRIOR TO ASSERTING THE CONSOLE | | | | | | | |
| : SERVICE. THE FOLLOWING TABLE SHOWS THE ASSIGNMENT OF CODES. | | | | | | | |
| : CONSOLE KEY ! SWCD<4:0> | | | | | | | |
| ----- | | | | | | | |
| | UNUSED | ! | 00000 | | | | |
| | UNUSED | ! | 00001 | | | | |
| | UNUSED | ! | 00010 | | | | |
| | UNUSED | ! | 00011 | | | | |
| | DIAG | ! | 00100 | | | | |
| | BOOT | ! | 00101 | | | | |
| | START | ! | 00110 | | | | |
| | CONT | ! | 00111 | | | | |
| | DEP | ! | 01000 | | | | |
| | MAINT | ! | 01001 | | | | |
| | LADRS | ! | 01010 | | | | |
| | EXAM | ! | 01011 | | | | |
| | DADRS | ! | 01100 | | | | |
| | DSWR | ! | 01101 | | | | |
| | LSWR | ! | 01110 | | | | |
| | HALT/SI | ! | 01111 | | | | |
| | 0 | ! | 10000 | | | | |
| | 1 | ! | 10001 | | | | |
| | 2 | ! | 10010 | | | | |
| | 3 | ! | 10011 | | | | |
| | 4 | ! | 10100 | | | | |
| | 5 | ! | 10101 | | | | |
| | 6 | ! | 10110 | | | | |
| | 7 | ! | 10111 | | | | |
| ----- | | | | | | | |
| : SCRATCH PAD REGISTERS USED: | | | | | | | |
| : NAME USED IN THESE FLOWS ! NAME USED IN SPEC | | | | | | | |
| : R(TMPSW) ! CNSL.TMPSW | | | | | | | |
| : R(SW) ! CNSL.SW | | | | | | | |
| : R(CADRS) ! CNSL.ADR | | | | | | | |
| : R(CNTL) ! CNSL.CNTL | | | | | | | |
| : OTHER DEFINITIONS: | | | | | | | |
| : TSR<17:00> = R(CNTL)<9:8> # R(TMPSW)<15:00> | | | | | | | |
| : SW.REG<17:00> = R(CNTL)<11:10> # R(SW)<15:00> | | | | | | | |
| : CAR<17:00> = R(CNTL)<1:0> # R(CADRS)<15:00> | | | | | | | |
| : ASSIGNMENT OF BITS IN R(CNTL): | | | | | | | |
| :----- | | | | | | | |
| | CONSOLE | ! | DLOCK | ! | EXAM | ! | DEP |
| | 15 | ! | 14 | ! | 13 | ! | 12 |
| | | ! | | ! | SW.REG<17> | ! | SW.REG<16> |
| | | ! | | ! | 11 | ! | 10 |
| | | ! | | ! | | ! | 9 |
| :----- | | | | | | | |
| | TSR<16> | ! | SI | ! | DNTCLCSR | ! | UNUSED |
| | 8 | ! | 7 | ! | 6 | ! | 5, 4, 3, 2 |
| | | ! | | ! | | ! | 1 |
| | | ! | | ! | | ! | 0 |
| | | ! | | ! | | ! | |
| :----- | | | | | | | |

N11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 324

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---|----------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| ;; THE CSR FLOW ACCOMPLISHES THE FOLLOWING: ;; LOADS THE CSP REGISTERS WITH CONSTANTS USED IN CONSOLE, SETS ;; CSP INVALID BIT, INITIALIZES R(CNTL), AND FINDS OUT THE NATURE OF ;; THE ENTRY INTO THE FLOW--WHETHER IT IS A NORMAL ENTRY OR A REENTRY ;; AFTER THE EXECUTION OF A SINGLE INSTRUCTION IN RESPONSE TO SI KEY. ;; IF THE ENTRY IS DUE TO SINGLE INSTRUCTION, THE SI BIT IS CLEARED ;; AND CONSOLE BIT IS SET AND HALT FLOW IS ENTERED TO DISPLAY PC ;; AND LOOP IN EOS FLOW FOR SERVICING THE KEYS. IF IT IS A NORMAL ;; ENTRY SDCD FLOW IS ENTERED. .CASE 5 OF BSER11 | | | | | | | | | | |
| 980 | CSR01:1664 | F/SER11 | <-- | 1016 | 401 | 167 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, CSP(10)+100000, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/CSR04 | | --> | 1263 | 981 | 324 | | | | |
| 981 | CSR04:1263 | F/CSR01 | <-- | 1664 | 980 | 323 | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, CSP(12)+030000, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/CSR05 | | --> VV | | | | | | | |
| 982 | CSR05:1264 | F/CSR04 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, CSP(13)+040000, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/CSR06A | | --> | 1265 | 983 | 325 | | | | |
| | ***** | | | | | | | | | |

```

1664          000000001000
      1000 10 00 00 00 000 000 0000 0
      00111 100000 11000 010110011

1263          000000001000
      0011 10 00 00 00 000 000 0000 0
      00101 100000 11000 010110100

1264          000000001000
      0100 10 00 00 00 000 000 0000 0
      00100 100000 11000 010110101
  
```

| BOX NO. | TAG: ADDRESS | F/CSROS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---|----------|---------------------------------------|-----------------------|------|------------|--------------|-------------|-----------------------------|
| 983 | CSR06A: 1265 | F/CSR05 | 1264 982 324 | | 1265 | 0001 0000 | 00 01 000000 | 01 10 11100 | 00000001000 0000 0 |
| | * THIS AND THE FOLLOWING TWO WORDS SET * * THE CSP INVALID BIT. * *-----* * RETURN+CSR06B * * NEXT, BUT(GO TO), PAGE+1, * * J/FLG01 * *-----* | | | | | | | | |
| | | | 1254 564 216 | | | | | | |
| | | | VV | | | | | | |
| | | | 1266 984 325 | | | | | | |
| 984 | CSR06B: 1266 | | | | 1266 | 0000 00010 | 10 10 100000 | 00 00 11000 | 00000001000 0000 0 |
| | * P2, MD+4000, * * NEXT, * * J/CSR06C * *-----* | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 985 | CSR06C: 1270 | F/CSR06B | 1260 568 218 | | 1270 | 0001 0000 | 00 01 00000 | 01 11 11100 | 00000001000 0001 001 0000 0 |
| | * RETURN+CSR06 * * NEXT, BUT(GO TO), PAGE+1, * * J/FLG01 * *-----* | | | | | | | | |
| | | | 1271 986 325 | | | | | | |
| | | | | | | | | | |
| 986 | CSR06: 1271 | | | | 1271 | 1010 00100 | 10 00 010001 | 00 00 11000 | 00000001000 000 100 0100 0 |
| | * TO CLEAR * * RES * *-----* * P2, D+CSP(13) D(C)+ALU15, * * RES+CSP(13), * * NEXT, * * J/CSR06D * *-----* | | | | | | | | |
| | | | 1272 987 326 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 987 | CSR06D:1272 | F/CSR06 | <-- | 1271 | 986 | 325 | | | | |
| | ***** | | | | | | | | | |
| | * CLEARS "DNTCLRCR" IN R(CNTL). * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, | D+(NOT(D RIGHT 8)) AND R(CNTL) | | | | | | | | |
| | *P3, | R(CNTL)+D, | | | | | | | | |
| | *NEXT, | J/CSR06E | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 988 | CSR06E:1273 | F/CSR06D | <-- VV | 1273 | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, | D+CSP(12), | | | | | | | | |
| | *NEXT, | J/CSR12 | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 989 | CSR12:1274 | F/CSR06E | <-- VV | 1274 | | | | | | |
| | ***** | | | | | | | | | |
| | * CLEAR 'EXAM' AND 'DEP' IN R(CNTL).AND *D(C) GETS *'SI'. * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, | D+NOT(D) AND R(CNTL), | | | | | | | | |
| | *P3, | D(C)+ALU07, | | | | | | | | |
| | *NEXT, | R(CNTL)+D, | | | | | | | | |
| | *P3, | J/CSR07 | --> | 1275 | 990 | 327 | | | | |
| | ***** | | | | | | | | | |

```

1272          000000001000
0010 01 11 01 01 111 000 0100 0
00110 011100 11000 010111011

1273          000000001000
1010 10 00 00 00 000 000 0100 0
00101 000000 11000 010111100

1274          000000001000
0010 01 11 01 01 111 011 0100 0
00000 011100 11000 010111101
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------|--|---------------------------------------|-----------------------|--------------|-------------|------------|----------|-----------|----------|--------|----------------|
| | | | | | | | | RIF | COUT | CLOCKS | |
| 990 | CSR07:1275 | F/CSR12 | <-- | 1274 | 989 | 326 | | | | | |
| | ***** | | | | | | | 1275 | 00000000 | 1000 | |
| | * THIS WORD TESTS THE 'SI' BIT OF | | | | | | | 1010 | 10 00 | 00 00 | 000 111 0100 0 |
| | *R(CNTL). THIS BIT WILL BE SET IN SINGLE | | | | | | | 00100 | 000000 | 01111 | 000000010 |
| | *INSTRUCTION | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+CSP(13),D(C)+D(C), | | | | | | | | | | |
| | *NEXT, BUTR(SI), | | | | | | | | | | |
| | * J/SDC001 | | --> | 10 | 1002 | 994 | 328 | | | | |
| | * J/CSR08 | | --> | 11 | 1003 | 991 | 327 | | | | |
| | ***** | | | | | | | | | | |
| .CASE | 2 OF BCSR07 | | | | | | | | | | |
| 991 | CSR08:1003 | F/CSR07 F/E0513 | <-- <-- | 1275 1063 | 990 1131 | 327 366 | | | | | |
| | ***** | | | | | | | 1003 | 00000000 | 1000 | |
| | *SERVICE, BEFORE LEAVING THE CONSOLE TO | | | | | | | 1010 | 10 00 | 00 00 | 000 100 0100 0 |
| | *EXECUTE ONE INSTRUCTION. SO TESTING OF | | | | | | | 00100 | 000000 | 11000 | 010111110 |
| | *THIS BIT DIFFERENTIATES THE ENTRY AFTER | | | | | | | | | | |
| | *A SINGLE INSTRUCTION FROM NORMAL | | | | | | | | | | |
| | *ENTRY. BRANCH TARGETS ARE SDC001 AND | | | | | | | | | | |
| | *CSR08. ENTER FROM CSR07 IF 'SI' IS | | | | | | | | | | |
| | *SET. CSR08 TO CSR11 WILL CLEAR 'SI' AND | | | | | | | | | | |
| | *SET | | | | | | | | | | |
| | *'CONSOLE'. | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+CSP(13),D(C)+ALU15, | | | | | | | | | | |
| | *NEXT, J/CSR09 | | --> | VV | | | | | | | |
| | ***** | | | | | | | | | | |
| 992 | CSR09:1276 | F/CSR08 | <-- | VV | | | | | | | |
| | ***** | | | | | | | 1276 | 00000000 | 1000 | |
| | *----- | | | | | | | 0010 | 01 11 | 01 00 | 111 000 0100 0 |
| | *P2, D+(NOT(D RIGHT 7)) AND | | | | | | | | | | |
| | * R(CNTL) | | | | | | | | | | |
| | *P3, R(CNTL)+D, | | | | | | | | | | |
| | *NEXT, J/CSR10 | | --> | 1300 | 993 | 328 | | | | | |
| | ***** | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | | |
|------------|--|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-----------|----------|--------|-----------|--------|
| | | | | | | | | RIF | COUT | | | |
| .CASE 1001 | 1 OF BSDC004 SDC005:1231 | F/SDC004 | <-- | 1311 | 1000 | 329 | | | | | | |
| | ***** | | | | | | | 1231 | 00000000 | 1000 | | |
| | * ENTER FROM SDC004 WHEN SWCD <4:3>=00. * | | | | | | | 1010 | 01 11 | 00 00 | 111 100 | 0100 0 |
| | *THIS MAJOR BRANCH LEADS TO CODES OF * *FUNCTIONS * | | | | | | | 00000 | 000000 | 00000 | 00110110 | |
| | *-----* | | | | | | | | | | | |
| | *P2, D+R(CNTL), D(C)+ALU15, * | | | | | | | | | | | |
| | *NEXT, BUTR(SWCD02), * | | | | | | | | | | | |
| | * J/SDC006 * | | --> | 1110 | 1156 | 1002 | 330 | | | | | |
| | * J/SDC007 * | | --> | 1111 | 1157 | 1003 | 330 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 1002 | 1 OF BSDC005 SDC006:1156 | F/SDC005 F/SDC017 | <-- <-- | 1231 1237 | 1001 1013 | 330 334 | | | | | | |
| | ***** | | | | | | | 1156 | 00000000 | 1000 | | |
| | *WHICH ARE SERVICED ONLY IN CONSOLE MODE. * | | | | | | | 0100 | 00 00 | 00 00 | 100 010 | 0000 0 |
| | *OF THE POSSIBLE EIGHT ONLY FOUR ARE * | | | | | | | 11011 | 000000 | 11000 | 110001001 | |
| | *USED. THE FOUR CODES HAVING SWCD<2>=0, * | | | | | | | | | | | |
| | *ARE NOT USED. BRANCH TARGETS ARE SDC006 * | | | | | | | | | | | |
| | *AND SDC007. ENTER FROM SDC005 WHEN * | | | | | | | | | | | |
| | *SWCD<2>=0. UNDEFINED * | | | | | | | | | | | |
| | *CODES. * | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | *P3, CMND REJECT, * | | | | | | | | | | | |
| | *NEXT, * | | | | | | | | | | | |
| | * J/E0S04B * | | --> | 1611 | 1120 | 363 | | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 1003 | 2 OF BSDC005 SDC007:1157 | F/SDC005 F/SDC017 | <-- <-- | 1231 1237 | 1001 1013 | 330 334 | | | | | | |
| | ***** | | | | | | | 1157 | 00000000 | 1000 | | |
| | *CMND REJECT SENT TO REMOTE CONSOLE * | | | | | | | 1010 | 11 10 | 00 00 | 000 000 | 0010 0 |
| | *ENTER FROM SDC005 WHEN SWCD<2>=1. * | | | | | | | 00000 | 000000 | 01111 | 000110110 | |
| | *SR<3:0> GETS SWCD<4:3>. TEST CONSOLE BIT * | | | | | | | | | | | |
| | *IN R(CNTL). BRANCH TARGETS ARE * | | | | | | | | | | | |
| | *SDC008, SDC009. * | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | *P2, SR+MD, * | | | | | | | | | | | |
| | *NEXT, BUTR(CONSOLE), * | | | | | | | | | | | |
| | * J/SDC008 * | | --> | 10 | 1066 | 1004 | 331 | | | | | |
| | * J/SDC009 * | | --> | 11 | 1067 | 1005 | 331 | | | | | |
| | ***** | | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|------------|--|---------------------------------------|-----------------------|--------------|--------------|------------|----------|--------------------|--------|
| .CASE 1004 | SDCD08:1066 | F/SDCD07 F/SDCD12 | <-- <-- | 1157 1012 | 1003 1009 | 330 332 | | | |
| | ***** | | | 1066 | 0100 | 00 00 | 00 00 | 010 010 | 0000 0 |
| | * ENTER FROM SDCD07 WHEN 'CONSOLE' NOT | | | | 11011 | 000000 | 11000 | 110001001 | |
| | *SET. SEND | | | | | | | | |
| | *CMND | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P3, CMND ILLEGAL, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/E0S04B | | --> | 1611 | 1120 | 363 | | | |
| | ***** | | | | | | | | |
| .CASE 1005 | SDCD09:1067 | F/SDCD07 F/SDCD12 | <-- <-- | 1157 1012 | 1003 1009 | 330 332 | | | |
| | ***** | | | 1067 | 1010 | 10 00 | 00 00 | 000 100 | 0100 0 |
| | *ILLEGAL TO REMOTE CONSOLE AND LEAVE | | | | 00100 | 000000 | 01011 | 001100001 | |
| | *CONSOLE ENTERED ALSO FROM SDCD12. ENTER | | | | | | | | |
| | *FROM SDCD07 WHEN 'CONSOLE' IS SET. THIS | | | | | | | | |
| | *BRANCH LEADS TO DIAG, BOOT, START AND | | | | | | | | |
| | *CONT | | | | | | | | |
| | *ROUTINES. | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, D+CSP(13) D(C)+ALU15, | | | | | | | | |
| | *NEXT, BUTR(SWCD01 # SWCD00), | | | | | | | | |
| | * J/DIAG01 | | --> | 001 | 1141 | 1104 | 358 | | |
| | * J/BOOT | | --> | 011 | 1143 | 1110 | 360 | | |
| | * J/STC01 | | --> | 101 | 1145 | 1093 | 356 | | |
| | * J/STC02 | | --> | 111 | 1147 | 1094 | 356 | | |
| | ***** | | | | | | | | |
| .CASE 1006 | SDCD10:1233 | F/SDCD04 | <-- | 1311 | 1000 | 329 | | | |
| | ***** | | | 1233 | 1010 | 11 10 | 00 00 | 000 000 | 0010 0 |
| | *BRANCH TARGETS ARE DIAG01, BOOT01, | | | | 00000 | 000000 | 11000 | 011000101 | |
| | *STC01, STC02. ENTER FROM SDCD04 WHEN | | | | | | | | |
| | *SWCD<4:3>=1. THIS MAJOR BRANCH LEADS TO | | | | | | | | |
| | *EIGHT | | | | | | | | |
| | *CODES | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, SR+MD, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/SDCD20 | | --> | 1305 | 1007 | 332 | | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|------------|---|--|--------------------------|------|------------|------------|-------------|-----------|-------|----------------------------|--|
| | | | | | | | | RIF | COUT | | |
| 1007 | SDCD20:1305 | F/SDCD10 | <-- | 1233 | 1006 | 331 | | | | | |
| | ***** | | | | | | | | 1305 | 000000001000 | |
| | *THE FOUR HAVING SWCD<2>=0, ARE SERVICED * | | | | | | | | 1010 | 01 11 00 00 111 100 0100 0 | |
| | *ONLY IF 'CONSOLE' IS SET. THIS TEST * | | | | | | | | 00000 | 000000 00000 001001011 | |
| | *DIVIDES THE CODES INTO TWO PARTS. BRANCH * | | | | | | | | | | |
| | *TARGETS ARE * | | | | | | | | | | |
| | *SDCD11 * | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+R(CNTL), D(C)+ALU15, | | | | | | | | | | |
| | *NEXT, BUTR(SWCD02), | | | | | | | | | | |
| | * J/SDCD11 | | | | | | | | | | |
| | | J/SDCD11 | --> | 1011 | 1113 | 1008 | 332 | | | | |
| | | J/SDCD14 | --> | 1111 | 1117 | 1011 | 333 | | | | |
| | ***** | | | | | | | | | | |
| .CASE 1008 | 1 OF BSDCD20 | F/SDCD20 | <-- VV | | | | | | | | |
| | SDCD11:1113 | | | | | | | | | | |
| | ***** | | | | | | | | 1113 | 000000001000 | |
| | *AND SDCD14. ENTER FROM SDCD20 WHEN * | | | | | | | | 0000 | 00 00 00 00 000 000 0000 0 | |
| | *SWCD<2>=0, SIGNIFYING CODES SERVICED * | | | | | | | | 00000 | 000000 01111 000001010 | |
| | *ONLY IN CONSOLE MODE. TEST * | | | | | | | | | | |
| | *'CONSOLE'. | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | * NULL, NULL, | | | | | | | | | | |
| | *NEXT, BUTR(CONSOLE), | | | | | | | | | | |
| | * J/SDCD12 | | | | | | | | | | |
| | | J/SDCD12 | --> | 10 | 1012 | 1009 | 332 | | | | |
| | | J/SDCD13 | --> | 11 | 1013 | 1010 | 333 | | | | |
| | ***** | | | | | | | | | | |
| .CASE 1009 | 1 OF BSDCD11 | F/SDCD11 | <-- VV | | | | | | | | |
| | SDCD12:1012 | | | | | | | | | | |
| | ***** | | | | | | | | 1012 | 000000001000 | |
| | *BRANCH TARGETS ARE SDCD12 AND SDCD13. * | | | | | | | | 0000 | 00 00 00 00 000 000 0000 0 | |
| | *ENTER FROM SDCD11 WHEN 'CONSOLE' NOT * | | | | | | | | 00000 | 000000 11000 000110110 | |
| | *SET. SEND CMND * | | | | | | | | | | |
| | *ILLEGAL * | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/SDCD08 | | --> | 1066 | 1004 | 331 | | | | | |
| | ***** | | | | | | | | | | |

J12

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 333

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|--|--|--------------------------|------|------------|------------|-------------|---------------------------------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1010 | 2 OF BSDCD11 SDCD13:1013 | F/SDCD11 | <-- | 1113 | 1008 | 332 | | | | |
| | ***** | | | | | | | 1013 | 000000001000 | |
| | * ENTER FROM SDCD11 WHEN 'CONSOLE' IS | | | | | | | 1010 01 11 00 00 111 000 0100 0 | | |
| | *SET. THIS BRANCH LEADS TO DEP. INT. LAD | | | | | | | 00000 000000 01011 001011001 | | |
| | *AND EXAM ROUTINES. BRANCH TARGETS | | | | | | | | | |
| | *ARE | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P2, D+R(CNTL), | | | | | | | | | |
| | *NEXT, BUTR(SWCD01 # SWCD00), | | | | | | | | | |
| | * J/DEPO1 | | | | | | | | | |
| | | J/DEPO1 | --> | 001 | 1131 | 1083 | 353 | | | |
| | | J/INT01 | --> | 011 | 1133 | 1078 | 352 | | | |
| | | J/LAD01 | --> | 101 | 1135 | 1070 | 350 | | | |
| | | J/EXM01 | --> | 111 | 1137 | 1059 | 347 | | | |
| | ***** | | | | | | | | | |
| .CASE 1011 | 2 OF BSDCD20 SDCD14:1117 | F/SDCD20 | <-- | 1305 | 1007 | 332 | | | | |
| | ***** | | | | | | | 1117 | 000000001000 | |
| | *DEPO1,INT01,LAD01,EXM01. ENTER FROM | | | | | | | 1010 10 00 00 00 000 111 0100 0 | | |
| | *SDCD20 WHEN SWCD02 =1 BRANCH TARGETS | | | | | | | 00100 000000 01011 001110001 | | |
| | *ARE DIS01, | | | | | | | | | |
| | *LSR01 | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P2, D+CSP(13) D(C)+D(C), | | | | | | | | | |
| | *NEXT, BUTR(SWCD01 # SWCD00), | | | | | | | | | |
| | * J/DIS01 | | | | | | | | | |
| | | J/DIS01 | --> | 001 | 1161 | 1054 | 345 | | | |
| | | J/DSR01 | --> | 011 | 1163 | 1041 | 342 | | | |
| | | J/LSR01 | --> | 101 | 1165 | 1045 | 343 | | | |
| | | J/SDCD16 | --> | 111 | 1167 | 1012 | 334 | | | |
| | ***** | | | | | | | | | |

K12

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | | |
|------------------|--|---|--------------------------|--|------------|-------------|-----------|------|--------|--|---|
| | | | | | | | RIF | COUT | | | |
| 1012 | SDCD16:1167 | F/IA115C F/LOG31A F/SDCD14 F/LAD08 | <-- <-- <-- <-- | 3273 696 253 3631 979 322 1117 1011 333 1421 1077 352 | | | | | | | |
| | ***** *DSR01, AND SDCD16. ALL THESE ARE SERVICED * *IN RUN AND CONSOLE MODES. ENTER FROM * *SDCD14. BRANCH FURTHER INTO HALT AND * *SI ROUTINES BRANCH TARGETS ARE HLTO1 * *AND * *SINO1. * *-----* *P2, D+CSP(10), D(C)+D(C), * * SR+CSP(10), * *NEXT, BUTR(CONSOLE), * * J/HLTO1 * * J/HLTO1 * --> 10 1032 1029 339 * J/SINO1 * --> 11 1033 1035 340 ***** | | | | | | | 1167 | | | 000000001000 1010 10 00 00 00 000 111 0110 0 00111 000000 01111 000011010 |
| 1013 | SDCD17:1237 | F/SDCD04 | <-- | 1311 1000 329 | | | | | | | |
| | ***** * ENTER FROM SDCD04 WHEN SWCD<4:3> IS 11. * *THESE ARE UNDEFINED CODES. GO TO * *SDCD06 * *-----* * NULL, NULL, * *NEXT, * * J/SDCD06 * --> 1156 1002 330 ***** | | | | | | | 1237 | | | 000000001000 0000 00 00 00 00 000 000 0000 0 00000 000000 11000 001101110 |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---|--|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .TOC "BEGINING OF NUMERIC ROUTINE." ::: THIS ROUTINE ENTERS THE VALUE OF THE NUMERIC DEPRESSED ::: INTO THE LOWER THREE BITS OF THE TSR WITH THE PREVIOUS ::: CONTENTS LEFT SHIFTED THREE BITS. OPERATION OCCURS ::: IN BOTH CONSOLE AND RUN MODES. .CASE 3 OF BSDC004 | | | | | | | |
| 1014 | NMRC01:1235 | F/SDC04 | <-- | 1311 | 1000 | 329 | |
| | ***** | | | | | | |
| | *TO SEND CMND REJECTED. SR<1:0> GETS * | | | | | | |
| | *R(TMP SW)<14:13>. ENTER FROM SDC04 WHEN * | | | | | | |
| | *SWCD<4:3>=10. * | | | | | | |
| | *-----* | | | | | | |
| | *P2, SR+D RIGHT 13, * | | | | | | |
| | *NEXT, * | | | | | | |
| | * J/NMRC02 * --> VV | | | | | | |
| | ***** | | | | | | |
| 1015 | NMRC02:1312 | F/NMRC01 | <-- VV | | | | |
| | ***** | | | | | | |
| | *SELECT, EMIT, * | | | | | | |
| | *NEXT, * | | | | | | |
| | * J/NMRC02A * --> VV | | | | | | |
| | ***** | | | | | | |
| 1016 | NMRC02A:1313 | F/NMRC02 | <-- VV | | | | |
| | ***** | | | | | | |
| | * MAKES RES<3>=1, TO DISABLE SENDMUX. SO * | | | | | | |
| | * THAT D(0) GETS ZERO ON LEFT * | | | | | | |
| | * SHIFTS. * | | | | | | |
| | *-----* | | | | | | |
| | * RES+0, * | | | | | | |
| | *NEXT, * | | | | | | |
| | * J/NMRC03 * --> | | | | | | |
| | ***** | | | | | | |
| | | | | 1314 | 1017 | 336 | |

| 1235 | 1111 | 00 | 00 | 01 | 10 | 000 | 000 | 0010 | 0 |
|------|-------|--------|-------|-----------|----|-----|-----|------|---|
| | 01110 | 000000 | 11000 | 011001010 | | | | | |
| 1312 | 0000 | 00 | 00 | 00 | 01 | 000 | 000 | 0000 | 0 |
| | 11001 | 000000 | 11000 | 011001011 | | | | | |
| 1313 | 0000 | 10 | 00 | 00 | 00 | 000 | 000 | 0000 | 0 |
| | 00001 | 010001 | 11000 | 011001100 | | | | | |

M12

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK | |
|---------|--|--|--------------------------|------|------------|------------|-------------|-----------|----------|----------------|--|
| | | | | | | | | RIF | COUT | | |
| 1017 | NMRC03:1314 | F/NMRC02A | <-- | 1313 | 1016 | 335 | | | | | |
| | ***** | | | | | | | 1314 | 00000000 | 1000 | |
| | * R(TMP) IS SHIFTED LEFT BY THREE IN | | | | | | 1111 | 00 00 | 01 00 | 000 000 0100 0 | |
| | * THIS AND THE | | | | | | 00000 | 000000 | 11000 | 011001101 | |
| | * FOLLOWING | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+D LEFT 1, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/NMRC04 | | --> VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| 1018 | NMRC04:1315 | F/NMRC03 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 1315 | 00000000 | 1000 | |
| | * TWO UWORDS. | | | | | | 1111 | 00 00 | 01 00 | 000 000 0100 0 | |
| | ----- | | | | | | | | | | |
| | *P2, D+D LEFT 1, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/NMRC05 | | --> VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| 1019 | NMRC05:1316 | F/NMRC04 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 1316 | 00000000 | 1000 | |
| | * J/NMRC05 | | | | | | 1111 | 00 11 | 01 00 | 110 000 0100 0 | |
| | ----- | | | | | | | | | | |
| | *P2, D+D LEFT 1, | | | | | | | | | | |
| | *P3, R(TEMP2A)+D (B ADDR), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/NMRC06A | | --> VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| 1020 | NMRC06A:1317 | F/NMRC05 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 1317 | 00000000 | 1000 | |
| | * TO CLEAR | | | | | | 0000 | 10 00 | 00 00 | 000 000 0000 0 | |
| | *RES | | | | | | 00100 | 010001 | 11000 | 011011010 | |
| | ----- | | | | | | | | | | |
| | *P2, RES+CSP(13), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/NMRC06 | | --> | 1332 | 1021 | 337 | | | | | |
| | ***** | | | | | | | | | | |

N12

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | CLOCK COUNT | |
|---------|--|---------------------------------------|-----------------------|------|------------|-------------|-------------|-------------------|-------------|--------|
| 1021 | NMRC06:1332 ***** * MD(LOW) HAS SWCD<4:0> SWCD<2:0> *REPRESENTS THE NUMERIC TO BE LOADED IN *TSR. *-----* *P2, D+MD, *P3, R(TEMP2B)+D (A ADDR), *NEXT, * J/NMRC07A ***** | <-- | 1317 1020 336 | 1332 | 1010 00000 | 11 10 010 | 00 01 110 | 000 0110 | 00000001000 | 0100 0 |
| 1022 | NMRC07A:1333 ***** *P2, MD+177770 (BC), *NEXT, * J/NMRC07B ***** | <-- VV | | 1333 | 1111 00010 | 10 11 10000 | 11 11 11000 | 111 000 0110 | 0000 00000 | 0 |
| 1023 | NMRC07B:1334 ***** *P2, D+MD, *NEXT, * J/NMRC08 ***** | <-- VV | | 1334 | 1010 00000 | 11 10 00000 | 00 00 11000 | 000 000 0110 | 0000 00000 | 0 |
| 1024 | NMRC08:1335 ***** * R(TEMP2B)<15:3> IS CLEARED. *R(TEMP2B)<2:0> CONTAINS THE VALUE OF *NUMERIC BEING *SERVICED. *-----* *P2, D+NOT(D) AND R(TEMP2B), *P3, R(TEMP2B)+D, *NEXT, * J/NMRC09 ***** | <-- VV | 1340 1025 338 | 1335 | 0010 00000 | 01 11 01100 | 01 01 110 | 000 000 0110 | 0000 00000 | 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|---------------------------------------|-----------------------|---------------|------------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1025 | NMRC09:1340 ***** * D HAS THE * DESIRED *-----* *P2, D+R(TEMP2A) OR R(TEMP2B), *NEXT * J/NMRC10 ***** | F/NMRC08 | <-- | 1335 1024 337 | 1340 | | | 00000000 | 1000 | |
| | | | | | 1110 01 11 | 11 01 | 110 000 | 0100 | 0 | |
| | | | | | 00000 | 000000 | 11000 | 011100001 | | |
| 1026 | NMRC10:1341 ***** *R(TMPSW)<12:00> NUMERIC<2:0> *R(TMPSW)<15:00> = R(TMPSW)<12:00> *NUMERIC *<550> *-----* *P2, R(TMPSW)+D, *NEXT, * J/NMRC11 ***** | F/NMRC09 | <-- VV | | 1341 | | | 00000000 | 1000 | |
| | | | | | 0000 00 00 | 00 01 | 101 000 | 0000 | 0 | |
| | | | | | 00000 | 010010 | 11000 | 011100010 | | |
| 1027 | NMRC11:1342 ***** * TSR<17:16> GETS SR<1:0> AND HENCE *R(TMPSW)<14:13> LOOK AT *NMRC02 *-----* * RETURN+NMRC12, *NEXT, BUT(GO TO),PAGE+1, * J/SBR01 ***** | F/NMRC10 | <-- VV | | 1342 | | | 00000000 | 1000 | |
| | | | | | 0001 00 01 | 11 00 | 011 001 | 0000 | 0 | |
| | | | | | 00000 | 000000 | 11100 | 101101101 | | |
| | | | | | ***** | | | | | |
| | | | | | 1555 | 1152 | 373 | | | |
| | | | | | ***** | | | | | |
| | | | | | | VV | | | | |
| | | | | | 1343 | 1028 | 338 | | | |
| 1028 | NMRC12:1343 ***** *-----* * RETURN+E0S03, *NEXT, BUT(GO TO),PAGE+1, * J/SBRA01 ***** | | <--> | | 1343 | | | 00000000 | 1000 | |
| | | | | | 0001 00 10 | 01 10 | 100 001 | 0000 | 0 | |
| | | | | | 00000 | 000000 | 11100 | 101000101 | | |
| | | | | | ***** | | | | | |
| | | | | | 1505 | 1132 | 367 | | | |
| | | | | | ***** | | | | | |
| | | | | | | VV | | | | |
| | | | | | 1464 | 1115 | 361 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
|---------|--------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|

```

.TOC "BEGINING OF 'HALT' (HLT) ROUTINE."
;;; THIS ROUTINE SETS
;;; CONSOLE BIT IN R(CNTL) AS WELL AS THE CONSOLE FLAG IN STATUS
;;; BOARD. DISPLAYS PC.
.CASE 1 OF BSDCD16

```

| | | | | | | | |
|------|------------|---------------------|------------|-------------------------------|--|--|--|
| 1029 | HLT01:1032 | F/CSR10 F/SDCD16 | <-- <-- | 1300 993 328 1167 1012 334 | | | |
|------|------------|---------------------|------------|-------------------------------|--|--|--|

| | | | | | | | |
|------|--|--|--|--------------------|--|---------|--------------|
| 1032 | | | | | | | 000000001000 |
| | | | | 1110 01 11 01 01 | | 111 000 | 0100 0 |
| | | | | 00000 011100 11000 | | | 011100100 |

```

*****
* SET 'CONSOLE' IN R(CNTL)
*-----*
*P2,      D+D OR R(CNTL),
*P3,      R(CNTL)+D,
*NEXT,
*          J/HLT02
***** --> VV

```

| | | | | | | | |
|------|------------|---------|--------|--|--|--|--|
| 1030 | HLT02:1344 | F/HLT01 | <-- VV | | | | |
|------|------------|---------|--------|--|--|--|--|

| | | | | | | | |
|------|--|--|--|--------------------|--|---------|--------------|
| 1344 | | | | | | | 000000001000 |
| | | | | 0100 00 00 00 00 | | 100 001 | 0000 0 |
| | | | | 11011 000000 11000 | | | 011100101 |

```

*****
* THRU UCON INTERFACE
*-----*
*P3,      SET CONSOLE,
*NEXT,
*          J/HLT03
***** --> VV

```

| | | | | | | | |
|------|------------|---------|--------|--|--|--|--|
| 1031 | HLT03:1345 | F/HLT02 | <-- VV | | | | |
|------|------------|---------|--------|--|--|--|--|

| | | | | | | | |
|------|--|--|--|--------------------|--|---------|--------------|
| 1345 | | | | | | | 000000001000 |
| | | | | 1111 00 00 10 01 | | 111 000 | 0100 0 |
| | | | | 00000 000000 11000 | | | 011100110 |

```

*****
*
*-----*
*P2,      D+PC (A),
*NEXT,
*          J/HLT04
***** --> VV

```

| | | | | | | | |
|------|------------|---------|--------|--|--|--|--|
| 1032 | HLT04:1346 | F/HLT03 | <-- VV | | | | |
|------|------------|---------|--------|--|--|--|--|

| | | | | | | | |
|------|--|--|--|--------------------|--|---------|--------------|
| 1346 | | | | | | | 000000001000 |
| | | | | 0000 00 00 00 01 | | 101 000 | 0000 0 |
| | | | | 00000 010010 11000 | | | 011101000 |

```

*****
* TSR<15:00> GETS
*PC
*-----*
*P2,      R(TMPSW)+D,
*NEXT,
*          J/HLT05A
***** --> 1350 1033 340
*****

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|---|---|--------------------------------------|------|---------------|-----------------|----------------|--|--------|
| 1033 | HLT05A:1350 ***** *-----* * SET DP, *NEXT, * J/HLT05 ***** | F/HLT04 <-- | 1346 1032 339 | 1350 | 0100 11011 | 00 00 000000 | 00 00 11000 | 00000001000 110 001 0000 0 011101001 | |
| 1034 | HLT05:1351 ***** * TSR<17:16> GETS SR<1:0> WHICH IS <00>. *-----* * RETURN+EOS1A, *NEXT, BUT(GO TO),PAGE+1, * J/SBRCD1 ***** | F/HLT05A <-- VV <-- VV --> | 1555 1152 373 VV 1460 1111 360 | 1351 | 0001 00000 | 00 10 000000 | 01 10 11100 | 00000001000 000 001 0000 0 101101101 | |

.TOC "BEGINING OF 'SINGLE INSTRUCTION' (SIN) ROUTINE."
 ;;THIS ROUTINE CLEARS 'CONSOLE' IN R(CNTL) AND IN STATUS BOARD.
 ;;SETS 'SI' IN R(CNTL) AND SENDS CMND COMPLETE TO REMOTE CONSOLE.
 ;;IF BG IS ASSERTED IT GOES TO INTRO1 TO SERVICE THE PENDING REQUEST
 ;;AND RETURNS TO FETO1 TO EXECUTE AN INSTUCTION. IF BG IS NOT ASSERTED
 ;;IT DIRECTLY GOES TO FETO1 TO EXECUTE AN INSTUCTION. SINCE THE
 ;;CONSOLE SERVICE FLAG IS NOT CLEARED, CONSOLE IS REENTERED AFTER THE
 ;;EXECUTION OF ONE INSTRUCTION.
 .CASE 2 OF BSDCD16

| | | | | | | | | | |
|------|---|--|-------------------------------|------|---------------|-----------------|----------------|--|--|
| 1035 | SIND1:1033 ***** * CLEAR 'CONSOLE' IN R(CNTL) AND THE *HARDWARE FLAG IN STATUS *BOARD *-----* * RETURN+SIND2, *NEXT, BUT(GO TO),PAGE+1, * J/SBRED1 ***** | F/CSR10 F/SOCD16 <-- <-- --> | 1300 993 328 1167 1012 334 | 1033 | 0001 00000 | 00 01 000000 | 11 01 11100 | 00000001000 100 001 0000 0 101110110 | |
|------|---|--|-------------------------------|------|---------------|-----------------|----------------|--|--|

E13

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 341

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|-----------|--------------------------------|--------------------|---------------|-----------------------|------------|---------|---------|----------|-----------|--------|----------------------|
| | | OFST | ADDR BOX PAGE | | | | | | RIF UPF | COUT | CLOCKS |
| 1036 | SIN02:1354 | | | | 1354 | | | | 00000000 | 1000 | |
| | *-----* | | | | | | | | 1010 | 10 00 | 00 00 000 100 0100 0 |
| | *P2, D+CSP(13),D(C)+ALU15, | | | | | | | | 00100 | 000000 | 11000 011101101 |
| | *NEXT, J/SIN03 | | | --> VV | | | | | | | |
| 1037 | SIN03:1355 | | | | 1355 | | | | 00000000 | 1000 | |
| | *-----* | | | <-- VV | | | | | 1110 | 01 11 | 01 00 111 000 0100 0 |
| | * SET 'SI' IN R(CNTL) | | | | | | | | 00110 | 011100 | 11000 011101110 |
| | *P2, D+(D RIGHT 7) OR R(CNTL), | | | | | | | | | | |
| | *P3, R(CNTL)+D, | | | | | | | | | | |
| | *NEXT, J/SIN05 | | | --> VV | | | | | | | |
| 1038 | SIN05:1356 | | | | 1356 | | | | 00000000 | 1000 | |
| | *-----* | | | <-- VV | | | | | 0000 | 00 00 | 00 01 000 000 0000 0 |
| | * OTHER TARGET | | | | | | | | 11001 | 000000 | 01100 100010011 |
| | *SIN08 | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *SELECT, EMIT, | | | | | | | | | | |
| | *NEXT, BUTR(BG), | | | | | | | | | | |
| | * J/SIN06 | | | --> | 011 1423 | 1039 | 341 | | | | |
| | * J/SIN08 | | | --> | 111 1427 | 1040 | 342 | | | | |
| | *-----* | | | | | | | | | | |
| CASE 1039 | 1 OF BSIN05 | | | | | | | | | | |
| | SIN06:1423 | | | | 1423 | | | | 00000000 | 1000 | |
| | *-----* | | | <-- VV | | | | | 0000 | 00 11 | 10 00 010 000 0000 0 |
| | * RETURN TO | | | | | | | | 00000 | 000000 | 11100 000010011 |
| | *FETO1 | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | * RETURN+FETO1 | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | | |
| | * J/INTRO1 | | | --> | 23 389 164 | | | | | | |
| | *-----* | | | | | | | | | | |
| | | | | | 702 | VV | 1 | 2 | | | |

F13

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 342

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|--|--|---|--------------------------|------------------------------|----------------------------|--------------------------|----------|-------------------|--------------|---|
| .CASE 1040 | 2 OF BSIN05 SIN08:1427 | F/SIN05 | <-- | 1356 | 1038 | 341 | | | | |
| | ***** * EXECUTE ONE * INSTRUCTION. ***** | | | | | | | 1427 | 000000001000 | 0000 00 00 00 00 000 000 0000 0 00000 000000 11100 111000010 |
| | *NEXT, BUT(GO TO),PAGE+0, * J/FET01 | | --> | 702 | 1 | 2 | | | | |
| .TOC "BEGINING OF DISPLAY SWITCH REGISTER (DSR)" :: THIS DISPLAYS THE CONTENTS OF SWITCH REGISTER :: IN THE CONSOLE DISPLAY. | | | | | | | | | | |
| .CASE 1041 | 2 OF BSDCD14 DSR01:1163 | F/IA115C F/LOG31A F/SDCD14 F/LAD08 | <-- <-- <-- <-- | 3273 3631 1117 1421 | 696 979 1011 1077 | 253 322 333 352 | | | | |
| | ***** *P2, D+R(CNTL), *NEXT, * J/DSR02A | | | | | | | 1163 | 000000001000 | 1010 01 11 00 00 111 000 0100 0 00000 000000 11000 011110000 |
| 1042 | DSR02A:1360 | F/DSR01 | <-- VV | | | | | 1360 | 000000001000 | 1111 00 00 01 11 000 000 0010 0 00110 000000 11000 011110001 |
| | ***** * SR<1:0> GETS SW.REG<17:16> ***** *P2, SR+D RIGHT 10, *NEXT, * J/DSR02 | | | | | | | | | |
| 1043 | DSR02:1361 | F/DSR02A | <-- VV | | | | | 1361 | 000000001000 | 1111 00 00 11 00 111 000 0100 0 00000 000000 11000 011110010 |
| | ***** *P2, D+R(SW), *NEXT, * J/DSR03 | | --> | 1362 | 1044 | 343 | | | | |

H13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 344

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCKS | |
|---------|--|---------------------------------------|-----------------------|---------------|---------------|--------|-------|-----------|--------------|--------|--|
| | | | | | BUS | SP | UBF | RIF | COUT | | |
| 1048 | LSR03:1365 | F/LSR02 | <-- | 1364 1047 343 | | | | | | | |
| | ***** | | | | 1365 | | | | 000000001000 | | |
| | * CLEARS R(CNTTL)<11:10> AND HENCE | | | | 0010 | 01 11 | 01 11 | 111 000 | 0100 0 | | |
| | *SW.REG<17:16> | | | | 00000 | 011100 | 11000 | 011110110 | | | |
| | ***** | | | | | | | | | | |
| | *P2, | | | | | | | | | | |
| | * D+(NOT(D RIGHT 2)) AND | | | | | | | | | | |
| | * R(CNTL),R(CNTL)+D, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/LSR04 | | --> | VV | | | | | | | |
| 1049 | LSR04:1366 | F/LSR03 | <-- | VV | | | | | | | |
| | ***** | | | | 1366 | | | | 000000001000 | | |
| | *P2, D+D LEFT 1, | | | | 1111 | 00 00 | 01 00 | 000 000 | 0100 0 | | |
| | *NEXT, | | | | 00000 | 000000 | 11000 | 011111000 | | | |
| | * J/LSR05 | | --> | VV | | | | | | | |
| 1050 | LSR05:1370 | F/LSR04 | <-- | VV | | | | | | | |
| | ***** | | | | 1370 | | | | 000000001000 | | |
| | * R(TEMP2B)<11:10> GETS R(CNTL)<9:8> AND | | | | 1111 | 00 11 | 01 00 | 110 000 | 0100 0 | | |
| | *HENCE | | | | 00000 | 011100 | 11000 | 011111001 | | | |
| | *TSR<17:16> | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *P2, D+D LEFT 1, | | | | | | | | | | |
| | *P3, R(TEMP2B)+0, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/LSR06 | | --> | VV | | | | | | | |
| 1051 | LSR06:1371 | F/LSR05 | <-- | VV | | | | | | | |
| | ***** | | | | 1371 | | | | 000000001000 | | |
| | *P2, D+CSP(12), | | | | 1010 | 10 00 | 00 00 | 000 000 | 0100 0 | | |
| | *NEXT, | | | | 00101 | 000000 | 11000 | 011111010 | | | |
| | * J/LSR07 | | --> | | | | | | | | |
| | ***** | | | | 1372 1052 345 | | | | | | |

J13

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|---------|-------------------------------------|--|--------------------------|--------------|-------------|------------|-------------|-----------|----------|----------------|--|
| | | | | | | | | RIF | COUT | | |
| 1055 | DIS04:1374 | F/DIS01 | <-- | 1161 | 1054 | 345 | | | | | |
| | ***** | | | | | | | 1374 | 00000000 | 1000 | |
| | *P2, D+R(CADRS), | | | | | | 1111 | 00 00 | 11 01 | 111 000 0100 0 | |
| | *NEXT, J/DIS02 | | --> VV | | | | 00000 | 000000 | 11000 | 011111101 | |
| 1056 | DIS02:1375 | F/DIS04 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 1375 | 00000000 | 1000 | |
| | * R(TMPSW)+R(CADRS) | | | | | | 0000 | 00 00 | 00 01 | 101 000 0000 0 | |
| | *P2, R(TMPSW)+D, | | | | | | 00000 | 010010 | 11000 | 011111110 | |
| | *NEXT, J/DIS03 | | --> VV | | | | | | | | |
| 1057 | DIS03:1376 | F/DIS02 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 1376 | 00000000 | 1000 | |
| | * SET D.P THROUGH UCON | | | | | | 0100 | 00 00 | 00 00 | 110 001 0000 0 | |
| | *INTERFACE | | | | | | 11011 | 000000 | 11000 | 100000000 | |
| | *P3, SET DP, | | | | | | | | | | |
| | *NEXT, J/DIS06 | | --> VV | | | | | | | | |
| 1058 | DIS06:1400 | F/MED85 F/DSR03 F/DIS03 | <-- <-- <-- VV | 3343 1362 | 722 1044 | 260 343 | | | | | |
| | ***** | | | | | | | 1400 | 00000000 | 1000 | |
| | * CALL SUBROUTINE C WHICH TRANSFERS | | | | | | 0001 | 00 10 | 01 10 | 000 001 0000 0 | |
| | *SR<1:0> TO | | | | | | 00000 | 000000 | 11100 | 101101101 | |
| | *TSR<17:16> | | | | | | | | | | |
| | * RETURN+EOS1A, | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | | | | |
| | * J/SBR01 | | --> | | | | | | | | |
| | ***** | | | | | | | | | | |
| | | | | 1555 | 1152 | 373 | | | | | |
| | | | | VV | | | | | | | |
| | | | | 1460 | 1111 | 360 | | | | | |

K13

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 347

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---|-------------|--|--------------------------|-----------------|------------|-------------|--|
| <pre> .TOC "BEGINNING OF EXAM ROUTINE." .: THIS ROUTINE ACCESSES THE UNIBUS .: ADDRESS SPECIFIED BY THE CONSOLE ADDRESS REGISTER AND DISPLAYS .: THE CONTENTS OF THAT LOCATION. SEQUENTIAL EXAMINES AUTOMATICALLY .: WORD INCREMENT THE CONSOLE ADDRESS REGISTER AND USE THE .: INCREMENTED ADDRESS. AN 'EXAM' BIT IN R(CNTL) IS USED FOR .: THIS PURPOSE. .CASE 4 OF BSDCD13 1059 EXM01:1137 F/SDCD13 <-- 1013 1010 333 ***** * *-----* *P2, D+D RIGHT 13,D(C)+ALU00, * *NEXT, * * J/EXM02 * --> VV ***** 1060 EXM02:1401 F/EXM01 <-- VV ***** * TEST 'EXAM' IN R(CNTL). BRANCH * * TARGETS ARE EXM03 AND * * EXM06. * *-----* *P2, D+CSP(12) D(C)+D(C), * *NEXT, BUTR(EXAM), * * * J/EXM03 * --> 10 1042 1061 347 * J/EXM06 * --> 11 1043 1065 349 ***** .CASE 1 OF BEXM02 1061 EXM03:1042 F/EXM02 <-- VV ***** * FROM EXM02 WHEN EXAM NOT SET. THIS IS * * THE FIRST EXAM. CLEAR 'EXAM' AND 'DEP' * * IN * * R(CNTL). * *-----* *P2, D+NOT(D) AND R(CNTL), * *P3, R(CNTL)+D, * *NEXT, * * J/EXM04 * --> 1402 1062 348 ***** </pre> | | | | | | | |
| | | | | | | | <pre> 1137 000000001000 1111 00 00 01 10 000 010 0100 0 01110 000000 11000 100000001 </pre> |
| | | | | | | | <pre> 1401 000000001000 1010 10 00 00 00 000 111 0100 0 00101 000000 01111 000100010 </pre> |
| | | | | | | | <pre> 1042 000000001000 0010 01 11 01 01 111 000 0100 0 00000 011100 11000 100000010 </pre> |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|------------|------------|-------------|-----------|--------|----------------|
| | | | | | | | | RIF | COUT | |
| 1062 | EXM04:1402 | F/EXM03 | <-- | 1042 | 1061 | 347 | 1402 | 00000000 | 1000 | |
| | *-----* | | | | | | | 1010 | 10 00 | 00 00 |
| | *P2, D+CSP(13),D(C)+ALU15, | | | | | | | 00100 | 000000 | 11000 |
| | *NEXT, | | | | | | | | | 000 100 0100 0 |
| | * J/EXM05 | | --> VV | | | | | | | 100000011 |
| 1063 | EXM05:1403 | F/EXM04 | <-- VV | 1403 | | | | 00000000 | 1000 | |
| | * SET 'EXAM', CLEAR | | | | | | | 1110 | 01 11 | 01 10 |
| | *'DEP' | | | | | | | 00000 | 011100 | 11000 |
| | *-----* | | | | | | | | | 111 000 0100 0 |
| | *P2, D+(D RIGHT 1) OR R(CNTL), | | | | | | | | | 100000100 |
| | *P3, R(CNTL)+D, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/EXM07A | | --> VV | | | | | | | |
| 1064 | EXM07A:1404 | F/EXM05 | <-- VV | 1404 | | | | 00000000 | 1000 | |
| | * THIS CLEARS R(CADRS)<00> WHICH MAKES AN | | | | | | | 0111 | 11 00 | 11 01 |
| | *ODD | | | | | | | 00000 | 000000 | 11000 |
| | *EVEN. | | | | | | | | | 111 111 0110 0 |
| | *-----* | | | | | | | | | 100000101 |
| | *P2, SR+NOT(ONE) AND R(CADRS), | | | | | | | | | |
| | * D(C)+D(C), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/EXM07 | | --> | 1405 | 1066 | 349 | | | | |

M13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 349

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|---------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|------|--------|--|
| | | | | | | | | RIF | COUT | | |
| 1065 | EXM06:1043 | F/EXM02 | <-- | 1401 | 1060 | 347 | | | | | |
| | ***** | | | | | | | | | | |
| | * GO TO SUBROUTINE D FOR INCREMENTING | | | | | | | | | | |
| | * CONSOLE ADDRESS BY 2. ENTER FROM EXM02 | | | | | | | | | | |
| | * WHEN 'EXAM' IS | | | | | | | | | | |
| | * SET | | | | | | | | | | |
| | -----* | | | | | | | | | | |
| | * RETURN+EXM07A, | | | | | | | | | | |
| | * NEXT, BUT(GO TO),PAGE+1, | | | | | | | | | | |
| | * J/SBRD01 | | | | | | | | | | |
| | ***** --> | | | | | | | | | | |
| | | | | 1560 | 1160 | 376 | | | | | |
| | | | | VV | | | | | | | |
| 1066 | EXM07:1405 | F/EXM07A | <-- | 1404 | 1064 | 348 | | | | | |
| | ***** | | | | | | | | | | |
| | * -----* | | | | | | | | | | |
| | * TURN OFF KT, | | | | | | | | | | |
| | * NEXT, J/EXM08 | | | | | | | | | | |
| | ***** --> VV | | | | | | | | | | |
| 1067 | EXM08:1406 | F/EXM07 | <-- VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| | * -----* | | | | | | | | | | |
| | * P1, BA+CONSOLE ADDRESS, | | | | | | | | | | |
| | * P3, U,DATI, | | | | | | | | | | |
| | * NEXT, J/EXM09 | | | | | | | | | | |
| | ***** --> VV | | | | | | | | | | |
| 1068 | EXM09:1410 | F/EXM08 | <-- VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| | * -----* | | | | | | | | | | |
| | * P3, MD+DATA, | | | | | | | | | | |
| | * NEXT, J/EXM10 | | | | | | | | | | |
| | ***** --> | | | | | | | | | | |
| | | | | 1411 | 1069 | 350 | | | | | |

```

1043      000000001000
0001 00 10 00 00 100 001 0000 0
0000 000000 11100 101110000

1405      000000001000
0001 00 00 00 00 000 010 0000 0
11001 000000 11000 100000110

1406      000000001000
0000 01 11 00 00 111 000 0001 0
10110 000000 11000 100001000

1410      000000001000
0000 11 10 00 00 000 000 0000 0
00000 100000 11000 100001001
    
```

N13

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--|--|--|--------------------------|---------------|------------|------------|-------------|-----------|-----|--------|
| | | | | | | | | RIF | COU | |
| 1069 | EXM10:1411 | F/EXM09 | <-- | 1410 1068 349 | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+MD, | | | | | | | | | |
| | *P3, R(TMPSW)+D, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/E0501 | | --> | 1462 1113 361 | | | | | | |
| | ***** | | | | | | | | | |
| .TOC "BEGINING OF 'LOAD ADDRESS' (LAD) ROUTINE." | | | | | | | | | | |
| :; TSR IS LOADED | | | | | | | | | | |
| :; INTO CONSOLE ADDRESS REGISTER. 'EXAM' AND 'DEP' BITS | | | | | | | | | | |
| :; IN R(CNTL) ARE CLEARED. | | | | | | | | | | |
| .CASE 3 OF BSDCD13 | | | | | | | | | | |
| 1070 | LAD01:1135 | F/SDCD13 | <-- | 1013 1010 333 | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+CSP(12),D(C)+ALU15, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LAD02 | | --> | VV | | | | | | |
| | ***** | | | | | | | | | |
| 1071 | LAD02:1412 | F/LAD01 | <-- | VV | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+NOT(D RIGHT 12) AND R(CNTL), | | | | | | | | | |
| | *P3, R(CNTL)+D, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LAD03 | | --> | VV | | | | | | |
| | ***** | | | | | | | | | |
| 1072 | LAD03:1413 | F/LAD02 | <-- | VV | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+CSP(12),D(C)+ALU15, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LAD04 | | --> | 1414 1073 351 | | | | | | |
| | ***** | | | | | | | | | |

```

1411
1010 11 10 00 01 101 000 0100 0
00000 010010 11000 100110010

1135
1010 10 00 00 00 000 100 0100 0
00101 000000 11000 100001010

1412
0010 01 11 01 01 111 000 0100 0
01110 011100 11000 100001011

1413
1010 10 00 00 00 000 100 0100 0
00101 000000 11000 100001100
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|-------------------------------------|---------------------------------------|-----------------------|---------------|--------------|---------|-----------|---------------------------|
| 1073 | LAD04:1414 | F/LAD03 | <-- | 1413 1072 350 | 1414 | | | 000000001000 |
| | *P2, D+(D RIGHT 4) AND R(CNTL), | | | | 1011 01 11 | 01 01 | 111 100 | 0100 0 |
| | *NEXT, D(C)+ALU15, | | | | 01000 000000 | 11000 | 100001101 | |
| | * J/LAD05 | | --> VV | | | | | |
| 1074 | LAD05:1415 | F/LAD04 | <-- VV | | 1415 | | | 000000001000 |
| | * R(CNTL)<1:0> GETS R(CNTL)<9:8> S0 | | | | 1110 01 11 | 01 01 | 111 000 | 0100 0 |
| | *CAR<17:16> GETS | | | | 00110 011100 | 11000 | 100001110 | |
| | *TSR<17:16> | | | | | | | |
| | *P2, D+(D RIGHT 8) OR R(CNTL), | | | | | | | |
| | *P3, R(CNTL)+D, | | | | | | | |
| | *NEXT, J/LAD06 | | --> VV | | | | | |
| 1075 | LAD06:1416 | F/LAD05 | <-- VV | | 1416 | | | 000000001000 |
| | *P2, D+R(TMPSW), | | | | 1111 00 00 | 11 01 | 101 000 | 0100 0 |
| | *NEXT, J/LAD07 | | --> VV | | 00000 000000 | 11000 | 100010000 | |
| 1076 | LAD07:1420 | F/LAD06 | <-- VV | | 1420 | | | 000000001000 |
| | *P2, R(CADRS)+D, | | | | 0000 00 00 | 00 01 | 111 000 | 0000 0 |
| | *NEXT, J/LAD08 | | --> | 1421 1077 352 | 00000 010010 | 11000 | 100010001 | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|--|-------------------------------|--|--------------------------|------|------------|------------|--------------------|----------------|--------------|
| | | | | | | | | RIF | COUT CLOCKS |
| 1077 | LAD08:1421 | F/LAD07 | <-- | 1420 | 1076 | 351 | | | |
| | ***** | | | | | | | 1421 | 000000001000 |
| | *-----* | | | | | | 1010 10 00 00 00 | 000 000 0100 0 | |
| | *P2, D+CSP(13), | | | | | | 00100 000000 11000 | 001110001 | |
| | *NEXT, | | | | | | | | |
| | * J/DISO1 | | --> | 1161 | 1054 | 345 | | | |
| | ***** | | | | | | | | |
| .TOC "THIS IS THE CONSOLE MAINT (INTERNAL EXAM OR DEPOSIT) ROUTINE." | | | | | | | | | |
| ;; THIS USES THE SAME CODE AS 'MED' INSTRUCTION. SO | | | | | | | | | |
| ;; WHAT IS NEEDED HERE IS MERELY AN ENTRY TO 'MED' FLOWS. | | | | | | | | | |
| CASE | 2 OF BSDCD13 | | | | | | | | |
| 1078 | INT01:1133 | F/SDCD13 | <-- | 1013 | 1010 | 333 | | | |
| | ***** | | | | | | | 1133 | 000000001000 |
| | *SELECT, EMIT AND CLKIR ENAB, | | | | | | 0000 00 00 00 01 | 000 100 0000 0 | |
| | *NEXT, | | | | | | 11001 000000 11000 | 100010010 | |
| | * J/INT02 | | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 1079 | INT02:1422 | F/INT01 | <-- | VV | | | | | |
| | ***** | | | | | | | 1422 | 000000001000 |
| | * IR+0, | | | | | | 0000 00 00 00 00 | 000 000 0000 0 | |
| | *NEXT, | | | | | | 11010 000000 11000 | 100010100 | |
| | * J/INT03 | | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 1080 | INT03:1424 | F/INT02 | <-- | VV | | | | | |
| | ***** | | | | | | | 1424 | 000000001000 |
| | *-----* | | | | | | 1111 00 00 11 00 | 111 000 0100 0 | |
| | *P2, D+R(SW), | | | | | | 00000 000000 11000 | 100010101 | |
| | *NEXT, | | | | | | | | |
| | * J/INT04 | | --> | 1425 | 1081 | 353 | | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UPF | EXTENSION | | CLOCK |
|--|---|--|--------------------------|------|------------|------------|-------------|-----------|--------|-------|
| | | | | | | | | RTE | COUT | |
| 1081 | INT04:1425 ***** *-----* * DBUF LATCH+D, * *NEXT, * * J/INT05 * ***** | <-- | 1424 1080 352 | 1425 | | | | 00000000 | 1000 | |
| | | | | | 0100 | 00 00 | 00 00 | 000 100 | 0000 0 | |
| | | | | | 11011 | 000000 | 11000 | 100010110 | | |
| 1082 | INT05:1426 ***** *-----* * BUT(GO TO),PAGE+3, * * J/MED02 * ***** | <-- VV | | 1426 | | | | 00000000 | 1000 | |
| | | | | | 0000 | 00 00 | 00 00 | 000 011 | 0000 0 | |
| | | | | | 00000 | 000000 | 11100 | 010111100 | | |
| | | --> | 3274 699 254 | | | | | | | |
| .TOC "BEGINING OF DEPOSIT (DEP) ROUTINE." ;; THIS DEPOSITS THE CONTENTS OF ;; THE TSR AT THE UNIBUS ADDRESS SPECIFIED BY THE CONSOLE ADDRESS ;; REGISTER. THE SWITCH REGISTER AND THE CONSOLE DATA REGISTER ARE ;; ALSO LOADED. SEQUENTIAL DEPOSITS AUTOMATICALLY WORD INCREMENT THE ;; CONSOLE ADDRESS REGISTER AND USE THE INCREMENTED ADDRESS. .CASE 1 OF BSDCD13 | | | | | | | | | | |
| 1083 | DEP01:1131 ***** * ENTER FROM SDCD13. D(C) GETS 'DEP' * *-----* *P2, D+D RIGHT 12,D(C)+ALU00, * *NEXT, * * J/DEP02 * ***** | <-- | 1013 1010 333 | 1131 | | | | 00000000 | 1000 | |
| | | | | | 1111 | 00 00 | 01 01 | 000 010 | 0100 0 | |
| | | | | | 01110 | 000000 | 11000 | 100011000 | | |
| 1084 | DEP02:1430 ***** * TEST 'DEP' IF NOT SET, FIRST DEPOSIT * *AND NO INCREMENTING * *NEEDED.BRANCH * *-----* *P2, D+CSP(12),D(C)+D(C), * *NEXT, BUTR(DEP), * * J/DEP03 * * J/DEP06 * ***** | <-- VV | | 1430 | | | | 00000000 | 1000 | |
| | | | | | 1010 | 10 00 | 00 00 | 000 111 | 0100 0 | |
| | | | | | 00101 | 000000 | 01111 | 000101010 | | |
| | | --> | 10 1052 1085 354 | | | | | | | |
| | | --> | 11 1053 1088 354 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|--|--------------------|---------------|-------|--------|-------|-----------|-----------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | UPF | RIF COUT CLOCKS |
| 1085 | DEPO3:1052 F/DEPO2 | <-- | 1430 1084 353 | 1052 | | | | 000000001000 |
| | *TARGETS ARE DEPO3 AND DEPO6. ENTER FROM * | | | 0010 | 01 11 | 01 01 | 111 000 | 0100 0 |
| | *DEPO2 WHEN 'DEP' IS SET CLEAR 'EXAM' * | | | 00000 | 011100 | 11000 | 100011010 | |
| | *AND 'DEP' * | | | | | | | |
| | *P2, D+NOT(D) AND R(CNTL), * | | | | | | | |
| | *P3, R(CNTL)+D, * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | J/DEPO4 | --> | VV | | | | | |
| 1086 | DEPO4:1432 F/DEPO3 | <-- | VV | 1432 | | | | 000000001000 |
| | *P2, D+CSP(13),D(C)+ALU15, * | | | 1010 | 10 00 | 00 00 | 000 100 | 0100 0 |
| | *NEXT, * | | | 00100 | 000000 | 11000 | 100011100 | |
| | J/DEPO5 | --> | VV | | | | | |
| 1087 | DEPO5:1434 F/DEPO4 | <-- | VV | 1434 | | | | 000000001000 |
| | * SET 'DEP', CLEAR * | | | 1110 | 01 11 | 01 11 | 111 000 | 0100 0 |
| | *'EXAM' * | | | 00000 | 011100 | 11000 | 100011101 | |
| | *P2, D+(D RIGHT 2) OR R(CNTL), * | | | | | | | |
| | *P3, R(CNTL)+D, * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | J/DEPO7A | --> | 1435 1089 355 | | | | | |
| .CASE | 2 OF BDEP02 | | | | | | | |
| 1088 | DEPO6:1053 F/DEPO2 | <-- | 1430 1084 353 | 1053 | | | | 000000001000 |
| | * ENTER FROM DEPO2 WHEN 'DEP' IS SET * | | | 0001 | 00 10 | 00 11 | 101 001 | 0000 0 |
| | *INCREMENT CONSOLE ADDRESS REG BY 2. * | | | 00000 | 000000 | 11100 | 101110000 | |
| | *P2, RETURN+DEPO7A, * | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, * | | | | | | | |
| | J/SBR001 | --> | 1560 1160 376 | | | | | |
| | | | VV | | | | | |
| | | | 1435 1089 355 | | | | | |

F14

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| 1089 | DEP07A:1435 ***** * CLEAR R(CADR)<00> TO MAKE THE ADDRESS * *EVEN * *-----* *P2, SR+NOT(ONE) AND R(CADRS), * *NEXT, * * J/DEP07B * ***** | <-- | 1434 1087 354 | 1435 | | | | 00000000 | 1000 | |
| | | | | | 0111 | 11 00 | 11 01 | 111 000 | 0010 | 0 |
| | | | | | 00000 | 000000 | 11000 | 100011110 | | |
| 1090 | DEP07B:1436 ***** *-----* *P2, D+R(TMPSW), * *NEXT, * * J/DEP07 * ***** | <-- VV | | 1436 | | | | 00000000 | 1000 | |
| | | | | | 1111 | 00 00 | 11 01 | 101 000 | 0100 | 0 |
| | | | | | 00000 | 000000 | 11000 | 100011111 | | |
| 1091 | DEP07:1437 ***** *-----* *NEXT, TURN OFF KT, * * J/DEP08 * ***** | <-- VV | | 1437 | | | | 00000000 | 1000 | |
| | | | | | 0001 | 00 00 | 00 00 | 000 010 | 0000 | 0 |
| | | | | | 11001 | 000000 | 11000 | 100100000 | | |
| 1092 | DEP08:1440 ***** *-----* *P1, BA+CONSOLE ADDRESS, * *P3 U,DATO, * *NEXT, * * J/EOS01 * ***** | <-- VV | | 1440 | | | | 00000000 | 1000 | |
| | | | | | 0000 | 01 11 | 00 00 | 111 000 | 0001 | 0 |
| | | | | | 10010 | 000000 | 11000 | 100110010 | | |
| | | | 1462 1113 361 | | | | | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF COUT | EXTENSION UPF | CLOCKS |
|---|--|---------------------------------------|-----------------------|--------------|---------|---------------|---------------------------------|--------|
| .TOC "THIS IS THE ROUTINE FOR START AND CONT FUNCTIONS." ;; THEY SHARE ;; THE CODE TO THE EXTENT POSSIBLE AND THEN DIVERGE. | | | | | | | | |
| CASE 1093 | 3 OF BSDCD09 STC01:1145 | F/SDCD09 | <-- | 1067 | 1005 | 331 | | |
| | * FROM SDCD09 IF START CLEAR 'DLOCK' IN * *R(CNTL) * *-----* *P2, D+NOT(D) AND R(CNTL), * *P3, R(CNTL)+D, * *NEXT, * * J/STC02 * --> VV | | | 1:45 | | | 000000001000 | |
| | | | | | | | 0010 01 11 01 01 111 000 0100 0 | |
| | | | | | | | 00000 011100 11000 001100111 | |
| CASE 1094 | 4 OF BSDCD09 STC02:1147 | F/SDCD09 | <-- | 1067 | 1005 | 331 | | |
| | * FROM SDCD09 IF CONT CLEAR 'CONSOLE' IN * *R(CNTL) AND STATUS * *BOARD * *-----* * RETURN+STC04, * *NEXT, BUT(GO TO),PAGE+1, * * J/SBREQ1 * --> | | | 1147 | | | 000000001000 | |
| | | | | | | | 0001 00 10 01 00 001 001 0000 0 | |
| | | | | | | | 00000 000000 11100 101110110 | |
| | | | | | | | ***** | |
| | | | | | | | 1566 1163 377 | |
| | | | | | | | VV | |
| | | | | 1441 | 1095 | 356 | | |
| 1095 | STC04:1441 | | | | | | | |
| | * THRU UCON * *-----* * CLEAR CSR, * * J/STC05 * --> VV | | | 1441 | | | 000000001000 | |
| | | | | | | | 0100 00 00 00 00 110 000 0000 0 | |
| | | | | | | | 11011 000000 11000 100100010 | |
| 1096 | STC05:1442 | F/STC04 | <-- VV | | | | | |
| | * TO REMOTE CONSOLE THRU UCON * *-----* * CMND COMPLETE, * * J/STC06 * --> | | | 1442 | | | 000000001000 | |
| | | | | | | | 0100 00 00 00 00 110 010 0000 0 | |
| | | | | | | | 11011 000000 11000 100100011 | |
| | | | | 1443 | 1097 | 357 | | |

H14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 357

| BOX NO. | TAG: ADDRESS | EXTENSION | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | RIF COUT | CLOCKS |
|------------|---|-------------------------|---------------------------------------|-----------------------|--------------|------------------|------------------|----------|---------------------|
| 1097 | STC06:1443 ***** * CLEAR * * TSR * *-----* * RETURN+STC07 * * NEXT, BUT(GO TO),PAGE+1, * * J/SBRB01 * ***** | F/STC05 000000001000 | 1442 | 1096 356 | 1443 | 0001 00 10 01 00 | 000000 11100 | 100 001 | 0000 0 101101010 |
| | | | 1552 | 1149 372 | | | | | |
| | | | VV | 1444 | 1098 357 | | | | |
| 1098 | STC07:1444 ***** * BRANCH TARGETS ARE STC09 AND * * STC08. * *-----* * P2, D+R(CADRS) * * NEXT, BUTR(SWC00), * * J/STC09 * *-----* * J/STC09 * --> 1110 1176 1100 357 * J/STC08 * --> 1111 1177 1099 357 ***** | | | | 1444 | 1111 00 00 11 01 | 000000 001111110 | 111 000 | 0100 0 |
| .CASE 1099 | 2 OF BSTC07 STC08:1177 ***** * FROM STC07 FOR 'CONTINUE' ROUTINE * *-----* * NEXT, BUT(GO TO),PAGE+0, * * J/FET01 * --> 702 1 2 ***** | F/STC07 000000001000 | | | 1177 | 0000 00 00 00 00 | 000000 11100 | 000 000 | 0000 0 111000010 |
| .CASE 1100 | 1 OF BSTC07 STC09:1176 ***** * FROM STC07.THIS IS START ROUTINE. * *-----* * P2, PC+D (A ADDR), * * NEXT, * * J/STC12 * --> 1446 1101 358 ***** | F/STC07 000000001000 | | | 1176 | 0000 00 00 00 01 | 000000 100100110 | 111 000 | 0000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR 1446 | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|-----------------------|---|--|-----------------------------------|--------------|------------|--------------|--------------|---------------------------|------------------|
| 1101 | STC12:1446 ***** *-----* *SELECT, EMIT, *NEXT, * J/STC13 ***** | <-- | 1176 1100 357 | 1446 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000 000 100101000 | 0000 0000 1000 0 |
| 1102 | STC13:1450 ***** *-----* * MD+35775 (BC), *NEXT, * J/STC14 ***** | <-- VV | | 1450 | 0011 00010 | 10 10 100000 | 11 11 11000 | 111 101 100101010 | 0000 0000 1000 0 |
| 1103 | STC14:1452 ***** * INITIALIZE AND GO TO *FETO1. *-----* *NEXT, BUT(GO TO),PAGE+3, * J/INIT00 ***** | <-- VV | | 1452 | 0000 00000 | 00 00 000000 | 00 00 11100 | 000 011 100010000 | 0000 0000 1000 0 |
| .TOC .CASE 1104 | "DIAG" 1 OF BSDC09 DIAG01:1141 ***** *-----* * START DCS, *NEXT, * J/DIAG02 ***** | <-- | 3420 834 284 1067 1005 331 | | 1141 | 0010 11011 | 00 00 000000 | 00 00 100 100101100 | 000 100 0000 0 |
| | | --> | 1454 1105 359 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------|-----------------------------|---------------------------------------|-----------------------|--------------------------------|--------------|---------|-----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1105 | DIAG02:1454 | F/DIAG01 | <-- | 1141 1104 358 | 1454 | | | 00000000 | 1000 | |
| | *-----* | | | | 1111 00 00 | 11 00 | 101 011 | 0100 | 0 | |
| | *P2, D+WHAMI, D(C)+ALU07, | | | | 00000 000000 | 11000 | 100101110 | | | |
| | *NEXT, J/DIAG03 | | --> VV | | | | | | | |
| 1106 | DIAG03:1456 | F/DIAG02 | <-- VV | | 1456 | | | 00000000 | 1000 | |
| | *-----* | | | | 0000 00 00 | 00 00 | 000 000 | 0000 | 0 | |
| | *NEXT, BUTR(WCS OR ECS), | | | | 00000 000000 | 01111 | 101001010 | | | |
| | * J/DIAG04 | | --> | 10 1512 1107 359 | | | | | | |
| | * J/DIAG05 | | --> | 11 1513 1108 359 | | | | | | |
| | *-----* | | | | | | | | | |
| .CASE 1107 | 1 OF BDIAG03 DIAG04:1512 | F/DIAG03 | <-- VV | | 1512 | | | 00000000 | 1000 | |
| | *-----* | | | | 0000 00 00 | 00 00 | 000 000 | 0000 | 0 | |
| | *NEXT, J/EOS1A | | --> | 1460 1111 360 | | | | | | |
| .CASE 1108 | 2 OF BDIAG03 DIAG05:1513 | F/DIAG03 | <-- | 1456 1106 359 | 1513 | | | 00000000 | 1000 | |
| | *-----* | | | | 0000 00 00 | 00 00 | 000 110 | 0000 | 0 | |
| | *NEXT, BUT(GO TO) PAGE+6, | | | | 00000 000000 | 11100 | 000001000 | | | |
| | * J/WCSDIAG01 | | --> VV | | | | | | | |
| | *-----* | | | | | | | | | |
| 1109 | WCSDIAG01:6010 | F/DIAG05 F/WCSDIAG01 | <-- <-- | 1513 1108 359 6010 1109 359 | 6010 | | | 00000000 | 1000 | |
| | *-----* | | | | 0000 00 00 | 00 00 | 000 000 | 0000 | 0 | |
| | *NEXT, J/WCSDIAG01 | | --> | 6010 1109 359 | | | | 000001000 | | |
| | *-----* | | | | 00000 000000 | 11000 | 000001000 | | | |

K14

PROGRAM FLOWS

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|--|--|-----------------------|------|---------|---------|----------|-----------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| 1110 | BOOT:1143 | F/SDCD09 | <-- | 1067 | 1005 | 331 | | | |
| | * CLEAR 'CONSOLE' IN R(CNTL) AND IN * *STATUS * *BOARD. * | | | | | | | | |
| | *-----* | | | | | | | | |
| | * RETURN+BOOT01 * *NEXT, BUT(GO TO),PAGE+1, * * J/SBREQ1 * | | | | | | | | |
| | ***** --> | | | | | | | | |
| | | | | 1566 | 1163 | 377 | | | |
| | | | | VV | | | | | |
| | | | | 1112 | 452 | 180 | | | |
| | .TOC "BEGINNING OF EOS (END OF SERVICE) ROUTINE." ;; THIS ROUTINE DISPLAYS TSR, SENDS A CMND COMPLETE TO REMOTE ;; CONSOLE, CLEARS CSR (WHICH ALSO CLEARS SWCD LATCH) AND TESTS ;; 'CONSOLE' BIT TO LEAVE THE CONSOLE OR STAY IN CONSOLE. | | | | | | | | |
| | | F/MEDZ4 | <-- | 3507 | 728 | 262 | | | |
| | | F/LSR08 | <-- | 1373 | 1053 | 345 | | | |
| 1111 | EOS1A:1460 | F/DIAG04 | <-- | 1512 | 1107 | 359 | | | |
| | *-----* | | | | | | | | |
| | *P2, D+CSP(12), * *NEXT, * * J/EOS1B * --> VV | | | | | | | | |
| | ***** --> | | | | | | | | |
| 1112 | EOS1B:1461 | F/EOS1A | <-- VV | | | | | | |
| | * CLEARS "EXAM" AND "DEP" IN R(CNTL). * *-----* | | | | | | | | |
| | *P2, D+NOT(D) AND R(CNTL), * *P3, R(CNTL)+D, * *NEXT, * * J/EOS01 * --> | | | | | | | | |
| | ***** --> | | | 1462 | 1113 | 361 | | | |

```

1143
0001 00 00 10 01 010 001 0000 0
00000 000000 11100 101110110
    
```

```

1460
1010 10 00 00 00 000 000 0100 0
00101 000000 11000 100110001
    
```

```

1461
0010 01 11 01 01 111 000 0100 0
00000 011100 11000 100110010
    
```

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|---|---------------------------------------|-----------------------|--|---------|---------|----------|---|--------|
| 1113 | E0S01:1462 | F/EXM10 F/DEPO8 F/E0S1B | <-- <-- <-- | 1411 1069 350 1440 1092 355 1461 1112 360 | 1462 | | | 000000001000 | |
| | * CALL SUBROUTINE A (SBRA) WHICH DISPLAYS * *THE CONTENTS OF TSR IN CONSOLE, AND * *RETURN TO * *E0S02. * *-----* * RETURN+E0S02, * *NEXT, BUT(GO TO),PAGE+1, * * J/SBRA01 * *-----* *-----* | | | | | | | 0001 00 10 01 10 011 001 0000 0 00000 000000 11100 101000101 | |
| | | | --> | ***** 1505 1132 367 ***** VV 1463 1114 361 | | | | | |
| 1114 | E0S02:1463 | | | | 1463 | | | 000000001000 | |
| | * CALL SUBROUTINE B (SBRB) WHICH CLEARS * *TSR. AND RETURN TO * *E0S03. * *-----* * RETURN+E0S03, * *NEXT, BUT(GO TO),PAGE+1, * * J/SBRB01 * *-----* *-----* | | | | | | | 0001 00 10 01 10 100 001 0000 0 00000 000000 11100 101101010 | |
| | | | --> | ***** 1552 1149 372 ***** VV 1464 1115 361 | | | | | |
| 1115 | E0S03:1464 | | | | 1464 | | | 000000001000 | |
| | * TO REMOTE CONSOLE * *-----* * CMND COMPLETE, * *NEXT, * * J/E0S03A * *-----* *-----* | | | | | | | 0100 00 00 00 00 110 010 0000 0 11011 000000 11000 100110101 | |
| | | | --> VV | | | | | | |
| 1116 | E0S03A:1465 | F/E0S03 | <-- VV | | 1465 | | | 000000001000 | |
| | *-----* *P2, D+R(CNTL),D(C)+ALU07, * *NEXT, * * J/E0S3B * *-----* *-----* | | | | | | | 1010 01 11 00 00 111 011 0100 0 00000 000000 11000 100111000 | |
| | | | --> | 1470 1117 362 | | | | | |

M14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 362

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | | |
|-----------|--|--|--------------------------|------|------------|------------|-------------|-----------|----------|----------|-----------|---------|--------|
| | | | | | | | | RIF | COUT | CLOCKS | | | |
| 1117 | E0S3B:1470 | F/E0S03A | <-- | 1465 | 1116 | 361 | | | | | | | |
| | ***** | | | | | | | 1470 | 00000000 | 1000 | | | |
| | * BRANCH TARGETS E0S05 | | | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | *-----* | | | | | | | 00000 | 000000 | 01111 | 100111010 | | |
| | *NEXT, BUTR(SI), | | | | | | | | | | | | |
| | * J/E0S04 | J/E0S04 | --> | 10 | 1472 | 1118 | 362 | | | | | | |
| | * J/E0S05 | J/E0S05 | --> | 11 | 1473 | 1122 | 363 | | | | | | |
| | ***** | | | | | | | | | | | | |
| CASE 1118 | 1 OF BE0S3B | F/E0S3B | <-- VV | | | | | | | | | | |
| | E0S04:1472 | F/E0S3B | | 1472 | | | | | | 00000000 | 1000 | | |
| | ***** | | | | | | | 1111 | 00 00 | 01 11 | 000 010 | 0100 0 | |
| | * D(C) GETS R(CNTL)<6>. THIS BIT IS SET BY | | | | | | | 01000 | 000000 | 11000 | 100111001 | | |
| | *BASE MACHINE BEFORE ENTERING CONSOLE | | | | | | | | | | | | |
| | * WHEN EXECUTING A MOVE | | | | | | | | | | | | |
| | *TO | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *P2, D+D RIGHT 6, D(C)+ALU00, | | | | | | | | | | | | |
| | *NEXT, J/E0S04A | J/E0S04A | --> VV | | | | | | | | | | |
| | ***** | | | | | | | | | | | | |
| 1119 | E0S04A:1471 | F/E0S04 | <-- VV | | | | | | | | | | |
| | ***** | | | | | | | 1471 | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 |
| | *177570 WHICH IS THE SWITH REGISTER | | | | | | | 00000 | 000000 | 10011 | 110001001 | | |
| | *ADDRESS. TARGETS | | | | | | | | | | | | |
| | *E0S04C | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | | | | |
| | * J/E0S04B | J/E0S04B | --> | 01 | 1611 | 1120 | 363 | | | | | | |
| | * J/E0S04C | J/E0S04C | --> | 11 | 1613 | 1121 | 363 | | | | | | |
| | ***** | | | | | | | | | | | | |

N14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|---|--|---|------|------------|------------|-------------|--------------------|----------------|
| | | | | | | | | RIF | COUT CLOCKS |
| .CASE | 1 OF BE0S04A | | | | | | | | |
| 1120 | E0S04B:1611 | F/SDC006 <-- F/SDC008 <-- F/E0S04A <-- | 1156 1002 330 1066 1004 331 1471 1119 362 | | | | | | |
| | ***** * CLEAR CSR. ENTERED ALSO FROM SDC006 AND * * SDC008 * *-----* | | | | | | | 1611 | 000000001000 |
| | *P3, CLEAR CSR, * | | | | | | | 0100 00 00 00 00 | 110 000 0000 0 |
| | *NEXT, * | | | | | | | 11011 000000 11000 | 100111011 |
| | * J/E0S05 * | --> | 1473 1122 363 | | | | | | |
| .CASE | 2 OF BE0S04A | | | | | | | | |
| 1121 | E0S04C:1613 | F/SDC006 <-- F/SDC008 <-- F/E0S04A <-- | 1156 1002 330 1066 1004 331 1471 1119 362 | | | | | | |
| | ***** *NEXT, * | | | | | | | 1613 | 000000001000 |
| | * J/E0S05 * | --> VV | | | | | | 0000 00 00 00 00 | 000 000 0000 0 |
| | ***** | | | | | | | 00000 000000 11000 | 100111011 |
| .CASE | 2 OF BE0S3B | | | | | | | | |
| 1122 | E0S05:1473 | F/E0S3B <-- | 1470 1117 362 | | | | | | |
| | ***** * D(C) GETS * * 'CONSOLE' * *-----* | | | | | | | 1473 | 000000001000 |
| | *P2, D+R(CNTL),D(C)+ALU15, * | | | | | | | 1010 01 11 00 00 | 111 100 0100 0 |
| | *NEXT, * | | | | | | | 00000 000000 11000 | 100111100 |
| | * J/E0S06 * | --> | 1474 1123 364 | | | | | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|--------|----------------------|
| | | | | | | | | RIF | COUT | |
| 1123 | E0S06:1474 | F/E0S05 | <-- | 1473 | 1122 | 363 | | | | |
| | ***** | | | | | | | | | |
| | * TEST 'CONSOLE'.BRANCH TARGETS E0S07 | | | 1474 | | | | 00000000 | 1000 | |
| | *AND | | | | | | | 0000 | 00 00 | 00 00 000 000 0000 0 |
| | *E0S07A. | | | | | | | 00000 | 000000 | 01111 000000110 |
| | -----* | | | | | | | | | |
| | *NEXT, NULL, NULL, | | | | | | | | | |
| | * BUTR(CONSOLE), | | | | | | | | | |
| | * J/E0S07 | | --> | 10 | 1006 | 1124 | 364 | | | |
| | * J/E0S07A | | --> | 11 | 1007 | 1125 | 364 | | | |
| | ***** | | | | | | | | | |
| CASE 1124 | 1 OF BE0S06 | F/E0S06 | <-- VV | | | | | | | |
| | E0S07:1006 | | | 1006 | | | | 00000000 | 1000 | |
| | ***** | | | | | | | | | |
| | * ENTER FROM E0S06 IF 'CONSOLE' NOT SET. | | | | | | | 0000 | 00 00 | 00 00 000 000 0000 0 |
| | *LEAVE CONSOLE FLOWS AND ENTER MAIN | | | | | | | 00000 | 000000 | 11100 000000011 |
| | *SERVICE | | | | | | | | | |
| | *ROUTINE. | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | |
| | ***** | | | | | | | | | |
| CASE 1125 | 2 OF BE0S06 | F/E0S06 | <-- | 1474 | 1123 | 364 | | | | |
| | E0S07A:1007 | | | 1007 | | | | 0100 | 01 00 | 00 00 000 000 0000 0 |
| | ***** | | | | | | | | | |
| | *SELECT, KBUS(STATUS), | | | | | | | 11001 | 000000 | 11000 100111101 |
| | *NEXT, | | | | | | | | | |
| | * J/E0S08 | | --> | 1475 | 1126 | 365 | | | | |
| | ***** | | | | | | | | | |

C15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|---|--|--------------------------|--------------------------------|------------|------------|-------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| 1126 | EOS08:1475 | F/EOS07A F/EOS12 | <-- <-- | 1007 1125 364 1062 1130 366 | | | | | | |
| | ***** | | | | | | | | | |
| | * READ STATUS REGISTER . EOS08 TO EOS11 * | | | | | | | | | |
| | *TEST IF CSR IS SET OR * | | | | | | | | | |
| | *NOT. * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P3, MD+KBUS(STATUS), * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/EOS09 * --> VV | | | | | | | | | |
| 1127 | EOS09:1500 | F/EOS08 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+MD, * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/EOS10 * --> VV | | | | | | | | | |
| 1128 | EOS10:1502 | F/EOS09 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+D RIGHT 4,D(C)+ALU00, * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/EOS11 * --> VV | | | | | | | | | |
| 1129 | EOS11:1504 | F/EOS10 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * BRANCH TARGETS ARE EOS12 AND EOS13. * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+R(CNTL),D(C)+D(C), * | | | | | | | | | |
| | *NEXT, BUTR(CSR), * | | | | | | | | | |
| | * J/EOS12 * --> 10 1062 1130 366 | | | | | | | | | |
| | * J/EOS13 * --> 11 1063 1131 366 | | | | | | | | | |
| | ***** | | | | | | | | | |

1475
0000 11 10 00 00 000 000 0000 0
00000 100000 11000 101000000

1500
1010 11 10 00 00 000 000 0100 0
00000 000000 11000 101000010

1502
1111 00 00 01 01 000 010 0100 0
01000 000000 11000 101000100

1504
1010 01 11 00 00 111 111 0100 0
00000 000000 01111 000110010

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1130 | 1 OF BE0S11 | | | | | | | | | |
| | EOS12:1062 | F/E0S11 | <-- | 1504 | 1129 | 365 | | | | |
| | ***** | | | | | | | | | |
| | * ENTER FROM EOS11 IF 'CSR' NOT SET. READ * *AND TEST 'CSR' * *AGAIN. * *-----* | | | | | | | | | |
| | NULL, NULL, | | | | | | | | | |
| | *NEXT, | J/E0S08 | *--> | 1475 | 1126 | 365 | | | | |
| ***** | | | | | | | | | | |
| .CASE 1131 | 2 OF BE0S11 | | | | | | | | | |
| | EOS13:1063 | F/E0S11 | <-- | 1504 | 1129 | 365 | | | | |
| | ***** | | | | | | | | | |
| | * ENTER FROM EOS11 IF 'CSR' SET. GO TO * *SDC01 TO READ AND * *DECODE * *-----* | | | | | | | | | |
| | NULL, NULL, | | | | | | | | | |
| | *NEXT, | J/SDC01 | *--> | 1002 | 994 | 328 | | | | |
| ***** | | | | | | | | | | |

1062
 0000 00 00 00 00 000 000 0000 0
 00000 000000 11000 100111101

1063
 0000 00 00 00 00 000 000 0000 0
 00000 000000 11000 000000010

E15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX | PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|--|-------------------|----------------------------------|------|-----------------------|--------------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| .TOC "BEGINNING OF 'SBRA'" | | | | | | | | | | |
| ;; SUBROUTINE WHICH MOVES TSR | | | | | | | | | | |
| ;; TO THE CONSOLE DISPLAY SCRATCHPAD WHICH IS CONTINUOUSLY | | | | | | | | | | |
| ;; SCANNED AND DISPLAYED IN CONSOLE. | | | | | | | | | | |
| | F/CONDIAG16 | <-- | | 3502 474 186 | | | | | | |
| | F/NMRC12 | <-- | | 1343 1028 338 | | | | | | |
| | F/EOS01 | <-- | | 1462 1113 361 | | | | | | |
| ***** | | | | | | | | | | |
| * | SUBROUTINE SBRA01 | * | | | | | | | | |
| | RETURN/CONDIAG07 | * --> | | 3025 464 184 | | | | | | |
| | RETURN/EOS03 | * --> | | 1464 1115 361 | | | | | | |
| | RETURN/EOS02 | * --> | | 1463 1114 361 | | | | | | |
| ***** | | | | | | | | | | |

F15

```
1132 SBRA01:1505
*****
*CONSOLE SWITCH CODE.
*-----*
*P3,          CLEAR WRITE COUNTER,
*NEXT,
*                J/SBRA02
***** --> VV
1133 SBRA02:1506          F/SBRA01 <-- VV
*****
*-----*
*P2,          D+R(TMPSW),SR+R(TMPSW),
*NEXT,
*                J/SBRA03
***** --> VV
1134 SBRA03:1507          F/SBRA02 <-- VV
*****
* DISPLAY SP(00) GETS D<5:0> AND HENCE
*TSR<5:0>
*-----*
*P3,          STROBE DISPLAY,
*NEXT,
*                J/SBRA04
***** -->
```

1514 1135 368

```
1505
0100 00 00 00 00 00000001000
11011 000000 11000 101000110
```

```
1506
1111 00 00 11 01 00000001000
00000 000000 11000 101000111
```

```
1507
0100 00 00 00 00 00000001000
11011 000000 11000 101001100
```

G15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 368

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | EXTENSION | | | | CLOCK |
|---------|---|--|--------------------------|------|---------------|-----------------|----------------|---|-------|
| | | | | | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | |
| 1135 | SBRA04:1514 ***** * FOR SUBSEQUENT LOADING *OF *-----* *P3, INC WRITE COUNTER, *NEXT, * J/SBRA05 ***** | <-- | 1507 1134 367 | 1514 | 0100 11011 | 00 00 000000 | 00 00 11000 | 000000001000 100 000 0000 0 101001101 | 0 |
| 1136 | SBRA05:1515 ***** *DISPLAY SP(01) *-----* *SELECT, EMIT, *NEXT, * J/SBRA06 ***** | <-- VV | | 1515 | 0000 11001 | 00 00 000000 | 00 01 11000 | 000000001000 000 000 0000 0 101001110 | 0 |
| 1137 | SBRA06:1516 ***** * CONSTANT FOR RES FOR SHIFTING (D # SR) *RIGHT. *-----* *P3, MD+020000 (BC), *NEXT, * J/SBRA07 ***** | <-- VV | | 1516 | 0010 00010 | 10 00 100000 | 00 00 11000 | 000000001000 000 000 0000 0 101001111 | 0 |
| 1138 | SBRA07:1517 ***** *-----* *P1, RES+MD, *NEXT, * J/SBRA08 ***** | <-- VV | | 1517 | 0000 00000 | 11 10 010001 | 00 00 11000 | 000000001000 000 000 0000 0 101010000 | 0 |
| | | | 1520 1139 369 | | | | | | |

H15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 369

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1139 | SBRA08:1520 ***** *-----* *P2, D+R(CNTL), * *NEXT, * * J/SBRA09 * ***** | <-- | 1517 1138 368 | 1520 | | | | 00000000 | 1000 | |
| | | | | | 1010 | 01 11 | 00 00 | 111 000 | 0100 | 0 |
| | | | | | 00000 | 000000 | 11000 | 101010010 | | |
| 1140 | SBRA09:1522 ***** * D<1:0> GETS * *TSR<17:16> * *-----* *P2, D+D RIGHT 8, * *NEXT, * * J/SBRA10 * ***** | <-- VV | | 1522 | | | | 00000000 | 1000 | |
| | | | | | 1111 | 00 00 | 01 01 | 000 000 | 0100 | 0 |
| | | | | | 00110 | 000000 | 11000 | 101010100 | | |
| 1141 | SBRA10:1524 ***** * (D # SR) SHIFTED RIGHT BY * *1 * *-----* *P2, D+D RIGHT 1,CLKSR/YES, * *NEXT, * * J/SBRA11 * ***** | <-- VV | | 1524 | | | | 00000000 | 1000 | |
| | | | | | 1111 | 00 00 | 01 10 | 000 000 | 0110 | 0 |
| | | | | | 00000 | 000000 | 11000 | 101010110 | | |
| 1142 | SBRA11:1526 ***** * (D # SR) SHIFTED RIGHT BY 1 SR<15:0> = * *TSR<17:2> * *-----* *P2, D+D RIGHT 1,CLKSR/YES, * *NEXT, * * J/SBRA12 * ***** | <-- VV | | 1526 | | | | 00000000 | 1000 | |
| | | | | | 1111 | 00 00 | 01 10 | 000 000 | 0110 | 0 |
| | | | | | 00000 | 000000 | 11000 | 101011100 | | |
| | | --> | 1534 1143 370 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|--|---------------------------------------|-----------------------|------|------------------|--------------------|----------------|-------------------|------|--------|
| 1143 | SBRA12:1534 ***** * D<15:0> = TSR<17:2> TO CLEAR * *RES * *-----* *P2, D+SR, RES+CSP(13), * *NEXT, * * J/SBRA13 * --> VV ***** | F/SBRA11 <-- | 1526 1142 369 | 1534 | | | | 000000001000 | | |
| | | | | | 1111 10 00 00 00 | 00100 010001 11000 | 000 000 0100 0 | 10101110 | | |
| 1144 | SBRA13:1536 ***** * D<11:0> = * *TSR<17:6> * *-----* *P2, D+D RIGHT 4, * *NEXT, * * J/SBRA14 * --> VV ***** | F/SBRA12 <-- VV | | 1536 | | | | 000000001000 | | |
| | | | | | 1111 00 00 01 01 | 01000 000000 11000 | 000 000 0100 0 | 101100100 | | |
| 1145 | SBRA14:1544 ***** * DISPLAY SP(01) GETS D <5:0> AND HENCE * *TSR<11:6> * *-----* *P3, STROBE DISPLAY, * *NEXT, * * J/SBRA15 * --> VV ***** | F/SBRA13 <-- VV | | 1544 | | | | 000000001000 | | |
| | | | | | 0100 00 00 00 00 | 11011 000000 11000 | 000 001 0000 0 | 101100110 | | |
| 1146 | SBRA15:1546 ***** * FOR SUBSEQUENT LOADING OF DISPLAY * *SP(10) * *-----* *P3, INC WRITE COUNTER, * *NEXT, * * J/SBRA16 * --> VV ***** | F/SBRA14 <-- VV | 1550 1147 371 | 1546 | | | | 000000001000 | | |
| | | | | | 0100 00 00 00 00 | 11011 000000 11000 | 100 000 0000 0 | 101101000 | | |

K15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 372

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| | .TOC "BEGINNING OF 'SBRB'" | | | | | | |
| | :: SUBROUTINE WHICH CLEARS TSR (TEMPORARY SWITCH REGISTER) | | | | | | |
| | :: TSR<17:00> = RCCNTL<9:8> R(TMP.SW)<15:0> | | | | | | |
| | F/STC06 | <-- | 1443 1097 357 | | | | |
| | F/EOS02 | <-- | 1463 1114 361 | | | | |
| ***** | | | | | | | |
| * | SUBROUTINE SBRB01 | * | | | | | |
| | RETURN/STC07 | * --> | 1444 1098 357 | | | | |
| | RETURN/EOS03 | * --> | 1464 1115 361 | | | | |
| ***** | | | | | | | |

L15

```
1149 SBRB01:1552
*****
* CLEARS TSR<15:00>
*-----*
*P2,      D←D,
*P3,      R(TMPSW)←D,
*NEXT,
*          J/SBRB02
***** --> VV
1150 SBRB02:1553      F/SBRB01 <-- VV
*****
*-----*
*P2,      D←CSP(12),D(C)←ALU15,
*NEXT,
*          J/SBRB03
***** --> VV
1151 SBRB03:1554      F/SBRB02 <-- VV
*****
* CLEARS
*TSR<17:16>
*-----*
*P2,
*          D←(NOT(D RIGHT 4)) AND
*          R CNTL),
*P3,      R(CNTL)←D,
*NEXT,
*          BUT(RETURN)
***** --> VV
*****
```

```
1552
0011 00 00 00 01 101 000 0100 0
00000 010010 11000 101101011
```

```
1553
1010 10 00 00 00 000 100 0100 0
00101 000000 11000 101101100
```

```
1554
0010 01 11 01 01 111 000 0100 0
01000 011100 11111 000000000
```

M15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 373

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|---|---------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF |
| | .TOC "BEGINING OF 'SBRC'" | | | | | | | | | | |
| | :: SUBROUTINE WHICH MOVES SR<1:0> TO | | | | | | | | | | |
| | :: R(CNTL) <9:8> WHICH REPRESENT TSR<17:16> | | | | | | | | | | |
| | | F/NMRC11 | <-- | 1342 | 1027 | 338 | | | | | |
| | | F/HLT05 | <-- | 1351 | 1034 | 340 | | | | | |
| | | F/DIS06 | <-- | 1400 | 1058 | 346 | | | | | |
| ***** | | | | | | | | | | | |
| * | SUBROUTINE SBRC01 | | * | | | | | | | | |
| | | RETURN/NMRC12 | * --> | 1343 | 1028 | 338 | | | | | |
| | | RETURN/EOS1A | * --> | 1460 | 1111 | 360 | | | | | |
| | | RETURN/EOS1A | * --> | 1460 | 1111 | 360 | | | | | |
| ***** | | | | | | | | | | | |

N15

```

1152 SBRC01:1555
*****
*P2,      D+CSP(12),D(C)+ALU15,      *
*NEXT,                                         *
*                J/SBRC02              * --> VV
*****
1153 SBRC02:1556      F/SBRC01      <-- VV
*****
* CLEARS TSR <17:16> IN                    *
*R(CNTL)<9:8>                                *
*-----*
*P2,      D+(NOT(D RIGHT 4)) AND          *
*                R(CNTL)                  *
*P3,      R(CNTL)+D,                      *
*NEXT,                                         *
*                J/SBRC03              * --> VV
*****
1154 SBRC03:1557      F/SBRC02      <-- VV
*****
* BRANCH TARGETS ARE SBRC04,              *
*SBRC05,SBRC06,SBRC07.                    *
*-----*
*P2,      D+CSP(13),D(C)+ALU15,          *
*NEXT,      BUTR(SR01#SR00),              *
*                J/SBRC04                  *
*                J/SBRC04                  * --> 1100 1214 1155 374
*                J/SBRC05                  * --> 1101 1215 1156 374
*                J/SBRC06                  * --> 1110 1216 1157 374
*                J/SBRC07                  * --> 1111 1217 1158 375
*****

```

```

1555      000000001000
1010 10 00 00 00 000 100 0100 0
00101 000000 11000 101101110

```

```

1556      000000001000
0010 01 11 01 01 111 000 0100 0
01000 011100 11000 101101111

```

```

1557      000000001000
1010 10 00 00 00 000 100 0100 0
00100 000000 00000 010001100

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------------|---|--|--------------------------|-------------|------------|------------|-------------|---|
| .CASE 1155 | 1 OF BSBR03 SBR04:1214 | F/SBR03 | <-- | 1557 | 1154 | 373 | | |
| | ***** * ENTER FROM SBR03 WHEN SR<1:0> = 00 00 * * NOTHING. * -----* * NULL, NULL, * * NEXT, * * BUT<RETURN> * --> VV ***** | | | | | | | 1214 0000 00 00 00 00 000 000 0000 0 00000 000000 11111 000000000 |
| .CASE 1156 | 2 OF BSBR03 SBR05:1215 | F/SBR03 | <-- | 1557 | 1154 | 373 | | |
| | ***** * ENTER FROM SBR03 WHEN SR<1:0> = 01. * * MAKE R<CNTL><9:8> = * * 01 * -----* * P2, D+(D RIGHT 6) OR R<CNTL>, * * R<CNTL>+D, * * NEXT, * * BUT<RETURN> * --> VV ***** | | | | | | | 1215 1110 01 11 01 11 111 000 0100 0 01000 011100 11111 000000000 |
| .CASE 1157 | 3 OF BSBR03 SBR06:1216 | F/SBR03 | <-- | 1557 | 1154 | 373 | | |
| | ***** * ENTER FROM SBR03 WHEN, SR<1:0> = 10 * * MAKE R<CNTL><9:8> = * * 10. * -----* * P2, D+(D RIGHT 5) OR R<CNTL>, * * P3, R<CNTL>+D, * * NEXT, * * BUT<RETURN> * --> VV ***** | | | | | | | 1216 1110 01 11 01 10 111 000 0100 0 01000 011100 11111 000000000 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------------|---------|----------|---------------------------|
| 1158 | SBRC07:1217 | F/SBRC03 | <-- | 1557 1154 373 | | | |
| | * ENTER FROM SBRC02 WHEN SR<1:0> = *11. | | | 1217 | | | 000000001000 |
| | | | | 1010 10 00 00 00 | | | 000 100 0100 0 |
| | | | | 00101 000000 11000 | | | 000010001 |
| | *P2, D+CSP(12), D(C)+ALU15, *NEXT, J/SBRC08 | | --> VV | | | | |
| 1159 | SBRC08:1021 | F/SBRC07 | <-- VV | | | | |
| | * MAKE R(CNTL)<9:8> = *11 | | | 1021 | | | 000000001000 |
| | | | | 1110 01 11 01 01 | | | 111 000 0100 0 |
| | | | | 01000 011100 11111 | | | 000000000 |
| | *P2, D+(D RIGHT 4) OR R(CNTL), *P3, R(CNTL)+D, *NEXT, BUT(RETURN) | | --> VV | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| | .TOC "BEGINING OF 'SBRD'" | | | | | | |
| | :: SUBROUTINE WHICH INCREMENTS CONSOLE ADDRESS | | | | | | |
| | :: BY 2. THIS IS USED IN EXM DEP ROUTINES. CONSOLE ADDRESS IS FORMED | | | | | | |
| | :: BY CAR<17:00>=R(CNTL)<01:00>*R(CADRS)<15:00>. | | | | | | |
| | F/EXM06 | <-- | 1043 1065 349 | | | | |
| | F/DEP06 | <-- | 1053 1088 354 | | | | |
| | ***** | | | | | | |
| * | SUBROUTINE SBRD01 | * | | | | | |
| | RETURN/EXM07A | * --> | 1404 1064 348 | | | | |
| | RETURN/DEP07A | * --> | 1435 1089 355 | | | | |
| | ***** | | | | | | |

```
1160 SBRD01:1560
*****
*-----*
*P2,      D+R(CADRS) PLUS 2,D(C)+COUT15,*
*P3,      R(CADRS)+D,*
*NEXT,    J/SBRD02* --> VV
*****
1161 SBRD02:1562      F/SBRD01 <-- VV
*****
*-----*
*P2,      SR+D,*
*NEXT,    J/SBRD03* --> VV
*****
1162 SBRD03:1564      F/SBRD02 <-- VV
*****
*-----*
*P2,      D+SR PLUS R(CNTL) PLUS D(C),*
*P3,      R(CNTL)+D,*
*NEXT,    BUT(RETURN)* --> VV
*****
```

```
1560      000000001000
1001 10 00 11 01 111 110 0100 0
00011 010010 11000 101110010
```

```
1562      000000001000
0011 00 00 00 00 000 000 0010 0
00000 000000 11000 101110100
```

```
1564      000000001000
0100 01 11 00 00 111 000 0100 0
00000 011100 11111 000000000
```

F16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 377

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COOT UPF | CLOCKS |
|---------|------------------------|---------------------------------------|-----------------------|--------------|---------|----------|------------------------|--------|
| | ;;AND IN STATUS BOARD. | | | | | | | |
| | F/SINO1 | <-- | 1033 1035 340 | | | | | |
| | F/STC02 | <-- | 1147 1094 356 | | | | | |
| | F/BOOT | <-- | 1143 1110 360 | | | | | |
| ***** | | | | | | | | |
| * | SUBROUTINE SBRE01 | * | | | | | | |
| | RETURN/SINO2 | * --> | 1354 1036 341 | | | | | |
| | RETURN/STC04 | * --> | 1441 1095 356 | | | | | |
| | RETURN/BOOT01 | * --> | 1112 452 180 | | | | | |
| ***** | | | | | | | | |

G16

```
1163 SBRE01:1566
*****
*P2,      D+CSP(10),
*NEXT,
*
*          J/SBRE02
***** --> VV
1164 SBRE02:1600      F/SBRE01 <-- VV
*****
*P2,      D+NOT(D) AND R(CNTL),
*P3,      R(CNTL)+D,
*NEXT,
*
*          J/SBRE03
***** --> VV
1165 SBRE03:1601      F/SBRE02 <-- VV
*****
* THRU
*UCON
*-----*
*
*          CLEAR CONSOLE,
*NEXT,
*
*          BUT(RETURN)
***** --> VV
*****
```

```
1566
1010 10 00 00 00 00000001000
00111 000000 11000 110000000
```

```
1600
0010 01 11 01 01 111 000 0100 0
00000 011100 11000 110000001
```

```
1601
0100 00 00 00 00 010 001 0000 0
11011 000000 11111 000000000
```

H16

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---|---|---------------------------------------|-----------------------|--------------|--------------|------------|------------------------|--------|
| .TOC "XFC FLOW" | | | | | | | | |
| :: THIS FLOW IS ENTERED FROM BUT(INSTR1) WHEN AN XFC CODE IS DECODED | | | | | | | | |
| :: IN IR.XFC INSTRUCTIONS ARE TO BE EXECUTED BY WCS IF WCS IS ENABLED | | | | | | | | |
| :: OTHERWISE TRAPPED TO LOCATION 10.THE ONLY EXCEPTION IS MED | | | | | | | | |
| :: INSTRUCTION WHOSE CODE 076600 IS PART OF THE XFC INSTUCTION.THIS | | | | | | | | |
| :: HAS TO BE EXECUTED IRRESPECTIVE OF WCS BEING ENABLED OR NOT. | | | | | | | | |
| .CASE 40 OF BFET03 | | | | | | | | |
| 1166 | XFC01:0447 | F/FET03 | <-- | 700 | 3 | 11 | | |
| | ***** | | | | | | | |
| | *P2, D+WHAMI, | * | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | * | | | | | | |
| | * J/XFC02 | * --> VV | | | | | | |
| | ***** | | | | | | | |
| 1167 | XFC02:1602 | F/XFC01 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | * SR GETS CONTENTS OF IR. BRANCH ON WCS | * | | | | | | |
| | *ENABLE IN WHAMI. BRANCH TARGETS ARE | * | | | | | | |
| | *XFC03 IF ENABLED OR ELSE | * | | | | | | |
| | *XFC12. | * | | | | | | |
| | ----- | | | | | | | |
| | *P2, SR+MD, | * | | | | | | |
| | *NEXT, BUTR(007), | * | | | | | | |
| | * J/XFC12 | * | | | | | | |
| | | * --> | | 101 | 1445 | 1184 | 382 | |
| | | * --> | | 111 | 1447 | 1168 | 378 | |
| | ***** | | | | | | | |
| .CASE 2 OF BXFC01 | | | | | | | | |
| 1168 | XFC03:1447 | F/XFC02 F/XFC10 | <-- <-- | 1602 1676 | 1167 1181 | 378 381 | | |
| | ***** | | | | | | | |
| | * BRANCH TARGETS ARE XFC04 TO | * | | | | | | |
| | *XFC11. | * | | | | | | |
| | ----- | | | | | | | |
| | *NEXT, BUTR(IR(8#7#6)), | * | | | | | | |
| | * J/XFC04 | * | | | | | | |
| | | * --> | | 1000 | 1670 | 1169 | 379 | |
| | | * --> | | 1001 | 1671 | 1171 | 379 | |
| | | * --> | | 1010 | 1672 | 1173 | 379 | |
| | | * --> | | 1011 | 1673 | 1175 | 380 | |
| | | * --> | | 1100 | 1674 | 1177 | 380 | |
| | | * --> | | 1101 | 1675 | 1179 | 381 | |
| | | * --> | | 1110 | 1676 | 1181 | 381 | |
| | | * --> | | 1111 | 1677 | 1182 | 381 | |
| | ***** | | | | | | | |

```

447      000000001000
        1111 00 00 11 00 101 001 0100 0
        00000 000000 11100 110000010

1602      000000001000
        1010 11 10 00 00 000 000 0010 0
        00000 000000 01000 100100101

1447      000000001000
        0000 00 00 00 00 000 000 0000 0
        00000 000000 00100 110111000
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---------------------------|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-------------------------------|
| .CASE 1169 | XFC04:1670 | F/XFC03 | <-- | 1447 | 1168 | 378 | | |
| | ***** | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+6, | | | | | | | |
| | * J/XFC0TH01 | | --> VV | | | | | |
| | ***** | | | | | | | |
| 1170 | XFC0TH01:6001 | F/XFC04 F/XFC0TH01 | <-- <-- | 1670 6001 | 1169 1170 | 379 379 | | |
| | ***** | | | | | | | |
| | * IN WCS ENGINEERING | | | | | | | |
| | *SECTION. | | | | | | | |
| | ----- | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/XFC0TH01 | | --> | 6001 | 1170 | 379 | | |
| | ***** | | | | | | | |
| .CASE 1171 | XFC05:1671 | F/XFC03 | <-- | 1447 | 1168 | 378 | | |
| | ***** | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+6, | | | | | | | |
| | * J/XFC0TH10 | | --> VV | | | | | |
| | ***** | | | | | | | |
| 1172 | XFC0TH10:6011 | F/XFC05 F/XFC0TH10 | <-- <-- | 1671 6011 | 1171 1172 | 379 379 | | |
| | ***** | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/XFC0TH10 | | --> | 6011 | 1172 | 379 | | |
| | ***** | | | | | | | |
| .CASE 1173 | XFC06:1672 | F/XFC03 | <-- | 1447 | 1168 | 378 | | |
| | ***** | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+6, | | | | | | | |
| | * J/XFC0TH20 | | --> | 6012 | 1174 | 380 | | |
| | ***** | | | | | | | |

```

1670          000000001000
      0000  00 00  00 00  000 110  0000  0
      00000 000000 11100 000000001

6001          000000001000
      0000  00 00  00 00  000 000  0000  0
      00000 000000 11000 000000001

1671          000000001000
      0000  00 00  00 00  000 110  0000  0
      00000 000000 11100 000001001

6011          000000001000
      0000  00 00  00 00  000 000  0000  0
      00000 000000 11000 000001001

1672          000000001000
      0000  00 00  00 00  000 110  0000  0
      00000 000000 11100 000001010
    
```

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | | | | | | | |
|---------------|---------------------------|--|--------------------------|--------------|--------------|------------|-------------|------------|-------|--------|------|--------------|-----|------|---|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT | CLOCKS | | | | | |
| 1174 | XFC0TH20:6012 | F/XFC06 F/XFC0TH20 | <-- <-- | 1672 6012 | 1173 1174 | 379 380 | 6012 | | | | | 000000001000 | | | |
| | *NEXT, | | | | | | 0000 | 00 | 00 | 00 | 00 | 000 | 000 | 0000 | 0 |
| | * J/XFC0TH20 | | --> | 6012 | 1174 | 380 | 00000 | 000000 | 11000 | 00000 | 1010 | | | | |
| .CASE 1175 | 4 OF BXFC03 XFC07:1673 | F/XFC03 | <-- | 1447 | 1168 | 378 | 1673 | | | | | 000000001000 | | | |
| | *NEXT, BUT(GO TO),PAGE+6, | | | | | | 0000 | 00 | 00 | 00 | 00 | 000 | 110 | 0000 | 0 |
| | * J/XFC0TH30 | | --> VV | | | | 00000 | 000000 | 11100 | 00000 | 1011 | | | | |
| 1176 | XFC0TH30:6013 | F/XFC07 F/XFC0TH30 | <-- <-- | 1673 6013 | 1175 1176 | 380 380 | 6013 | | | | | 000000001000 | | | |
| | *NEXT, | | | | | | 0000 | 00 | 00 | 00 | 00 | 000 | 000 | 0600 | 0 |
| | * J/XFC0TH30 | | --> | 6013 | 1176 | 380 | 00000 | 000000 | 11000 | 00000 | 1011 | | | | |
| .CASE 1177 | 5 OF BXFC03 XFC08:1674 | F/XFC03 | <-- | 1447 | 1168 | 378 | 1674 | | | | | 000000001000 | | | |
| | *NEXT, BUT(GO TO),PAGE+6, | | | | | | 0000 | 00 | 00 | 00 | 00 | 000 | 110 | 0000 | 0 |
| | * J/XFC0TH40 | | --> VV | | | | 00000 | 000000 | 11100 | 00000 | 1100 | | | | |
| 1178 | XFC0TH40:6014 | F/XFC08 F/XFC0TH40 | <-- <-- | 1674 6014 | 1177 1178 | 380 380 | 6014 | | | | | 000000001000 | | | |
| | *NEXT, | | | | | | 0000 | 00 | 00 | 00 | 00 | 000 | 000 | 0000 | 0 |
| | * J/XFC0TH40 | | --> | 6014 | 1178 | 380 | 00000 | 000000 | 11000 | 00000 | 1100 | | | | |

L16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 382

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | SOURCE/DESTINATION | | | MICROFICHE | ADDR | ALU | BUSB | BUS | SP | BUS | UBF | EXTENSION | RIF | COUT | CLOCKS |
|---------|---------------------------------------|-------------------------|--------------------|------|------|------------|------|-----|------|-----|----|-----|-----|-----------|-----|------|--------|
| | | | OFST | ADDR | BOX | | | | | | | | | | | | |
| 1183 | USERDISP01:6002 | F/XFC11 F/USERDISP01 | <-- | 1677 | 1182 | 381 | | | | | | | | | | | |
| | *NEXT,* | J/USERDISP01 | --> | 6002 | 1183 | 382 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | |
| | 6002 0000 00 00 00 00 000 000 0000 0 | | | | | | | | | | | | | | | | |
| | 0000 000000 11000 00000010 | | | | | | | | | | | | | | | | |
| .CASE | 1 OF BXFC01 | | | | | | | | | | | | | | | | |
| 1184 | XFC12:1445 | F/XFC02 F/XFC10 | <-- | 1602 | 1167 | 378 | | | | | | | | | | | |
| | *ENTERED FROM XFC02 AND XFC10 MD GETS | | <-- | 1676 | 1181 | 381 | | | | | | | | | | | |
| | *MED | | | | | | | | | | | | | | | | |
| | *OPCODE. | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | |
| | *P3, MD+076600, | | | | | | | | | | | | | | | | |
| | *NEXT,* | J/XFC13 | --> | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | |
| 1185 | XFC13:1603 | F/XFC12 | <-- | | | | | | | | | | | | | | |
| | *P2, D+SR MINUS MD, | | | | | | | | | | | | | | | | |
| | *NEXT,* | J/XFC14 | --> | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | |
| 1186 | XFC14:1604 | F/XFC13 | <-- | | | | | | | | | | | | | | |
| | *BRANCH TARGETS ARE | | | | | | | | | | | | | | | | |
| | *XFC15,16. | | | | | | | | | | | | | | | | |
| | *NEXT, BUTR(D(14-00) EQUALS 0), | | | | | | | | | | | | | | | | |
| | *J/XFC15 | | --> | 01 | 1455 | 1187 | 383 | | | | | | | | | | |
| | *J/XFC16 | | --> | 11 | 1457 | 1188 | 383 | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | |

M16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 383

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1187 | 1 OF BXFC14 | | | | | | | | | |
| | XFC15:1455 | F/XFC14 | <-- | 1604 | 1186 | 382 | | | | |
| | ***** | | | | | | | | | |
| | * NOT MED OPCODE SO | | | | | | | | | |
| | *TRAP. | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P3, MD+10, | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | |
| | * J/TRPOD | | --> | 127 | 357 | 151 | | | | |
| | ***** | | | | | | | | | |
| .CASE 1188 | 2 OF BXFC14 | | | | | | | | | |
| | XFC16:1457 | F/XFC14 | <-- | 1604 | 1186 | 382 | | | | |
| | ***** | | | | | | | | | |
| | * IT IS MED SO CHECK FOR KERNEL | | | | | | | | | |
| | *MODE | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *NEXT, BUTR(PS15), | | | | | | | | | |
| | * J/XFC18 | | | | | | | | | |
| | | J/XFC18 | --> | 10 | 1466 | 1190 | 383 | | | |
| | | J/XFC17 | --> | 11 | 1467 | 1189 | 383 | | | |
| | ***** | | | | | | | | | |
| .CASE 1189 | 2 OF BXFC16 | | | | | | | | | |
| | XFC17:1467 | F/XFC16 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * USER MODE SO | | | | | | | | | |
| | *TRAP. | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P3, MD+10, | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | |
| | * J/TRPOD | | --> | 127 | 357 | 151 | | | | |
| | ***** | | | | | | | | | |
| .CASE 1190 | 1 OF BXFC16 | | | | | | | | | |
| | XFC18:1466 | F/XFC16 | <-- | 1457 | 1188 | 383 | | | | |
| | ***** | | | | | | | | | |
| | * IT IS MED AND KERNEL MODE SO EXECUTE | | | | | | | | | |
| | *MED INSTUCTION. | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | |
| | * J/MED01 | | --> | 333 | 698 | 254 | | | | |
| | ***** | | | | | | | | | |

```

1455
0000 10 00 00 00 001 000 0000 0
00010 100000 11100 001010111

1457
0000 00 00 00 00 000 000 0000 0
00000 000000 01110 100110110

1467
0000 10 00 00 00 001 000 0000 0
00010 100000 11100 001010111

1466
0000 00 00 00 00 000 000 0000 0
00000 000000 11100 011011011
    
```

B01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 384

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|------------------------------------|--------------------------|--------------------|------|------|------|------|-----------------------|------|---------|---------|----------|--------------|--------|--------|--|
| | | | | | | | | | | | | RIF | COUT | CLOCKS | |
| .TOC "THIS COMPLETES OTHER DECODE" | | | | | | | | | | | | | | | |
| .CASE 4 OF BOTH01 | | | | | | | | | | | | | | | |
| 1191 | FIS01:0043 | F/OTH01 | <-- | 417 | 285 | 127 | | 43 | | | | 000000001000 | | | |
| | #P2, SR+0, | * | | | | | | | 0011 | 00 00 | 00 00 | 000 000 | 0010 0 | | |
| | #NEXT, | * | | | | | | | 00000 | 000000 | 11000 | 000110000 | | | |
| | * J/RSVD02 | * --> | | 60 | 1194 | 384 | | | | | | | | | |
| .CASE 2 OF BOTH01 | | | | | | | | | | | | | | | |
| 1192 | FASTX1:0041 | F/OTH01 | <-- | 417 | 285 | 127 | | 41 | | | | 000000001000 | | | |
| | #P2, SR+1, | * | | | | | | | 1010 | 11 00 | 00 00 | 000 000 | 0010 0 | | |
| | #NEXT, | * | | | | | | | 00000 | 000000 | 11000 | 000110000 | | | |
| | * J/RSVD02 | * --> | | 60 | 1194 | 384 | | | | | | | | | |
| .CASE 1 OF BOTH01 | | | | | | | | | | | | | | | |
| 1193 | RSVD01:0040 | F/OTH01 | <-- | 417 | 285 | 127 | | 40 | | | | 000000001000 | | | |
| | #P2, D+MHAMI,D(C)+ALU07, | * | | | | | | | 1111 | 00 00 | 11 00 | 101 011 | 0100 0 | | |
| | #NEXT, | * | | | | | | | 00000 | 000000 | 11000 | 011011100 | | | |
| | * J/RSVD03 | * --> | | 334 | 1195 | 385 | | | | | | | | | |
| .CASE 17 OF BOTH01 | | | | | | | | | | | | | | | |
| 1194 | RSVD02:0060 | F/OTH01 | <-- | 417 | 285 | 127 | | 60 | | | | 000000001000 | | | |
| | #P2, D+MHAMI,D(C)+ALU07, | * | | | | | | | 1111 | 00 00 | 11 00 | 101 011 | 0100 0 | | |
| | #NEXT, | * | | | | | | | 00000 | 000000 | 11000 | 011011100 | | | |
| | * J/RSVD03 | * --> | | 334 | 1195 | 385 | | | | | | | | | |

C01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 385

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------|---------------------------|--------------------|--------|------|-----------------------|------|---------|---------|----------|-----------|-----|------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF | COUT |
| 1195 | RSVD03:0334 | F/RSVD01 | <-- | 40 | 1193 | 384 | | | | | | |
| | | F/RSVD02 | <-- | 60 | 1194 | 384 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *SELECT, EMIT | | | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | | | |
| | * J/RSVD04 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | | J/RSVD04 | --> | 00 | 330 | 1196 | 385 | | | | | |
| | | J/RSVD05 | --> | 01 | 332 | 1197 | 385 | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | |
| | | UNDEFINED CASE | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 1196 | 1 OF BRSVD03 | F/RSVD03 | <-- VV | | | | | | | | | |
| | RSVD04:0330 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *P3, MD+10, | | | | | | | | | | | |
| | *NEXT, J/TRPOD | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | | | | 127 | 357 | 151 | | | | | | |
| .CASE 1197 | 2 OF BRSVD03 | F/RSVD03 | <-- | 334 | 1195 | 385 | | | | | | |
| | RSVD05:0332 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *NEXT, BUT(GO TO) PAGE+6, | | | | | | | | | | | |
| | * J/MCSRSVD01 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | | F/RSVD05 | <-- | 332 | 1197 | 385 | | | | | | |
| | | F/MCSRSVD01 | <-- | 6003 | 1198 | 385 | | | | | | |
| 1198 | MCSRSVD01:6003 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *NEXT, J/MCSRSVD01 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | | | | 6003 | 1198 | 385 | | | | | | |

```

334 0000 00 00 00 01 000 000 0000 0
    11001 000000 10011 011011000
    00000001000
    011010111

330 0000 10 00 00 00 001 000 0000 0
    00010 100000 11000 001010111
    00000001000

332 0000 00 00 00 00 000 110 0000 0
    00000 000000 11100 000000011
    00000001000

6003 0000 00 00 00 00 000 000 0000 0
    00000 000000 11000 000000011
    00000001000
  
```

D01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 386

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | RIF RPF | EXTENSION COUT | CLOCKS |
|--|---|--|--------------------------|--------------|-------------|------------|--------------|------------|-------------------|--------|
| <p>..TOC THIS ROUTINE INITIALIZES WCS ARRAY. THE PURPOSE IS TO WRITE EVERY " " LOCATION IN THE WCS ARRAY SO THAT CORRECT PARITY IS GENERATED AND WRITTEN. LOCATION 0 GETS 0. LOCATION 1 GETS 172002. LOCATION 2 GETS 172003. LOCATION N GETS (172001+N). THE LAST LOCATION 5777 GETS 0. NO CONTAINS 172001 BEFORE ENTERING THIS ROUTINE.</p> <p>.CASE 2 OF BINIT20</p> | | | | | | | | | | |
| 1199 | WCSINIT01:3337 | F/INIT20 F/WCSINIT08 | <-- <-- | 3434 3713 | 855 1206 | 290 388 | | | | |
| | <p>***** * DB IN WCS GETS * *#0. * *-----* *P2, D+0, * *P3, WCSADR+0, * *NEXT, * * J/WCSINIT02 * --> VV *****</p> | | | | | | | | | |
| 1200 | WCSINIT02:3632 | F/WCSINIT01 | <-- VV | | | | | | | |
| | <p>***** * SELECT PROPER ROUTINE IN TMS * *ROM. * *-----* *P3, TMSPTR+001, * *NEXT, * * J/WCSINIT03 * --> VV *****</p> | | | | | | | | | |
| 1201 | WCSINIT03:3634 | F/WCSINIT02 | <-- VV | | | | | | | |
| | <p>***** * ADR REG IN WCS GETS 0.DB HAS * *#0. * *-----* *NEXT, * * J/WCSINIT04 * --> 3640 1202 387 *****</p> | | | | | | | | | |
| | | | | 3337 | | | 000000001000 | | | |
| | | | | 0011 | 00 00 | 00 01 | 100 000 | 0100 0 | | |
| | | | | 00000 | 010010 | 11000 | 110011010 | | | |
| | | | | 3632 | | | 000000001000 | | | |
| | | | | 0010 | 00 00 | 10 00 | 000 000 | 0000 0 | | |
| | | | | 11011 | 000000 | 11000 | 110011100 | | | |
| | | | | 3634 | | | 000000001000 | | | |
| | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | | |
| | | | | 00000 | 000000 | 11000 | 110100000 | | | |

E01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 387

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|--------------------------------|------------|------------|-------------|-----------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 1202 | WCSINIT04:3640 | F/WCSINIT03 | <-- | 3634 1201 386 | | | | | | |
| | ***** | | | | 3640 | | | | 000000001000 | |
| | * LOCATION 0 IN ARRAY IS WRITTEN WITH 0. | | | | 1010 | 11 10 | 00 00 | 000 000 | 0100 0 | |
| | *DB GETS | | | | 00000 | 000000 | 11000 | 111001001 | | |
| | *172001 | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+MD, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/WCSINIT05 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BMCINIT06 | | | | | | | | | |
| 1203 | WCSINIT05:3711 | F/WCSINIT04 F/WCSINIT07 | <-- <-- | 3640 1202 387 3644 1205 387 | | | | | | |
| | ***** | | | | 3711 | | | | 000000001000 | |
| | *P3, TMSPTR+004, | | | | 0010 | 00 10 | 00 00 | 000 000 | 0000 0 | |
| | *NEXT, | | | | 11011 | 000000 | 11000 | 110100010 | | |
| | * J/WCSINIT06 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 1204 | WCSINIT06:3642 | F/WCSINIT05 | <-- VV | | | | | | | |
| | ***** | | | | 3642 | | | | 000000001000 | |
| | *P2, D+D PLUS 1, | | | | 1001 | 11 00 | 01 01 | 000 000 | 0100 0 | |
| | *NEXT, | | | | 00000 | 000000 | 11000 | 110100100 | | |
| | * J/WCSINIT07 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 1205 | WCSINIT07:3644 | F/WCSINIT06 | <-- VV | | | | | | | |
| | ***** | | | | 3644 | | | | 000000001000 | |
| | * TARGETS ARE WCSINIT05 | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | * ,08. | | | | 00000 | 000000 | 01101 | 111001001 | | |
| | ----- | | | | | | | | | |
| | *NEXT, BUTR(D(14-00) EQUALS 0), | | | | | | | | | |
| | * J/WCSINIT05 | | --> | 01 3711 1203 387 | | | | | | |
| | * J/WCSINIT08 | | --> | 11 3713 1206 388 | | | | | | |
| | ***** | | | | | | | | | |

F01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 388

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|----------------------------------|------------|-----------------------|--------------|------------|---------|----------|-----------|------|--------|
| | | | | | | | | | RIF | COUT | |
| .CASE | 2 OF BMCINIT06 | | | | | | | | | | |
| 1206 | WCSINIT08:3713 | F/WCSINIT04 F/WCSINIT07 | <-- <-- | 3640 3644 | 1202 1205 | 387 387 | | | | | |
| | *NEXT, * J/INIT21 | | --> | 3327 | 856 | 290 | | | | | |
| .TOC | "THIS ROUTINE SERVICES WCSADR REGISTER." | | | | | | | | | | |
| 1207 | WCSMRADR01:3111 | | | | | | | | | | |
| | *NEXT, * TMSPTR+020, * J/WCSMRADR02 | | --> | VV | | | | | | | |
| 1208 | WCSMRADR02:3645 | F/WCSMRADR01 | <-- | VV | | | | | | | |
| | * WRITE WCSADR WITH DATA IN D. *-----* *P3, WCSADR+D, *NEXT, * J/IAS0A | | --> | 3063 | 602 | 229 | | | | | |
| 1209 | WCSRDRADR:3110 | | | | | | | | | | |
| | * READ WCSADR AND PUT CONTENTS IN D. *-----* *P2, D+WCSADR, *NEXT, * J/IA102 | | --> | 3057 | 600 | 228 | | | | | |
| .TOC | "THIS ROUTINE READS WCSADR REGISTER AND PUTS IN D" | | | | | | | | | | |
| 1210 | WCSRDDAT01:3124 | | | | | | | | | | |
| | * DB GETS WCS *ADR. *-----* *P2, D+WCSADR, *NEXT, * J/WCSRDDAT02 | | --> | 3646 | 1211 | 389 | | | | | |

H01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 390

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|--|-----------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------|
| .TOC "THIS ROUTINE WRITES WCSDAT REGISTER WITH DATA IN D AND SR" | | | | | | | | |
| 1215 | WCSMRDAT01:3125 | | | 3125 | | | | 000000001000 |
| | * DB GETS | | | | 1111 | 00 00 | 11 01 | 100 000 0100 0 |
| | *WCSADR. | | | | 00000 | 000000 | 11000 | 110101010 |
| | *-----* | | | | | | | |
| | *P2, D+WCSADR, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/WCSMRDAT02 | | --> VV | | | | | |
| 1216 | WCSMRDAT02:3652 | F/WCSMRDAT01 | <-- VV | 3652 | | | | 000000001000 |
| | * SELECTS PROPER ROUTINE IN | | | | 0010 | 01 00 | 00 00 | 000 000 0000 0 |
| | *TMSROM. | | | | 11011 | 000000 | 11000 | 110101100 |
| | *-----* | | | | | | | |
| | * TMSPTR+010, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/WCSMRDAT03 | | --> VV | | | | | |
| 1217 | WCSMRDAT03:3654 | F/WCSMRDAT02 | <-- VV | 3654 | | | | 000000001000 |
| | * DB GETS DATA TO BE | | | | 1111 | 00 00 | 00 00 | 000 000 0100 0 |
| | *WRITTEN. | | | | 00000 | 000000 | 11000 | 110101101 |
| | *-----* | | | | | | | |
| | *P2, D+SR, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/WCSMRDAT04 | | --> VV | | | | | |
| 1218 | WCSMRDAT04:3655 | F/WCSMRDAT03 | <-- VV | 3655 | | | | 000000001000 |
| | * DATA IS WRITTEN IN WCS | | | | 0000 | 00 00 | 00 00 | 000 000 0000 0 |
| | *ARRAY. | | | | 00000 | 000000 | 11000 | 000110011 |
| | *-----* | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/IA50A | | --> | 3063 | 602 | 229 | | |
| | *-----* | | | | | | | |

I01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 391

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|--|---------------------------------------|--------------------|------|------|-----------------------|------|---------|---------|----------|-----------|----------|------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF | COUT |
| .TOC "THIS ROUTINE WRITES WCS STATUS REGISTER WITH DATA IN D AND SR" | | | | | | | | | | | | |
| 1219 | WCSMRST01:3115 | | | | | 3115 | | | | | 00000000 | 1000 |
| | * WRITE WCS STATUS, | | | | | | 0010 | 00 00 | 01 00 | 000 000 | 0000 | 0 |
| | * NEXT, | | | | | | 11011 | 000000 | 11000 | 000110011 | | |
| | * J/IAS0A | | --> | 3063 | 602 | 229 | | | | | | |
| .TOC "THIS ROUTINE READS WCS STATUS REGISTER AND PUTS IT IN D." | | | | | | | | | | | | |
| 1220 | WCSRST01:3114 | | | | | 3114 | | | | | 00000000 | 1000 |
| | * TMSPTR+030, | | | | | | 1010 | 01 00 | 00 00 | 000 000 | 0000 | 0 |
| | * NEXT, | | | | | | 11011 | 000000 | 11000 | 110101110 | | |
| | * J/WCSRST02 | | --> | VV | | | | | | | | |
| 1221 | WCSRST02:3656 | F/WCSRST01 | <-- | VV | | 3656 | | | | | 00000000 | 1000 |
| | * DB GETS WCSADR FOR PARITY PURPOSES. | | | | | | 1111 | 00 00 | 11 01 | 100 000 | 0100 | 0 |
| | * ----- | | | | | | 00000 | 000000 | 11000 | 110110010 | | |
| | * P2, D+WCSADR, | | | | | | | | | | | |
| | * NEXT, | | | | | | | | | | | |
| | * J/WCSRST03 | | --> | VV | | | | | | | | |
| 1222 | WCSRST03:3662 | F/WCSRST02 | <-- | VV | | 3662 | | | | | 00000000 | 1000 |
| | * PREPARATION FOR READING WCS STATUS. | | | | | | 0010 | 00 00 | 01 00 | 000 000 | 0000 | 0 |
| | * ----- | | | | | | 11001 | 000000 | 11000 | 110101000 | | |
| | * READ WCS STATUS, | | | | | | | | | | | |
| | * NEXT, | | | | | | | | | | | |
| | * J/WCSRDDAT06 | | --> | 3650 | 1213 | 389 | | | | | | |

L01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 394

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|-------------------------------|---------------------------------------|-----------------------|--------------|--------------|------------|----------|---------------------------------|
| .CASE 1231 | 1 OF BSVCDEF SVCDEF02:1026 | F/SVCDEF | <-- | 1733 | 1230 | 393 | | |
| | ***** | | | 1026 | | | | 000000001000 |
| | #0 - SVCDEF02 1 - SVCDEF03 | | * | | | | | 0000 00 00 00 00 000 110 0000 0 |
| | -----* | | | | | | | 00000 000000 11100 000000111 |
| | *NEXT, BUT(GO TO),PAGE+6, | | * | | | | | |
| | * J/SVCDEF01 | | * --> | 6007 | 1233 | 394 | | |
| .CASE 1232 | 2 OF BSVCDEF SVCDEF03:1027 | F/SVCDEF | <-- | 1733 | 1230 | 393 | | |
| | ***** | | | 1027 | | | | 000000001000 |
| | *NEXT, BUT(GO TO),PAGE+6, | | * | | | | | 0000 00 00 00 00 000 110 0000 0 |
| | * J/SVCDEF02 | | * --> | 6005 | 1234 | 394 | | 00000 000000 11100 000000101 |
| | ***** | | | | | | | |
| 1233 | SVCDEF01:6007 | F/SVCDEF02 F/SVCDEF01 | <-- <-- | 1026 6007 | 1231 1233 | 394 394 | | |
| | ***** | | | 6007 | | | | 000000001000 |
| | *NEXT, | | * | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | * J/SVCDEF01 | | * --> | 6007 | 1233 | 394 | | 00000 000000 11000 000000111 |
| | ***** | | | | | | | |
| 1234 | SVCDEF02:6005 | F/SVCDEF03 F/SVCDEF02 | <-- <-- | 1027 6005 | 1232 1234 | 394 394 | | |
| | ***** | | | 6005 | | | | 000000001000 |
| | *NEXT, | | * | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | * J/SVCDEF02 | | * --> | 6005 | 1234 | 394 | | 00000 000000 11000 000000101 |
| | ***** | | | | | | | |

MO1

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 395

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|
| | .TOC "TABLE OF CONTENTS - FLOATING POINT MICROCODE" | | | | | | |
| | SETCLASS SETF, SETD, CFCC, LDUBRK, ILLEGAL | | | | | | |
| | STATUS LDFPS, STFPS, STST | | | | | | |
| | CTAN CLEAR, TEST, ABSOLUTE, NEGATE | | | | | | |
| | MULF/D | | | | | | |
| | MODF/D | | | | | | |
| | ADDF/D | | | | | | |
| | LDF/D | | | | | | |
| | SUBF/D | | | | | | |
| | CHPF/D | | | | | | |
| | STF/D | | | | | | |
| | DIVF/D | | | | | | |
| | STEXP | | | | | | |
| | STCT STCFI, STCFL, STCDI, STCDL | | | | | | |
| | LDEXP | | | | | | |
| | LDCT LDCIF, LDCLF, LDCID, LDCLD | | | | | | |
| | LDCP LDCFD, LDCDF | | | | | | |
| | NROUND NORMALIZATION AND ROUNDING ROUTINE | | | | | | |
| | TRAPS FLOATING POINT EXCEPTIONS | | | | | | |
| | I/O SUBROUTINES | | | | | | |
| | FETCHINT | | | | | | |
| | STOREINT | | | | | | |
| | FLOATING I/O PREFIXES | | | | | | |
| | FETCHFLT | | | | | | |
| | STOREFLT | | | | | | |
| | SUBROUTINES | | | | | | |
| | DATAPREP PREPARE OPERANDS FDST AND FAC(SF) | | | | | | |
| | EXPTST TEST FAC(SF) AND FDST EXPONENTS | | | | | | |
| | FD-TOGGLE FLIP FD BIT OF FPS | | | | | | |
| | LEFTSHIFTSF LEFT SHIT SOURCE ACCUMULATOR | | | | | | |
| | MOVFDSTSF MOVE FDST DATA TO SF ACCUMULATOR | | | | | | |
| | MOVSFDFST MOVE SF ACCUMULATOR TO FDST REGISTERS | | | | | | |
| | RESTART RESTART THE INSTRUCTION | | | | | | |
| | RESTORECSP RESTORE CSP CONSTANTS | | | | | | |
| | RTSHFSF RIGHT SHIFT SOURCE FIELD ACCUMULATOR | | | | | | |
| | RTSHFDST RIGHT SHIFT FDST REGISTERS | | | | | | |
| | SETFZFN SET FLOATING POINT CONDITION CODES | | | | | | |
| | EIS DISPATCH EIS MICROCODE | | | | | | |
| | MUL | | | | | | |
| | DIV | | | | | | |
| | ASH | | | | | | |
| | ASHC | | | | | | |
| | .TOC " SCRATCH PAD LAYOUT IN BASE MACHINE ##FLPT##" | | | | | | |
| | BSP[0:15] BSP[16:31] ASP[0:15] ASP[16:31] | | | | | | |
| | (BSPLO) (BSPHI) (ASPL0) (ASPHI) | | | | | | |
| | 0 R0 WCSB[0] R0 WCSADR | | | | | | |
| | FAC3(SAV) | | | | | | |
| | 1 R1 WCSB[1] R1 WCSA[1] | | | | | | |

NO1

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 396

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|---------|--|------------------------------------|----------------|-------------------------|------|-----|------|------|-----------|------|
| | | OFST | ADDR | | | | | | BOX | PAGE |
| | FAC2(SAV) | | | | | | | | | |
| 2 R2 | R(VECT SAV) R2 CR1 | GEN-WHAMI | | | | | | | | |
| 3 R3 | R(ZERO) R3 CR2 | CNSL.TMPSW | | | | | | | | |
| 4 R4 | R(T1B) R4 [R(SRC)-BM] R(ES) R(MADR2) R(MADR) R(MAND1) R(MAND0) R(DSOR3) R(RMDR3) | R(T1A) R(ER) [R(SRC)-BM] | | | | | | | | |
| 5 R5 | R(T2B) R5 [R(DST)-BM] R(ED) R(DST X) R(EDIFF) R(EDIFF) R(EDIFF) R(GRINC) R(DST I) R(MAND3) R(MAND2) R(DSOR1) R(RMDR1) R(TRAPSEN) R(TRAPSEN) | R(T2A) R(GRINC-SAV) [R(DST)-BM] | | | | | | | | |
| 6 R6 | FPA FAC1(SAV) | R6 CNSL.SW | | | | | | | | |
| 7 R7 | CNSL.CNTL R7 FAC0(SAV) | CNSL.ADR | | | | | | | | |
| ----- | | | | | | | | | | |
| 10 | FAC2[0] | FAC0[0] | FAC3[0] | FAC1[0] | | | | | | |
| 11 | FAC2[1] | FAC0[1] | FAC3[1] | FAC1[1] | | | | | | |
| 12 | FAC2[2] | FAC0[2] | FAC3[2] | FAC1[2] | | | | | | |
| 13 | FAC2[3] | FAC0[3] | FAC3[3] | FAC1[3] | | | | | | |
| ----- | | | | | | | | | | |
| 14 | FAC2[4] | FAC0[4] | FAC3[4] | FAC1[4] | | | | | | |
| 15 | FAC2[5] | FAC0[5] | FAC3[5] | FAC1[5] | | | | | | |
| ----- | | | | | | | | | | |
| 16 | USER R6 | FEA | USER R6 | FPSHI-FEC | | | | | | |
| 17 | FDST2 DSOR2 R(T3) | FDST0 DSOR0 R(T3) | FDST3 RMDR0 | FDST1 RMDR2 R(IR) | | | | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|--|---|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|
| .TOC " CSP ALLOCATION AND CONTENTS ##FLPT##" | | | | | | | |
| | LOCATION NAME CONTENTS | | | | | | |
| | CSP(0) EXPMASK 077600 LOG.JAM | | | | | | |
| | CSP(1) CNST8 000010 LOG.SERVICE | | | | | | |
| | CSP(2) RESRIGHT 020000 LOG.PBA | | | | | | |
| | CSP(3) CNST4 000004 LOG.CUA | | | | | | |
| | CSP(4) RESLEFTD(C) 050000 LOG.FLAG/INTR | | | | | | |
| | CSP(5) RESLEFTGD 054000 LOG.MHAMI | | | | | | |
| | CSP(6) EMITCON LOG.CACHEDATA | | | | | | |
| | CSP(7) RESRIGHTGD 024000 LOG.TAG/CPU | | | | | | |
| | CSP(10) HIBYTEMASK 177400 CNSL.CNST100000 | | | | | | |
| | CSP(11) SEXPMASK 177600 LOG.DS | | | | | | |
| | CSP(12) SIGNBIT 100000 CNSL.CNST30000 CNST100000 | | | | | | |
| | CSP(13) CNST200 000200 CNSL.CNST040000 HIDDENBIT SETDMASK | | | | | | |
| | CSP(14) # 2 000002 | | | | | | |
| | CSP(15) MD ##### | | | | | | |
| | CSP(16) # 0 000000 | | | | | | |
| | CSP(17) # 1 000001 | | | | | | |

 .TOC " TEMPORARY REGISTERS ##FLPT##"
 .TOC " LABELLING CONVENTIONS IN ALL FLP MICROCODE:- ##FLPT##"

SECTIONS:
 THE LABEL ON THE FIRST WORD OF A SECTION IS ALSO THE NAME OF

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-------------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|
|---------|-------------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|

THAT SECTION. BY CONVENTION IT HAS NO TRAILING NUMERICS.
 FOR EXAMPLE, ADDNZ IS THE LABEL OF THE FIRST WORD OF THE
 SECTION DOING ADD WITH A NON-ZERO DEST MODE, BUT CFC03 IS THE THIRD
 WORD OF THE SECTION CFCC. SUBROUTINES ARE ALSO SECTIONS.

WARM VS HOT:
 THE LAST CHARACTER OF A WARM SECTION NAME IS W.

 TOC "UCON - FLOATING POINT SPECIFIC ##FLPT##"

FPS<7:4>
 READ (TOGETHER WITH FLAGS AND FPS<3:0>) BY SELECTING
 KP HBMUX X PORT

EXAMPLE IN UWORDS:
 WRITTEN BY SELECT AND DATTB (MACRO IS FPS+D)
 EXAMPLE IN UWORD LDFPS2

FPS<3:0>
 READ WITH FPS<7:4> AS ABOVE

WRITTEN BY
 (A) MUX SELECT ROMEX.FPSSSEL (MACRO FPSCC)
 (B) CLOCK ROMEX.USFCC (MACRO CLKFPSCC)
 EXAMPLE IN UWORDS LDFPS2 AND FET03F1

 TOC "USAGE OF TEMPORARIES ##FLPT##"

NAME USED BY SCOPE

R(FSTA) - MERGE WITH CR CONCEPT

R(EDIFF)

R(ES)

R(ED)

R(WDADR)

R(GRINC) FETCHSTOREFLT DURATION OF SUBROUTINE

FLAGS<2:1>

D(C)

R(CR)

R(TRAPSEN)

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|------------|-------------|--------------------|------|--------------------------|-----------------|------------|-------------|-----------|------|-------|
| | | OFST | ADDR | | | | | RIF | COUF | |

TOC " OCCURRENCE OF FLOATING POINT EXCEPTIONS ##FLPT##"

INSTRUCTION I/O ROUTINE EXCEPTIONS

```

LOADF/D  FETCHFLT  FIUV
STOREF/D  STOREFLT  NONE
MULF/D  FETCHFLT  FIV,FIU,FIUV
DIVF/D  FETCHFLT  FIV,FIU,FIUV,ZERODIV
CLRF/D  STOREFLT  NONE
TSTF/D  FFLTDEFER  FIUV
ABSF/D  FFLTDEFER  FIUV
NEGF/D  FFLTDEFER  FIUV
ADDF/D  FETCHFLT  FIV,FIU,FIUV
SUBF/D  FETCHFLT  FIV,FIU,FIUV
CHPF/D  FETCHFLT  FIUV
LDCP  LDCFETH  FIV,FIUV
STCP  STCFLT  FIV
LDCT  FETCHINT,FETCHINTLG  NONE
STCT  STOREINT,STOREINTLG  FIC
LDEXP  FETCHINT  FIV,FIU
STEXP  STOREINT  NONE

```

TOC " FLOATING POINT INSTRUCTION ABORTS ##FLPT##"

THE LENGTH OF TIME REQUIRED TO COMPLETE EXECUTION OF THE ARITHMETIC INSTRUCTIONS AND THE REQUIREMENTS OF HONORING INTERRUPTS IN ORDER TO PREVENT INTERRUPT LATENCIES NECESSITATES THAT THE EXECUTION OF THESE INSTRUCTIONS BE INTERRUPTABLE. INSTRUCTIONS CAPABLE OF BEING INTERRUPTED AND RESTARTED ARE AS FOLLOWS:

ADDF/D, SUBF/D, MULF/D, DIVF/D, MODF/D, LDCT

TESTS ARE MADE AT APPROPRIATE POINTS IN THESE INSTRUCTIONS BY USING BUTR(BG) - CHECKING WHETHER A BUS GRANT IS PENDING. SHOULD INTERRUPT PENDING EXIST, THE PC OF THE INSTRUCTION IS BACKED UP TO REEXECUTE THE INSTRUCTION, THE ACCUMULATORS REFERENCED BY THE INSTRUCTION ARE RESTORED AND THE SPECIFIED SOURCE OPERAND REGISTER WOULD BE RESTORED IF IT WAS PUSHED OR POPPED. THE REFERENCED ACCUMULATOR IS SAVED BEFORE EXECUTION IN "A" SCRATCH PAD LOW, ALSO SAVED IS R(GRINC) INDICATING THE INCREMENT VALUE FOR THE GENERAL REGISTER. RESTORATION OCCURS IN THE RESTART FLOWS OF THE MICROCODE. ANOTHER POINT IN THE MICROCODE FLOWS WHERE AN INSTRUCTION ABORT CAN OCCUR IS IN THE OPERAND FETCH ROUTINE LABELLED AS FETCHSTOREFLT AS A CONSEQUENCE OF SHARING THE SAME I/O ROUTINE AS MFPP. IN THIS SITUATION, RESTORATION OF ACCUMULATORS AND GENERAL REGISTERS IS NOT NECESSARY AS NOTHING HAS BEEN ALTERED UP TO THIS POINT. ONLY THE PC IS BACKED UP AND THE T-BIT MASK IS SET UP BEFORE EXECUTING THE INTERRUPT ROUTINE.

TOC " USAGE OF TEMPORARIES ##FLPT##"

;; REGISTER LOCATION COMMENT

| | | | | | | | |
|---------|-------------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|
| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-------------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|

```

CR2 R3 (A) USED TO HOLD CONDITIONS INDICATING OVERFLOW
UNDERFLOW, MOD FLAG, AND MOD RESTORE AC+1
FLAG
CR2<00> MOD FLAG
CR2<01> OVERFLOW FLAG
CR2<02> UNDERFLOW FLAG
CR2<03> RESTORE AC+1 MOD FLAG
CR1 R2 (A) USED TO HOLD THE RESULTANT SIGN BIT IN CR1<15>
FAC3(SAV) R0 (A) SAVE FAC3(SF)
FAC2(SAV) R1 (A) SAVE FAC2(SF)
FAC1(SAV) R6 (A) SAVE FAC1(SF)
FAC0(SAV) R7 (A) SAVE FAC0(SF)
R(GRINC-SAV)R5 (A) SAVE R(GRINC) - GENERAL REGISTER INCREMENT
R(ER) R4(A) RESULTANT EXPONENT IS STORED

```

.TOC " HOT FLOATING POINT MICROCODE ##FLPT##"

.CASE 2 OF BRESTCSP17

```

1235 MFORK:0475 F/RESTCSP17 <-- 646 2284 752

```

```

475 1010 11 10 00 01 00000001000
00000 010010 00011 010100000

```

```

*****
#NAME USE ACTUAL REGISTER R(ES) SOURCE *
#EXPONENT R(ED) DESTINATION EXPONENT *
#R(ER) EXPONENT RESULT R(EDIFF) EXPONENT *
#DIFFERENCE R(WDADR) WORD ADDRESS *
#-----:FROM *
#BUT(INSTR 1) WHEN ; FLTP#HOT ;FLOATING *
#POINT DECODE IS PERFORMED BY *
#BUT(IR11#FLPROM<3:0>) ;:FLOATING POINT *
#DECODE ROM IS DIVIDED INTO THE FOLLOWING *
#DECODE ;TARGETS - ; INPUT OUTPUT *
# INSTRUCTION IR11=0' INSTRUCTION *
#IR11=1 *

```

```

#P2, SR+MD, D+MD, *
#P3, R(IR)+D (A' ADDR), *
#NEXT, BUTR(FLPDECODE), *
# J/SETCLASS *
# J/STATUS *
# J/CTANZ *
# J/CTANZ *
# J/MULFZ *
# J/MULDZ *
# J/MULXNZ *
# J/ADDZ *
# J/ADDZ *
# J/LOADZ *
# J/LOADSIX *
# J/LOADNZS *
# J/SUBZ *
# J/SUBNZ *
# J/STFD *
# J/STFD2 *
# J/DIVZ *
# J/DIVNZ *
# J/STOREXP *

```

| | | | | |
|-----|-------|-----|------|-----|
| --- | 00000 | 240 | 1237 | 402 |
| --- | 00001 | 241 | 1259 | 409 |
| --- | 00010 | 242 | 1254 | 407 |
| --- | 00011 | 243 | 1255 | 408 |
| --- | 00100 | 244 | 1243 | 404 |
| --- | 00101 | 245 | 1244 | 404 |
| --- | 00110 | 246 | 1245 | 404 |
| --- | 00111 | 247 | 1260 | 409 |
| --- | 01000 | 250 | 1246 | 405 |
| --- | 01001 | 251 | 1247 | 405 |
| --- | 01010 | 252 | 1248 | 405 |
| --- | 01011 | 253 | 1249 | 406 |
| --- | 01100 | 254 | 1251 | 406 |
| --- | 01101 | 255 | 1252 | 407 |
| --- | 01110 | 256 | 1253 | 407 |
| --- | 01111 | 257 | 1261 | 409 |
| --- | 10000 | 260 | 1262 | 409 |
| --- | 10001 | 261 | 1263 | 410 |
| --- | 10010 | 262 | 1283 | 416 |
| --- | 10011 | 263 | 1284 | 416 |
| --- | 10100 | 264 | 1264 | 410 |

| | | | | | | |
|---|------------|-------|-------|-----|------|-----|
| * | J/STOREXP0 | * --> | 10101 | 265 | 1265 | 410 |
| * | J/STOREXPX | * --> | 10110 | 266 | 1266 | 410 |
| * | J/STCT | * --> | 10111 | 267 | 1267 | 416 |
| * | J/STCPZ | * --> | 11000 | 270 | 1269 | 411 |
| * | J/STCPNZ | * --> | 11001 | 271 | 1270 | 412 |
| * | J/LDEXP | * --> | 11010 | 272 | 1272 | 412 |
| * | J/LDEXPDM6 | * --> | 11011 | 273 | 1273 | 413 |
| * | J/LDEXPX | * --> | 11100 | 274 | 1274 | 413 |
| * | J/LDCTZ | * --> | 11101 | 275 | 1275 | 413 |
| * | J/LDCTNZ | * --> | 11110 | 276 | 1276 | 414 |
| * | J/LDCP | * --> | 11111 | 277 | 1291 | 418 |

502

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|------------|--|---------------------------------------|-----------------------|------|---------|---------|----------|--------------|--------|--------|--|
| | | | | | | | | RIF | COUT | CLOCKS | |
| .CASE 1236 | 4 OF BRESTCSP17 MFORKNVALD:0477 | F/RESTCSP17 | <-- | 646 | 2284 | 752 | | | | | |
| | ***** * SECONDARY ENTRY POINT INTO HOT FLOW * * WITH THE CSP NOT VALID FROM INSTR 1 * * BRANCH SR+IR GET INSTRUCTION RESTORE CSP * * CONSTANTS FOR FLOATING POINT * * RESTOREATION OF * * CSP * *-----* | | | | | | | | | | |
| | *P2, SR+MD, D+MD, * *P3, R(IR)+D (A ADDR) * *NEXT, BUT(GO TO), PAGE+2, * * J/RESTORECSP * ***** | | --> | 2662 | 2268 | 749 | | | | | |
| | | | | 477 | | | | 000000001000 | | | |
| | | | | | 1010 | 11 10 | 00 01 | 011 010 | 0110 0 | | |
| | | | | | 00000 | 010010 | 11100 | 110110010 | | | |

H02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 402

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF COUT | EXTENSION UPF | CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------|---------|---------------|---------------|--------|
| .TOC - | HOT FLOATING POINT MICROCODE ##FLPT## | | | | | | | |
| .CASE | 1 OF H/FORK | | | | | | | |
| 1237 | SETCLASS:0240 F/HFORK | <-- | 475 1235 395 | | | | | |
| | ***** | | | | | | | |
| | *RETURNS TO HFORK LABEL ENTRY INTO THIS | | | | | | | |
| | *POINT IS FROM HFORK INSTRUCTIONS | | | | | | | |
| | *EXCEUTED ARE - | | | | | | | |
| | *SETF SETD, SETI, SETL, LDUBRK, ILLEGAL CLOCK | | | | | | | |
| | *CONDITION CODES TARGETS | | | | | | | |
| | *- | | | | | | | |
| | ----- | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | |
| | *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | |
| | * J/SETCLASS2 | | | | | | | |
| | * J/SETCLASS2 | * --> | 0101 205 1238 402 | | | | | |
| | * J/SETCLASS3 | * --> | 0111 207 1239 403 | | | | | |
| | * J/SETCLASS4 | * --> | 1101 215 1240 403 | | | | | |
| | * J/SETCLASS5 | * --> | 1111 217 1241 403 | | | | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BSETCLASS | | | | | | | |
| 1238 | SETCLASS2:0205 F/SETCLASS | <-- | 240 1237 402 | | | | | |
| | F/SETCLASS2 | <-- | 205 1238 402 | | | | | |
| | ***** | | | | | | | |
| | *00 - SETCLASS2 01 - SETCLASS3 10 - | | | | | | | |
| | *SETCLASS4 11 - SETCLASS5 | | | | | | | |
| | ----- | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | |
| | *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | |
| | * J/SETCLASS2 | | | | | | | |
| | * J/SETCLASS2 | * --> | 0101 205 1238 402 | | | | | |
| | * J/SETCLASS3 | * --> | 0111 207 1239 403 | | | | | |
| | * J/SETCLASS4 | * --> | 1101 215 1240 403 | | | | | |
| | * J/SETCLASS5 | * --> | 1111 217 1241 403 | | | | | |
| | ***** | | | | | | | |

240
 0000 00 00 00 00 000 000 0000 0
 11100 000000 00111 010000101

205
 0000 00 00 00 00 000 000 0000 0
 11100 000000 00111 010000101

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|--|----------------------------|---------------|------------------------------|-----|------|------|---|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | | UPF |
| 1239 | SETCLASS3:0207 | F/SETCLASS F/SETCLASS2 | <-- <-- | 240 1237 402 205 1238 402 | | | | |
| | ***** * SAVE PC FOR POSSIBLE EXCEPTIONS GO TO * WARM FOR * EXECUTION *-----* | | | | | | | 207 00000001000 |
| | *P2, D+PC (A), *P3, FPA+D (B ADDR), *NEXT, * J/SETCLASSM | | | 340 1320 431 | | | | 1111 00 10 10 01 111 000 0100 0 00000 011100 11000 011100000 |
| 1240 | SETCLASS4:0215 | F/SETCLASS F/SETCLASS2 | <-- <-- | 240 1237 402 205 1238 402 | | | | |
| | ***** * SELECT, FPP(ABORT), * NEXT, * J/SETCLASS6 | | | 335 1242 403 | | | | 215 00000001000 |
| | ***** | | | | | | | 0000 00 00 00 00 001 001 0000 0 11001 000000 11000 011011101 |
| 1241 | SETCLASS5:0217 | F/SETCLASS F/SETCLASS2 | <-- <-- | 240 1237 402 205 1238 402 | | | | |
| | ***** * ABORT INSTRUCTION * EXECUTION *-----* | | | | | | | 217 00000001000 |
| | * SELECT, FPP(ABORT), * NEXT, * J/SETCLASS6 | | | | | | | 0000 00 00 00 00 001 001 0000 0 11001 000000 11000 011011101 |
| | ***** | | | | | | | |
| 1242 | SETCLASS6:0335 | F/SETCLASS4 F/SETCLASS5 | <-- <-- VV | 215 1240 403 | | | | |
| | ***** * GO SET T-BIT MASK THEN TO SERVICE FLOWS *-----* | | | | | | | 335 00000001000 |
| | * NEXT, BUT(GO TO) PAGE+4, * J/FPPABORT10 | | | 4741 2185 720 | | | | 0000 00 00 00 00 000 100 0000 0 00000 000000 11100 111100001 |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-------------------------------------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE 1243 | 5 OF BHFORK | F/HFORK | <-- | 475 | 1235 | 395 | | |
| | MULFZ:0244 | | | | | | | 244 010000001000 |
| | ***** | | | | | | | |
| | #----- | | | | | | | |
| | #----- HOT MULTIPLY DMO | | | | | | | |
| | #SINGLE PRECISION ENTRY DO DMO SYNC | | | | | | | |
| | #OPERATION | | | | | | | |
| | #----- | | | | | | | |
| | #P2, D+PC (A) | | | | | | | |
| | #SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | |
| #NEXT, BUTR(SERVICE#FPPACK), | | | | | | | | |
| # J/HOTDMOSYNC | | | | | | | | |
| ***** | | | | | | | | |
| J/HOTDMOSYNC --> 0101 165 1292 418 | | | | | | | | |
| J/HOTDMOSYNC2 --> 0111 167 1293 419 | | | | | | | | |
| J/HOTDMOSYNC3 --> 1101 175 1294 419 | | | | | | | | |
| J/HOTDMOSYNC4 --> 1111 177 1295 420 | | | | | | | | |
| ***** | | | | | | | | |
| .CASE 1244 | 6 OF BHFORK | F/HFORK | <-- | 475 | 1235 | 395 | | |
| | MULDZ:0245 | | | | | | | 245 010000001000 |
| | ***** | | | | | | | |
| | #----- | | | | | | | |
| | #----- HOT MULTIPLY DMO DOUBLE PRECISION ENTRY | | | | | | | |
| | #DO DMO SYNC | | | | | | | |
| | #OPERATION | | | | | | | |
| | #----- | | | | | | | |
| | #P2, D+PC (A) | | | | | | | |
| | #SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | |
| #NEXT, BUTR(SERVICE#FPPACK), | | | | | | | | |
| # J/HOTDMOSYNC | | | | | | | | |
| ***** | | | | | | | | |
| J/HOTDMOSYNC --> 0101 165 1292 418 | | | | | | | | |
| J/HOTDMOSYNC2 --> 0111 167 1293 419 | | | | | | | | |
| J/HOTDMOSYNC3 --> 1101 175 1294 419 | | | | | | | | |
| J/HOTDMOSYNC4 --> 1111 177 1295 420 | | | | | | | | |
| ***** | | | | | | | | |
| .CASE 1245 | 7 OF BHFORK | F/HFORK | <-- | 475 | 1235 | 395 | | |
| | MULXNZ:0246 | | | | | | | 246 000000001000 |
| | ***** | | | | | | | |
| | #----- | | | | | | | |
| | #----- HOT MULTIPLY NON DMO | | | | | | | |
| | #OPERATION | | | | | | | |
| | #----- | | | | | | | |
| | #NEXT, BUT(GO TO) PAGE+4, | | | | | | | |
| | # J/FETCHFLT2 --> 4651 2060 671 | | | | | | | |
| | ***** | | | | | | | |

K02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 405

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSB | BUSB | EXTENSION | |
|-------------------------------------|---|--------------------|------------|------|------|------|------|------|-----------|------|
| | | | | | | | | | | OFST |
| .CASE 1246 | 9 OF BHFORK | | | | | | | | | |
| | ADDZ:0250 | F/HFORK | <-- | 475 | 1235 | 395 | | | | |
| | ***** | | | | | | | | | |
| | ----- | | | | | | | | | |
| | HOT FLOATING | | | | | | | | | |
| | *POINT ADD DMD | | | | | | | | | |
| | *OPERATION | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+PC (A), | | | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | | | |
| *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | | | | |
| * J/HOTDMSYNC | | | | | | | | | | |
| * J/HOTDMSYNC --> 0101 165 1292 418 | | | | | | | | | | |
| * J/HTDMSYNC2 --> 0111 167 1293 419 | | | | | | | | | | |
| * J/HTDMSYNC3 --> 1101 175 1294 419 | | | | | | | | | | |
| * J/HTDMSYNC4 --> 1111 177 1295 420 | | | | | | | | | | |
| ***** | | | | | | | | | | |
| .CASE 1247 | 10 OF BHFORK | | | | | | | | | |
| | ADDZ:0251 | F/HFORK | <-- | 475 | 1235 | 395 | | | | |
| | ***** | | | | | | | | | |
| *NEXT, BUT(GO TO) PAGE+4, | | | | | | | | | | |
| * J/FETCHFLT2 --> 4651 2060 671 | | | | | | | | | | |
| ***** | | | | | | | | | | |
| .CASE 1248 | 11 OF BHFORK | | | | | | | | | |
| | LOADZ:0252 | F/HFORK | <-- | 475 | 1235 | 395 | | | | |
| | ***** | | | | | | | | | |
| | ----- | | | | | | | | | |
| | HOT FLOATING | | | | | | | | | |
| | *POINT LOAD DMD | | | | | | | | | |
| | *OPERATION | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+PC (A), | | | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | | | |
| *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | | | | |
| * J/HOTDMSYNC | | | | | | | | | | |
| * J/HOTDMSYNC --> 0101 165 1292 418 | | | | | | | | | | |
| * J/HTDMSYNC2 --> 0111 167 1293 419 | | | | | | | | | | |
| * J/HTDMSYNC3 --> 1101 175 1294 419 | | | | | | | | | | |
| * J/HTDMSYNC4 --> 1111 177 1295 420 | | | | | | | | | | |
| ***** | | | | | | | | | | |

250
 1111 00 00 10 01 111 000 0100 0
 11100 000000 00111 001110101

251
 0000 00 00 00 00 000 100 0000 0
 00000 000000 11100 110101001

252
 1111 00 00 10 01 111 000 0100 0
 11100 000000 00111 001110101

L02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 406

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---------------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .CASE 1249 | LOADSIX:0253 F/HFORK | <-- | 475 1235 395 | 253 | | | 000000001011 |
| | * HOT FLOATING POINT LOAD DESTINATION | | | 1001 | 11 11 | 10 01 | 111 100 0101 0 |
| | *MODE 6 | | | 10001 | 000110 | 11100 | 001101100 |
| | *OPERATION | | | | | | |
| | *P1, BA+PC, CURRENT MODE, | | | | | | |
| | *P2, D+PC PLUS 2, | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+4, | | | | | | |
| | * J/LOADSIX2 | --> | VV | | | | |
| 1250 | LOADSIX2:4154 F/LOADSIX | <-- | VV | 4154 | | | 000000001000 |
| | * NEEDED AT | | | 0011 | 11 10 | 00 01 | 110 010 0100 0 |
| | *FSDM6FLT3 | | | 00000 | 110100 | 11000 | 011011110 |
| | *P2, D+D, D(C)+ALUDD, | | | | | | |
| | *P3, R(GRINC)+D (A ADDR), MD+DATA, | | | | | | |
| | *NEXT, J/FSDM6FLT3 | --> | 4336 2090 685 | | | | |
| .CASE 1251 | LOADNZS:0254 F/HFORK | <-- | 475 1235 395 | 254 | | | 000000001000 |
| | *NEXT, BUT(GO TO), PAGE+4, | | | 0000 | 00 00 | 00 00 | 000 100 0000 0 |
| | * J/FETCHFLT2 | --> | 4651 2060 671 | 00000 | 000000 | 11100 | 110101001 |

M02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 407

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|---|--|-----------------------|------|---------|---------|----------|--------------------------------------|
| .CASE 1252 | 14 OF BHFORK | F/HFORK | <-- | 475 | 1235 | 395 | | |
| | SUBZ: 0255 | | | | | | | 255 |
| | ***** | | | | | | | 010000001000 |
| | ----- NOT FLOATING | | | | | | | 111100 000000 00111 001110101 0100 0 |
| | *POINT | | | | | | | |
| | *SUBTRACT | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+PC (A) | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | |
| | *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | |
| | J/HOTDMOSYNC | | | | | | | |
| | J/HOTDMOSYNC | --> | 0101 | 165 | 1292 | 418 | | |
| | J/HTDMOSYNC2 | --> | 0111 | 167 | 1293 | 419 | | |
| | J/HTDMOSYNC3 | --> | 1101 | 175 | 1294 | 419 | | |
| | J/HTDMOSYNC4 | --> | 1111 | 177 | 1295 | 420 | | |
| | ***** | | | | | | | |
| .CASE 1253 | 15 OF BHFORK | F/HFORK | <-- | 475 | 1235 | 395 | | |
| | SUBZ: 0256 | | | | | | | 256 |
| | *NEXT, BUT(GO TO), PAGE+4, | | | | | | | 000000001000 |
| | J/FETCHFLT2 | --> | 4651 | 2060 | 671 | | | 0000 00 00 00 00 000 100 0000 0 |
| | ***** | | | | | | | 00000 000000 11100 110101001 |
| .CASE 1254 | 3 OF BHFORK | F/HFORK | <-- | 475 | 1235 | 395 | | |
| | CTANZ: 0242 | | | | | | | 242 |
| | ***** | | | | | | | 010000001000 |
| | ----- | | | | | | | 1111 00 00 10 01 111 000 0100 0 |
| | *P2, D+PC (A) | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | |
| | *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | |
| | | J/HOTDMOSYNC | | | | | | |
| | | J/HOTDMOSYNC | --> | 0101 | 165 | 1292 | 418 | |
| | | J/HTDMOSYNC2 | --> | 0111 | 167 | 1293 | 419 | |
| | J/HTDMOSYNC3 | --> | 1101 | 175 | 1294 | 419 | | |
| | J/HTDMOSYNC4 | --> | 1111 | 177 | 1295 | 420 | | |
| | ***** | | | | | | | |

N02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 408

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|----------------------------------|-------------------|
| 1255 | CTANNZ:0243 F/HFORK | <-- | 475 1235 395 | 243 | 0000 11001 | 10 00 100000 | 11 01 11000 | 00000001000 000 000 011011110 | 0000 0 |
| | * READ FLAG REGISTER | | | | | | | | |
| | *SELECT, P3, NEXT, J/CTANNZ2 | | | | | | | | --> VV |
| 1256 | CTANNZ2:0336 F/CTANNZ | <-- | VV | 336 | 1010 01001 | 10 00 000000 | 00 00 11000 | 00000001000 000 000 011011111 | 0100 0 |
| | *P2, D+EMITCON, NEXT, J/CTANNZ3 | | | | | | | | --> VV |
| 1257 | CTANNZ3:0337 F/CTANNZ | <-- | VV | 337 | 1110 00000 | 11 11 000000 | 01 01 11100 | 00000001000 000 010 001001000 | 0100 0 |
| | * SET UP FLAG REGISTER FORCE WARM ON BUTR(HOTWARM) | | | | | | | | |
| | *P2, D+D OR 2, NEXT, BUT(GO TO), PAGE+2, J/CTANNZ4 | | | | | | | | --> VV |
| 1258 | CTANNZ4:2110 F/CTANNZ3 | <-- | VV | 2110 | 0000 11011 | 00 00 000000 | 00 01 11000 | 00000001000 000 001 001001010 | 0000 0 |
| | *SELECT, P3, NEXT, J/CTANNZ2 | | | | | | | | --> 2112 1374 449 |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|--|---------------------------------------|-----------------------|----------------------|---------|---------|----------|--|
| .CASE 1259 | 2 OF BHFORK STATUS:0241 | F/HFORK | <-- | 475 1235 395 | | | | |
| | ***** ----- *----- *OPERATION *----- *NEXT, CALL HOTSYNC, * RETURN+STATUSM ***** | | | | | | | 241 0000 00 01 11 00 001 100 0000 0 00000 000000 11100 101110101 |
| | | | --> | 4565 1297 421 | | | | |
| | | | | VV -1 -1 -1 2 1 1 | | | | |
| .CASE 1260 | 8 OF BHFORK MOD:0247 | F/HFORK | <-- | 475 1235 395 | | | | |
| | ***** *THEN GO TO WARM FOR EXECUTION *----- *NEXT, BUT(GO TO),PAGE+4, * J/FETCHFLT2 ***** | | | | | | | 247 0000 00 00 00 00 000 100 0000 0 00000 000000 11100 110101001 |
| | | | --> | 4651 2060 671 | | | | |
| .CASE 1261 | 16 OF BHFORK CMP:0257 | F/HFORK | <-- | 475 1235 395 | | | | |
| | ***** *NEXT, BUT(GO TO),PAGE+4, * J/FETCHFLT2 ***** | | | | | | | 257 0000 00 00 00 00 000 100 0000 0 00000 000000 11100 110101001 |
| | | | --> | 4651 2060 671 | | | | |
| .CASE 1262 | 17 OF BHFORK STFD:0260 | F/HFORK | <-- | 475 1235 395 | | | | |
| | ***** *----- *----- *POINT STORE OPERATION ACCUMULATOR ZERO *STORE *----- *NEXT, BUT(GO TO),PAGE+4, * J/STOREFLT ***** | | | | | | | 260 0000 00 00 00 00 000 100 0000 0 00000 000000 11100 110101100 |
| | | | --> | 4654 2061 674 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|---|---------------------------------------|---|------|---------------|-----------------|----------------|--|
| .CASE 1263 | 18 OF BHFORK STFD2:0261 F/HFORK | <-- | 475 1235 395 | 261 | 0000 00000 | 00 00 000000 | 00 00 11100 | 00000001000 000 100 0000 0 110101100 |
| | * ACCUMULATOR 1, 2, OR 3 * STORE | | | | | | | |
| | * NEXT, BUT(GO TO), PAGE+4, * J/STOREFLT | --> | 4654 2061 674 | | | | | |
| .CASE 1264 | 21 OF BHFORK STOREXP:0264 F/HFORK | <-- | 475 1235 395 | 264 | 0000 00000 | 00 10 000000 | 00 00 11100 | 00000001000 001 100 0000 0 101110101 |
| | * NEXT, CALL HOTSINC, * RETURN+STEXPHOT | --> | ***** 4565 1297 421 ***** VV 401 1267 411 | | | | | |
| .CASE 1265 | 22 OF BHFORK STOREXPD:0265 F/HFORK | <-- | 475 1235 395 | 265 | 0000 00000 | 00 10 000000 | 00 00 11100 | 00000001000 001 100 0000 0 101110101 |
| | * NEXT, CALL HOTSINC, * RETURN+STEXPHOT | --> | ***** 4565 1297 421 ***** VV 401 1267 411 | | | | | |
| .CASE 1266 | 23 OF BHFORK STOREXPX:0266 F/HFORK | <-- | 475 1235 395 | 266 | 0000 00000 | 00 10 000000 | 00 00 11100 | 00000001000 001 100 0000 0 101110101 |
| | * NEXT, CALL HOTSINC, * RETURN+STEXPHOT | --> | ***** 4565 1297 421 ***** VV 401 1267 411 | | | | | |

E03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 412

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUF CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|---|---------|---------|----------|--|
| .CASE 1270 | 26 OF BHFORK STCPNZ:0271 | F/HFORK | <-- | 475 1235 395 | | | | |
| | ***** * NON DESTINATION MODE *0 *-----* | | | | | | | 271 00000001000 1111 00 00 10 01 111 100 0100 0 00000 000000 11100 001101110 |
| | *P2, D+PC (A) *NEXT, BUT(GO TO),PAGE+4, * J/STCPNZ2 *-----* | | --> VV | | | | | |
| 1271 | STCPNZ2:4156 | F/STCPNZ | <-- VV | | | | | |
| | ***** * SAVE THE PC FOR THE FPA STORE INTO FPA *OCCURS *ONLY *-----* | | | | | | | 4156 00000001000 0000 00 00 00 01 011 000 0000 0 00000 000110 11000 110010001 |
| | *P3, R(T3)+D (A ADDR), *NEXT, * J/STCFLT *-----* | | --> | 4621 2042 664 | | | | |
| .CASE 1272 | 27 OF BHFORK LDEXP:0272 | F/HFORK | <-- | 475 1235 395 | | | | |
| | ***** *ON AN EXCEPTION DONE IN STOREHOT FLOWS *-----* | | | | | | | 272 00000001000 0000 00 01 11 11 010 100 0000 0 00000 000000 11100 101110101 |
| | *----- LOAD EXPONENT *ENTRY FOR HOT FLOATING POINT PERFORM *SYNC *OPERATION *-----* | | | | | | | |
| | *NEXT, CALL HOTSUNC, * RETURN+LDEXPZM *-----* | | --> | ***** 4565 1297 421 ***** VV -1 -1 -1 0 1 1 | | | | |

F03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 413

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUF | |
| .CASE 1273 | 28 OF BHFORK LDEXPDM6:0273 | F/HFORK | <-- | 475 | 1235 | 395 | | | | |
| | ***** *THEN GO TO WARM FLOWS FOR EXECUTION A * *DOUBLE FLPGO OPERATION IS PERFORMED FOR * *THIS INSTRUCTION DESTINATION MODE 6 * *ENTRY * *-----* *NEXT, CALL HOTSINC, * * RETURN+LDEXPDM6H * *-----* ***** | | | | | | | | | |
| | | | --> | 4565 | 1297 | 421 | | | | |
| | | | | | | | | | | |
| | | | | 373 | 1836 | 594 | | | | |
| .CASE 1274 | 29 OF BHFORK LDEXPX:0274 | F/HFORK | <-- | 475 | 1235 | 395 | | | | |
| | ***** *NEXT, CALL HOTSINC, * * RETURN+LDEXPXZW * *-----* ***** | | | | | | | | | |
| | | | --> | 4565 | 1297 | 421 | | | | |
| | | | | | | | | | | |
| | | | | 374 | 1837 | 594 | | | | |
| .CASE 1275 | 30 OF BHFORK LDCTZ:0275 | F/HFORK | <-- | 475 | 1235 | 395 | | | | |
| | ***** *-----* *-----* *LOAD AND CONVERT FROM INTEGER LONG OR * *SHORT TO FLOATING POINT SINGLE OR DOUBLE * *GO TO WARM FOR * *PARTIAL * *-----* *P3, * * EMITCON+GUARD * *-----* *ENABLE, * *NEXT, * * J/LDCTW2 * *-----* ***** | | | | | | | | | |
| | | | --> | 630 | 1858 | 600 | | | | |

273
0000 00 01 11 11 011 100 0000 0
00000 000000 11100 101110101

274
0000 00 01 11 11 100 100 0000 0
00000 000000 11100 101110101

275
0100 10 10 00 00 000 000 0000 0
01001 100000 11000 110011000

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | CLOCKS |
|------------|------------------------------------|--------------------|------------|------------------|-------|--------|-------|----------------|--------|
| | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT UPF | |
| .CASE 1276 | 31 OF BHFORK LDCTNZ: 0276 | F/HFORK <-- | | 475 1235 395 | | | | | |
| | *EXECUTION | | | | 276 | | | 000000001000 | |
| | *P3, | | | | 0100 | 10 10 | 00 00 | 000 000 0000 0 | |
| | *EMITCON+GUARD | | | | 01001 | 100000 | 11000 | 110011000 | |
| | *ENABLE, | | | | | | | | |
| | *NEXT, | J/LDCTW2 --> | | 630 1858 600 | | | | | |
| 1277 | LDCT2: 1606 | | | | | | | | |
| | *TARGETS | | | | 1606 | | | 000000001000 | |
| | *- | | | | 1111 | 00 10 | 10 01 | 111 111 0100 0 | |
| | *P2, D+PC (A),D(C)+D(C), | | | | 00000 | 011100 | 10011 | 010101001 | |
| | *P3, FPA+D (B ADDR), | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | |
| | * J/LDCT3 | | | | | | | | |
| | * J/LDCT3 --> | | | 01 1251 1278 414 | | | | | |
| | * J/LDCT5 --> | | | 11 1253 1280 415 | | | | | |
| .CASE 1278 | 1 OF BLDCT2 LDCT3: 1251 | F/LDCT2 <-- VV | | | | | | | |
| | *0 - LDCT3 1 - LDCT5 SHORT INTEGER | | | | 1251 | | | 000000001000 | |
| | *FETCH | | | | 0000 | 00 10 | 00 10 | 100 010 0000 0 | |
| | *NEXT, CALL FETCHINT, | | | | 00000 | 000000 | 11100 | 101101000 | |
| | * RETURN+LDCT4 | | | | | | | | |
| | | | | ***** | | | | | |
| | | | | 2550 2009 650 | | | | | |
| | | | | ***** | | | | | |
| | | | | VV | | | | | |
| | | | | 424 1279 415 | | | | | |

H03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 415

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|--|---------------------------------------|-----------------------|---------------|---------|-------------|----------|-------------------------------|
| 1279 | LDCT4:0424 | | | 424 | | | | 000000001000 |
| | *P2, D+R(T2) (A), FLPG0, | | | | 1111 | 00 00 | 11 01 | 110 000 0100 0 |
| | *NEXT, BUTR(SERVICE), | | | | 11100 | 000000 | 10000 | 111000010 |
| | * J/FETO1 | | | | | | | |
| | * J/FETO3 | --> | 00 700 3 11 | | | | | |
| | * J/SERO1 | --> | 01 701 385 160 | | | | | |
| | * J/FETO1 | --> | 10 702 1 2 | | | | | |
| | * J/SERO2 | --> | 11 703 387 162 | | | | | |
| CASE 1280 | 2 OF BLDCT2 | | | | | | | |
| | LDCT5:1253 | F/LDCT2 | <-- | 1606 1277 414 | | | | |
| | * LONG INTEGER | | | | | | | 000000001000 |
| | *FETCH | | | | 0000 | 00 10 00 10 | 101 100 | 0000 0 |
| | *-----* | | | | 00000 | 000000 | 11100 | 110010100 |
| | *NEXT, CALL FETCHINTLG, | | | | | | | |
| | * RETURN+LDCT6 | | | | | | | |
| | *-----* | --> | ***** | | | | | |
| | | | 4624 2043 665 | | | | | |
| | | | ***** | | | | | |
| | | | VV | | | | | |
| | | | 425 1281 415 | | | | | |
| 1281 | LDCT6:0425 | | | 425 | | | | 000000001000 |
| | * ONLY WHEN IT IS DMO WILL A RETURN BE | | | | 1111 | 00 00 | 10 01 | 011 000 0100 0 |
| | *MADE | | | | 11100 | 000000 | 11000 | 100010110 |
| | *-----* | | | | | | | |
| | *P2, D+FDST3, FLPG0, | | | | | | | |
| | *NEXT, J/LDCT7 | --> VV | | | | | | |
| 1282 | LDCT7:0426 | F/LDCT6 | <-- VV | 426 | | | | 000000001000 |
| | * SUCH THAT DATA IS FETCHED FROM D BUS | | | | 1010 | 00 11 00 00 | 011 000 | 0100 0 |
| | *-----* | | | | 00000 | 000000 | 10000 | 111000010 |
| | *P2, D+FDST2, | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | * J/FETO1 | | | | | | | |
| | * J/FETO3 | --> | 00 700 3 11 | | | | | |
| | * J/SERO1 | --> | 01 701 385 160 | | | | | |
| | * J/FETO1 | --> | 10 702 1 2 | | | | | |
| | * J/SERO2 | --> | 11 703 387 162 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|---|---------------------------------------|-----------------------|------|--------------|---------|-----------|---------------------------|
| .CASE 1283 | DIVZ:0262 F/HFORK | <-- | 475 1235 395 | 262 | 1111 00 00 | 10 01 | 111 000 | 010000001000 0100 0 |
| | ***** | | | | 11100 000000 | 00111 | 001110101 | |
| | ----- HOT FLOATING | | | | | | | |
| | *DIVIDE ENTRY DESTINATION MODE | | | | | | | |
| | *ZERO | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+PC (A) | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, FLPGO, | | | | | | | |
| | *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | |
| | * J/HOTDMSYNC | --> | 0101 165 1292 418 | | | | | |
| | * J/HOTDMSYNC2 | --> | 0111 167 1293 419 | | | | | |
| | * J/HOTDMSYNC3 | --> | 1101 175 1294 419 | | | | | |
| | * J/HOTDMSYNC4 | --> | 1111 177 1295 420 | | | | | |
| | ***** | | | | | | | |
| .CASE 1284 | DIVZ:0263 F/HFORK | <-- | 475 1235 395 | 263 | 0000 00 00 | 00 00 | 000 100 | 0000 0 |
| | *NEXT, BUT(GO TO) PAGE+4, | | | | 00000 000000 | 11100 | 110101001 | |
| | * J/FETCHFLT2 | --> | 4651 2060 671 | | | | | |
| | ***** | | | | | | | |
| .CASE 1285 | STCT:0267 F/HFORK | <-- | 475 1235 395 | 267 | 0000 00 10 | 01 00 | 000 100 | 0000 0 |
| | *NEXT, CALL HOTSINC, | | | | 00000 000000 | 11100 | 101110101 | |
| | * RETURN+STCT2 | --> | 4565 1297 421 | | | | | |
| | ***** | | | | | | | |
| | VV | | 440 1286 416 | | | | | |
| 1286 | STCT2:0440 | | | 440 | 0000 11 10 | 00 00 | 001 000 | 0000 0 |
| | *SELECT, FPP(READ), | | | | 11001 100000 | 11000 | 100101000 | |
| | *P3, MD+DATA, | | | | | | | |
| | *NEXT, J/STCT3 | --> | 450 1287 417 | | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIE COUT CLOCKS |
|------------|--|---------|--|-----------------------|------|---------|---------|----------|---------------------------|
| 1287 | STCT3:0450 | F/STCT2 | <-- | 440 1286 416 | 450 | 1010 | 11 10 | 00 01 | 011 100 0100 0 |
| | ***** | | | | | 00000 | 100010 | 11100 | 01000000 |
| | *P2, D+MD, | | | | | | | | |
| | *P3, FDST3+D (A ADDR), MD+DATA, | | | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+4, | | | | | | | | |
| | * J/STCT4 | | --> | VV | | | | | |
| 1288 | STCT4:4200 | F/STCT3 | <-- VV | | 4200 | 1010 | 11 10 | 00 01 | 011 000 0100 0 |
| | ***** | | | | | 00000 | 100100 | 10111 | 111011010 |
| | * TARGETS - 0 - F - | | | | | | | | |
| | *STCT5 | | | | | | | | |
| | *P2, D+MD, | | | | | | | | |
| | *P3, FDST2+D (A ADDR), MD+DATA, | | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | | |
| | * J/STCT5 | | --> | 10 4732 1289 417 | | | | | |
| | * J/STCT6 | | --> | 11 4733 1290 417 | | | | | |
| | ***** | | | | | | | | |
| .CASE 1289 | 1 OF BSTCT4 | F/STCT4 | <-- VV | | 4732 | 0011 | 00 00 | 00 01 | 011 000 0100 0 |
| | STCT5:4732 | F/STCT4 | | | | 00000 | 010110 | 11000 | 011110010 |
| | *1 - D - STCT6 | | | | | | | | |
| | *P2, D+0, | | | | | | | | |
| | *P3, FDST10+D (A ADDR), | | | | | | | | |
| | *NEXT, J/STCTW2 | | --> | 4362 1758 571 | | | | | |
| .CASE 1290 | 2 OF BSTCT4 | F/STCT4 | <-- | 4200 1288 417 | 4733 | 1010 | 11 10 | 00 01 | 011 000 0100 0 |
| | STCT6:4733 | F/STCT4 | | | | 00000 | 010010 | 11000 | 011110010 |
| | * NOTE - ONLY THREE WORDS ARE REQUIRED | | | | | | | | |
| | *FOR | | | | | | | | |
| | *CONVERSION | | | | | | | | |
| | *P2, D+MD, | | | | | | | | |
| | *P3, FDST1+D (A ADDR), | | | | | | | | |
| | *NEXT, J/STCTW2 | | --> | 4362 1758 571 | | | | | |
| | ***** | | | | | | | | |

K03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 418

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---------------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|---|
| .CASE 1291 | LDCP:0277 | F/HFORK | <-- | 475 | 1235 | 395 | | |
| | ***** | | | | | | | 277 00000001000 |
| | *NEXT, BUT(GO TO),PAGE+4,* | J/LDCFETCH | --> | 4620 | 2041 | 663 | | 0000 00 00 00 00 000 100 0000 0 00000 000000 11100 110010000 |
| .CASE 1292 | HOTDMOSYNC:0165 | F/MULFZ | <-- | 244 | 1243 | 404 | | |
| | | F/MULDZ | <-- | 245 | 1244 | 404 | | |
| | | F/ADDZ | <-- | 250 | 1246 | 405 | | |
| | | F/LOADZ | <-- | 252 | 1248 | 405 | | |
| | | F/SUBZ | <-- | 255 | 1252 | 407 | | |
| | | F/CTANZ | <-- | 242 | 1254 | 407 | | |
| | | F/STCPZ | <-- | 270 | 1269 | 411 | | |
| | | F/DIVZ | <-- | 262 | 1283 | 416 | | |
| | | F/HOTDMOSYNC | <-- | 165 | 1292 | 418 | | |
| | | F/FSDMOFLTS | <-- | 4607 | 2066 | 676 | | |
| | ***** | | | | | | | 165 010000001000 |
| | ----- DESTINATION MODE ----- | | | | | | | 0000 00 00 00 00 000 000 0000 0 11100 000000 00111 001110101 |
| | *ZERO SYNC OPERATIONS TARGETS - 00 - | | | | | | | |
| | *HTDMOSYNC 01 - HTDMOSYNC2 10 - | | | | | | | |
| | *HTDMOSYNC3 11 - | | | | | | | |
| | *HTDMOSYNC4 | | | | | | | |
| | ----- | | | | | | | |
| | *SELECT, FPSCC(FPP),FPSCC+DATA,FLPGO, | | | | | | | |
| | *NEXT, BUTR(SERVICE#FPPACK), | | | | | | | |
| | * J/HOTDMOSYNC | | | | | | | |
| | | J/HOTDMOSYNC | --> | 0101 | 165 | 1292 | 418 | |
| | | J/HTDMOSYNC2 | --> | 0111 | 167 | 1293 | 419 | |
| | | J/HTDMOSYNC3 | --> | 1101 | 175 | 1294 | 419 | |
| | | J/HTDMOSYNC4 | --> | 1111 | 177 | 1295 | 420 | |
| | ***** | | | | | | | |

L03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 419

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---------------------------------------|-------------|--------------------|------------|------|--------|------|----------|---------------------------------|
| .CASE | 2 OF BMULFZ | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF COUT | CLOCKS |
| | | F/MULFZ | <-- | 244 | 1243 | 404 | | | |
| | | F/MULDZ | <-- | 245 | 1244 | 404 | | | |
| | | F/ADDZ | <-- | 250 | 1246 | 405 | | | |
| | | F/LOADZ | <-- | 252 | 1248 | 405 | | | |
| | | F/SUBZ | <-- | 255 | 1252 | 407 | | | |
| | | F/CTANZ | <-- | 242 | 1254 | 407 | | | |
| | | F/STCPZ | <-- | 270 | 1269 | 411 | | | |
| | | F/DIVZ | <-- | 262 | 1283 | 416 | | | |
| | | F/HTDMOSYNC | <-- | 165 | 1292 | 418 | | | |
| 1293 | HTDMOSYNC2:0167 | F/FSDMOFLT5 | <-- | 4607 | 2066 | 676 | | | |
| | ***** | | | | | | | | |
| | *P2, D+PC (A), | * | | | | | | | 167 |
| | *P3, FPA+D (B ADDR), | * | | | | | | | 1111 00 10 10 01 111 000 0100 0 |
| | *NEXT, BUTR(SERVICE), | * | | | | | | | 00000 011100 10000 111000010 |
| | * J/FETO1 | * | | | | | | | |
| | * J/FETO3 | * --> | 00 700 | 3 | 11 | | | | |
| | * J/SERO1 | * --> | 01 701 | 385 | 160 | | | | |
| | * J/FETO1 | * --> | 10 702 | 1 | 2 | | | | |
| | * J/SERO2 | * --> | 11 703 | 387 | 162 | | | | |
| | ***** | | | | | | | | |
| .CASE | 3 OF BMULFZ | | | | | | | | |
| | | F/MULFZ | <-- | 244 | 1243 | 404 | | | |
| | | F/MULDZ | <-- | 245 | 1244 | 404 | | | |
| | | F/ADDZ | <-- | 250 | 1246 | 405 | | | |
| | | F/LOADZ | <-- | 252 | 1248 | 405 | | | |
| | | F/SUBZ | <-- | 255 | 1252 | 407 | | | |
| | | F/CTANZ | <-- | 242 | 1254 | 407 | | | |
| | | F/STCPZ | <-- | 270 | 1269 | 411 | | | |
| | | F/DIVZ | <-- | 262 | 1283 | 416 | | | |
| | | F/HTDMOSYNC | <-- | 165 | 1292 | 418 | | | |
| | | F/FSDMOFLT5 | <-- | 4607 | 2066 | 676 | | | |
| 1294 | HTDMOSYNC3:0175 | | | | | | | | |
| | ***** | | | | | | | | |
| | * DO INTERRUPT AND ABORT EXECUTION OF | * | | | | | | | 175 |
| | * INSTRUCTION | * | | | | | | | 0000 00 00 00 00 001 001 0000 0 |
| | ----- | | | | | | | | |
| | *SELECT, FPP(ABORT), | * | | | | | | | 11001 000000 11000 100101111 |
| | *NEXT, J/HTDMOSYNCS | * --> | 457 1296 | 420 | | | | | |
| | ***** | | | | | | | | |

M03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 420

BOX NO. TAG: ADDRESS
 .CASE 4 OF BMULFZ

SOURCE/DESTINATION OFST ADDR BOX PAGE MICROFICHE COORD CARD ADDR ALU BUSB BUSA EXTENSION RIF COUT CLOCKS
 UPF

```

F/MULEZ      <-- 244 1243 404
F/MULDZ      <-- 245 1244 404
F/ADDZ       <-- 250 1246 405
F/LOADZ      <-- 252 1248 405
F/SUBZ       <-- 255 1252 407
F/CTANZ      <-- 242 1254 407
E/STCPZ      <-- 270 1269 411
F/DIVZ       <-- 262 1283 416
F/HTDMOSYNC  <-- 165 1292 418
F/FSDMOFLT5  <-- 4607 2066 676
    
```

```

1295 HTDMOSYNC4:0177
*****
* SIMULTANEOUS RECEPTION OF FPPACK AND
* SERVICE CLEAR COUNTER DO NOT ABORT
* FPP
*-----*
* P2,      D+PC (A),
* P3,      FPA+D (B ADDR),
* NEXT,    BUTR(SERVICE),
*          J/SER02
*          J/FET03
*          J/SER01
*          J/FET01
*          J/SER02
    
```

```

177 000000001000
    1111 00 10 10 01 111 000 0100 0
    00000 011100 10000 111000011
    
```

```

--> 00 700 3 11
--> 01 701 385 160
--> 10 702 1 2
--> 11 703 387 162
    
```

```

1296 HTDMOSYNC5:0457
*****
* DEFER EXECUTION OF INSTRUCTION GO BACK
* UP PC AND SET T
* BIT
*-----*
* NEXT,    BUT(GO TO) PAGE+4,
*          J/FPPABORT10
*****
    
```

```

457 000000001000
    0000 00 06 00 00 000 100 0000 0
    00000 000000 11100 111100001
    
```

```

--> 4741 2185 720
    
```

N03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCKS |
|---------|--------------------|-------|--------------------|------|-----|------------|------|-----|------|------|-----------|-----|--------|
| .CASE | 1 OF BHOTSYNC | | OFST | ADDR | BOX | COORD | BUS | SP | UBF | RIF | COU | UPF | |
| | F/STATUS | <-- | 241 | 1259 | 409 | | | | | | | | |
| | F/STOREXP | <-- | 264 | 1264 | 410 | | | | | | | | |
| | F/STOREXPD | <-- | 265 | 1265 | 410 | | | | | | | | |
| | F/STOREXPX | <-- | 266 | 1266 | 410 | | | | | | | | |
| | F/LDEXP | <-- | 272 | 1272 | 412 | | | | | | | | |
| | F/LDEXPDM6 | <-- | 273 | 1273 | 413 | | | | | | | | |
| | F/LDEXPX | <-- | 274 | 1274 | 413 | | | | | | | | |
| | F/STCT | <-- | 267 | 1285 | 416 | | | | | | | | |
| | F/LDCTW7 | <-- | 4713 | 1863 | 602 | | | | | | | | |
| ***** | | | | | | | | | | | | | |
| * | SUBROUTINE HOTSUNC | | | | | | | | | | | | |
| | RETURN/STATUS | * --> | -1 | -1 | -1 | | | | | 2 | 1 | 1 | |
| | RETURN/STEXPHOT | * --> | 401 | 1267 | 411 | | | | | | | | |
| | RETURN/STEXPHOT | * --> | 401 | 1267 | 411 | | | | | | | | |
| | RETURN/STEXPHOT | * --> | 401 | 1267 | 411 | | | | | | | | |
| | RETURN/LDEXPZW | * --> | -1 | -1 | -1 | | | | | 2 | 1 | 1 | |
| | RETURN/LDEXPDM6W | * --> | 373 | 1836 | 594 | | | | | | | | |
| | RETURN/LDEXPNZW | * --> | 374 | 1837 | 594 | | | | | | | | |
| | RETURN/STCT2 | * --> | 440 | 1286 | 416 | | | | | | | | |
| | RETURN/LDCT2 | * --> | -1 | -1 | -1 | | | | | 2 | 1 | 1 | |
| ***** | | | | | | | | | | | | | |

245

```

1297 HOTSUNC:4565
*****
#MASK
-----
#----- GENERAL
#SYNCRONIZATION SUBROUTINE FOR
#INSTRUCTIONS FOR HOT FLOATING POINT NOTE
#ROUTINE DOES NOT SAVE PC FOR FPA TARGETS
#- HOTSUNC -
#HOTSUNC4
-----
#SELECT,   FPSCC(FPP),
#SELECT,   FPP(READ),FPSCC+DATA,FLPGO,
#P3,       MD+DATA,
#NEXT,     BUTR(SERVICE#FPPACK),
#          J/HOTSUNC
*****
BRANCHING-BUT USED WITH TAG NOT IDENTIFIED AS .CASE -- BOX 1297
*****

```

```

4565
0000 11 10 00 00 01000001000
11101 100000 00111 101110101

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|---|---------|---------|----------|-------------------------------|
| .CASE | 2 OF BHOTSYNC | | | | | | | |
| 1298 | HOTSYNC2:4567 | F/STATUS F/IA60B F/HOTSYNC | <-- <-- <-- | 241 1259 409 3106 628 236 4565 1297 421 | | | | |
| | ***** | | | | | | | |
| | * SYNC | | | | | | | |
| | * COMPLETE | | | | | | | |
| | ----- | | | | | | | |
| | * SELECT, EMIT, | | | | | | | |
| | * NEXT, | | | | | | | |
| | * BUT(RETURN) | | --> | VV | | | | |
| | ***** | | | | | | | |
| .CASE | 3 OF BSTFLT4 | | | | | | | |
| 1299 | HOTSYNC3:4575 | F/STFLT4 | <-- | 4711 2119 696 | | | | |
| | ***** | | | | | | | |
| | * RETURN TO CALLER ABORT THE EXECUTION OF | | | | | | | |
| | * INSTRUCTION | | | | | | | |
| | ----- | | | | | | | |
| | * SELECT, FPP(ABORT), | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/FPPABORT10 | | --> | 4741 2185 720 | | | | |
| | ***** | | | | | | | |
| .CASE | 4 OF BSTFLT4 | | | | | | | |
| 1300 | HOTSYNC4:4577 | F/STFLT4 | <-- | 4711 2119 696 | | | | |
| | ***** | | | | | | | |
| | * ABORT EXECUTION OF INSTRUCTION AND GO | | | | | | | |
| | * BACK UP PC | | | | | | | |
| | * FOR | | | | | | | |
| | ----- | | | | | | | |
| | * SELECT, FPP(ABORT), | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/FPPABORT10 | | --> | 4741 2185 720 | | | | |
| | ***** | | | | | | | |

4567
0000 00 00 00 01 000 000 0000 0
11001 000000 11111 00000000

4575
0000 00 00 00 00 001 001 0000 0
11001 000000 11000 111100001

4577
0000 00 00 00 00 001 001 0000 0
11001 000000 11000 111100001

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|--|-------------|--------------------|---------------|-----------------------|--------------|---------|----------|-----------|------|--------|
| | | OFST | ADDR BOX PAGE | | | | | RIF | COUT | CLOCKS |
| <pre> .TOC " HOT FLOATING POINT SERVICE HANDLER ##FLPT##" ;; THIS POINT IS ENTERED TO SERVICE HOT FLOATING POINT EXCEPTIONS ;; HOT FLOATING POINT IS IN A WAIT STATE MONITORING THE ISSANCE ;; OF A UNCON PATTERN GENERATED BY "SELECT, FPP(SERVICE)" ;; AN EXCHANGE OF INFORMATION IS MADE DURING THIS SERVICE ROUTINE. ;; HOT FLOATING POINT WILL PRESENT A CODE TO BE DECODED BY THE ;; BASE MACHINE AS TO THE TYPE OF EXCEPTION THAT OCCURRED, BASE ;; MACHINE WILL PRESENT THE FPSHI REGISTER RIGHT JUSTIFIED TO ;; INFORM THE HOT FPP IF THE PARTICULAR TRAP IS ENABLED. ;; ;; IF THE PRIORITY OF THE PROCESSOR IS 7 AND THE INSTRUCTION ;; REGISTER DOES NOT CONTAIN </pre> | | | | | | | | | | |

| | | | | | | | | | |
|------|---------------------------|-----------|--------|------|------|-----|-----------|-------|----------------------------|
| 1301 | HFPPSVC:1663 | F/SER11 | <-- | 1016 | 401 | 167 | OF BSER11 | 1663 | 000000001000 |
| | ***** | | | | | | | 1000 | 00 00 10 01 010 010 0000 0 |
| | #REEXECUTION | | | | | | | 11001 | 000000 11000 110001000 |
| | *-----* | | | | | | | | |
| | *SELECT, PS, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/HFPPSVC2 | | | | | | | | |
| | ***** | | | | | | | | |
| 1302 | HFPPSVC2:1610 | F/HFPPSVC | <-- VV | | | | | 1610 | 000000001000 |
| | ***** | | | | | | | 0000 | 11 10 00 00 000 100 0000 0 |
| | #P2, MD+PS | | | | | | | 00000 | 100000 11100 010000010 |
| | #NEXT, BUT(GO TO),PAGE+4, | | | | | | | | |
| | * J/HFPPSVC3 | | | | | | | | |
| | ***** | | | | | | | | |
| | | | --> | 4202 | 1303 | 424 | | | |

E04

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|---------|---|--|--------------------------|-----------|---------------|-----------------|----------------|----------------------|----------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS |
| 1303 | HFPPSVC3:4202 ***** *P2, SR+MD, *NEXT, BUT(CLEAR FLAGS), * J/HFPPSVC4 ***** | <-- | 1610 1302 423 | 4202 | 1010 00000 | 11 10 000000 | 00 00 11010 | 000 000 010000100 | 0010 0 0 |
| 1304 | HFPPSVC4:4204 ***** * MASK TO ISOLATE PRIORITY *FIELD ----- *P3, MD+340 (BC), *NEXT, * J/HFPPSVC5 ***** | <-- VV | | 4204 | 0000 00010 | 10 00 100000 | 00 11 11000 | 100 000 010000110 | 0000 0 0 |
| 1305 | HFPPSVC5:4206 ***** * ISOLATE *PRIORITY ----- *P2 D+NOT SR AND MD, *SETUP, TEST FOR FP INSTRUCTION, *NEXT, * J/HFPPSVC6 ***** | <-- VV | | 4206 | 0010 00000 | 11 10 000000 | 00 00 11000 | 000 101 010001000 | 0100 0 0 |
| 1306 | HFPPSVC6:4210 ***** * CHECK 17 OPCODE TARGETS * ----- *NEXT, BUTM(FP), * J/HFPPSVC7 ***** | <-- VV | | 4210 | 0000 00000 | 00 00 000000 | 00 00 01100 | 000 101 110010110 | 0000 0 0 |
| | | --> | 4626 1307 425 | | | | | | |

F04

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 425

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|------------|--|--|--------------------------|------|------------|------------|-------------|-----------|----------|--------|----------------|
| | | | | | | | | RIF | COUT | | |
| .CASE 1307 | 1 OF BHPPSVC6 HFPPSVC7:4626 | F/HFPPSVC6 | <-- | 4210 | 1306 | 424 | | | | | |
| | ***** | | | | | | | 4626 | 00000000 | 1000 | |
| | *0 - HFPPSVC7 1 - HFPPTRAP READ FPP DATA * | | | | | | | 0000 | 11 10 | 00 00 | 001 000 0000 0 |
| | *TARGETS - 0 - * | | | | | | | 11001 | 100000 | 01101 | 010011001 |
| | *HFPPTRAP2 * | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *SELECT, FPP(READ), * | | | | | | | | | | |
| | *P3, MD+DATA, * | | | | | | | | | | |
| | *NEXT, BUTR(D(14-00) IS 0), * | | | | | | | | | | |
| | * J/HFPPTRAP2 * | | | | | | | | | | |
| | * J/HFPPTRAP2 * | --> | | 01 | 4231 | 1309 | 425 | | | | |
| | * J/FETO1F2 * | --> | | 11 | 4233 | 1315 | 427 | | | | |
| | ***** | | | | | | | | | | |
| .CASE 1308 | 2 OF BHPPSVC6 HFPPTRAP:4627 | F/HFPPSVC6 | <-- | 4210 | 1306 | 424 | | | | | |
| | ***** | | | | | | | 4627 | 00000000 | 1000 | |
| | *1 - FETO1F2 READ HOT FPP * | | | | | | | 0000 | 11 10 | 00 00 | 001 000 0000 0 |
| | *CODE * | | | | | | | 11001 | 100000 | 11000 | 010011001 |
| | ----- | | | | | | | | | | |
| | *SELECT, FPP(READ), * | | | | | | | | | | |
| | *P3, MD+DATA, * | | | | | | | | | | |
| | * J/HFPPTRAP2 * | --> | VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| .CASE 1309 | 1 OF BHPPSVC7 HFPPTRAP2:4231 | F/HFPPSVC7 F/HFPPTRAP | <-- <-- VV | 4626 | 1307 | 425 | | | | | |
| | ***** | | | | | | | 4231 | 00000000 | 1000 | |
| | *P2, SR+MD, * | | | | | | | 1010 | 11 10 | 00 00 | 000 000 0010 0 |
| | *NEXT, J/HFPPTRAP3 * | | | | | | | 00000 | 000000 | 11000 | 010001010 |
| | ----- | | | | | | | | | | |
| .CASE 1310 | HFPPTRAP3:4212 | F/HFPPTRAP2 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 4212 | 00000000 | 1000 | |
| | * FETCH * | | | | | | | 1111 | 00 00 | 11 00 | 011 000 0100 0 |
| | *FPSHI * | | | | | | | 00000 | 000000 | 11000 | 010001100 |
| | ----- | | | | | | | | | | |
| | *P2, D+FPSHIFEC, * | | | | | | | | | | |
| | *NEXT, J/HFPPTRAP4 * | --> | | 4214 | 1311 | 426 | | | | | |
| | ***** | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|--|---------------------------------------|-----------------------|--------------------------------|---------|----------|---------------------------------|
| .CASE | 2 OF BHFPSSVC7 | | | | | | |
| 1315 | FETO1F2:4233 | F/HFPSSVC7 F/HFPSTRAP | <-- <-- | 4626 1307 425 4627 1308 425 | | | |
| | ***** | | | | | | |
| | *TARGETS - 001 - OPCODEERR 010 - ZERODIV | | | | | | 4233 00000001011 |
| | *100 - VTRAPS 101 - UFLOTRAP 110 - | | | | | | 1001 11 11 10 01 111 000 0101 0 |
| | *NZEROTRAP 111 - MAINTRAP PS PRIORITY IS | | | | | | 10000 000110 11100 000000001 |
| | *HIGHEST (7) DEFER OPERATING ON HOTT FPP | | | | | | |
| | *SERVICE REQUEST UNTIL PRIORITY LEVEL | | | | | | |
| | *DROPS BELOW 7 FETCH NEXT | | | | | | |
| | *INSTRUCTION | | | | | | |
| | ----- | | | | | | |
| | *P1, BA+PC, CURRENT MODE, | | | | | | |
| | *P2, D+PC PLUS 2, | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | |
| | *P3, U, DATI CLKIR, | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+D, | | | | | | |
| | * J/FET02 | | --> | 1 2 10 | | | |
| | ***** | | | | | | |
| .TOC " | PAGE FOUR COPY OF FETO1 #FLPT#" | | | | | | |
| .CASE | 1 OF BTSTNZW6 | | | | | | |
| | F/TSTNZW6 | <-- | | 4636 1385 452 | | | |
| | F/WARMDIS3 | <-- | | 4406 1994 645 | | | |
| | F/WARMDIS4 | <-- | | 4407 1995 645 | | | |
| | F/HOTDIS | <-- | | 4447 1996 645 | | | |
| | F/UVDIS3 | <-- | | 4643 1999 646 | | | |
| | F/CDIS | <-- | | 4617 2000 646 | | | |
| | F/NOTRAP | <-- | | 4027 2008 649 | | | |
| | F/FFLT8 | <-- | | 4102 2104 690 | | | |
| | F/FFLT18 | <-- | | 4277 2114 693 | | | |
| 1316 | FETO1F:4722 | | | | | | |
| | ***** | | | | | | |
| | *P1, BA+PC, CURRENT MODE, | | | | | | 4722 00000001011 |
| | *P2, D+PC PLUS 2, | | | | | | 1001 11 11 10 01 111 000 0101 0 |
| | *P3, PC+D (A ADDR), | | | | | | 10000 000110 11100 000000001 |
| | *P3, U, DATI CLKIR, | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+D, | | | | | | |
| | * J/FET02 | | --> | 1 2 10 | | | |
| | ***** | | | | | | |

| BOX NO. .CASE | TAG: ADDRESS 2 OF BTSTNZW6 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------------|-----------------------------------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|
| | F/TSTNZW6 | <-- | 4636 1385 452 | | | | |
| | F/WARMDIS3 | <-- | 4406 1994 645 | | | | |
| | F/WARMDIS4 | <-- | 4407 1995 645 | | | | |
| | F/HOTDIS | <-- | 4447 1996 645 | | | | |
| | F/LVDIS3 | <-- | 4643 1999 646 | | | | |
| | F/CDIS | <-- | 4617 2000 646 | | | | |
| | F/NOTRAP | <-- | 4027 2008 649 | | | | |
| | F/FFLT8 | <-- | 4102 2104 690 | | | | |
| 1317 | SER02F:4723 | <-- | 4277 2114 693 | | | | |
| | ***** | | | | | | 4723 00000001000 |
| | * CHECK IF THIS SHOULD BE BRAOS * | | | | | | 0000 00 00 00 10 001 000 0000 0 |
| | ***** | | | | | | 00000 000000 11100 011010010 |
| | -----* | | | | | | |
| | * RETURN+SER04 * | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, * | | | | | | |
| | * J/SER03 * | | | | | | |
| | ***** --> | | ***** | | | | |
| | | | 322 388 163 | | | | |
| | | | ***** | | | | |
| | | | W | | | | |
| | | | 21 394 165 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSB UBF | EXTENSION RIE COUT CLOCKS |
|---------|---|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------|
| .TOC - | WARM FLOATING POINT UCODE:- ##FLTPT##" | | | | | | | |
| .CASE | 1 OF BRESTCSP17 | | | | | | | |
| 1318 | MFORK:0474 F/RESTCSP17 | <-- | 646 2284 752 | | | | | |
| | ***** | | | 474 | | | | 00000001000 |
| | * FROM BUT(INSTR I) WHEN FLOATING POINT | | | | 1010 | 10 11 | 00 00 | 011 000 0110 0 |
| | * AND NOT HOT; FLOATING POINT DECODE IS | | | | 00010 | 011010 | 00011 | 011100000 |
| | * PERFORMED BY BUT(IR11#FLPROM<3:0>); | | | | | | | |
| | * FLOATING POINT DECODE ROM IS DIVIDED | | | | | | | |
| | * INTO THE FOLLOWING DECODE TARGETS - ; | | | | | | | |
| | * INPUT OUTPUT INSTRUCTION | | | | | | | |
| | * IR11=0 INSTRUCTION IR11=1; | | | | | | | |
| | * IR<10:3>#FD; :00 000 XXX X | | | | | | | |
| | * 00 SETCLASS STF1 :00 0XX XXX X | | | | | | | |
| | * 01 STATUS STF2 :00 1XX 000 X | | | | | | | |
| | * 02 CTAN#DMD DIV#DMD | | | | | | | |
| | ----- | | | | | | | |
| | * P2, SR#MD(D) D#MD(D), | | | | | | | |
| | * P3, R(IR)+D (B ADDR), | | | | | | | |
| | * NEXT, BUTR(FLPDECODE), | | | | | | | |
| | * J/SETCLASSM | | | | | | | |
| | * J/SETCLASSM | --> | 00000 340 1320 431 | | | | | |
| | * J/STATUSM | --> | 00001 341 1345 439 | | | | | |
| | * J/CTANZM | --> | 00010 342 1360 444 | | | | | |
| | * J/CTANZM | --> | 00011 343 1373 448 | | | | | |
| | * J/MULFZM | --> | 00100 344 1404 457 | | | | | |
| | * J/MULDZM | --> | 00101 345 1405 457 | | | | | |
| | * J/MULXM | --> | 00110 346 1406 458 | | | | | |
| | * J/MODM | --> | 00111 347 1479 481 | | | | | |
| | * J/ADDZM | --> | 01000 350 1565 508 | | | | | |
| | * J/ADDZM | --> | 01001 351 1566 509 | | | | | |
| | * J/LOADZM | --> | 01010 352 1641 534 | | | | | |
| | * J/LOADSIXM | --> | 01011 353 1648 536 | | | | | |
| | * J/LOADNZM | --> | 01100 354 1650 537 | | | | | |
| | * J/SUBZM | --> | 01101 355 1567 509 | | | | | |
| | * J/SUBNZM | --> | 01110 356 1568 509 | | | | | |
| | * J/CMPM | --> | 01111 357 1656 539 | | | | | |
| | * J/ST1M | --> | 10000 360 1680 546 | | | | | |
| | * J/ST2M | --> | 10001 361 1681 547 | | | | | |
| | * J/DIVZM | --> | 10010 362 1683 548 | | | | | |
| | * J/DIVNZM | --> | 10011 363 1684 548 | | | | | |
| | * J/STOREXPW | --> | 10100 364 1750 568 | | | | | |
| | * J/STOREXPDM | --> | 10101 365 1751 569 | | | | | |
| | * J/STOREXPXM | --> | 10110 366 1752 569 | | | | | |
| | * J/STCTM | --> | 10111 367 1757 571 | | | | | |
| | * J/STCPZM | --> | 11000 370 1803 584 | | | | | |
| | * J/STCPNZM | --> | 11001 371 1806 585 | | | | | |
| | * J/LDEXPZM | --> | 11010 372 1835 594 | | | | | |
| | * J/LDEXPDM6M | --> | 11011 373 1836 594 | | | | | |
| | * J/LDEXPNZM | --> | 11100 374 1837 594 | | | | | |
| | * J/LDCTZM | --> | 11101 375 1856 600 | | | | | |
| | * J/LDCTNZM | --> | 11110 376 1857 600 | | | | | |
| | * J/LDCPW1 | --> | 11111 377 1889 610 | | | | | |
| | ***** | | | | | | | |

K04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 430

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|---|---------------------------------------|------------------------------|------|---------------|-----------------|----------------|--|
| .CASE 1319 | 3 OF BRESTCSP17 WFORKNVALD:0476 | F/RESTCSP17 <-- | 646 2284 752 | 476 | 1010 00000 | 11 10 010010 | 00 01 11100 | 00000001000 011 010 0110 0 110110010 |
| | * SECONDARY ENTRY POINT INTO WFPP FROM * * INSTR 1 BRANCH WHERE CSP'S ARE NOT VALID * * SECOND ENTRY TO WFORK CSP NOT VALID GO * * RESTORE CSP FPP * * CONSTANTS * *-----* | | | | | | | |
| | *P2, D+MD, SR+MD, * *P3, R(IR)+D (A, ADDR), * *NEXT, BUT(GO TO), PAGE+2, * * J/RESTORECSP * --> | | 2662 2268 749 | | | | | |
| .CASE 1320 | 1 OF BWFORK SETCLASSM:0340 | F/SETCLASS3 <-- F/WFORK <-- | 207 1239 403 474 1318 429 | 340 | 0000 11001 | 10 00 100000 | 11 01 00101 | 00000001000 000 000 0000 0 011001001 |
| | * THEN RETURN TO WFORK LABEL ENTRY INTO * * THIS POINT IS FROM WFORK OR SETCLASS3 * * INSTRUCTION EXECUTED ARE - * * SETF, SETD, SETI, SETL, LDURK, ILLEGAL * * INSTRUCTION DECODE TARGETS * *-----* | | | | | | | |
| | *SELECT, FPS(READ), EMITCON+FPS, * *NEXT, BUTR(DM), * * J/SETFDW * --> | | 1001 311 1324 432 | | | | | |
| | * J/ILLEGAL1 * --> | | 1011 313 1321 432 | | | | | |
| | * J/ILLEGAL2 * --> | | 1101 315 1322 432 | | | | | |
| | * J/ILLEGAL3 * --> | | 1111 317 1323 432 | | | | | |

M04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 432

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUF CLOCKS |
|----------------------|--|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|--|
| .CASE 1321 | 2 OF BSETCLASSM ILLEGAL1:0313 F/SETCLASSM | <-- | 340 1320 431 | 313 | 0100 00000 | 00 10 000000 | 11 00 11100 | 00000001000 001 010 0000 0 101100100 |
| | *OOX - SETFDW 01X,10X,11X *ILLEGAL1-ILLEGAL3 ILLEGAL INSTRUCTION *GO TO *TRAPS ----- *NEXT, BUT(GO TO),PAGE+2, * RETURN+OPCODERR, * J/TPREAMBLE | | --> 2544 1969 637 | | | | | |
| .CASE 1322 | 3 OF BSETCLASSM ILLEGAL2:0315 F/SETCLASSM | <-- | 340 1320 431 | 315 | 0100 00000 | 00 10 000000 | 11 00 11100 | 00000001000 001 010 0000 0 101100100 |
| | * ILLEGAL INSTRUCTION GO TO *TRAPS ----- *NEXT, BUT(GO TO),PAGE+2, * RETURN+OPCODERR, * J/TPREAMBLE | | --> 2544 1969 637 | | | | | |
| .CASE 1323 | 4 OF BSETCLASSM ILLEGAL3:0317 F/SETCLASSM | <-- | 340 1320 431 | 317 | 0100 00000 | 00 10 000000 | 11 00 11100 | 00000001000 001 010 0000 0 101100100 |
| | * ILLEGAL INSTRUCTION GO TO *TRAPS ----- *NEXT, BUT(GO TO),PAGE+2, * RETURN+OPCODERR, * J/TPREAMBLE | | --> 2544 1969 637 | | | | | |
| .TOC = .CASE 1324 | SETL AND SETD AND RESERVED INSTRUCTIONS 1 OF BSETCLASSM SETFDW:0311 F/SETCLASSM | <-- | 340 1320 431 | 311 | 1010 01001 | 10 00 010110 | 00 00 11000 | 00000001000 110 000 0100 0 100110000 |
| | *P2, D+EMITCON *P3, R(T1)+D (A ADDR), *NEXT, J/SETFD02 | | --> 460 1325 433 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--|--------------------------|------|------------|------------|-------------|-----------|-----|-------|
| | | | | | | | | RIF | COU | |
| 1325 | SETFD02:0460 | F/SETFDW | <-- | 311 | 1324 | 432 | | | | |
| | ***** | | | | | | | | | |
| | * TARGETS | | | | | | | | | |
| | *-- | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *SELECT, EMIT, | | | | | | | | | |
| | *NEXT, BUT(CASE), | | | | | | | | | |
| | * J/CFCC | | | | | | | | | |
| | * J/CFCC | | --> | 0000 | 220 | 1326 | 433 | | | |
| | * J/SETF | | --> | 0001 | 221 | 1327 | 434 | | | |
| | * J/SETI | | --> | 0010 | 222 | 1328 | 434 | | | |
| | * J/LDUBRK | | --> | 0011 | 223 | 1330 | 435 | | | |
| | * J/FPPMAINT1 | | --> | 0100 | 224 | 1331 | 435 | | | |
| | * J/FPPMAINT2 | | --> | 0101 | 225 | 1332 | 435 | | | |
| | * J/ILLTWO | | --> | 0110 | 226 | 1333 | 436 | | | |
| | * J/FPPMAINT3 | | --> | 0111 | 227 | 1334 | 436 | | | |
| | * J/ILLTHREE | | --> | 1000 | 230 | 1335 | 436 | | | |
| | * J/SETD | | --> | 1001 | 231 | 1336 | 436 | | | |
| | * J/SETL | | --> | 1010 | 232 | 1338 | 437 | | | |
| | * J/ILLFOUR | | --> | 1011 | 233 | 1340 | 437 | | | |
| | * J/ILLFIVE | | --> | 1100 | 234 | 1341 | 438 | | | |
| | * J/ILLSIX | | --> | 1101 | 235 | 1342 | 438 | | | |
| | * J/ILLSEVEN | | --> | 1110 | 236 | 1343 | 438 | | | |
| | * J/ILLEIGHT | | --> | 1111 | 237 | 1344 | 438 | | | |
| | ***** | | | | | | | | | |
| .TOC " | SETF SETI CFCC LDUBRK AND RESERVED INSTRUCTIONS ##FLPT## | | | | | | | | | |
| .CASE | 1 OF BSETFD02 | | | | | | | | | |
| 1326 | CFCC:0220 | F/SETFD02 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *SR<3:0> 0000 - CFCC 0001 - SETF | | | | | | | | | |
| | *0010 - SETI 0011 - LDUBRK | | | | | | | | | |
| | *1000 - ILLTHREE 1001 - SETD 1010 - SETL | | | | | | | | | |
| | *1011 - ILLFOUR INSTRUCTION COPIES | | | | | | | | | |
| | *FLOATING POINT CONDITION CODES INTO PSW | | | | | | | | | |
| | *COPY | | | | | | | | | |
| | *FPSCC | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *SELECT, PS(CC), | | | | | | | | | |
| | *P3, PS(CC)+D, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FET01 | | | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | | | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | | | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | | | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |

460
 0000 00 00 00 01 000 000 0000 0
 11001 000000 00000 010010000

220
 1000 00 00 10 01 000 000 0000 0
 11011 000000 10000 111000010

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|--------------|--------------------|----------------|-------------------------------|
| .CASE 1327 | 2 OF BSETFD02 SETF:0221 | F/SETFD02 <-- | 460 1325 433 | 221 | 0111 10 00 11 00 | 110 000 0100 0 | 00000001000 |
| | *INSTRUCTION CLEARS FPS<07> IN FLOATING *POINT STATUS REGISTER | | | | 00100 000000 11000 | 100111000 | |
| | *P2, D+R(T1) AND NOT SETDMASK, *NEXT, J/SETDM2 | --> | 470 1337 437 | | | | |
| .CASE 1328 | 3 OF BSETFD02 SETI:0222 | F/SETFD02 <-- | 460 1325 433 | 222 | 0000 10 00 00 01 | 000 000 0000 0 | 00000001000 |
| | *INSTRUCTION CLEARS FPS<06> IN FLOATING *POINT STATUS REGISTER | | | | 00010 100000 11000 | 100110001 | |
| | *P3, MD+SETLMASK, *NEXT, J/SETI2 | --> VV | | | | | |
| 1329 | SETI2:0461 | F/SETI <-- VV | | 461 | 0111 11 10 11 00 | 110 000 0100 0 | 00000001000 |
| | *P2, D+R(T1) AND NOT MD, *NEXT, J/SETDM2 | --> | 470 1337 437 | | 00000 000000 11000 | 100111000 | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------|---|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1330 | 4 OF BSETFD02 LDUBRK:0223 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | |
| | ***** | | | | | | | | | |
| | * LOAD NOT FPP UBREAK REGISTER IN THE | | | | | | | | | |
| | * FLOATING POINT PROCESSOR :- IF EXECUTED | | | | | | | | | |
| | * BY WARM FLOATING POINT, NO ACTION IS | | | | | | | | | |
| | * TAKEN SOURCE OF ADDRESS IS FROM GENERAL | | | | | | | | | |
| | * REGISTER | | | | | | | | | |
| | *3 | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+R3 (A), FLPG0, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FET01 | | | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | | | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | | | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | | | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |
| .CASE 1331 | 5 OF BSETFD02 FPPMAINT1:0224 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | |
| | ***** | | | | | | | | | |
| | * FLOATING POINT MAINTENANCE | | | | | | | | | |
| | * INSTRUCTION | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FET01 | | | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | | | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | | | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | | | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |
| .CASE 1332 | 6 OF BSETFD02 FPPMAINT2:0225 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | |
| | ***** | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FET01 | | | | | | | | | |
| | * J/FET03 | | --> | 00 | 700 | 3 | 11 | | | |
| | * J/SER01 | | --> | 01 | 701 | 385 | 160 | | | |
| | * J/FET01 | | --> | 10 | 702 | 1 | 2 | | | |
| | * J/SER02 | | --> | 11 | 703 | 387 | 162 | | | |
| | ***** | | | | | | | | | |

223
1111 00 00 10 01 101 000 0100 0
11100 000000 10000 111000010

224
0000 00 00 00 00 000 000 0000 0
00000 000000 10000 111000010

225
0000 00 00 00 00 000 000 0000 0
00000 000000 10000 111000010

D05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | | | |
|--|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|--|--|--|--|
| | | | | | | | | RIF | COUT | CLOCKS | | | | |
| .CASE 1333 | 7 OF BSETFD02 ILLTWO:0226 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | #NEXT, RETURN+OPCODERR, PAGE+2, # BUT(GO TO) # J/TPREAMBLE | | --> | 2544 | 1969 | 637 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |
| .CASE 1334 | 8 OF BSETFD02 FPPMAINT3:0227 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | #P2, D+R4 FLPG0 | | | | | | | | | | | | | |
| | #NEXT, BUTR(SERVICE), | | | | | | | | | | | | | |
| | # J/FETO1 | | | | | | | | | | | | | |
| | # J/FETO3 | | --> | 00 | 700 | 3 | 11 | | | | | | | |
| # J/SERO1 | | --> | 01 | 701 | 385 | 160 | | | | | | | | |
| # J/FETO1 | | --> | 10 | 702 | 1 | 2 | | | | | | | | |
| # J/SERO2 | | --> | 11 | 703 | 387 | 162 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |
| .CASE 1335 | 9 OF BSETFD02 ILLTHREE:0230 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | # ILLEGAL INSTRUCTION GO TO # TRAPS | | | | | | | | | | | | | |
| ----- | | | | | | | | | | | | | | |
| #NEXT, BUT(GO TO) PAGE+2, # RETURN+OPCODERR, # J/TPREAMBLE | | --> | 2544 | 1969 | 637 | | | | | | | | | |
| ***** | | | | | | | | | | | | | | |
| .CASE 1336 | 10 OF BSETFD02 SETD:0231 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | #INSTRUCTION SETS FPS<07> IN FLOATNG #POINT STATUS REGISTER | | | | | | | | | | | | | |
| ----- | | | | | | | | | | | | | | |
| #P2, D+R(T1) OR SETDMASK, | | | | | | | | | | | | | | |
| #NEXT, J/SETDW2 | | --> | 470 | 1337 | 437 | | | | | | | | | |
| ***** | | | | | | | | | | | | | | |

E05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------|---------------------------------------|-----------|--------|--------------------|------|-----|--------------------------|--------------------|------------|------------|-------------|-----------|-----|-------------|-------------|
| | | | | OFST | ADDR | BOX | | | | | | PAGE | RIF | COUT | CLOCKS |
| | | F/SETF | <-- | 221 | 1327 | 434 | | | | | | | | | |
| | | F/SETI2 | <-- | 461 | 1329 | 434 | | | | | | | | | |
| | | F/SETD | <-- | 231 | 1336 | 436 | | | | | | | | | |
| | | F/SETL2 | <-- | 471 | 1339 | 437 | | | | | | | | | |
| 1337 | SETDM2:0470 | ***** | | | | | | | | | | 470 | | | 00000001000 |
| | *SELECT, FPS(WRITE), FPS+D, | * | | | | | | 0000 | 00 00 | 00 01 | 100 000 | 0000 0 | | | |
| | *NEXT, BUTR(SERVICE), | * | | | | | | 11011 | 000000 | 10000 | 111000010 | | | | |
| | * J/FETO1 | * | | | | | | | | | | | | | |
| | * J/FETO3 | * --> | | 00 | 700 | 3 | 11 | | | | | | | | |
| | * J/SERO1 | * --> | | 01 | 701 | 385 | 160 | | | | | | | | |
| | * J/FETO1 | * --> | | 10 | 702 | 1 | 2 | | | | | | | | |
| | * J/SERO2 | * --> | | 11 | 703 | 387 | 162 | | | | | | | | |
| | ***** | | | | | | | | | | | | | | |
| .CASE | 11 OF BSETFD02 | | | | | | | | | | | | | | |
| 1338 | SETL:0232 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | | | | | | |
| | ***** | | | | | | | | | | 232 | | | 00000001000 | |
| | *INSTRUCTION SETS FPS<06> IN FLOATING | * | | | | | | 0000 | 10 00 | 00 01 | 000 000 | 0000 0 | | | |
| | *POINT STATUS REGISTER | * | | | | | | 00010 | 100000 | 11000 | 100111001 | | | | |
| | *P3, MD+SETLMASK, | * | | | | | | | | | | | | | |
| | *NEXT, J/SETL2 | * --> VV | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | |
| 1339 | SETL2:0471 | F/SETL | <-- VV | | | | | | | | | | | | |
| | ***** | | | | | | | | | | 471 | | | 00000001000 | |
| | *P2, D+R(T1) OR MD, | * | | | | | | 1110 | 11 10 | 11 00 | 110 000 | 0100 0 | | | |
| | *NEXT, J/SETDM2 | * --> | | 470 | 1337 | 437 | | 00000 | 000000 | 11000 | 100111000 | | | | |
| | ***** | | | | | | | | | | | | | | |
| .CASE | 12 OF BSETFD02 | | | | | | | | | | | | | | |
| 1340 | ILLFOUR:0233 | F/SETFD02 | <-- | 460 | 1325 | 433 | | | | | | | | | |
| | ***** | | | | | | | | | | 233 | | | 00000001000 | |
| | * ILLEGAL INSTRUCTION GO TO | * | | | | | | 0100 | 00 10 | 11 00 | 001 010 | 0000 0 | | | |
| | *TRAPS | * | | | | | | 00000 | 000000 | 11100 | 101100100 | | | | |
| | *NEXT, BUT(GO TO), PAGE+2, | * | | | | | | | | | | | | | |
| | * RETURN+OPCODERR, | * | | | | | | | | | | | | | |
| | * J/TPREAMBLE | * --> | | 2544 | 1969 | 637 | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | |

G05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 439

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|------------------------|------------|---------------|--------------|------------|------|-------------------------------------|
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| .CASE | FLOATING POINT STATUS LOAD/STORE ##FLPT## | | | | | | | |
| .CASE | 2 OF BMFORK | | | | | | | |
| 1345 | STATUSM:0341 | F/SETCLASS3 F/WFORK | <-- <-- | 207 474 | 1239 1318 | 403 429 | | |
| | *IR<7:6> | | | | | | | 341 00000001000 |
| | *SELECT, FPS(READ), | | | | | | | 0000 11 10 11 01 000 000 0000 0 |
| | *P3, MD+FPS, | | | | | | | 11001 100000 00100 101000100 |
| | *NEXT, BUTR(IR07#IR06), | | | | | | | |
| | * J/0504 | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | J/LDFPS | --> | | 1001 505 | 1346 | 439 | | |
| | J/STFPS | --> | | 1010 506 | 1355 | 442 | | |
| | J/STST | --> | | 1011 507 | 1357 | 443 | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| | UNDEFINED CASE | | | | | | | |
| .CASE | 2 OF BSTATUSM | | | | | | | |
| 1346 | LDFPS:0505 | F/STATUSM | <-- VV | | | | | |
| | *01 LDFPS 10 STFPS 11 STST FETCH | | | | | | | 505 0000 00 10 01 11 010 010 0000 0 |
| | *OPERAND | | | | | | | 00000 000000 11100 101101000 |
| | *NEXT, CALL FETCHINT, | | | | | | | |
| | * RETURN+LDFPS2 | | | | | | | |
| | ***** | --> | | 2550 2009 650 | | | | |
| | ***** | | | | | | | |
| | VV | | | | | | | |
| | | | | 472 1347 | 439 | | | |
| 1347 | LDFPS2:0472 | | | | | | | |
| | * USED TO SATISFY HOT FPP REQUIREMENT FOR | | | | | | | 472 0000 00 00 00 01 000 000 0000 0 |
| | *DOUBLE FLPGO IN STATUS | | | | | | | 11101 000000 11000 100111011 |
| | *CODE | | | | | | | |
| | *SELECT, EMIT,FLPGO, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/LDFPS3 | --> | | 473 1348 | 440 | | | |

H05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | EXTENSION | | | | | | | | | | | | | |
|---------|--|--|--------------------------|------------------------------|------------|------------|------------|----|------|--------|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | BUSB UP | IF | COUT | CLOCKS | | | | | | | | | | |
| 1348 | LDFPS3:0473 | F/LDFPS2 | <-- | 472 1347 439 | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | * CHECK IF KERNAL OR USER 0 - KERNAL - | | | | | | | | | | | | | | | | | | | |
| | *LDFPS6 | | | | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *P3, | MD+147400, | | | | | | | | | | | | | | | | | | |
| | *NEXT, | BUTR(PS15), | | | | | | | | | | | | | | | | | | |
| | * | J/LDFPS6 | --> | 10 162 1351 441 | | | | | | | | | | | | | | | | |
| | * | J/LDFPS4 | --> | 11 163 1349 440 | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| .CASE | 2 OF BLDFPS3 | | | | | | | | | | | | | | | | | | | |
| 1349 | LDFPS4:0163 | F/LDFPS3 F/LDFPS5 | <-- <-- | 473 1348 440 500 1350 440 | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | #1 - USER - LDFPS4 CONSTANT TO MASK | | | | | | | | | | | | | | | | | | | |
| | #FMM | | | | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *P3, | EMITCON+147757, | | | | | | | | | | | | | | | | | | |
| | *NEXT, | J/LDFPS5 | --> | VV | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| 1350 | LDFPS5:0500 | F/LDFPS4 | <-- | VV | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | # FMM IS | | | | | | | | | | | | | | | | | | | |
| | #REMOVED | | | | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |
| | *P2, | D+R(T2) AND EMITCON, | | | | | | | | | | | | | | | | | | |
| | *P3, | R(T2)+D (A ADDR), | | | | | | | | | | | | | | | | | | |
| | *NEXT, | J/LDFPS6 | --> | 162 1351 441 | | | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | | | | | |

```

473          000000001000
      1100  10 11  11 00  000 000  0000 0
      00010 100000 01110 001110010

163          000000001000
      1100  10 11  11 11  101 111  0000 0
      01001 100000 11000 101000000

500          000000001000
      1011  10 00  11 01  110 000  0100 0
      01001 010110 11000 001110010
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-------------------------------------|---------------------------------------|-----------------------|------------------------------|--------------|---------|-----------|-------------------------------|
| 1351 | LDFPS6:0162 | F/LDFPS3 F/LDFPS5 | <-- <-- | 473 1348 440 500 1350 440 | | | | |
| | ***** | | | 162 | | | | 011000001000 |
| | * LO BYTE OF FPS HAS BEEN LOADED IN | | | | 0000 00 00 | 00 01 | 100 000 | 0000 0 |
| | *FPSLO | | | | 11011 000000 | 11000 | 101000010 | |
| | ***** | | | | | | | |
| | *SELECT, FPS(WRITE), | | | | | | | |
| | *SELECT, FPSCC(DBUF), | | | | | | | |
| | *P3, FPS+D,FPSCC+DATA, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/LDFPS7 | | --> VV | | | | | |
| 1352 | LDFPS7:0502 | F/LDFPS6 | <-- VV | | | | | |
| | ***** | | | 502 | | | | 000000001000 |
| | * MASK OUT LO BYTE OF NEW | | | | 1011 11 10 | 01 01 | 000 000 | 0110 0 |
| | *FPS | | | | 00000 000000 | 11000 | 101000100 | |
| | ***** | | | | | | | |
| | *P2, D+D AND MD,SR+D AND MD, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/LDFPS8 | | --> VV | | | | | |
| 1353 | LDFPS8:0504 | F/LDFPS7 | <-- VV | | | | | |
| | ***** | | | 504 | | | | 000000001000 |
| | * GET RID OF OLD FPS | | | | 0111 10 11 | 11 00 | 011 000 | 0100 0 |
| | *HI | | | | 00111 001110 | 11000 | 101001000 | |
| | ***** | | | | | | | |
| | *P2, D+FPSHIFEC AND NOT HIBYTEMASK, | | | | | | | |
| | *P3, R(T3)+D (B ADDR), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/LDFPS9 | | --> | 510 1354 442 | | | | |
| | ***** | | | | | | | |

J05

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| BOX NO. | TAG: ADDRESS | F/ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COOT CLOCKS |
|-----------|---|-----------|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------|
| 1354 | LDFPS9:0510 | F/LDFPS8 | <-- | 504 1353 441 | 510 | | | | 000000001000 |
| | ***** | | | | | | | | |
| | * INSERT NEW FPSHI FOR WRITE BACK | | | | | | | | |
| | ***** | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+SR OR R(T3), | | | | | | | | |
| | *P3, D+FPSHIFEC+D (A ADDR), | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | |
| | * J/FET01 | | | | | | | | |
| | | J/FET03 | --> | 00 700 3 11 | | | | | |
| | | J/SER01 | --> | 01 701 385 160 | | | | | |
| | | J/FET01 | --> | 10 702 1 2 | | | | | |
| | | J/SER02 | --> | 11 703 387 162 | | | | | |
| | ***** | | | | | | | | |
| CASE 1355 | 3 OF BSTATUS | F/STATUSM | <-- | 341 1345 439 | 506 | | | | 000000001000 |
| | STFPS:0506 | | | | | | | | |
| | ***** | | | | | | | | |
| | * ISSUED TO SATISFY HFPP'S REQUIREMENTS | | | | | | | | |
| | * IN ALL STATUS | | | | | | | | |
| | * CODE | | | | | | | | |
| | ----- | | | | | | | | |
| | * FLPG0, | | | | | | | | |
| | *P2, D+FPSHIFEC, | | | | | | | | |
| | *P3, R(T3)+D (B ADDR), | | | | | | | | |
| | *NEXT, J/STFPS2 | | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 1356 | STFPS2:0544 | F/STFPS | <-- | VV | 544 | | | | 000000111000 |
| | ***** | | | | | | | | |
| | * MERGE FPSLO AND FPSHI GO TO STEXP5 TO | | | | | | | | |
| | * CALL | | | | | | | | |
| | * STOREINT | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+MD, | | | | | | | | |
| | *P3, R(T3)(LBYTE)+D (A ADDR), | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+1, | | | | | | | | |
| | * J/STEXPS | | --> | 1622 1756 570 | | | | | |
| | ***** | | | | | | | | |

K05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 443

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|---------|--|--|--------------------------|-------|------------|------------|-------------|-----------|------|--------|--|
| | | | | | | | | RIF | COUT | | |
| 1357 | STST:0507 | F/STATUSH | <-- | 341 | 1345 | 439 | | | | | |
| | ***** | | | | | | | | | | |
| | *P2, D+FPSHIFEC AND NOT HIBYTE MASK, * | | | | | | | | | | |
| | *P3, FDST3+D (B ADDR), * | | | | | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+1, * | | | | | | | | | | |
| | * J/STST2 * | | --> | VV | | | | | | | |
| | ***** | | | | | | | | | | |
| 1358 | STST2:1612 | F/STST | <-- | VV | | | | | | | |
| | ***** | | | | | | | | | | |
| | *P2, D+R(FEA), * | | | | | | | | | | |
| | *P3, FDST2+D (A ADDR), * | | | | | | | | | | |
| | *NEXT, * | | | | | | | | | | |
| | * J/STST3 * | | --> | VV | | | | | | | |
| | ***** | | | | | | | | | | |
| 1359 | STST3:1614 | F/STST2 | <-- | VV | | | | | | | |
| | ***** | | | | | | | | | | |
| | *NEXT, CALL STOREINTLG, * | | | | | | | | | | |
| | * RETURN+BRADS * | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | | | --> | VV | | | | | | | |
| | | | | 4632 | 2048 | 667 | | | | | |
| | | | | ***** | | | | | | | |
| | | | | VV | | | | | | | |
| | | | | 3 | 283 | 126 | | | | | |

```

507      000000001000
      0111 10 11 11 00 011 001 0100 0
      00111 001010 11100 110001010

1612     000000001000
      1010 01 10 00 01 011 000 0100 0
      00000 000100 11000 110001100

1614     000000001000
      0000 00 00 00 00 011 100 0000 0
      00000 000000 11100 110011010
  
```

L05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 444

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|--|--|---------------------------------------|-----------------------|------------------------------|---------|----------|--|
| .TOC - FLOATING POINT CLEAR, TEST ABSOLUTE AND NEGATE | | | | | | | |
| CTAN - CLEAR TEST ABSOLUTE, AND NEGATE | | | | | | | |
| DESCRIPTION OF INSTRUCTIONS:- | | | | | | | |
| ===== | | | | | | | |
| CLR CLEAR THE WHOLE WORD. NO INTERRUPTS WILL OCCUR. | | | | | | | |
| TST SET THE CONDITION CODES. FIUV INTERRUPT, IF ENABLED, FOR DM NON ZERO, AFTER EXECUTION. DOES NOT CLEAN UP A DIRTY ZERO. | | | | | | | |
| ABS CLEAR SIGN BIT. FIUV INTERRUPT, IF ENABLED, FOR DM NON ZERO, AFTER EXECUTION. CLEANS UP A DIRTY ZERO. | | | | | | | |
| NEG INVERT THE SIGN BIT, UNLESS EXPONENT IS ZERO. FIUV INTERRUPT, IF ENABLED, FOR DM NON ZERO, AFTER EXECUTION. CLEANS UP A DIRTY ZERO. | | | | | | | |
| .CASE 3 OF BWFORK | | | | | | | |
| 1360 | CTANZM:0342 | F/SETCLASS3 F/WFORK | <-- <-- | 207 1239 403 474 1318 429 | | | |
| | ***** # FROM WFORK 0#D11 TARGETS #- #----- #NEXT, BUTR(NOT DST REG 6-7), # J/CTANZM2 # J/CTANZM2 J/CTANZM3 # J/CTANZM3 ***** | | | | | | 342 0000 00 00 00 00 000 000 0000 0 00000 000000 10001 001010010 |
| .CASE 1 OF BCTANZM | | | | | | | |
| 1361 | CTANZM2:0122 | F/CTANZM | <-- VV | | | | |
| | ***** #0 - CTANZM2 1 - CTANZM3 ILLEGAL #INSTRUCTION #----- #NEXT, BUT(GO TO), PAGE+2, # RETURN+OPCODERR, # J/TPREAMBLE ***** | | | | | | 122 0100 00 10 11 00 001 010 0000 0 00000 000000 11100 101100100 |
| | | | <-- | 2544 1969 637 | | | |

M05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 445

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1362 | 2 OF BCTANZW CTANZW3:0123 | F/CTANZW | <-- | 342 | 1360 | 444 | | | | |
| | ***** | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, * J/CTANZW38 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 1363 | CTANZW38:3663 | F/CTANZW3 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * EXTRACT SIGN AND EXPONENT TARGETS *IR(7:6) *ARE: | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+FAC3(DF) AND SEXPMASK, *NEXT, BUTR(IRD7#IRD6), * J/CLRZW | | | | | | | | | |
| | | J/CLRZW | --> | 1100 | 3454 | 1364 | 445 | | | |
| | | J/TSTZW | --> | 1101 | 3455 | 1367 | 446 | | | |
| | | J/ABSZW | --> | 1110 | 3456 | 1368 | 447 | | | |
| | | J/NEGZW | --> | 1111 | 3457 | 1372 | 448 | | | |
| | ***** | | | | | | | | | |
| .CASE 1364 | 1 OF BCTANZW38 CLRZW:3454 | F/CTANZW38 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *00 CLRZW CLEAR 01 TSTZW TEST 10 ABSZW *ABSOLUTE 11 NEGZW NEGATE CLEAR *FAC3(DF) AND FAC2(DF) IF FLOATING GO TO *CLRFZW | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+0, *P3, FAC32(DF)+D (B ADDR), *NEXT, BUTR(FD), * J/CLRFZW | | | | | | | | | |
| | | J/CLRFZW | --> | 10 | 3226 | 1365 | 446 | | | |
| | | J/CLRDZW | --> | 11 | 3227 | 1366 | 446 | | | |
| | ***** | | | | | | | | | |

```

123      0000 00 00 00 00 00000001000
        00000 000000 11100 110110011

3663     1011 10 00 10 10 10000001000
        00110 000000 00100 100101100

3454     0011 00 00 00 00 10000001000
        00000 001110 10111 010010110
    
```

N05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 446

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|---------------------------------------|-----------------------|----------------------|----------------------|-------------------|----------|-----------|----------|--------|
| | | | | | | | | RIF UPF | COUT UPF | |
| .CASE | 1 OF BCLRZW | | | | | | | | | |
| 1365 | CLRFZW:3226 | F/CLRZW F/CLRDZW F/ABSZW3 | <-- <-- <-- | 3454 3227 3237 | 1364 1366 1370 | 445 446 447 | | | | |
| | ***** *ELSE GO TO CLRDZW *----- *NEXT, BUT(GO TO),RETURN+BRA05, * PAGE+2, * J/FCCHX2 ***** | | | | | | | | | |
| | | | --> | 2032 | 2327 | 770 | | | | |
| .CASE | 2 OF BCLRZW | | | | | | | | | |
| 1366 | CLRDZW:3227 | F/CLRZW F/CLRDZW F/ABSZW3 | <-- <-- <-- | 3454 3227 3237 | 1364 1366 1370 | 445 446 447 | | | | |
| | ***** * CLEAR FAC1(DF) AND *FAC0(DF) *----- *P2, D+0 *P3, FAC10(DF)+D (A ADDR), *NEXT, * J/CLRFZW ***** | | | | | | | | | |
| | | | --> | 3226 | 1365 | 446 | | | | |
| .CASE | 2 OF BCTANZW3B | | | | | | | | | |
| 1367 | TSTZW:3455 | F/CTANZW3B | <-- | 3663 | 1363 | 445 | | | | |
| | ***** *GO TO CLRFZW TO LOAD FPS<3:0> WITH 0100 *----- *NEXT, BUT(GO TO),RETURN+BRA05, * PAGE+2, * J/SETFZFN2 ***** | | | | | | | | | |
| | | | --> | 2730 | 2324 | 769 | | | | |

```

3226
0000 00 00 00 00 011 010 0000 0
00000 000000 11100 000011010
    
```

```

3227
0011 00 00 00 10 000 000 0100 0
00000 010110 11000 010010110
    
```

```

3455
0000 00 00 00 00 011 010 0000 0
00000 000000 11100 111011000
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|------------|--|--|--------------------------|--------------|--------------|------------|-------------|------------|----------------|
| | | | | | | | | RIF UPF | COUT CLOCKS |
| .CASE 1368 | 3 OF BCTANZW38 ABSZW: 3456 | F/CTANZW38 | <-- | 3663 | 1363 | 445 | | | |
| | ***** # TARGETS - 0 - #ABSZW2 ***** | | | | | | | | |
| | #P3, D+(P3) FAC3(DF) # -SIGNBIT, #NEXT, BUT(D(14-00) IS 0), # J/ABSZW2 | | | | | | | | |
| | ***** | J/ABSZW2 | --> | 01 | 3235 | 1369 | 447 | | |
| | ***** | J/ABSZW3 | --> | 11 | 3237 | 1370 | 447 | | |
| | ***** | | | | | | | | |
| .CASE 1369 | 1 OF BABSZW ABSZW2: 3235 | F/ABSZW F/NEGZW | <-- <-- | 3456 3457 | 1368 1372 | 447 448 | | | |
| | ***** #1 - ABSZW3 STORE RESULT GO SET CC'S AND #EXIT ***** | | | | | | | | |
| | #P3, FAC3(DF)+D (A ADDR), #NEXT, J/ABSZW4 | | | | | | | | |
| | ***** | | | | | | | | |
| .CASE 1370 | 2 OF BABSZW ABSZW3: 3237 | F/ABSZW F/NEGZW | <-- <-- | 3456 3457 | 1368 1372 | 447 448 | | | |
| | ***** # EXP IS #ZERO ***** | | | | | | | | |
| | #P2, D+0, #P3, FAC32(DF)+D (A ADDR), #NEXT, BUTR(FD), # J/CLRFZW | | | | | | | | |
| | ***** | J/CLRFZW | --> | 10 | 3226 | 1365 | 446 | | |
| | ***** | J/CLRDZW | --> | 11 | 3227 | 1366 | 446 | | |
| | ***** | | | | | | | | |

3456
0111 10 00 10 10 000 000 1100 0
00101 000000 01101 010011101

3235
0000 00 00 00 10 000 000 0000 0
00000 000010 11000 110110100

3237
0011 00 00 00 10 000 000 0100 0
00000 000110 10111 010010110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|-------------|--------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1374 | CTANNZM2:2112 | F/CTANNZ4 F/CTANNZM | <-- <-- | 2110 343 | 1258 1373 | 408 448 | | | | |
| | ***** | | | | | | | | | |
| | * IR<7:6> TARGETS | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *SELECT, EMIT | | | | | | | | | |
| | *NEXT, BUTR(IR07#IR06), | | | | | | | | | |
| | * J/CLRNZM | | | | | | | | | |
| | * J/CLRNZM | | --> | 1100 | 2654 | 1375 | 449 | | | |
| | * J/TSTNZM | | --> | 1101 | 2655 | 1380 | 450 | | | |
| | * J/ABSNZM | | --> | 1110 | 2656 | 1387 | 452 | | | |
| | * J/NEGNZM | | --> | 1111 | 2657 | 1401 | 456 | | | |
| | ***** | | | | | | | | | |
| CASE | 1 OF BCTANNZM2 | | | | | | | | | |
| 1375 | CLRNZM:2654 | F/CTANNZM2 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *00 - CLEAR 01 - TEST 10 - ABSOLUTE 11 - | | | | | | | | | |
| | *NEGATE STORE A ZERO WORD TO MEMORY. | | | | | | | | | |
| | *FIRST SET FOST TO ZERO THEN CALL | | | | | | | | | |
| | *STOREFLT | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+0 | | | | | | | | | |
| | *P3, FDST32+D (A ADDR), | | | | | | | | | |
| | *NEXT, J/CLRNZM2 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 1376 | CLRNZM2:2114 | F/CLRNZM | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+0 | | | | | | | | | |
| | *P3, FDST10+D (A ADDR), | | | | | | | | | |
| | *NEXT, J/CLRNZM3 | | --> | 2115 | 1377 | 450 | | | | |
| | ***** | | | | | | | | | |

2112
0000 00 00 00 01 000 000 0000 0
11001 000000 00100 110101100

2654
0011 00 00 00 01 011 000 0100 0
00000 000110 11000 001001100

2114
0011 00 00 00 01 011 000 0100 0
00000 010110 11000 001001101

E06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 450

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|--------------|---|--|--|------|---------------|-----------------|----------------|---|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| 1377 | CLRNZM3:2115 ***** * FROM *CSP ***** *P2, D+CNST4 *NEXT, BUT(GO TO),PAGE+0, * J/CLRNZM4 ***** | F/CLRNZM2 <-- | 2114 1376 449 | 2115 | 1010 01100 | 10 00 000000 | 00 00 11100 | 000000001000 000 000 0100 0 101100101 | |
| 1378 | CLRNZM4:0545 ***** *SELECT, FPSCC(DBUF), *P2, FPSCC+DATA, *NEXT, BUT(GO TO),PAGE+2, * J/CLRNZM5 ***** | F/CLRNZM3 <-- VV | | 545 | 0000 00000 | 00 00 000000 | 00 00 11100 | 011000001000 000 010 0000 0 001010000 | |
| 1379 | CLRNZM5:2120 ***** *NEXT, CALL STOREFLT, * RETURN+BRADS ***** | F/CLRNZM4 <-- VV | ***** 4654 2061 674 ***** VV 3 283 126 | 2120 | 0000 00000 | 00 00 000000 | 00 00 11100 | 000000001000 011 100 0000 0 110101100 | |
| CASE 1380 | 2 OF BCTANZM2 TSTNZW:2655 ***** *NEXT, CALL FFLTDEFER, * RETURN+TSTNZW2 ***** | F/CTANZM2 <-- | ***** 4616 2040 662 ***** VV 2122 1381 451 | 2655 | 0010 00000 | 00 00 000000 | 10 10 11100 | 000000001000 010 100 0000 0 110001110 | |

F06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 451

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|---------|---|--|--------------------------|-----------|------------|------------|-------------|-------------|---------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCK |
| 1381 | TSTNZW2:2122 ***** *P2, D+FDST3 AND SEXPMASK, *NEXT, * J/TSTNZW3 ***** | | | 2122 | | | | 00000001000 | |
| | | | | | 1011 | 10 00 | 10 01 | 011 000 | 0100 0 |
| | | | | | 00110 | 000000 | 11000 | 001010100 | |
| | | | --> VV | | | | | | |
| 1382 | TSTNZW3:2124 F/TSTNZW2 ***** * GO SET FCC'S THEN RETURN TO TSTNZW4 AND *TEST FOR NEG ZERO *FETCH ----- *NEXT, BUT(GO TO),PAGE+2, * RETURN+TSTNZW4, * J/SETFZF2 ***** | | | 2124 | | | | 00000001000 | |
| | | | | | 0100 | 00 01 | 00 10 | 100 010 | 0000 0 |
| | | | | | 00000 | 000000 | 11100 | 111011000 | |
| | | | --> VV | | | | | | |
| | | | --> | 2730 | 2324 | 769 | | | |
| 1383 | TSTNZW4:4224 ***** * LOAD CONDITION SR WITH *CONDITION ----- *P2, SR+R(T2A), *NEXT, * J/TSTNZW5 ***** | | | 4224 | | | | 00000001000 | |
| | | | | | 1111 | 00 00 | 11 01 | 110 000 | 0010 0 |
| | | | | | 00000 | 000000 | 11000 | 010010110 | |
| | | | --> VV | | | | | | |
| 1384 | TSTNZW5:4226 F/TSTNZW4 ***** *REGISTER CHECK ON POSSIBLE TRAP OF NEG *ZERO CONDITION *REG<00> ----- *P2, D+FPSHIFEC, *NEXT, BUT(CASE), * J/TSTNZW6 * J/TSTNZW6 * J/TSTNZW7 ***** | | | 4226 | | | | 00000001000 | |
| | | | | | 1111 | 00 00 | 11 00 | 011 000 | 0100 0 |
| | | | | | 00000 | 000000 | 00000 | 110011110 | |
| | | | --> | 1110 | 4636 | 1385 | 452 | | |
| | | | --> | 1111 | 4637 | 1386 | 452 | | |

H06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 453

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|--------------------|------------|------|--------|------|------|-----------------|
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 1389 | ABSZNW3:2130 | F/ABSZNW2 | <-- | 2126 | 1388 | 452 | | |
| | ***** | | | | | | | |
| | * TARGETS - 0 - | | | | | | | |
| | *ANWRTBAK | | | | | | | |
| | ----- | | | | | | | |
| | *P3, D+(P3) FDST3 * -SIGNBIT, | | | | | | | |
| | *NEXT, BUT(D(14-00) IS 0), | | | | | | | |
| | * J/ANWRTBAK | | | | | | | |
| | | J/ANWRTBAK | --> | 01 | 2261 | 1390 | 453 | |
| | | J/ANWRTBAK2 | --> | 11 | 2263 | 1391 | 453 | |
| | ***** | | | | | | | |
| .CASE | 1 OF BABSZNW3 | | | | | | | |
| 1390 | ANWRTBAK:2261 | F/ABSZNW3 | <-- | 2130 | 1389 | 453 | | |
| | | F/NEGNW3 | <-- | 2151 | 1403 | 457 | | |
| | ***** | | | | | | | |
| | *1 - ANWRTBAK2 R(WDADR) SAVED BY | | | | | | | |
| | *FETCHFLT EXP IS NOT | | | | | | | |
| | *ZERO | | | | | | | |
| | ----- | | | | | | | |
| | *P1, BA+R(WDADR),CURRENT MODE, | | | | | | | |
| | *P3, U,DATO, | | | | | | | |
| | *ENABLE, KJ, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/ANWRTBAK11 | | --> | 2146 | 1400 | 456 | | |
| | ***** | | | | | | | |
| .CASE | 2 OF BABSZNW3 | | | | | | | |
| 1391 | ANWRTBAK2:2263 | F/ABSZNW3 | <-- | 2130 | 1389 | 453 | | |
| | | F/NEGNW3 | <-- | 2151 | 1403 | 457 | | |
| | ***** | | | | | | | |
| | * CHECK ON IMMEDIATE ADDRESSING ZERO | | | | | | | |
| | *EXPONENT | | | | | | | |
| | *EXISTS | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+SR,D(C)+ALU15, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/ANWRTBAK3 | | --> | 2131 | 1392 | 454 | | |
| | ***** | | | | | | | |

```

2130
0111 10 00 10 01 011 000 1100 0
00101 000000 01101 010110001
    
```

```

2261
0000 00 00 11 00 110 000 0001 0
10010 000000 11000 001100110
    
```

```

2263
1111 00 00 00 00 000 100 0100 0
00000 000000 11000 001011001
    
```


J06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 455

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|------------------|---|--|--------------------------------|------|--------------------------|---------------------|---------------------|--------------|--------------|--------|--|
| | | | | | | | | RIF | COUT | | |
| 1395 | ANMRTBAK6:2103 ***** * DOUBLE PRECISION AND NOT IMMEDIATE * ADDRESSING *-----* *P1, BA+SR, CURRENT MODE, * CURRENT MODE, *P2, D+0, *P3, U, DATO, *ENABLE, KJ, *NEXT, * J/ANMRTBAK7 ***** | <-- <-- | 2121 1393 454 2144 1398 455 | 2103 | | | | | 000001001011 | 0101 0 | |
| | | | | | 0011 00 00 00 00 000 000 | 00 00 00 00 000 000 | 00 00 00 00 000 000 | 00000000 | 0101 0 | | |
| | | | | | 10010 000000 | 11000 | 001011100 | | | | |
| 1396 | ANMRTBAK7:2134 ***** *P2, SR+SR PLUS 2, *NEXT, * J/ANMRTBAK8 ***** | <-- VV <-- VV | | 2134 | | | | 000000001000 | 0010 0 | | |
| | | | | | 1001 11 11 00 00 000 000 | 00 00 00 00 000 000 | 0010 0 | | | | |
| | | | | | 00000 000000 | 11000 | 001011101 | | | | |
| 1397 | ANMRTBAK8:2135 ***** *P1, BA+SR, CURRENT MODE, *P2, D+0, *P3, U, DATO, *ENABLE, KJ, *NEXT, * J/ANMRTBAK9 ***** | <-- VV <-- VV | | 2135 | | | | 000001001011 | 0101 0 | | |
| | | | | | 0011 00 00 00 00 000 000 | 00 00 00 00 000 000 | 0101 0 | | | | |
| | | | | | 10010 000000 | 11000 | 001100100 | | | | |
| 1398 | ANMRTBAK9:2144 ***** *P2, SR+SR PLUS 2, *NEXT, * J/ANMRTBAK5 ***** | <-- VV <-- VV | | 2144 | | | | 000000001000 | 0010 0 | | |
| | | | | | 1001 11 11 00 00 000 000 | 00 00 00 00 000 000 | 0010 0 | | | | |
| | | | | | 00000 000000 | 11000 | 001000010 | | | | |
| | | | 2102 1394 454 | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|------------|--|---------------------------------------|-----------------------|---------------------------------|---------|--------------------|----------------|------------------------|--------|
| .CASE 1399 | 2 OF BANMRTBAK3 ANMRTBAK10:2123 | F/ANMRTBAK3 | <-- | 2131 1392 454 | 2123 | 0100 00 01 00 10 | 100 010 0000 0 | 00000001000 | |
| | * AN EXACT ZERO WAS STORED INTO MEMORY GO * *SET FCC'S THEN RETURN TO TST FOR NEG * *ZERO * *TRAP * | | | | | 00000 000000 11100 | 000011010 | | |
| 1400 | *NEXT, BUT(GO TO), RETURN+TSTNZW4, * PAGE+2, * J/FCCHEX2 | | --> | 2032 2327 770 | | | | | |
| | ANMRTBAK11:2146 | F/ANMRTBAK | <-- | 2261 1390 453 | 2146 | 0000 00 00 00 00 | 011 010 0000 0 | 00000001000 | |
| | * POINT REACHED WHERE SIGN OPERATION AND * *EXPONENT WAS NOT ZERO GO SET * *FCC'S * | | | | | 00000 000000 11100 | 111011000 | | |
| | *NEXT, BUT(GO TO), PAGE+2, * RETURN+BRADS, * J/SETFZFN2 | | --> | 2730 2324 769 | | | | | |
| .CASE 1401 | 4 OF BCTANNZW2 NEGNZW:2657 | F/CTANNZW2 | <-- | 2112 1374 449 | 2657 | 0010 00 00 11 01 | 000 100 0000 0 | 00000001000 | |
| | *NEXT, CALL FFLTDEFER, * RETURN+NEGNZW2 | | --> | ***** 4616 2040 662 ***** | | 00000 000000 11100 | 110001110 | | |
| 1402 | NEGNZW2:2150 | | | 2150 1402 456 | 2150 | 1011 10 00 10 01 | 011 000 0100 0 | 00000001000 | |
| | *P2, D+FDST3 AND EXPMASK, *NEXT, J/NEGNZW3 | | --> | 2151 1403 457 | | 01111 000000 11000 | 001101001 | | |

L06

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 457

| BOX NO. | TAG: ADDRESS | OPERATION | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIE COUT CLOCKS |
|---------|--|------------------------|--|------------------------------|------|---------|---------|----------|-------------------------------|
| 1403 | NEGNZW3:2151 | F/NEGNZW2 | <-- | 2150 1402 456 | 2151 | 0110 | 10 00 | 10 01 | 00000001000 011 000 1100 0 |
| | * REVERSE SIGN | | | | | 00101 | 000000 | 01101 | 010110001 |
| | *BIT | | | | | | | | |
| | *P3, D+(P3) FDST3 XOR SIGNBIT, | | | | | | | | |
| | *NEXT, BUT(D(14-00) IS 0), | | | | | | | | |
| | * J/ANWRTBAK | | | | | | | | |
| | * J/ANWRTBAK | | --> | 01 2261 1390 453 | | | | | |
| | * J/ANWRTBAK2 | | --> | 11 2263 1391 453 | | | | | |
| .TOC " | FLOATING POINT MULTIPLICATION | ##FLPT##" | | | | | | | |
| .CASE | 5 OF BWFORK | | | | | | | | |
| 1404 | MULFZW:0344 | F/SETCLASS3 F/WFORK | <-- <-- | 207 1239 403 474 1318 429 | 344 | 0010 | 00 00 | 11 01 | 00000001000 010 100 0000 0 |
| | * FROM FLPDECODE WHEN 0=D2 ENTRY POINT | | | | | 00000 | 000000 | 11100 | 110001100 |
| | *FOR SINGLE | | | | | | | | |
| | *AND | | | | | | | | |
| | *NEXT, CALL FETCHFLT, | | | | | | | | |
| | * RETURN+MULMODW | | | | | | | | |
| | ***** | | --> | 4614 2039 661 | | | | | |
| | ***** | | | VV | | | | | |
| | ***** | | | -1 -1 -1 0 1 1 | | | | | |
| .CASE | 6 OF BWFORK | | | | | | | | |
| 1405 | MULDZW:0345 | F/SETCLASS3 F/WFORK | <-- <-- | 207 1239 403 474 1318 429 | 345 | 0010 | 00 00 | 11 01 | 00000001000 010 100 0000 0 |
| | *AND DMD | | | | | 00000 | 000000 | 11100 | 110001100 |
| | *NEXT, CALL FETCHFLT, | | | | | | | | |
| | * RETURN+MULMODW | | | | | | | | |
| | ***** | | --> | 4614 2039 661 | | | | | |
| | ***** | | | VV | | | | | |
| | ***** | | | 2152 1408 458 | | | | | |

M06

| BOX NO. .CASE | TAG: ADDRESS | F/SETCLASS3 F/BFORK | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|------------------|---|------------------------|--|--|-----------------|------------|-------------|-------------|------|-------|
| | | | | | | | | RIF | COOT | |
| 1406 | MULXM:0346 | | <-- | 207 1239 403 474 1318 429 | | | | | | |
| | ***** *NEW FLPDECODE DOES NOT REQUIRE FD ***** ENTRY POINT FOR MULF OR MULD *AND ----- *NEXT, CALL FETCHFLT, * RETURN+MULMODW ***** | | <-- | 4614 2039 661 VV -1 -1 -1 0 1 1 | | | | 00000001000 | | |
| 1407 | MULFDW:2273 | F/MFRAC12 | <-- | 2225 1445 471 | | | | | | |
| | ***** *-DND RETURN POINT FROM MFRAC FOR MUL *SET UP EXPONENT DELTA AND GO TO NROUND *TO LEFT-NORMALIZE RESET RES SETUP *FROM ----- *P2, D+1 *P3, R(T1)+D (A ADDR), *NEXT, BUTR(RESET RES), * J/NROUND26 ***** | | <-- | 2201 1931 623 | | | | 00000001000 | | |
| 1408 | MULMODW:2152 | | | | | | | | | |
| | ***** *MFRAC12 MULMODW ROUTINE SHARED BY *MODF/D AND MULF/D FLOATING POINT *INSTRUCTIONS ----- *NEXT, CALL EXPTST, * RETURN+MULMODW2 ***** | | <-- | 2621 2213 730 VV 2154 1409 459 | | | | 00000001000 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|---|---------------------------------------|-----------------------|---|---------|----------|--|
| .CASE 1412 | MULMOD5:2117 | F/MULMOD3 | <-- | 2075 1410 459 | | | 2117 0000 00 00 00 00 000 000 0000 0 00000 000000 00100 001101011 |
| | * RESULT IS ZERO CHECK IF MOD OR * *MUL * -----* | | | | | | |
| | *NEXT, BUTR(IROB), * * J/MULMOD6 * * J/MULMOD7 * -----* | | | 1011 2153 1413 460 1111 2157 1414 460 | | | |
| .CASE 1413 | MULMOD6:2153 | F/MULMOD4 F/MULMOD5 F/ADDSDFEZ | <-- <-- <-- | 2077 1411 459 2117 1412 460 4417 1582 514 | | | 2153 0011 00 00 00 11 000 000 0100 0 00000 000110 10111 000000110 |
| | *TARGETS - 0 - MULMOD5 1 - MULMOD7 * *ALSO ENTERED BY WORDCMP6 TARGETS - 0 - * *MULMOD11 * -----* | | | | | | |
| | *P2, D+0, * *P3, FAC32(SF)+D (A ADDR), * *NEXT, BUTR(FD), * * J/MULMOD11 * * J/MULMOD12 * -----* | | | 10 2006 1418 462 11 2007 1419 462 | | | |
| .CASE 1414 | MULMOD7:2157 | F/MULMOD4 F/MULMOD5 F/ADDSDFEZ | <-- <-- <-- | 2077 1411 459 2117 1412 460 4417 1582 514 | | | 2157 0011 00 00 00 11 000 000 0100 0 00000 000110 10010 001101101 |
| | *1 - MULMOD12 * -----* | | | | | | |
| | *P2, D+0, * *P3, FAC32(SF)+D (A ADDR), * *NEXT, BUT(ROR1), * * J/MULMOD8 * -----* | | | 2155 1415 461 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA LBF | EXTENSION RIF COUF CLOCKS |
|---------|---|--|---------------------------------|--------------------------------------|--------------------------------------|---------------------------------|----------|---|
| .CASE | 1 OF BMULMODW6 | | | | | | | |
| 1418 | MULMODW11:2006 | F/MULMODW6 F/MULMODW12 F/WORDCMP8 F/DIVFDW7 F/LDCPW7 | <-- <-- <-- <-- <-- | 2153 2007 2673 2355 2547 | 1413 1419 1677 1690 1895 | 460 462 545 550 611 | | 2006 0000 00 00 00 00 011 010 0000 0 00000 000000 11100 000011010 |
| | * GO SET CONDITON *CODES *-----* *NEXT, BUT(GO TO),RETURN+BRAS, * PAGE+2, * J/FCCHEX2 | | | 2032 | 2327 | 770 | | |
| .CASE | 2 OF BMULMODW6 | | | | | | | |
| 1419 | MULMODW12:2007 | F/MULMODW6 F/MULMODW12 F/WORDCMP8 F/DIVFDW7 F/LDCPW7 | <-- <-- <-- <-- <-- | 2153 2007 2673 2355 2547 | 1413 1419 1677 1690 1895 | 460 462 545 550 611 | | 2007 0011 00 00 00 11 000 000 0100 0 00000 010110 11000 000000110 |
| | * WHEN ENTERED BY MULMODW6 *FAC1(SF)-FAC0(SF) GETS *CLEARED *-----* *P2, D+0 *P3, FAC10(SF)+D (A ADDR), *NEXT, * J/MULMODW11 | | | 2006 | 1418 | 462 | | |
| .CASE | 1 OF BMULMODW3 | | | | | | | |
| 1420 | MULMODW13:2116 | F/MULMODW3 | <-- | 2075 | 1410 | 459 | | 2116 0010 00 00 11 01 110 010 0000 0 00000 000000 11100 101111001 |
| | * WHEN ENTERED BY MULMODW10 FAC0(SF+1) - *FAC1(SF+1) IS CLEARED ALSO ENTERED BY *LDCPW9 *-----* *NEXT, CALL DATAPREP, * RETURN+MULMODW14 | | | 2571 | 2196 | 725 | | |
| | | | | 2156 | 1421 | 463 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|---------|------------------------------------|---------------------------------------|-----------------------|------|------------|------------|----------|-------------------------------|--------|
| 1421 | MULMODW14:2156 | | | 2156 | 1111 00 10 | 10 01 | 101 000 | 0100 0 | |
| | *P2, D+CR2, | | | | 00000 | 001010 | 11000 | 001110000 | |
| | *P3, CR1+D' (B ADDR), | | | | | | | | |
| | *NEXT, J/MULMODW15 | --> | VV | | | | | | |
| 1422 | MULMODW15:2160 | F/MULMODW14 | <-- | VV | 2160 | 1001 01 11 | 11 00 | 110 000 | 0100 0 |
| | * ADD | | | | 00000 | 000010 | 11010 | 001110001 | |
| | *EXONENTS | | | | | | | | |
| | *P2, D+R(ES) PLUS R(ED), | | | | | | | | |
| | *P3, R(ER)+D (A ADDR), | | | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), | | | | | | | | |
| | * J/MULMODW16 | --> | VV | | | | | | |
| 1423 | MULMODW16:2161 | F/MULMODW15 | <-- | VV | 2161 | 1101 10 00 | 10 00 | 110 000 | 0100 0 |
| | * REMOVE EXCESS 200 BIAS OF RESULT | | | | 00100 | 000010 | 00100 | 010101011 | |
| | *TARGETS | | | | | | | | |
| | *- | | | | | | | | |
| | *P2, D+R(ER) MINUS CNST200, | | | | | | | | |
| | *P3, R(ER)+D (A ADDR), | | | | | | | | |
| | *NEXT, BUTR(IROB), | | | | | | | | |
| | * J/MFRAC | --> | 1011 2253 1433 467 | | | | | | |
| | * J/MFRAC | --> | 1111 2257 1424 464 | | | | | | |
| | * J/MULMODW17 | | | | | | | | |

F07

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF COUT | EXTENSION UPF | CLOCKS |
|------------|--|---------------------------------------|-----------------------|------------------|---------|---------------|---------------|--------|
| .CASE 1424 | MULMODW17:2257 | F/MULMODW16 | <-- | 2161 1423 463 | | | | |
| | ***** | | | 2257 | | | 000000001000 | |
| | *0 - MFRAC 1 - MULMODW17 DO PREPARATION | | | 1010 11 00 | 00 00 | 000 000 | 0010 0 | |
| | *STEPS FOR MOD INSTRUCTION TARGETS | | | 00000 000000 | 10111 | 111010010 | | |
| | *-----* | | | | | | | |
| | *P2, SR+1 | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | |
| | * J/MULMODW18 | | | | | | | |
| | * J/MULMODW18 | | --> | 10 2722 1425 464 | | | | |
| | * J/MULMODW24 | | --> | 11 2723 1431 465 | | | | |
| | ***** | | | | | | | |
| .CASE 1425 | MULMODW18:2722 | F/MULMODW17 | <-- VV | | | | | |
| | ***** | | | 2722 | | | 000000001000 | |
| | *F - MULMODW18 D - MULMODW24 FLIP THE FD | | | 0010 00 00 | 11 10 | 100 001 | 0000 0 | |
| | *BIT IN FPS | | | 00000 000000 | 11100 | 110010011 | | |
| | *REGISTER | | | | | | | |
| | *-----* | | | | | | | |
| | *NEXT, CALL FD-TOGGLE | | | | | | | |
| | * RETURN+MULMODW19 | | | | | | | |
| | ***** | | | | | | | |
| | | | --> | 1623 2219 732 | | | | |
| | | | | VV | | | | |
| | | | | -1 -1 -1 0 1 1 | | | | |
| 1426 | MULMODW19:2164 | | | | | | | |
| | ***** | | | 2164 | | | 000000001000 | |
| | *SELECT, EMIT, | | | 0000 00 00 | 00 01 | 000 000 | 0000 0 | |
| | *NEXT, | | | 11001 000000 | 11000 | 001110101 | | |
| | * J/MULMODW20 | | --> VV | | | | | |
| 1427 | MULMODW20:2165 | F/MULMODW19 | <-- VV | | | | | |
| | ***** | | | 2165 | | | 000000001000 | |
| | * COUNT VALUE FOR MFRAC | | | 1111 10 11 | 11 11 | 100 111 | 0000 0 | |
| | *SUBROUTINE | | | 00010 100000 | 11000 | 001111000 | | |
| | *-----* | | | | | | | |
| | *P3, MD+-31 (BC), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/MULMODW21 | | --> | 2170 1428 465 | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------------|--|--------------------|------------------------------------|------|---------------|-----------------|----------------|---|
| | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | | UPF |
| 1428 | MULMODW21:2170 ***** * SETUP FOR REMEMBERING * STATE ----- * P2, D+0, SR+0, * P3, FAC10(SF)+D (A ADDR), * NEXT, * J/MULMODW22 ***** | <-- | 2165 1427 464 | 2170 | 0011 00000 | 00 00 010110 | 00 11 11000 | 100000001000 000 000 0110 0 001111010 |
| 1429 | MULMODW22:2172 ***** * OF FD BIT IN BA<00> PERFORM WORD SHIFT * TO PROVIDE * FASTER ----- * P2, D+FDST3, * P3, FDST1+D (B ADDR), * NEXT, * J/MULMODW23 ***** | <-- VV | | 2172 | 1111 00000 | 00 11 011010 | 10 01 11000 | 000000001000 011 000 0100 0 010000000 |
| 1430 | MULMODW23:2200 ***** * MULTIPLICATION FOR DOUBLE PRECISION ----- * P2, D+FDST2, * P3, FDST0+D (A ADDR), * NEXT, * J/MULMODW25 ***** | <-- VV | | 2200 | 1010 00000 | 00 11 010100 | 00 01 11000 | 000000001000 011 000 0100 0 010000010 |
| .CASE 1431 | 2 OF BMULMODW17 MULMODW24:2723 ***** * COUNT FOR MFRAC * SUBROUTINE ----- * P3, MD+-71 (BC), * NEXT, * J/MULMODW25 ***** | <-- | 2202 1432 466 2257 1424 464 | 2723 | 1111 00010 | 10 11 100000 | 11 11 11000 | 000000001000 000 111 0000 0 010000010 |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|------------------------|--------|
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|------------------------|--------|

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: .TOC = MULTIPLICATION FRACTION SUBROUTINE ##FLPT##"
: MFRAC SUBROUTINE
: WARM MULTIPLICATION FRACTION PROCESSING SUBROUTINE -
: GENERATES FRACTION RESULT FOR SINGLE AND DOUBLE PRECISION.
: PRODUCES 24 BITS PLUS GUARD FOR SINGLE
: PRODUCES 56 BITS PLUS GUARD FOR DOUBLE
: RESULTS ARE ALWAYS NORMALIZED AND CR.UFLO IS UPDATED IF REQUIRED
: NOTE: MFRAC CALLS UPON THE FOLLOWING SUBROUTINES:
:   RTSHFSF - SHIFT RIGHT SOURCE REGISTERS
:   RTSHFDST - SHIFT RIGHT DESTINATION REGISTERS
:
: PARAMETERS FOR ENTRY:
: RETURN ADDRESS MUST HAVE BEEN LOADED IN R(RETURN)
: MULTIPLIER IS IN FAC3(SF) - FAC0(SF)
: MULTIPLICAND IS IN FDST3 - FDST0
: R(ER) CONTAINS RESULTANT BIASED EXPONENT (RIGHT JUSTIFIED)
:
: TEMPORARIES USED ARE:
: R(MAND3) - R(MAND0) LOCATED IN R(T1A),R(T1B),R(T2A),R(T2B)
:
: UPON EXIT:
: FRACTION PRODUCT IS IN FAC3(SF) - FAC0(SF)
: FRACTION REQUIRES AT MOST ONE RIGHT SHIFT FOR NORMALIZATION
: GUARD BITS ARE IN GUARD REGISTER
: RETURN IS TO THE CALLER

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CASE 1 OF BMULMODW16
1433 MFRAC:2253 F/MULMODW16 <-- 2161 1423 463
*****
#TO GENERATE FRACTION RESULT TARGETS - F *
#- *
#MFRACF *
#-----*
#P2, SR+FDST2, *
#NEXT, BUTR(FD), *
# J/MFRACF *
# J/MFRACF --> 10 2402 1451 473
# J/MFRACD --> 11 2403 1434 468
*****

```

```

2253 000000001000
1010 00 11 00 00 011 000 0010 0
00000 000000 10111 100000010

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|---------------------------------------|-----------------------|------|------------------------------|----------------|----------|-----------|------|---------------|
| | | | | | | | | RIF UPF | COUT | |
| 1434 | MFRACD:2403 F/MFRAC ***** #0 - MFRACD CONSTANT 57 FOR COUNTER FOR #DOUBLE #PRECISION ----- *P3, MD+-71 (BC), *NEXT, * J/MFRAC2 ***** | <-- | 2253 1433 467 | 2403 | | | | 00000000 | 1000 | |
| | | | | | 1111 10 11 11 11 | 000 111 0000 0 | | | | |
| | | | | | 00010 100000 11000 010000100 | | | | | |
| 1435 | MFRAC2:2204 F/MULMODW25 F/MFRACD ***** * LOAD SR WITH L0 #MIER ----- *P2, SR+FDST0, *NEXT, * J/MFRAC3 ***** | <-- VV <-- VV | 2202 1432 466 | 2204 | | | | 00000000 | 1000 | |
| | | | | | 1010 01 11 00 00 | 011 000 0010 0 | | | | |
| | | | | | 00000 000000 11000 010000101 | | | | | |
| 1436 | MFRAC3:2205 F/MFRAC2 ***** * PUT -57. IN #COUNTER ----- * COUNTER+MD(D), *NEXT, * J/MFRAC4 ***** | <-- VV <-- VV | | 2205 | | | | 00000000 | 1000 | |
| | | | | | 0000 10 00 00 00 | 000 000 0000 0 | | | | |
| | | | | | 00010 000101 11000 010000110 | | | | | |
| 1437 | MFRAC4:2206 F/MFRAC3 ***** * LOAD R(MAND) WITH #FAC(SF) ----- *P2, D+FAC3(SF), *P3, R(MAND3)+D' (B ADDR), *NEXT, * J/MFRAC5 ***** | <-- VV <-- VV | | 2206 | | | | 10000000 | 1000 | |
| | | | | | 1111 00 11 10 11 | 110 000 0100 0 | | | | |
| | | | | | 00000 011100 11000 010000111 | | | | | |
| | | | | | | | | | | 2207 1438 469 |

K07

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 469

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------------------|--|--------------------------|---------------|------------|------------|-------------|-----------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 1438 | MFRAC5:2207 | F/MFRAC4 | <-- | 2206 1437 468 | 2207 | | | | 100000001000 | |
| | *P2, D+FAC2(SF), | | | | 1010 | 00 01 | 00 01 | 110 000 | 0100 0 | |
| | *P3, R(MAND2)+D (A ADDR), | | | | 00000 | 010010 | 11000 | 010001000 | | |
| | *NEXT, | | | | | | | | | |
| | * J/MFRAC6 | | --> VV | | | | | | | |
| 1439 | MFRAC6:2210 | F/MFRAC5 | <-- VV | | 2210 | | | | 100000001000 | |
| | *P2, D+FAC1(SF), | | | | 1111 | 00 10 | 11 11 | 110 000 | 0100 0 | |
| | *P3, R(MAND1)+D (B ADDR), | | | | 00000 | 011100 | 11000 | 010001010 | | |
| | *NEXT, | | | | | | | | | |
| | * J/MFRAC7 | | --> VV | | | | | | | |
| 1440 | MFRAC7:2212 | F/MFRAC6 | <-- VV | | 2212 | | | | 100000001000 | |
| | *P2, D+FAC0(SF), | | | | 1010 | 01 01 | 00 00 | 110 000 | 0100 0 | |
| | *P3, R(MAND0)+D (A ADDR), | | | | 00000 | 010010 | 11000 | 010001100 | | |
| | *NEXT, | | | | | | | | | |
| | * J/MFRAC8 | | --> VV | | | | | | | |
| 1441 | MFRAC8:2214 | F/MFRAC7 | <-- VV | | 2214 | | | | 100000001000 | |
| | * CLEAR THE ACCUMULATORS FOR | | | | 0011 | 00 00 | 00 11 | 000 000 | 0100 0 | |
| | *DATA | | | | 00000 | 000110 | 11000 | 010001101 | | |
| | *-----* | | | | | | | | | |
| | *P2, D+D, | | | | | | | | | |
| | *P3, FAC32(SF)+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MFRAC9 | | --> | 2215 1442 470 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | |
|---------|---|--|---|-----------|---------------|-----------------|----------------|---|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF |
| 1442 | MFRAC9:2215 F/MFRAC8 ***** * CLEAR LOWER SET OF * ACCUMULATORS *-----* *P2, D+0 *P3, FAC10(SF)+D (A ADDR), *NEXT, * J/MFRAC10 ***** | <-- | 2214 1441 469 | 2215 | 0011 00000 | 00 00 010110 | 00 11 11000 | 100000001000 000 000 0100 0 010010000 |
| 1443 | MFRAC10:2220 F/MFRAC9 ***** * FOR RTSHFDF BRANCH ON LO BIT OF MIER * TARGETS: *-----* *P3, MD+RESRIGHT *NEXT, BUTR(SROD#COUNT IS -1), * J/MFRAC11 * J/MFRAC11 * J/MFRAC12 * J/MFRAC13 * UNDEFINED CASE ***** | <-- VV --> VV | | 2220 | 0010 00010 | 10 00 100000 | 00 00 01011 | 000000001000 000 000 0000 0 010010100 |
| .CASE | 1 OF BMFRAC10 F/MFRAC10 F/MFRAC16 ***** | <-- <-- | 2220 1443 470 2230 1449 472 | | | | | |
| 1444 | MFRAC11:2224 ***** *00 MFRAC11 01 MFRAC12 10 MFRAC13 11 *IMPOSSIBLE MIER BIT = 0 AND COUNT NOT *SATISFIED *-----* *NEXT, CALL RTSHFSF * RETURN+MFRAC17 ***** | <-- --> | 2220 1443 470 2230 1449 472 | 2224 | 0010 00000 | 00 01 000000 | 00 11 11100 | 000000001000 001 010 0000 0 111010000 |
| | | | ***** 2720 2306 761 ***** W 2231 1450 472 | | | | | |

M07

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|------------------|---|--|--------------------------|--------------------|--------------|-------------|-----------|------|-------|
| | | | | | | | RIF | COUT | |
| 1445 | MFRAC12:2225 | F/MFRAC10 F/MFRAC16 | <-- <-- | 2220 2230 | 1443 1449 | 470 472 | | | |
| | ***** | | | 2225 | | | 10000000 | 1000 | |
| | * MIER BIT = 0 AND COUNT SATISFIED SET UP * | | | 1111 | 10 00 | 10 11 | 000 011 | 0100 | 0 |
| | * GUARD TO ELIMINATE GUARD<00> - TARGETS * | | | 01000 | 010001 | 00100 | 010111011 | | |
| | *-----* | | | | | | | | |
| | *P2, | D+FA3(SF), D(C)+ALU07, | * | | | | | | |
| | * | RES+RESRIGHTGD, | * | | | | | | |
| | *NEXT, | BUTR(I08), | * | | | | | | |
| | * | J/MULFDW | * | | | | | | |
| | | J/MULFDW | *--> | 1011 | 2273 | 1407 | 458 | | |
| | | J/MDW3 | *--> | 1111 | 2277 | 1480 | 482 | | |
| | ***** | | | | | | | | |
| .CASE | 3 OF BMFRAC10 | | | | | | | | |
| 1446 | MFRAC13:2226 | F/MFRAC10 F/MFRAC16 | <-- <-- | 2220 2230 | 1443 1449 | 470 472 | | | |
| | ***** | | | 2226 | | | 10000000 | 1000 | |
| | * 0 - MULFDW 1 - MDW3 * | | | 1001 | 01 01 | 11 00 | 110 110 | 0100 | 0 |
| | *-----* | | | 00000 | 011100 | 11000 | 010010001 | | |
| | *P2, | D+FA3(SF) PLUS R(MAND), | * | | | | | | |
| | * | D(C)+COUT15, | * | | | | | | |
| | *P3, | FA3(SF)+D (B ADDR), | * | | | | | | |
| | *NEXT, | | * | | | | | | |
| | | J/MFRAC14 | *--> VV | | | | | | |
| | ***** | | | | | | | | |
| 1447 | MFRAC14:2221 | F/MFRAC13 | <-- VV | | | | | | |
| | ***** | | | 2221 | | | 10000000 | 1000 | |
| | *P2, | D+FA1(SF) PLUS R(MAND) | * | 0100 | 01 10 | 11 11 | 110 110 | 0100 | 0 |
| | * | 1) PLUS D(C) D(C)+COUT15, | * | 00000 | 010010 | 11000 | 010010111 | | |
| | *P3, | FA1(SF)+D (A ADDR), | * | | | | | | |
| | *NEXT, | | * | | | | | | |
| | | J/MFRAC15 | *--> | 2227 | 1448 | 472 | | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--|------|---------------|-----------------|----------------|----------------------|--------------|--------|
| | | | | | | | | RIF | COU | |
| 1448 | MFRAC15:2227 ***** *P2, * D+D(C) PLUS R(MAND2) P * * LUS FAC2(SF) D(C)+COUT15, *P3, FAC2(SF)+D (B ADDR), *NEXT, * J/MFRAC16 ***** | <-- | 2221 1447 471 | 2227 | 0100 00000 | 00 01 001100 | 11 01 11000 | 110 110 010011000 | 100000001000 | 0100 0 |
| 1449 | MFRAC16:2230 ***** *P2, * D+FAC3(SF) PLUS R(MAND * * 3) PLUS D(C) D(C)+COUT15, *P3, FAC3(SF)+D (A ADDR), *NEXT, * J/MFRAC11 ***** | <-- VV | | 2230 | 0100 00000 | 01 11 000010 | 10 11 11000 | 110 110 010010100 | 100000001000 | 0100 0 |
| 1450 | MFRAC17:2231 ***** *NEXT, CALL RTSHFDST, * RETURN+MFRAC10 ***** | --> | 2224 1444 470 | 2231 | 0010 00000 | 00 01 000000 | 00 10 11100 | 000 010 111000110 | 00000001000 | 0000 0 |
| | | | ***** 2706 2285 753 ***** VV 2220 1443 470 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|--------------------|------------|-------|--------|-------|--------------|-----------|
| .CASE | 1 OF MFRAC | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF COUT | CLOCKS |
| 1451 | MFRACF:2402 | F/MFRAC | | 2253 | 1433 | 467 | | |
| | ***** | | | 2402 | | | 100000001000 | |
| | * ;SINGLE PRECISION FRACTION GENERATION | | | 1010 | 00 01 | 00 01 | 110 000 | 0100 0 |
| | *ROUTINE :ROUTINE PRODUCES 24 FRACTION | | | 00000 | 010100 | 11000 | 010011100 | |
| | *BITS PLUS GUARD :BY GENERATING CROSS | | | | | | | |
| | *PRODUCTS AND USING EIS :INNER LOOP TO | | | | | | | |
| | *PRODUCE INDIVIDUAL TERMS :CROSS | | | | | | | |
| | *PRODUCTS ARE - : FOST2 * FAC2(SF) : | | | | | | | |
| | *FOST2 * FAC3(SF) ; FAC2(SF) * FOST3 : | | | | | | | |
| | *FAC3(SF) * FOST3 :CROSS PRODUCT TERMS | | | | | | | |
| | *ARE THEN SUMMED AND GUARD BIT :SHIFTED | | | | | | | |
| | *INTO THE GUARD REGISTER GENERATE | | | | | | | |
| | *FAC2(SF)*FOST2 | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+FAC2(SF) | | | | | | | |
| | *P3, R(T2B)+D (A ADDR), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/MFRACF2 | | --> | | | | | |
| 1452 | MFRACF2:2234 | F/MFRACF | | 2234 | | | 000000001000 | |
| | ***** | | | | | | | |
| | * CALL EIS INNER | | | 0001 | 00 11 | 00 01 | 101 001 | 0000 0 |
| | *LOOP | | | 00000 | 000000 | 11100 | 111001010 | |
| | ----- | | | | | | | |
| | *NEXT, CALL MULTLOOP | | | | | | | |
| | * RETURN+MFRACF2B | | --> | | | | | |
| | ***** | | | 1712 | 2393 | 792 | | |
| | ***** | | | | | | | |
| | | | | 1615 | 1453 | 473 | | |
| | | | | | | | | |
| 1453 | MFRACF2B:1615 | | | 1615 | | | 000000001000 | |
| | ***** | | | | | | | |
| | * REALIGN PRODUCT | | | 1001 | 11 01 | 01 10 | 000 000 | 0100 0 |
| | *D(C)=0 | | | 00000 | 000000 | 11000 | 110001110 | |
| | ----- | | | | | | | |
| | *P2, D+D RIGHT 1 PLUS 0,D(C)+CIN, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/MFRACF3 | | --> | | | | | |
| | ***** | | | 1616 | 1454 | 474 | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA LBF | EXTENSION RIF COUT | CLOCKS | |
|---------|---|---------------------------------------|---|------|---------------|-----------------|----------------|----------------------|------------------------|--|
| 1454 | MFRACF3:1616 ***** * CONSTANT FOR RIGHT SHIFT GUARD ENABLE * *AND COUNT * *7 * -----* *P3, MD+24371 (BC), * *NEXT, BUTR(RESET RES), * * J/MFRACF4 * --> VV ***** | <-- | 1615 1453 473 | 1616 | 0010 00010 | 10 10 100000 | 00 11 11010 | 111 001 110010000 | 000000001000 0000 0 | |
| 1455 | MFRACF4:1620 ***** * LOAD NEW MIER FOR FAC3(SF)*FDST2 CROSS * *PRODUCT * -----* *P2, SR+FDST3, RES+MD, COUNTER+MD, * *NEXT, * * J/MFRACF5 * --> VV ***** | <-- VV | | 1620 | 1111 00000 | 11 10 010101 | 10 01 11000 | 011 000 110010001 | 000000001000 0010 0 | |
| 1456 | MFRACF5:1621 ***** * ENTER AT MLOOP2B, WHICH ADDS THE * *CONTENTS OF D INTO THE * *PRODUCT * -----* *NEXT, CALL MULTLOOP3, * * RETURN+MFRACF6 * ***** --> | <-- VV | | 1621 | 0010 00000 | 00 01 000000 | 00 11 11100 | 101 001 111001011 | 000000001000 0000 0 | |
| | | | ***** 1713 2394 793 ***** VV -1 -1 -1 2 1 1 | | | | | | | |
| 1457 | MFRACF6:2235 ***** * REALIGN * *PRODUCT * -----* *P2, D+D RIGHT 1, SHIFT SR, * *P3, R(T1)+D (B ADDR), * *NEXT, BUTR(RESET RES), * * J/MFRACF7 * --> | | 2240 1458 475 | 2235 | 1111 00000 | 00 10 011110 | 01 10 11010 | 110 000 010100000 | 000000001000 0110 0 | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---|--|-----------------------|------|---------------|-----------------|----------------|----------------------|--------|-------------|
| | | | | | | | | RIF UPF | COUT | CLOCKS |
| 1458 | MFRACF7:2240 ***** #P2, D+FDST2, #NEXT, * J/MFRACF8 ***** | <-- | 2235 1457 474 | 2240 | 1010 0000 | 00 11 000000 | 00 00 11000 | 011 000 010100001 | 0100 0 | 00000001000 |
| 1459 | MFRACF8:2241 ***** # LOAD #MIER ----- #P3, R(T2B)+D (A ADDR), #NEXT, * J/MFRACF9 ***** | <-- VV | | 2241 | 0000 0000 | 00 00 010100 | 00 01 11000 | 110 000 010100010 | 0000 0 | 00000001000 |
| 1460 | MFRACF9:2242 ***** # COUNTER GETS LO BYTE OF #R(T1) ----- #P2, D+SR, COUNTER+R(T1), #NEXT, * J/MFRACF10 ***** | <-- VV | | 2242 | 1111 0000 | 01 10 000101 | 00 00 11000 | 110 000 010100100 | 0100 0 | 00000001000 |
| 1461 | MFRACF10:2244 ***** # MERGE BYTE #TERMS ----- #P2, D+COUNTER#D(HIBYTE), #NEXT, * J/MFRACF11 ***** | <-- VV | | 2244 | 1111 00111 | 00 00 000000 | 01 01 11000 | 000 000 010100101 | 0100 0 | 00000001000 |
| | | | 2245 1462 476 | | | | | | | |

F08

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-------------------------------|---------------------------------------|-----------------------|---------------|---------|---------|----------|-----------|-------------|--------|
| | | | | | | | | RIF | COUT | |
| 1466 | MFRACF14:2250 | F/MFRACF13 | <-- | 2246 1465 476 | 2250 | | | | 00000001000 | |
| | *P2, D+SR, | | | | 1111 | 00 00 | 00 00 | 000 000 | 0100 0 | |
| | *NEXT, | | | | 00000 | 000000 | 11000 | 010101001 | | |
| | * J/MFRACF15 | | --> VV | | | | | | | |
| 1467 | MFRACF15:2251 | F/MFRACF14 | <-- VV | | 2251 | | | | 00000001000 | |
| | * SAVE HIGHEST 2 BIT FOR | | | | 1111 | 00 11 | 01 11 | 110 000 | 0100 0 | |
| | *GUARD | | | | 01110 | 011010 | 11000 | 010101010 | | |
| | *P2, D+D RIGHT 14, | | | | | | | | | |
| | *P3, R(T2A)+D (B ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MFRACF16 | | --> VV | | | | | | | |
| 1468 | MFRACF16:2252 | F/MFRACF15 | <-- VV | | 2252 | | | | 10000001000 | |
| | * LOAD NEW | | | | 1111 | 00 11 | 10 11 | 110 000 | 0100 0 | |
| | *MIER | | | | 00000 | 011100 | 11000 | 010101100 | | |
| | *P2, D+FAC3(SF), | | | | | | | | | |
| | *P3, R(T2B)+D (B ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MFRACF17 | | --> VV | | | | | | | |
| 1469 | MFRACF17:2254 | F/MFRACF16 | <-- VV | | 2254 | | | | 00000001000 | |
| | *P2, D+R(T1) AND HIBYTE MASK, | | | | 1011 | 10 00 | 11 00 | 110 000 | 0100 0 | |
| | *NEXT, | | | | 00111 | 000000 | 11000 | 010101101 | | |
| | * J/MFRACF18 | | --> | 2255 1470 478 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|--|--|------|----------------------------|------------|-------------|-------------------------------------|
| 1470 | MFRACF18:2255 ***** *P2, D+D SWAP, *NEXT, * J/MFRACF19 ***** | <-- | 2254 1469 477 | 2255 | 1111 00 00 00101 000000 | 01 01 | 000 000 | 0100 0 010101110 |
| 1471 | MFRACF19:2256 ***** * LOAD LAST *MIER ----- *P2, SR+FDST3, RES+MD, COUNTER+MD, *NEXT, * J/MFRACF20 ***** | <-- VV | | 2256 | 1111 11 10 00000 010101 | 10 01 | 011 000 | 0010 0 010110000 |
| 1472 | MFRACF20:2260 ***** *NEXT, CALL MULTLOOP3 * RETURN+MFRACF21 ***** | <-- VV | ***** 1713 2394 793 ***** VV 2262 1473 478 | 2260 | 0010 00 01 00000 000000 | 01 10 | 010 001 | 0000 0 111001011 |
| 1473 | MFRACF21:2262 ***** * REALIGN *PRODUCT ----- *P2, D+D RIGHT 1, SHIFT SR, *P3, FAC3(SF)+D (B ADDR), *NEXT, BUTR(RESET RES), * J/MFRACF21B ***** | <-- | 2264 1474 479 | 2262 | 1111 00 01 00000 001010 | 01 10 | 000 000 | 0110 0 010110100 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|--|--------------------------|------|---------------|-----------------|----------------|--|
| 1474 | MFRACF21B:2264 ***** * CLEAR OUT LO BYTE DUE TO 9 SHIFTS * *OF ----- *P2, SR+SR AND HIBYTE MASK, *NEXT, * J/MFRACF22 ***** | <-- | 2262 1473 478 | 2264 | 1011 00111 | 10 00 000000 | 00 00 11000 | 00000001000 000 000 0010 0 010110101 |
| 1475 | MFRACF22:2265 ***** *THE SR OCCURS IN MLOOP3 AND MLOOP4 - *WOULD CAUSE SR<07> = 1 IF D<00> = 1 UPON *INITIALLY ENTERING MLOOP ----- *P2, D+SR PLUS FAC2(SF), * D(C)+COUT15, *P3, FAC2(SF)+D (B ADDR), *NEXT, * J/MFRACF23 ***** | <-- VV | | 2265 | 1001 00000 | 00 01 001100 | 00 00 11000 | 10000001000 000 110 0100 0 010110110 |
| 1476 | MFRACF23:2266 ***** * GET GUARD BITS INTO SR AND ENABLE *LOADING GUARD WITH RIGHT *SHIFTS ----- *P2, SR+R(T2A), RES+MD, *NEXT, * J/MFRACF24 ***** | <-- VV | | 2266 | 1111 00000 | 11 10 010001 | 11 01 11000 | 00000001000 110 000 0010 0 010110111 |
| 1477 | MFRACF24:2267 ***** * D(C) = *0 ----- *P2, D+FAC3(SF) PLUS 0 PLUS D(C), * D(C)+COUT15, SHIFT SR, *P3, FAC3(SF)+D (A ADDR), *NEXT, * J/MFRACF25 ***** | <-- VV | | 2267 | 0100 00000 | 11 01 000010 | 10 11 11000 | 10000001000 000 110 0110 0 010111000 |
| | | --> | 2270 1478 480 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | | | |
|---------|--------------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|--|--|--|--|
| | | | | | | | | RIF | COUT | CLOCKS | | | | |
| 1478 | MFRACF25:2270 | F/MFRACF24 | <-- | 2267 | 1477 | 479 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |
| | * SR IS IN SHIFT MODE TO ALIGN GUARD | | | | | | | | | | | | | |
| | *BITS | | | | | | | | | | | | | |
| | ----- | | | | | | | | | | | | | |
| | *P2, D+1 SHIFT SR | | | | | | | | | | | | | |
| | *P3, R(T1)+D (A ADDR), | | | | | | | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | | | | | | | |
| | * J/NROUND26 | | --> | 2201 | 1931 | 623 | | | | | | | | |
| | ***** | | | | | | | | | | | | | |

2270 000000001000
 1010 11 00 00 00 110 000 0110 0
 00000 010110 11010 010000001

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|

```

.TOC = MOD SPECIFIC INSTRUCTION PROPROCESSING ##FLPT##"
:MOD SPECIFIC PROCESSING
:INSTRUCTION SEPARATES INTEGER AND FRACTION INTO TWO FLOATING POINT
:FORMATTED NUMBERS
:INSERTS INTEGER PORTION IN FAC(SF+1) AND FRACTION PORTION INTO
:FAC(SF) ACCUMULATORS
:IF ODD ACCUMULATOR IS USED, ONLY THE FRACTION PORTION OF THE
:OPERATION IS KEPTED
:INSTRUCTION FALLS INTO 5 CLASSES OF OPERATION AND ARE AS FOLLOWS
    
```

```

CLASS 5 - PRODUCT PRODUCED AN UNDERFLOW
FRACTION RESULTS IN FAC(SF) WITH THE EXPONENT OFF
BY 400 OCTAL AND INTEGER PORTION IS EXACT ZERO
IN FAC(SF+1)
    
```

```

CLASS 4 - ABS(PROD) IS < 1 BUT NOT UNDERFLOWED
FRACTION RESULTS IN FAC(SF) AND INTEGER IS = 0
IN FAC(SF+1)
    
```

```

CLASS 3 - 1 < ABS(PROD) < 2**L WHERE L IS THE NUMBER OF
BITS AVAILABLE FOR PRECISION AND ARE 24 FOR
SINGLE PRECISION AND 56 BITS FOR DOUBLE PRECISION
THIS IS THE ONLY CLASS WHERE THIS INSTRUCTION IS OF
MOST VALUE. THE INTEGER RESULT IN FLOATING POINT
FORMAT WILL BE IN FAC(SF+1) AND THE FRACTION
NORMALIZED RESULT WILL BE IN FAC(SF)
    
```

```

CLASS 2 - ABS(PROD) < 2**L BUT NOT OVERFLOW
INTEGER RESULT WILL BE FAC(SF+1) AND FRACTION =0
IN FAC(SF)
    
```

```

CLASS 1 - ABS(PROD) PRODUCED AN OVERFLOW
INTEGER RESULT OFF BY 400 OCTAL IN EXPONENT WILL
BE IN FAC(SF+1) AND FRACTION = 0 IN FAC(SF)
    
```

.CASE 8 OF BIFORK

| | | | | | | | | | |
|------|-----------|-------------|-----|-----|------|-----|--|--|--|
| 1479 | MODM:0347 | F/SETCLASS3 | <-- | 207 | 1239 | 403 | | | |
| | | F/WFORK | <-- | 474 | 1318 | 429 | | | |

```

*****
*NEXT, CALL FETCHFLT, *
* RETURN+MULMODM *
***** -->
    
```

```

*****
4614 2039 661
*****
VV
2152 1408 458
    
```

```

347 0010 00 00 11 01 010 100 0000 0
00000 000000 11100 110001100
    
```

K08

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 482

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|------------|------------|-------------|-----------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 1480 | MODM3:2277 ***** * REMOVE GUARD<00> *-----* *P2, SHIFT GUARD, *NEXT, * J/MODM3B ***** | <-- | 2225 1445 471 | 2277 | | | | | 000000001000 | |
| | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0010 0 | |
| | | | | | 00000 | 000000 | 11000 | 010111001 | | |
| 1481 | MODM3B:2271 ***** * RELOAD RES FOR LEFT SHIFT REMOVE *GUARD<00> *-----* *P2, RES+RESLEFTGD, *NEXT, * J/MODM3C ***** | <-- VV | | 2271 | | | | | 000000001000 | |
| | | | | | 0000 | 10 00 | 00 00 | 000 000 | 0000 0 | |
| | | | | | 01010 | 010001 | 11000 | 010111010 | | |
| 1482 | MODM3C:2272 ***** * MASK OUT LO BYTE SHIFT GUARD LEFT *GUARD<00> = 0 TARGETS *- *-----* *P2, D+R(ER) AND HIBYTE MASK, * D(C)+D(C) SHIFT GUARD, *NEXT, BUTR(D(C)), * J/MOD4M * J/MOD4M * J/MOD6M ***** | <-- VV | | 2272 | | | | | 000000001000 | |
| | | | | | 1011 | 10 00 | 10 00 | 110 111 | 0110 0 | |
| | | | | | 00111 | 000000 | 10011 | 001010101 | | |
| | | | 01 2125 1483 483 | | | | | | | |
| | | | 11 2127 1485 483 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|--------------------|------------|-------|--------|-------|-----------|-----------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 1483 | 1 OF BMODW3C MOD4W:2125 | F/MODW3C | <-- | 2272 | 1482 | 482 | | |
| | ***** | | | 2125 | | | | 000000001000 |
| | *0 - MOD4W 1 - MOD6W TEST IF PRODUCT IS | | | 1101 | 11 00 | 10 00 | 110 000 | 0100 0 |
| | *NORMALIZED UPDATE R(ER) DUE TO LEFT | | | 00000 | 000010 | 11010 | 010111100 | |
| | *SHIFT | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+R(ER) MINUS 1, | | | | | | | |
| | *P3, R(ER)+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | |
| | * J/MOD5W | | --> VV | | | | | |
| 1484 | MOD5W:2274 | F/MOD4W | <-- VV | 2274 | | | | 000000001000 |
| | ***** | | | 0010 | 00 00 | 10 10 | 111 010 | 0000 0 |
| | *NEXT, CALL LEFTSHFSF, | | | 00000 | 000000 | 11100 | 110010110 | |
| | * RETURN+MOD6W | | | | | | | |
| | ***** | | --> | 2626 | 2223 | 734 | | |
| | | | | VV | | | | |
| | | | | 2127 | 1485 | 483 | | |
| 1485 | 2 OF BMODW3C MOD6W:2127 | F/MODW3C | <-- | 2272 | 1482 | 482 | | |
| | ***** | | | 2127 | | | | 000000001000 |
| | * REASSEBLE | | | 1111 | 00 00 | 10 00 | 101 100 | 0100 0 |
| | *SIGN | | | 00000 | 000000 | 11010 | 010111101 | |
| | ----- | | | | | | | |
| | *P2, D+CR1 D(C)+ALU15, | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | |
| | * J/MOD7W | | --> VV | | | | | |
| 1486 | MOD7W:2275 | F/MOD6W | <-- VV | 2275 | | | | 000000001000 |
| | ***** | | | 0111 | 10 00 | 10 00 | 110 111 | 0100 0 |
| | *P2, D+R(ER) AND NOT HIBYTE MASK, | | | 00111 | 000000 | 11000 | 010111110 | |
| | * D(C)+D(C), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/MOD8W | | --> | 2276 | 1487 | 484 | | |
| | ***** | | | | | | | |

M08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 484

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------|------------|------------|-------------|-----------|--------|--------|
| | | | | | | | | RIF | COOT | |
| 1487 | MOD7W: 2276 ***** * GENERATE SIGN AND * EXPONENT ***** *P2, D+D SWAP RIGHT 1, D(C)+D(C), *P3, R(T1)+D (B ADDR), *NEXT, * J/MOD9W ***** | <-- | 2275 1486 483 | 2276 | | | | 00000000 | 1000 | |
| | | | | | 00101 | 0010 | 0110 | 0110 | 110111 | 0100 0 |
| 1488 | MOD9W: 2300 ***** * REMOVE HIDDEN * BIT ***** *P2, D+FAC3(SF) AND NOT HIDDENBIT, *P3, FAC3(SF)+D (A ADDR), *NEXT, * J/MOD10W ***** | <-- VV | | 2300 | | | | 10000000 | 1000 | |
| | | | | | 0111 | 10 00 | 10 11 | 000 000 | 0100 0 | |
| | | | | | 01111 | 000010 | 11000 | 011000010 | | |
| 1489 | MOD10W: 2302 ***** * ASSEMBLE SIGN EXPONENT AND * FRACTION ***** *P2, D+FAC3(SF) OR R(T1), *P3, FAC3(SF)+D (A ADDR), *NEXT, * J/MOD11W ***** | <-- VV | | 2302 | | | | 10000000 | 1000 | |
| | | | | | 1110 | 01 10 | 10 11 | 110 000 | 0100 0 | |
| | | | | | 00000 | 000010 | 11000 | 011000100 | | |
| 1490 | MOD11W: 2304 ***** * D(C)=0 ***** *P2, D+R(ER) AND HIBYTE MASK, * D(C)+CIN, *NEXT, * J/MOD12W ***** | <-- VV | | 2304 | | | | 00000000 | 1000 | |
| | | | | | 1011 | 10 00 | 10 00 | 110 000 | 0100 0 | |
| | | | | | 00111 | 000000 | 11000 | 011000101 | | |
| | | | 2305 1491 485 | | | | | | | |

N08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR ALU | BUSB | BUSA | EXTENSION | CLOCKS |
|-----------|--|--------------------|------------|----------|--------|-------|----------------|--------|
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | RIF COOT UPF | |
| 1491 | MOD12W:2305 | F/MOD11W | <-- | 2304 | 1490 | 484 | | |
| | * BRANCH ON EXPONENT DATA TARGETS | | | 2305 | | | 000000001000 | |
| | *-----* | | | 0000 | 00 00 | 00 01 | 000 000 0000 0 | |
| | *SELECT, EMIT | | | 11001 | 000000 | 01101 | 000110000 | |
| | *NEXT, BUT(D(14-00) IS 0 & D15), | | | | | | | |
| | * J/MOD1CLSS | | --> | 00 | 2060 | 1497 | 487 | |
| | * J/MOD5CLSS | | --> | 01 | 2061 | 1553 | 504 | |
| | * J/MOD13W | | --> | 10 | 2062 | 1492 | 485 | |
| | * UNDEFINED CASE | | | | | | | |
| CASE 1492 | 3 OF BMOD12W | F/MOD12W | <-- VV | | | | | |
| | MOD13W:2062 | | | 2062 | | | 000000001000 | |
| | *00 - MOD1CLSS 01 - MOD5CLSS 10 - MOD13W | | | 0101 | 10 10 | 10 00 | 110 100 0100 0 | |
| | *11 - IMPOSSIBLE NOTE - D(C)=0 UPON | | | 00100 | 011110 | 10011 | 000111010 | |
| | *ENTRY BRANCH ON FD 0 - | | | | | | | |
| | *MOD14W | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, | | | | | | | |
| | * (D+R(ER) MINUS CNST200 | | | | | | | |
| | * MINUS 1) D(C)+ALU15, | | | | | | | |
| | *P3, R(T1)+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(BA00), | | | | | | | |
| | * J/MOD14W | | --> | 10 | 2072 | 1493 | 485 | |
| | * J/MOD15W | | --> | 11 | 2073 | 1494 | 486 | |
| CASE 1493 | 1 OF BMOD13W | F/MOD13W | <-- VV | | | | | |
| | MOD14W:2072 | | | 2072 | | | 000000001000 | |
| | *1 - MOD15W 24 DECIMAL BRANCH ON SIGN | | | 0000 | 10 00 | 00 00 | 011 000 0000 0 | |
| | *TARGETS | | | 00010 | 100000 | 10011 | 010001001 | |
| | *-----* | | | | | | | |
| | *P3, MD+30 (BC), | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | |
| | * J/MOD16W | | --> | 01 | 2211 | 1495 | 486 | |
| | * J/MOD4CLSS | | --> | 11 | 2213 | 1552 | 504 | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCKS |
|------------|------------------------------------|-----------------------|------------|------|------|------|------|-----------|------|--------|
| | | | | | | | | OFST | ADDR | |
| .CASE 1494 | MOD15M:2073 | F/MOD13M | <-- | 2062 | 1492 | 485 | | | | |
| | ***** | | | | | | | | | |
| | #0 - MOD16M 1 - MOD4CLSS | 56 DECIMAL | * | | | | | | | |
| | #TARGETS - 0 - | | * | | | | | | | |
| | #MOD16M | | * | | | | | | | |
| | ----- | | | | | | | | | |
| | #P3, MD+70 (BC), | | * | | | | | | | |
| | #NEXT, BUTR(D(C)), | | * | | | | | | | |
| | # | J/MOD16M | * --> | 01 | 2211 | 1495 | 486 | | | |
| | # | J/MOD4CLSS | * --> | 11 | 2213 | 1552 | 504 | | | |
| | ***** | | | | | | | | | |
| .CASE 1495 | MOD16M:2211 | F/MOD14M | <-- | 2072 | 1493 | 485 | | | | |
| | | F/MOD15M | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | #1 - MOD4CLSS | PERFORM FURTHER CLASS | * | | | | | | | |
| | #DECODE | | * | | | | | | | |
| | ----- | | | | | | | | | |
| | #P2, D+R(T1) MINUS MD,D(C)+ALU15, | | * | | | | | | | |
| | #NEXT, | | * | | | | | | | |
| | # | J/MOD17M | * --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 1496 | MOD17M:2310 | F/MOD16M | <-- | | | | | | | |
| | | | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | # TARGETS | | * | | | | | | | |
| | #- | | * | | | | | | | |
| | ----- | | | | | | | | | |
| | #P2, D+R(T1) PLUS CNSTB,D(C)+D(C), | | * | | | | | | | |
| | #P3, R(T1)+D (A ADDR), | | * | | | | | | | |
| | #NEXT, BUTR(D(C)), | | * | | | | | | | |
| | # | J/MOD2CLSS | * --> | 01 | 2021 | 1516 | 492 | | | |
| | # | J/MOD3CLSS | * --> | 11 | 2023 | 1517 | 493 | | | |
| | ***** | | | | | | | | | |

2073
 0000 10 00 00 00 00000001000
 00010 10000 10011 010001001

2211
 1101 11 10 11 00 00000001000
 00000 00000 11000 011001000

2310
 1001 10 00 11 00 00000001000
 01110 010110 10011 000010001

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|------------------------------------|--------------------|------------------|------|--------------|-------|-----------|-----------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 1497 | MOD1CLSS:2060 F/MOD12W | <-- | 2305 1491 485 | 2060 | | | | 000000001000 |
| | *0 - MOD2CLASS 1 - MOD3CLASS | | | | 1111 00 00 | 11 00 | 011 000 | 0100 0 |
| | ----- CLASS 1 FOR MOD | | | | 00000 000000 | 11000 | 011001010 | |
| | *EXECUTION POINT REACHED WHERE | | | | | | | |
| | *MULTIPLICATION PRODUCED AN | | | | | | | |
| | *OVERFLOW | | | | | | | |
| | *P2, D+FPSHIFEC, | | | | | | | |
| | *NEXT, J/MOD1CLSS2 | --> VV | | | | | | |
| 1498 | MOD1CLSS2:2312 F/MOD1CLSS | <-- VV | | 2312 | | | | 000000001000 |
| | * ALIGN FIV | | | | 1111 00 00 | 01 11 | 000 011 | 0100 0 |
| | *BIT | | | | 00000 000000 | 11000 | 011001100 | |
| | ----- | | | | | | | |
| | *P2, D+D RIGHT 2,D(C)+ALU07, | | | | | | | |
| | *NEXT, J/MOD1CLSS3 | --> VV | | | | | | |
| 1499 | MOD1CLSS3:2314 F/MOD1CLSS2 | <-- VV | | 2314 | | | | 000000001000 |
| | * SET OVERFLOW CONDITION BRANCH ON | | | | 1110 11 11 | 10 01 | 101 111 | 0100 0 |
| | *CONDITION | | | | 00000 000010 | 10011 | 011000001 | |
| | ----- | | | | | | | |
| | * SET CR2.OFLO,D(C)+D(C), | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | |
| | * J/MOD1CLSS4 | --> | 01 2301 1500 488 | | | | | |
| | * J/MOD1CLSS6 | --> | 11 2303 1502 488 | | | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|------------|--|---------------------------|------------|--------------------------------|-----|------|------|-----------------|
| | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | UPF | |
| 1503 | MOD1CLSS7:2320 | F/MOD1CLSS6 F/MOD2CLSS | <-- <-- | 2303 1502 488 2021 1516 492 | | | | |
| | ***** | | | | | | | |
| | * CHECK FOR EVEN OR ODD | | | | | | | |
| | *ACCUMULATOR | | | | | | | |
| | ----- | | | | | | | |
| | *P3, FAC3(SF+1)+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(IR06), | | | | | | | |
| | * J/MOD1CLSS8 | | | | | | | |
| | ***** | | | | | | | |
| | | J/MOD1CLSS8 | --> | 1110 2716 1504 489 | | | | |
| | | J/MOD1CLSS9 | --> | 1111 2717 1505 489 | | | | |
| | ***** | | | | | | | |
| .CASE 1504 | 1 OF BMOD1CLSS7 | F/MOD1CLSS7 | <-- VV | | | | | |
| | MOD1CLSS8:2716 | | | | | | | |
| | ***** | | | | | | | |
| | *TARGETS - 0 - MOD1CLSS8 1 - MOD1CLSS9 | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+FAC2(SF), | | | | | | | |
| | *NEXT, BUTR(R0R1), | | | | | | | |
| | * J/MOD1CLSS10 | | | | | | | |
| | ***** | | | | | | | |
| | | | --> | 2321 1506 490 | | | | |
| .CASE 1505 | 2 OF BMOD1CLSS7 | F/MOD1CLSS7 | <-- | 2320 1503 489 | | | | |
| | MOD1CLSS9:2717 | | | | | | | |
| | ***** | | | | | | | |
| | * TARGETS - 0 - F - | | | | | | | |
| | *MOD1CLSS18 | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+0, | | | | | | | |
| | *P3, FAC32(SF)+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(BA00) | | | | | | | |
| | * J/MOD1CLSS18 | | | | | | | |
| | ***** | | | | | | | |
| | | J/MOD1CLSS18 | --> | 10 2332 1514 492 | | | | |
| | | J/MOD1CLSS19 | --> | 11 2333 1515 492 | | | | |
| | ***** | | | | | | | |

| ADDR | ALU | BUSB | BUSA | EXTENSION |
|------|-------|--------|-------|-----------------|
| | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | UPF | |
| 2320 | 0000 | 00 00 | 00 11 | 10000001000 |
| | 00000 | 000010 | 00100 | 000 000 0000 0 |
| | | | | 111001110 |
| 2716 | 1010 | 00 01 | 00 00 | 10000001000 |
| | 00000 | 000000 | 10010 | 000 000 0100 0 |
| | | | | 011010001 |
| 2717 | 0011 | 00 00 | 00 11 | 10000001000 |
| | 00000 | 000110 | 10011 | 000 000 0100 0 |
| | | | | 011011010 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|-----------|------------------------------------|---------------------------------------|-----------------------|------------------|---------|---------|----------|--------------------|--------|
| 1506 | MOD1CLSS10:2321 | F/MOD1CLSS8 | <-- | 2716 1504 489 | | | | | |
| | ***** | | | | | | | | |
| | #1 - D - MOD1CLASS19 TARGETS - F - | | | | | | | | |
| | #MOD1CLSS11 | | | | | | | | |
| | ----- | | | | | | | | |
| | #P3, FAC2(SF+1)+D (A ADDR), | | | | | | | | |
| | #NEXT, BUTR(BADD) | | | | | | | | |
| | # | J/MOD1CLSS11 | --> | 10 2306 1507 490 | | | | | |
| | # | J/MOD1CLSS12 | --> | 11 2307 1508 490 | | | | | |
| | ***** | | | | | | | | |
| CASE 1507 | 1 OF BMOD1CLSS10 | F/MOD1CLSS10 | <-- VV | | | | | | |
| | MOD1CLSS11:2306 | | | | | | | | |
| | ***** | | | | | | | | |
| | #D - MOD1CLSS12 | | | | | | | | |
| | ----- | | | | | | | | |
| | #P2, D+D | | | | | | | | |
| | #P3, FAC32(SF)+D (A ADDR), | | | | | | | | |
| | #NEXT, # | J/MOD1CLSS18 | --> | 2332 1514 492 | | | | | |
| | ***** | | | | | | | | |
| CASE 1508 | 2 OF BMOD1CLSS10 | F/MOD1CLSS10 | <-- | 2321 1506 490 | | | | | |
| | MOD1CLSS12:2307 | | | | | | | | |
| | ***** | | | | | | | | |
| | # FINISH INTEGER | | | | | | | | |
| | #TRANSFER | | | | | | | | |
| | ----- | | | | | | | | |
| | #P2, D+FAC1(SF), | | | | | | | | |
| | #NEXT, BUT(ROR1) | | | | | | | | |
| | # | J/MOD1CLSS13 | --> VV | | | | | | |
| | ***** | | | | | | | | |
| 1509 | MOD1CLSS13:2330 | F/MOD1CLSS12 | <-- VV | | | | | | |
| | ***** | | | | | | | | |
| | #P3, FAC1(SF+1)+D (A ADDR), | | | | | | | | |
| | #NEXT, # | J/MOD1CLSS14 | --> | 2331 1510 491 | | | | | |
| | ***** | | | | | | | | |

```

2321      100000001000
      0000 00 00 00 11 000 000 0000 0
      00000 000100 10011 011000110

2306      100000001000
      0011 00 00 00 11 000 000 0100 0
      00000 000110 11000 011011010

2307      100000001000
      1111 00 00 11 11 000 000 0100 0
      00000 000000 10010 011011000

2330      100000001000
      0000 00 00 00 11 000 000 0000 0
      00000 010010 11000 011011001
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------------|------|------------------|-------------|-----------------|-----------|--------|--------|
| | | | | | | | | RIF | COUT | |
| 1510 | MOD1CLSS14:2331 ***** *P2, D=FAC0(SF), *NEXT, BUT(ROR1), * J/MOD1CLSS15 ***** | F/MOD1CLSS13 <-- | 2330 1509 490 | 2331 | | | | 10000000 | 1000 | |
| | | | | | 1010 01 01 00 00 | 0000 000000 | 10010 011011100 | 000 000 | 0100 0 | |
| 1511 | MOD1CLSS15:2334 ***** *P3, FAC0(SF+1)+D (A ADDR), *NEXT, J/MOD1CLSS16 ***** | F/MOD1CLSS14 <-- VV | | 2334 | | | | 10000000 | 1000 | |
| | | | | | 0000 00 00 00 11 | 0000 010100 | 11000 011011101 | 000 000 | 0000 0 | |
| 1512 | MOD1CLSS16:2335 ***** * CLEAR OUT * ACCUMULATOR ----- *P2, D=0, *P3, FAC32(SF)+D (A ADDR), *NEXT, J/MOD1CLSS17 ***** | F/MOD1CLSS15 <-- VV | | 2335 | | | | 10000000 | 1000 | |
| | | | | | 0011 00 00 00 11 | 0000 000110 | 11000 011100000 | 000 000 | 0100 0 | |
| 1513 | MOD1CLSS17:2340 ***** * WHEN ENTERED FROM MOD1CLSS19 * FAC10(SF+1) IS * CLEARED ----- *P2, D=0, *P3, FAC10(SF)+D (A ADDR), *NEXT, BUT(GO TO), PAGE+2, * J/FINISH ***** | F/MOD1CLSS16 <-- F/MOD1CLSS19 <-- | 2335 1512 491 2333 1515 492 | 2340 | | | | 10000000 | 1000 | |
| | | | | | 0011 00 00 00 11 | 0000 010110 | 11100 101100010 | 000 010 | 0100 0 | |
| | | | 2542 1962 633 | | | | | | | |

H09

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|--|-----------------------|---|---------|---------|----------|---|
| .CASE | 1 OF BMOD1CLSS5 | | | | | | | |
| 1514 | MOD1CLSS18:2332 | F/MOD1CLSS5 F/MOD1CLSS9 F/MOD1CLSS11 | <-- <-- <-- | 2315 1501 488 2717 1505 489 2306 1507 490 | | | | |
| | ***** * REFLIP FD *BIT *-----* *NEXT, CALL FD-TOGGLE * RETURN+NROUND2 *-----* ***** | | | | | | | 2332 0010 00 10 10 00 110 001 0000 0 00000 000000 11100 110010011 |
| | | | | ***** 1623 2219 732 ***** VV -1 -1 -1 0 1 1 | | | | |
| .CASE | 2 OF BMOD1CLSS5 | | | | | | | |
| 1515 | MOD1CLSS19:2333 | F/MOD1CLSS5 F/MOD1CLSS9 F/MOD1CLSS11 | <-- <-- <-- | 2315 1501 488 2717 1505 489 2306 1507 490 | | | | |
| | ***** *P2, D+0 *P3, FAC10(SF)+D (A ADDR), *NEXT, BUT(ROR1) * J/MOD1CLSS17 *-----* ***** | | | | | | | 2333 0011 00 00 00 11 000 000 0100 0 00000 010110 10010 011100000 |
| .CASE | 1 OF BMOD17W | | | | | | | |
| 1516 | MOD2CLSS:2021 | F/MOD17W | <-- | 2310 1496 486 | | | | |
| | ***** *-----* *-----* POINT *REACHED WHERE CLASS 2 OPERATION OF MOD *IS EXECUTED OVERFLOW HAS NOT OCCURRED *BUT THE ABS(PROD) IS GREATER THAN *2**L *-----* *P2, D+FAC3(SF), *NEXT, BUT(ROR1) * J/MOD1CLSS7 *-----* ***** | | | | | | | 2021 1111 00 00 10 11 000 000 0100 0 00000 000000 10010 011010000 |
| | | | | 2320 1503 489 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUF CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|--------------|------------------|-----------------|-------------|-------------------------------|
| 1517 | MOD3CLSS:2023 F/MOD17W | <-- | 2310 1496 486 | 2023 | 1111 00 00 01 01 | 0000 000 0110 0 | 00000001000 | 01000 000000 11000 011100001 |
| | *----- POINT REACHED * *WHERE 1 < ABS(PROD) < 2**L INTEGER * *SEPARATION OCCURS AND INTEGER IS PLACED * *IN FAC(SF+1) FRACTION BECOMES NORMALIZED * *AND RESULT IS PLACED IN FAC(SF) SHIFT * *RIGHT 4 FOR CHECK ON * *WHICH * *----- * *P2, D+D RIGHT 4, SR+D RIGHT 4, * *NEXT, * * J/MOD3CLSS2 * --> VV * *----- * | | | | | | | |
| 1518 | MOD3CLSS2:2341 F/MOD3CLSS | <-- VV | | 2341 | 0000 10 00 00 00 | 001 111 0000 0 | 00000001000 | 00010 100000 11000 011100010 |
| | * GET LO 4 BIT * *MASK * *----- * *P3, MD+17 (BC), * *NEXT, * * J/MOD3CLSS2B * --> VV * *----- * | | | | | | | |
| 1519 | MOD3CLSS2B:2342 F/MOD3CLSS2 | <-- VV | | 2342 | 1110 10 00 10 01 | 101 000 0100 0 | 00000001000 | 01110 000010 11000 011100011 |
| | * SET INDICATOR TO RESTORE FAC(SF+1) IF * *INSTRUCTION * *GETS * *----- * *P2, D+CR2 OR CNSTB, * *P3, CR2+D (A ADDR), * *NEXT, * * J/MOD3CLSS3 * --> 2343 1520 494 * *----- * | | | | | | | |

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|---|--|--------------------------|---------------|------------|------------|-------------|-----------|----------|-------|
| | | | | | | | | RIF | COUT | |
| 1524 | MOD3CLSS3E:2352 | F/MOD3CLSS3D | <-- | 2350 1523 494 | 2352 | | | | 10000000 | 1000 |
| | *P2, D+FAC0(SF+1), | | | | 1010 | 01 01 | 00 01 | 011 000 | 0100 | 0 |
| | *P3, FDST0+D (A ADDR), | | | | 0000 | 010100 | 11000 | 011110000 | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOD3CLSS4 | | --> | VV | | | | | | |
| 1525 | MOD3CLSS4:2360 | F/MOD3CLSS3E | <-- | VV | 2360 | | | | 00000000 | 1000 |
| | * ONE'S COMPLEMENT FOR COUNTER D(C) = 1 | | | | 0000 | 00 00 | 11 00 | 110 000 | 0100 | 0 |
| | *FOR MASK | | | | 0000 | 010110 | 11000 | 011110001 | | |
| | *GEN | | | | | | | | | |
| | *P2, D+NOT R(T1),D(C)+CIN, | | | | | | | | | |
| | *P3, R(T1)+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOD3CLSS6 | | --> | VV | | | | | | |
| 1526 | MOD3CLSS6:2361 | F/MOD3CLSS4 | <-- | VV | 2361 | | | | 00000000 | 1000 |
| | * LOAD COUNTER INITIALIZE MASK TO 0 WE | | | | 0011 | 01 10 | 00 00 | 110 111 | 0100 | 0 |
| | *WILL SHIFT IN ONES FROM | | | | 0000 | 000101 | 11000 | 000000000 | | |
| | *D(C) | | | | | | | | | |
| | *P2, COUNTER+R(T1),D+0,D(C)+D(C), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MOD3CLSS8 | | --> | 2000 1527 496 | | | | | | |

L09

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------|--------------|------------|----------|---|
| .CASE | 1 OF BMOD3CLSS8 | | | | | | | |
| 1527 | MOD3CLSS8:2000 | F/MOD3CLSS6 F/MOD3CLSS8 | <-- <-- | 2361 2000 | 1526 1527 | 495 496 | | |
| | ***** # WHEN COUNT SATISFIED GO TO #MOD3CLSS9 ----- #P2, D+D RIGHT 1,D(C)+D(C), #P3, R(T1)+D (B ADDR), #NEXT, BUT(COUNT IS -1), # J/MOD3CLSS8 # J/MOD3CLSS8 # J/MOD3CLSS9 ***** | | | | | | | 2000 1111 00 10 01 10 110 111 0100 0 00000 011110 10101 00000000 |
| .CASE | 2 OF BMOD3CLSS8 | | | | | | | |
| 1528 | MOD3CLSS9:2001 | F/MOD3CLSS6 F/MOD3CLSS8 | <-- <-- VV | 2361 | 1526 | 495 | | |
| | ***** # CHECK ON EVEN OR ODD #ACCUMULATOR ----- #P3, MD+17777 (BC), #NEXT, BUTR(IRD6) # J/MOD3CLSS10 # J/MOD3CLSS10 # J/MOD3CLSS10B ***** | | | | | | | 2001 1111 10 11 11 11 111 111 0000 0 00010 100000 00100 100111110 |
| .CASE | 1 OF BMOD3CLSS9 | | | | | | | |
| 1529 | MOD3CLSS10:2476 | F/MOD3CLSS9 | <-- VV | | | | | |
| | ***** #TARGETS - 0 - MOD3CLSS10 1 - MOD3CLSS10B ----- #NEXT, BUT(ROR1) # J/MOD3CLSS11 ***** | | | | | | | 2476 0000 00 00 00 00 000 000 0000 0 00000 000000 10010 011110100 |
| | | | | 2364 | 1531 | 497 | | |

M09

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|---------|-----------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|-------|-------------|----------------------|
| | | | | | | | | RIF | COUT | | |
| 1530 | MOD3CLS108:2477 | F/MOD3CLSS9 | <-- | 2001 | 1528 | 496 | | | | | |
| | ***** | | | | | | | | 2477 | 00000001000 | |
| | * BRANCH ON WORD TO BE | | | | | | | | 0000 | 00 00 | 000 000 0000 0 |
| | * MASKED | | | | | | | | 00000 | 000000 | 00000 001111100 |
| | ----- | | | | | | | | | | |
| | *NEXT, BUT(CASE) | J/MOD3CLSS13 | | | | | | | | | |
| | | J/MOD3CLSS13 | --> | 1100 | 2174 | 1533 | 498 | | | | |
| | | J/MOD3CLSS14 | --> | 1101 | 2175 | 1534 | 498 | | | | |
| | | J/MOD3CLSS15 | --> | 1110 | 2176 | 1535 | 499 | | | | |
| | | J/MOD3CLSS16 | --> | 1111 | 2177 | 1536 | 499 | | | | |
| | ***** | | | | | | | | | | |
| 1531 | MOD3CLSS11:2364 | F/MOD3CLSS10 | <-- | 2476 | 1529 | 496 | | | | | |
| | ***** | | | | | | | | 2364 | 10000001000 | |
| | *BRANCH ON SR<1:0> TARGETS - 00 - | | | | | | | | 0011 | 00 00 | 00 11 000 000 0100 0 |
| | *MOD3CLSS13 01 - MOD3CLSS14 10 - | | | | | | | | 00000 | 000110 | 10010 011110101 |
| | *MOD3CLSS15 11 - MOD3CLSS16 | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+0 | | | | | | | | | | |
| | *P3, FAC32(SF+1)+D (A ADDR), | | | | | | | | | | |
| | *NEXT, BUT(ROR1) | J/MOD3CLSS12 | --> VV | | | | | | | | |
| | ***** | | | | | | | | | | |
| 1532 | MOD3CLSS12:2365 | F/MOD3CLSS11 | <-- VV | | | | | | | | |
| | ***** | | | | | | | | 2365 | 10000001000 | |
| | * BRANCH ON SR<1:0> TARGETS | | | | | | | | 0011 | 00 00 | 00 11 000 000 0100 0 |
| | *- | | | | | | | | 00000 | 010110 | 00000 001111100 |
| | ----- | | | | | | | | | | |
| | *P2, D+0 | | | | | | | | | | |
| | *P3, FAC10(SF+1)+D (A ADDR), | | | | | | | | | | |
| | *NEXT, BUT(CASE) | J/MOD3CLSS13 | | | | | | | | | |
| | | J/MOD3CLSS13 | --> | 1100 | 2174 | 1533 | 498 | | | | |
| | | J/MOD3CLSS14 | --> | 1101 | 2175 | 1534 | 498 | | | | |
| | | J/MOD3CLSS15 | --> | 1110 | 2176 | 1535 | 499 | | | | |
| | | J/MOD3CLSS16 | --> | 1111 | 2177 | 1536 | 499 | | | | |
| | ***** | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|--|--|-----------------------|---|---------|----------|-----------|------|--------|
| | | | | | | | RIF | COUT | CLOCKS |
| .CASE | 1 OF BMOD3CLS108 | | | | | | | | |
| 1533 | MOD3CLSS13:2174 | F/MOD3CLS108 F/MOD3CLSS12 F/MOD3CLSS25 | <-- <-- <-- | 2477 1530 497 2365 1532 497 2374 1545 502 | | | | | |
| | ***** | | | | | | | | |
| | *00 - MOD3CLSS13 01 - MOD3CLSS14 10 - | | | | | | | | |
| | *MOD3CLSS15 11 - MOD3CLSS16 SEPARATE | | | | | | | | |
| | *FRACTION CHECK ODD OR EVEN | | | | | | | | |
| | *ACCUMULATOR | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+FAC3(SF) * NOT R(T1), | | | | | | | | |
| | * SR+FAC3(SF) * NOT R(T1), | | | | | | | | |
| | *NEXT, BUTR(IRD6), | | | | | | | | |
| | * J/MOD3CLSS26 | | | | | | | | |
| | | J/MOD3CLSS26 | * --> | 1110 2636 1546 502 | | | | | |
| | | J/MOD3CLSS27 | * --> | 1111 2637 1547 502 | | | | | |
| | ***** | | | | | | | | |
| .CASE | 2 OF BMOD3CLS108 | | | | | | | | |
| 1534 | MOD3CLSS14:2175 | F/MOD3CLS108 F/MOD3CLSS12 F/MOD3CLSS25 | <-- <-- <-- | 2477 1530 497 2365 1532 497 2374 1545 502 | | | | | |
| | ***** | | | | | | | | |
| | *TARGETS - 0 - MOD3CLSS26 1 - MOD3CLSS27 | | | | | | | | |
| | *MASK FRACTION FOR IN 2ND WORD TARGETS - | | | | | | | | |
| | *0 - | | | | | | | | |
| | *MOD3CLSS23 | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+NOT R(T1) * FAC2(SF), | | | | | | | | |
| | * SR+NOT R(T1) * FAC2(SF), | | | | | | | | |
| | *NEXT, BUTR(IRD6), | | | | | | | | |
| | * J/MOD3CLSS23 | | | | | | | | |
| | | J/RTSHFSF8 | * --> | 1110 2567 2316 764 | | | | | |
| | | J/RTSHFSF11 | * --> | 1111 2573 2319 765 | | | | | |
| | ***** | | | | | | | | |

2174
 0111 01 10 10 11 110 000 0110 0
 00000 000000 00100 110011110

2175
 0010 00 01 11 00 110 000 0110 0
 00000 000000 00100 101111110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|--|--|-----------------------|----------------------|----------------------|-------------------|----------|-----------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| .CASE | 3 OF BMOD3CLS10B | | | | | | | | |
| 1535 | MOD3CLSS15:2176 | F/MOD3CLS10B F/MOD3CLSS12 F/MOD3CLSS25 | <-- <-- <-- | 2477 2365 2374 | 1530 1532 1545 | 497 497 502 | | | |
| | ***** | | | | | | | | |
| | #1 - MOD3CLSS24 MASK 3RD WORD OF | | | | | | | | |
| | #FRACTION TARGETS | | | | | | | | |
| | #- | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+FAC1(SF) * NOT R(T1), | | | | | | | | |
| | * SR+FAC1(SF) * NOT R(T1), | | | | | | | | |
| | *NEXT, BUTR(IRD6), | | | | | | | | |
| | * J/MOD3CLSS20 | | | | | | | | |
| | | J/MOD3CLSS20 | --> | 1110 | 2516 | 1540 | 500 | | |
| | | J/MOD3CLSS21 | --> | 1111 | 2517 | 1541 | 501 | | |
| | ***** | | | | | | | | |
| .CASE | 4 OF BMOD3CLS10B | | | | | | | | |
| 1536 | MOD3CLSS16:2177 | F/MOD3CLS10B F/MOD3CLSS12 F/MOD3CLSS25 | <-- <-- <-- | 2477 2365 2374 | 1530 1532 1545 | 497 497 502 | | | |
| | ***** | | | | | | | | |
| | #0 - MOD3CLSS20 1 - MOD3CLSS21 TARGETS | | | | | | | | |
| | #- | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+NOT R(T1) * FAC0(SF), | | | | | | | | |
| | * SR+NOT R(T1) * FAC0(SF), | | | | | | | | |
| | *NEXT, BUTR(IRD6), | | | | | | | | |
| | * J/MOD3CLSS17 | | | | | | | | |
| | | J/MOD3CLSS17 | --> | 1110 | 2236 | 1537 | 499 | | |
| | | J/MOD3CLSS18 | --> | 1111 | 2237 | 1538 | 500 | | |
| | ***** | | | | | | | | |
| .CASE | 1 OF BMOD3CLSS16 | | | | | | | | |
| 1537 | MOD3CLSS17:2236 | F/MOD3CLSS16 | <-- VV | | | | | | |
| | ***** | | | | | | | | |
| | #0 - MOD3CLSS17 1 - MOD3CLSS18 STORE | | | | | | | | |
| | #FRACTION | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, SR+R(T1) * FAC0(SF), | | | | | | | | |
| | *P3, FAC0(SF)+D (B ADDR), | | | | | | | | |
| | *NEXT, BUT(ROR1), | | | | | | | | |
| | * J/MOD3CLSS18 | | | | | | | | |
| | | | --> | 2237 | 1538 | 500 | | | |
| | ***** | | | | | | | | |

2176
 0111 01 10 11 11 110 000 0110 0
 00000 000000 00100 101001110

2177
 0010 01 01 11 00 110 000 0110 0
 00000 000000 00100 010011110

2236
 1011 01 01 11 00 110 000 0010 0
 00000 011100 10010 010011111

C10

PROGRAM FLOWS

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|--|--|--------------------------|------|--------------------|------------|-------------|----------------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1538 | 2 OF BMOD3CLSS16 MOD3CLSS18:2237 | F/MOD3CLSS16 | <-- | 2177 | 1536 | 499 | | | | |
| | ***** # STORE FRACTION PORTION IF ACCUM IS ODD #ELSE STORE #INTEGER ----- #P2, D+SR #P3, FAC0(SF)+D (B ADDR), #NEXT, # J/MOD3CLSS19 ***** | | | | | | | | | |
| | | | | 2237 | | | | 100000001000 | | |
| | | | | | 1111 00 01 00 00 | | | 000 000 0100 0 | | |
| | | | | | 00000 011100 11000 | | | 011111000 | | |
| 1539 | MOD3CLSS19:2370 | F/MOD3CLSS18 | <-- VV | | | | | | | |
| | ***** # GENERATE #177777 ----- #P2, D+MD #P3, R(T1)+D (A ADDR), #NEXT, # J/MOD3CLSS15 ***** | | | | | | | | | |
| | | | | 2370 | | | | 000000001000 | | |
| | | | | | 1010 11 10 00 00 | | | 110 000 0100 0 | | |
| | | | | | 00000 010110 11000 | | | 001111110 | | |
| .CASE 1540 | 1 OF BMOD3CLSS15 MOD3CLSS20:2516 | F/MOD3CLSS15 | <-- | 2176 | 1535 | 499 | | | | |
| | ***** # GENERATE INTEGER STORE #FRACTION ----- #P2, SR+FAC1(SF) * R(T1), #P3, FAC1(SF)+D (A ADDR), #NEXT, BUT(ROR1) # J/MOD3CLSS21 ***** | | | | | | | | | |
| | | | | 2516 | | | | 100000001000 | | |
| | | | | | 1011 01 10 11 11 | | | 110 000 0010 0 | | |
| | | | | | 00000 010010 10010 | | | 101001111 | | |
| | | | | 2517 | 1541 | 501 | | | | |

D10

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------|--|--|--------------------------|------|------------|------------|-------------|-----------|----------------------------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1541 | 2 OF BMOD3CLSS15 MOD3CLSS21:2517 | F/MOD3CLSS15 | <-- | 2176 | 1535 | 499 | | | | |
| | ***** # STORE FRACTION IF SF = #000 ----- #P2, D+SR, #P3, FAC1(SF)+D (B ADDR), #NEXT, # J/MOD3CLSS22 ***** | | | | | | | | | |
| | | | | | | | | 2517 | 100000001000 | |
| | | | | | | | | 1111 | 00 01 00 00 000 000 0100 0 | |
| | | | | | | | | 00000 | 011010 11000 011111001 | |
| 1542 | MOD3CLSS22:2371 | F/MOD3CLSS21 | <-- VV | | | | | | | |
| | ***** #ELSE STORE INTEGER GENERATE #17777 ----- #P2, D+MD, #P3, R(T1)+D (A ADDR), #NEXT, # J/MOD3CLSS14 ***** | | | | | | | | | |
| | | | | | | | | 2371 | 000000001000 | |
| | | | | | | | | 1010 | 11 10 00 00 110 000 0100 0 | |
| | | | | | | | | 00000 | 010110 11000 001111101 | |
| .CASE 1543 | 1 OF BMOD3CLSS14 MOD3CLSS23:2576 | F/RTSHFSF7 | <-- | 2417 | 2314 | 764 | | | | |
| | ***** #P2, SR+R(T1) * FAC2(SF), #P3, FAC2(SF)+D (B ADDR), #NEXT, BUT(ROR1) # J/MOD3CLSS24 ***** | | | | | | | | | |
| | | | | | | | | 2576 | 100000001000 | |
| | | | | | | | | 1011 | 00 01 11 00 110 000 0010 0 | |
| | | | | | | | | 00000 | 001100 10010 101111111 | |
| .CASE 1544 | 2 OF BMOD3CLSS14 MOD3CLSS24:2577 | F/RTSHFSF7 | <-- | 2417 | 2314 | 764 | | | | |
| | ***** #P2, D+SR, #P3, FAC2(SF)+D (B ADDR), #NEXT, # J/MOD3CLSS25 ***** | | | | | | | | | |
| | | | | | | | | 2577 | 100000001000 | |
| | | | | | | | | 1111 | 00 01 00 00 000 000 0100 0 | |
| | | | | | | | | 00000 | 001100 11000 011111100 | |

E10

PROGRAM FLOWS

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | | |
|-----------|---|--|--------------------------|-----------|---------------|-----------------|----------------|----------------------|----------------|-------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS | |
| 1545 | MOD3CLSS25:2374 ***** * GENERATE *177777 *-----* | F/MOD3CLSS24 2577 1544 501 | <-- | 2374 | 1010 00000 | 11 10 010110 | 00 00 11000 | 110 000 001111100 | 0100 0 1000 | 00000001000 |
| | *P2, D+MD *P3, R(T1)+D (A ADDR), *NEXT, * J/MOD3CLSS13 ***** | 2174 1533 498 | --> | | | | | | | |
| CASE 1546 | 1 OF BMOD3CLSS13 MOD3CLSS26:2636 ***** * GENERATE INTEGER STORE *FRACTION *-----* | F/MOD3CLSS13 2174 1533 498 | <-- | 2636 | 1011 00000 | 01 10 000010 | 10 11 10010 | 110 000 110011111 | 0010 0 1000 | 10000001000 |
| | *P2, SR+FAC3(SF) * R(T1), *P3, FAC3(SF)+D (A ADDR), *NEXT, BUT(ROR1), * J/MOD3CLSS27 ***** | | --> VV | | | | | | | |
| CASE 1547 | 2 OF BMOD3CLSS13 MOD3CLSS27:2637 ***** * STORE FRACTION IF SF = ODD ELSE STORE *INTEGER *D(C)=0 *-----* | F/MOD3CLSS13 2174 1533 498 | <-- | 2637 | 1001 00001 | 10 01 001010 | 00 00 10011 | 000 000 011110010 | 0100 0 1000 | 10000001000 |
| | *P2, D+SR PLUS 0(D), D(C)+CIN, *P3, FAC3(SF)+D (B ADDR), *NEXT, BUTR(BA00), * J/NROUND * J/NROUND ***** | 11 2362 1906 615 | --> | | | | | | | |

F10

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 503

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COOT CLOCKS UPF |
|---------|--------------------------------------|--|-----------------------|----------------------|----------------------|-------------------|----------|---------------------------------|
| .CASE | 2 OF BM003CLSS27 | | | | | | | |
| 1548 | MOD3CLSS28:2363 | F/MOD3CLSS27 F/LDCTW27 F/LDCTW31 | <-- <-- <-- | 2637 4341 4532 | 1547 1884 1888 | 502 608 609 | | |
| | *TARGETS - 0 - NROUND 1 - MOD3CLSS28 | | | 2363 | | | | 00000001000 |
| | *DECREMENT EXP BY THREE | | | | | | | 0101 11 11 10 00 110 000 0100 0 |
| | *D(C)=0 | | | | | | | 00000 000010 11000 011111101 |
| | *P2, D+R(ER) PLUS NOT 2 PLUS D(C), | | | | | | | |
| | *P3, R(ER)+D (A ADDR), | | | | | | | |
| | *NEXT, J/MOD3CLSS29 | | --> VV | | | | | |
| 1549 | MOD3CLSS29:2375 | F/MOD3CLSS28 | <-- VV | | | | | |
| | *NEXT, CALL LEFTSHFSF, | | | 2375 | | | | 00000001000 |
| | * RETURN+MOD3CLSS30 | | | | | | | 0010 00 10 00 00 000 010 0000 0 |
| | | | --> | | | | | 00000 000000 11100 110010110 |
| | | | | 2626 2223 734 | | | | |
| | | | | VV | | | | |
| | | | | 2400 1550 503 | | | | |
| 1550 | MOD3CLSS30:2400 | | | | | | | |
| | *NEXT, CALL LEFTSHFSF, | | | 2400 | | | | 00000001000 |
| | * RETURN+MOD3CLSS31 | | | | | | | 0010 00 10 00 00 001 010 0000 0 |
| | | | --> | | | | | 00000 000000 11100 110010110 |
| | | | | 2626 2223 734 | | | | |
| | | | | VV | | | | |
| | | | | 2401 1551 503 | | | | |
| 1551 | MOD3CLSS31:2401 | | | | | | | |
| | * GO TO NORMALIZATION | | | 2401 | | | | 00000001000 |
| | * ROUTINE | | | | | | | 0010 00 01 11 10 010 010 0000 0 |
| | * NEXT, CALL LEFTSHFSF, | | | | | | | 00000 000000 11100 110010110 |
| | * RETURN+NROUND | | --> | | | | | |
| | | | | 2626 2223 734 | | | | |
| | | | | VV | | | | |
| | | | | -1 -1 -1 0 1 1 | | | | |

G10

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 504

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---|----------------|---------------------------------------|-----------------------|--------------------------------|---------|----------|---|
| 1552 | MOD4CLSS:2213 | F/MOD14W F/MOD15W | <-- <-- | 2072 1493 485 2073 1494 486 | | | 2213 1110 10 00 10 11 000 000 0100 0 00100 000010 11000 100001000 |
| <p>***** ----- POINT OF ENTRY * *WHERE CLASS 4 MOD OPERATIONS ARE * *PERFORMED ABS(PROD) < 1 AND UNDERFLOW * *HAS NOT OCCURRED RE-SEPARATE FRACTION * *AND * *EXPONENT * *----- * *P2, D+FAC3(SF) OR HIDDENBIT, * *P3, FAC3(SF)+D (A ADDR), * *NEXT, * * J/MOD5CLSS5B * --> *****</p> | | | | | | | |
| 1553 | MOD5CLSS:2061 | F/MOD12W | <-- | 2305 1491 485 | | | 2061 1111 00 00 11 00 011 000 0100 0 00000 000000 11000 100000100 |
| <p>***** ----- POINT REACHED * *WHERE ABS(PROD) PRODUCED AN UNDERFLOW * *EXPONENT IS OFF BY 400 OCTAL FAC(SF+1) = * *0 FAC(SF) HOLD THE FRACTION * *RESULT * *----- * *P2, D+FPSHIFEC, * *NEXT, * * J/MOD5CLSS2 * --> VV *****</p> | | | | | | | |
| 1554 | MOD5CLSS2:2404 | F/MOD5CLSS | <-- VV | | | | 2404 1111 00 00 01 00 000 011 0100 0 01000 000000 11000 100000101 |
| <p>***** * SET UP TO LOOK AT FIU * *BIT * *----- * *P2, D+D RIGHT 3,D(C)+ALU07, * *NEXT, * * J/MOD5CLSS3 * --> *****</p> | | | | | | | |

H10

PROGRAM FLOWS

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | | |
|---------------|---|--|--------------------------|-----------|---------------|-----------------|----------------|----------------------|----------------|---|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCK | |
| 1555 | MOD5CLSS3:2405 ***** * BRANCH ON FIU BIT TARGETS * *- -----* * SET CR2.UFLO,D(C)+D(C), * *NEXT, BUTR(D(C)), * * J/MOD5CLSS4 * * J/MOD5CLSS4 * --> 01 2421 1556 505 * J/MOD5CLSS5 * --> 11 2423 1557 505 ***** | <-- | 2404 1554 504 | 2405 | 1110 01100 | 10 00 000010 | 10 01 10011 | 101 111 100010001 | 0100 0 1000 | 0 |
| .CASE 1556 | 1 OF BMOD5CLSS3 MOD5CLSS4:2421 ***** *0 - MOD5CLSS4 1 - MOD5CLSS5 INTERRUPT * *IS DISABLED CLEAR THE ACCUMULATORS FINIS * *OFF * -----* *P2, D+0, * *P3, FAC32(SF)+D (A ADDR), * *NEXT, BUT(ROR1), * * J/MOD1CLSS5 * --> 2315 1501 488 ***** | <-- VV | | 2421 | 0011 00000 | 00 00 000110 | 00 11 10010 | 000 000 011001101 | 0100 0 1000 | 0 |
| .CASE 1557 | 2 OF BMOD5CLSS3 MOD5CLSS5:2423 ***** *IN THE CLASS 1 OPERATIONS REINSERT THE * *HIDDEN BIT THAT WAS * *REMOVED * -----* *P2, D+FAC3(SF) OR HIDDENBIT, * *P3, FAC3(SF)+D (A ADDR), * *NEXT, * * J/MOD5CLSS5B * --> 2410 1558 506 ***** | <-- | 2405 1555 505 | 2423 | 1110 00100 | 10 00 000010 | 10 11 11000 | 000 000 100001000 | 0100 0 1000 | 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | BUSB | BUSA | EXTENSION | | |
|---------------|---|--|--------------------------|--------------|--------------|--------------|------------|-----------|------|--------|
| | | | | | BUS | SP | UBF | RIF | COUT | CLOCKS |
| 1558 | MOD5CLSS5B:2410 | F/MOD4CLSS F/MOD5CLSS5 | <-- <-- | 2213 2423 | 1552 1557 | 504 505 | | | | |
| | ***** * INTERRUPT IS ENABLED REMOVE THE HI BYTE * * INSERTED PREVIOUSLY CHECK EVEN OR * * ODD * *-----* | | | | | | | | | |
| | *P2, D+ FAC3(SF) * NOT HIBYTE MASK, * *P3, FAC3(SF)+D (A ADDR), * *NEXT, BUTR(IRD6), * * J/MOD5CLSS6 * * J/MOD5CLSS9 * ***** | | | | | | | | | |
| | | J/MOD5CLSS6 J/MOD5CLSS9 | --> --> | 1110 1111 | 2136 2137 | 1559 1564 | 506 508 | | | |
| | ***** 1 OF BMOD5CLSS5B | | | | | | | | | |
| .CASE 1559 | MOD5CLSS6:2136 | F/MOD5CLSS5B | <-- VV | | | | | | | |
| | ***** * ACCUMULATORS TARGETS - 0 - MOD5CLSS6 1 - * * MOD5CLSS9 EVEN ACCUMULATOR BEING * * USED * *-----* | | | | | | | | | |
| | *NEXT, BUT(ROR1), * * J/MOD5CLSS7 * ***** | | | | | | | | | |
| | | J/MOD5CLSS7 | --> | | | | | | | |
| 1560 | MOD5CLSS7:2411 | F/MOD5CLSS6 | <-- VV | | | | | | | |
| | ***** * TARGETS- CLEAR OUT INTEGER F - * * MOD5CLSS7B * *-----* | | | | | | | | | |
| | *P2, D+D, * *P3, FAC32(SF+1)+D (A ADDR), * *NEXT, BUTR(BA00), * * J/MOD5CLSS7B * * J/MOD5CLSS7C * ***** | | | | | | | | | |
| | | J/MOD5CLSS7B J/MOD5CLSS7C | --> --> | 10 11 | 2232 2233 | 1561 1562 | 507 507 | | | |

```

2410      100000001000
0111 10 00 10 11 000 000 0100 0
00111 000010 00100 001011110

2136      000000001000
0000 00 00 00 00 000 000 0000 0
00000 000000 10010 100001001

2411      100000001000
0011 00 00 00 11 000 000 0100 0
00000 000110 10011 010011010

```

J10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 507

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|---|--|--------------------------|------|------------|------------|-------------|-----------|--------|--------|
| | | | | | | | | RIF | COUF | |
| .CASE 1561 | 1 OF BMODSCLSS7 MODSCLSS7B:2232 | F/MODSCLSS7 | <-- | 2411 | 1560 | 506 | | | | |
| | ***** *D - MODSCLSS7C GET BIT TO BE ROUNDED GO *TO NROUND *FLOWS *-----* | | | 2232 | | | | 10000000 | 1000 | |
| | | | | | 1111 | 00 00 | 11 11 | 000 100 | 0100 0 | |
| | | | | | 00000 | 000000 | 11010 | 101101010 | | |
| | *P2, D+FA1(SF) D(C)+ALU15, *NEXT, BUT(CLEAR FLAGS), * J/NROUND53 ***** | | --> | 2552 | 1958 | 632 | | | | |
| .CASE 1562 | 2 OF BMODSCLSS7 MODSCLSS7C:2233 | F/MODSCLSS7 | <-- | 2411 | 1560 | 506 | | | | |
| | ***** *TO FINISH MOD INSTRUCTION FINISH *OPERATION *-----* | | | 2233 | | | | 00000000 | 1000 | |
| | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | | | | | 00000 | 000000 | 10010 | 100001010 | | |
| | *NEXT, BUT(ROR1), * J/MODSCLSS8 ***** | | --> VV | | | | | | | |
| 1563 | MODSCLSS8:2412 | F/MODSCLSS7C | <-- VV | | | | | | | |
| | ***** * GO NORMALIZE *FRACTION *-----* | | | 2412 | | | | 10000000 | 1000 | |
| | | | | | 0011 | 00 00 | 00 11 | 000 010 | 0100 0 | |
| | | | | | 00000 | 010110 | 11100 | 101101011 | | |
| | *P2, D+0, *P3, FAC10(SF+1)+D (A ADDR), *NEXT, BUT(GO TO),PAGE+2, * J/NROUND54 ***** | | --> | 2553 | 1959 | 632 | | | | |

K10

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 508

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---|--|--|--------------------------|------------|--------------|------------|-------------|---|
| .CASE 1564 | 2 OF BMODSCLSS5B MODSCLSS9:2137 | F/MODSCLSS5B ----- * GET BIT TO BE ROUNDED FOR SINGLE * PRECISION TARGETS * *-----* | <-- | 2410 | 1558 | 506 | | 2137 1111 00 00 11 11 000 100 0100 0 00000 000000 10011 101101010 10000001000 |
| | *P2, D+FAC1(SF),D(C)+ALU15, *NEXT, BUTR(BA00), * J/NROUND53 *-----* | J/NROUND53 J/NROUND54 ----- *-----* | --> | 10 | 2552 | 1958 | 632 | |
| | | | --> | 11 | 2553 | 1959 | 632 | |
| .TOC " | FLOATING POINT ADD AND SUBTRACT ##FLPT##" | | | | | | | |
| ADD 172ACFSRC, | SF(AC) PLUS DF(FSRC) | | | | | | | |
| SUB 173ACFSRC, | SF(AC) MINUS DF(FSRC) | | | | | | | |
| ALTERNATE REGISTERS FOR DOUBLE PRECISION A PLUS B | | | | | | | | |
| REFER TO START REGISTERS 2,3 FOR SINGLE PRECISION | | | | | | | | |
| START SF(AC) | FAC3(SF), FAC2(SF), FAC1(SF), FAC0(SF) | | | | | | | |
| START DF(FSRC) | FDST3, FDST2, FDST1, FDST0 | | | | | | | |
| ALTERNATE REG | FDST2, SR, FDST0, FDST3 | | | | | | | |
| RESULTANT | FAC3(SF), FAC2(SF), FAC1(SF), FAC0(SF) | | | | | | | |
| .CASE 1565 | ADDZM:0350 F/SETCLASS3 F/MFORK | | <-- <-- | 207 474 | 1239 1318 | 403 429 | | 350 0100 00 01 00 11 010 100 0000 0 00000 000000 11100 110001100 00000001000 |
| | *0 - F - NROUND53 1 - D - NROUND54 ADD, * FLOATING POINT FETCH, MODE *0 *-----* | | | | | | | |
| | *NEXT, CALL FETCHFLT, * RETURN+ADDW01 *-----* | | | | | | | |
| | | | --> | 4614 | 2039 | 661 | | |
| | | | | VV | | | | |
| | | | | 4232 | 1570 | 510 | | |

L10

| BOX NO. | TAG: ADDRESS | OFST | ADDR | ALU | BUSB | BUSB | BUSA | EXTENSION | CLOCKS |
|---------|----------------------------|------------------------|------------------------------|-----|------|------|------|-----------|--------|
| .CASE | 10 OF BMFORK | OFST ADDR BOX PAGE | ADDR | BUS | SP | UBF | UPF | RIF COUT | CLOCKS |
| 1566 | ADDNZH:0351 | F/SETCLASS3 F/WFORK | 207 1239 403 474 1318 429 | | | | | | |
| | ***** | | | | | | | | |
| | * ADD, FLOATING POINT | | | | | | | | |
| | * FETCH | | | | | | | | |
| | ----- | | | | | | | | |
| | * NEXT, CALL FETCHFLT, | | | | | | | | |
| | * RETURN+ADDW01 | | | | | | | | |
| | ***** --> | | | | | | | | |
| | | | 4614 2039 661 | | | | | | |
| | | | VV | | | | | | |
| | | | 4232 1570 510 | | | | | | |
| 1567 | SUBZM:0355 | F/SETCLASS3 F/WFORK | 207 1239 403 474 1318 429 | | | | | | |
| | ***** | | | | | | | | |
| | * SUBTRACT, FLOATING POINT | | | | | | | | |
| | * FETCH, MODE | | | | | | | | |
| | * 0 | | | | | | | | |
| | ----- | | | | | | | | |
| | * NEXT, CALL FETCHFLT, | | | | | | | | |
| | * RETURN+SUBW01 | | | | | | | | |
| | ***** --> | | | | | | | | |
| | | | 4614 2039 661 | | | | | | |
| | | | VV | | | | | | |
| | | | 4230 1569 510 | | | | | | |
| 1568 | SUBNZM:0356 | F/SETCLASS3 F/WFORK | 207 1239 403 474 1318 429 | | | | | | |
| | ***** | | | | | | | | |
| | * SUBTRACT, FLOATING POINT | | | | | | | | |
| | * FETCH0 | | | | | | | | |
| | ----- | | | | | | | | |
| | * NEXT, CALL FETCHFLT, | | | | | | | | |
| | * RETURN+SUBW01 | | | | | | | | |
| | ***** --> | | | | | | | | |
| | | | 4614 2039 661 | | | | | | |
| | | | VV | | | | | | |
| | | | 4230 1569 510 | | | | | | |

| ADDR | ALU | BUSB | BUSB | BUSA | EXTENSION | CLOCKS |
|------|-------|--------|-------|-----------|-----------|--------------|
| ADDR | BUS | SP | UBF | UPF | RIF COUT | CLOCKS |
| 351 | 0100 | 00 01 | 00 11 | 010 100 | 0000 0 | 000000001000 |
| | 00000 | 000000 | 11100 | 110001100 | | |
| 355 | 0100 | 00 01 | 00 11 | 000 100 | 0000 0 | 000000001000 |
| | 00000 | 000000 | 11100 | 110001100 | | |
| 356 | 0100 | 00 01 | 00 11 | 000 100 | 0000 0 | 000000001000 |
| | 00000 | 000000 | 11100 | 110001100 | | |

M10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 510

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UZF | EXTENSION RIF COUF CLOCKS |
|---------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|---|
| 1569 | SUBW01:4230 ***** * CHANGE SIGN, DO * *ADD * -----* *P2, D+FDST3 XOR SIGNBIT, * *P3, FDST3+D (A ADDR), * *NEXT, * * J/ADDW01 * --> VV ***** | | | 4230 | 0110 00101 | 10 00 000010 | 10 01 11000 | 00000001000 011 000 0100 0 010011010 |
| 1570 | ADDW01:4232 F/SUBW01 ***** * CHECK FOR ZERO EXPONENT, EXP CODE IN SR * *(00) BOTH EXP NOT * *0 * -----* *NEXT, CALL EXPTST * * RETURN+ADDW02 * ***** --> | | | 4232 | 0100 00000 | 00 01 000000 | 00 11 11100 | 00000001000 100 010 0000 0 110010001 |
| | | | | | | | | ***** 2621 2213 730 ***** VV -1 -1 -1 0 1 1 |
| 1571 | ADDW02:4234 ***** *(01) SF EXP=0 (10) DF EXP=0 (11) BOTH * *EXP=0 * *BUT(CASE), CASE=SR03#SR02#SR01#SR00 * *TARGETS (0) ADDW03, BOTH EXPONENTS NOT * *ZERO * -----* *NEXT, BUTR(SR01#SR00), * * J/ADDW03 * * J/ADDW03 * --> 1100 4414 1572 511 * J/ADDSFEZ * --> 1101 4415 1580 513 * J/ADDFEZ * --> 1110 4416 1581 513 * J/ADDSDFEZ * --> 1111 4417 1582 514 ***** | | | 4234 | 0000 00000 | 00 00 000000 | 00 00 00000 | 00000001000 000 000 0000 0 100001100 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|--|---------------------------------------|---|------|------------------|---------------------|-----------------|------------------------|--------|
| 1572 | 1 OF BADDW02 ADDW03:4414 ***** *(1) ADDSFEZ, SF EXPONENT 0 (2) 0DDDFEZ, *DF EXPONENT 0 (3) ADDSDFEZ, BOTH *EXPONENTS 0 SF(AC) SIGN IN *CR1 *-----* *P2, D+FAC3(SF) AND SIGNBIT, *P3, CR1+D (B ADDR), *NEXT, * J/ADDW04 ***** | <-- | 4234 1571 510 | 4414 | 1011 10 10 10 11 | 00101 001010 11000 | 0100 000 0100 0 | 10000001000 | 0100 0 |
| 1573 | ADDW04:4235 ***** * SAVE SIGNS, EXPONENTS,,,ADD HIDDEN *BITS EXPONENTS IN R(ES), *R(ED) *-----* *NEXT, CALL DATAPREP, * RETURN+ADDW05 ***** | <-- VV | ***** 2571 2196 725 ***** VV -1 -1 -1 0 1 1 | 4235 | 0100 00 01 01 00 | 0000 000 010 0000 0 | 00000001000 | 0000 0 | |
| 1574 | ADDW05:4240 ***** *EXIT D(C)=0 (LIKE SIGNS) EXIT D(C)=1 *(UNLIKE SIGNS) GUARDEN=4000, GUARD *ENABLE *-----* *P3, MD+4000, *NEXT, * J/ADDW06 ***** | <-- VV | | 4240 | 0000 10 10 00 00 | 000 000 0000 0 | 00000001000 | 0000 0 | |
| 1575 | ADDW06:4241 ***** * GUARD DIGIT=0 ON NEXT *CLOCKSR *-----* *P2, D+CR2,D(C)+ALU15,RES+MD, *NEXT, * J/ADDW07 ***** | <-- VV | | 4241 | 1111 11 10 10 01 | 101 100 0100 0 | 00000001000 | 0100 0 | |
| | | --> | 4244 1576 512 | | | | | | |

B11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 512

| BOX NO. | TAG: ADDRESS | F/ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | | RIF | COUT | |
| 1576 | ADDW07:4244 | F/ADDW06 | <-- | 4241 1575 511 | 4244 | | | | 00000000 | 1000 | |
| | ***** | | | | | | | | | | |
| | # PUT SF EXP IN RESULTANT EXP REGISTER | | | | | | | | | | |
| | # RETAIN D(C) (SIGN LIKES, | | | | | | | | | | |
| | # UNLIKES) | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | #P2, | D+R(ES),D(C)+D(C), | | | | | | | | | |
| | #P3, | R(ER)+D (B ADDR), | | | | | | | | | |
| | #NEXT, | | | | | | | | | | |
| | * | J/ADDW08 | --> | VV | | | | | | | |
| 1577 | ADDW08:4245 | F/ADDW07 | <-- | VV | 4245 | | | | 00000000 | 1000 | |
| | ***** | | | | | | | | | | |
| | # R(ES)=R(T1), R(ED)=R(T2) R(EDIFF)=R(T2) | | | | | | | | | | |
| | # D(C)=0 (LIKE SIGNS), D(C)=1 (UNLIKE | | | | | | | | | | |
| | # SIGNS) TARGETS (0) SUMP, SUM | | | | | | | | | | |
| | # MODE | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | #P2, | D+R(ES) MINUS R(ED),D(C)+D(C), | | | | | | | | | |
| | #P3, | R(EDIFF)+D (B ADDR), | | | | | | | | | |
| | #NEXT, | BUTR(D(C)), | | | | | | | | | |
| | * | J/SUMP | | | | | | | | | |
| | * | J/SUMP | --> | 01 4331 1578 512 | | | | | | | |
| | * | J/DIFP | --> | 11 4333 1579 513 | | | | | | | |
| | ***** | | | | | | | | | | |
| CASE | 1 OF BADDW08 | | | | | | | | | | |
| 1578 | SUMP:4331 | F/ADDW08 | <-- | VV | 4331 | | | | 00000000 | 1000 | |
| | ***** | | | | | | | | | | |
| | # (2) DIFP, DIF MODE SINGLE, DECIMAL 26 | | | | | | | | | | |
| | # TEST SIGN TARGETS (0) SUMSFGDF, SF>DF, | | | | | | | | | | |
| | # EXP DIF | | | | | | | | | | |
| | # POS | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | #P3, | MD+32 | | | | | | | | | |
| | #NEXT, | BUTR(D15) | | | | | | | | | |
| | * | J/SUMSFGDF | | | | | | | | | |
| | * | J/SUMSFGDF | --> | 10 4032 1586 515 | | | | | | | |
| | * | J/SUMDFGSF | --> | 11 4033 1584 514 | | | | | | | |
| | ***** | | | | | | | | | | |

C11

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 513

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|------------|--|--------------------|------------|------------------|--------|------|------|---------------------------------|
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| .CASE 1579 | 2 OF BADDW08 DIFP:4333 | F/ADDW08 | | 4245 1577 512 | | | | |
| | ***** | | | | | | | 4333 000000001000 |
| | *(1) SUNDGFSF, DF>SF, EXP DIF NEG | | | | | | | 0000 10 00 00 00 011 010 0000 0 |
| | *SINGLE, DECIMAL 26 TEST SIGN TARGETS | | | | | | | 00010 100000 01101 110100110 |
| | *(0) DIFSFGDF, SF>DF, EXP DIF | | | | | | | |
| | *POS | | | | | | | |
| | ----- | | | | | | | |
| | *P3, MD+32 | | | | | | | |
| | *NEXT, BUTR(015) | | | | | | | |
| | * J/DIFSFGDF | | | 10 4646 1585 515 | | | | |
| | * J/DIFDFGSF | | | 11 4647 1583 514 | | | | |
| | ***** | | | | | | | |
| .CASE 1580 | 2 OF BADDW02 ADDSFEZ:4415 | F/ADDW02 | | 4234 1571 510 | | | | |
| | ***** | | | | | | | 4415 000000001000 |
| | *(1) DIFDFGSF, DF>SF, EXP DIF NEG | | | | | | | 0011 00 01 00 10 010 100 0000 0 |
| | ----- | | | | | | | 00000 000000 11100 111100101 |
| | *SF(AC) OR DF(FSRC) EXPONENTS EQUAL TO | | | | | | | |
| | *ZERO MOVE DF(FSRC) TO | | | | | | | |
| | *SF(AC) | | | | | | | |
| | ----- | | | | | | | |
| | *NEXT, CALL MOVFDSTSF, | | | | | | | |
| | * RETURN+LOADZM4 | | | 4745 2235 738 | | | | |
| | ***** | | | | | | | |
| | | | | 3222 1645 535 | | | | |
| | | | | | | | | |
| .CASE 1581 | 3 OF BADDW02 ADDSFEZ:4416 | F/ADDW02 | | 4234 1571 510 | | | | |
| | ***** | | | | | | | 4416 000000001000 |
| | * CALL SETFZFN, ALL RESTOREGRS, | | | | | | | 0000 00 00 00 00 000 011 0000 0 |
| | *FETO1 | | | | | | | 00000 000000 11100 010010010 |
| | ----- | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | |
| | * J/LOADZM4 | | | 3222 1645 535 | | | | |
| | ***** | | | | | | | |

D11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 514

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------------|--|--|--------------------------|------|------------|------------|-------------|-----------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| .CASE 1582 | 4 OF BADDW02 ADDSDFEZ:4417 | F/ADDW02 | <-- | 4234 | 1571 | 510 | | | |
| | ***** | | | | | | | | |
| | *BOTH SF(AC) AND DF(FSRC) EXPONENTS EQUAL * *TO ZERO RESET FAC32(SF) AND * *FAC10(SF),,,,FD * *DEPENDENT * -----* *NEXT, BUT(GO TO),PAGE+2, * * J/MULMODW6 * --> | | 2153 | 1413 | 460 | | | | |
| .CASE 1583 | 2 OF BDIFP DIFDFGSF:4647 | F/DIFP | <-- | 4333 | 1579 | 513 | | | |
| | ***** | | | | | | | | |
| | *----- DF > * *SF,,, EXPONENT DIFFERENCE NEGATIVE * *DF>SF' 2'S COMP SMALLER * *FRACTION * -----* *NEXT, CALL SF2SCOMP, * * RETURN+SUMDFGSF * --> | | 4275 | 1626 | 529 | | | | |
| .CASE 1584 | 2 OF BSUMP SUMDFGSF:4033 | F/SUMP | <-- | 4033 | 1584 | 514 | | | |
| | ***** | | | | | | | | |
| | * UPDATE RESULTANT EXPONENT CIN=1 * *BUT(FOVPSAVE H#FPS07) TARGETS (0) * *ADDW10, * *SINGLE * -----* *P2, D+R(ER) MINUS R(EDIFF), * * D(C)+CIN * *P3, R(ER)+D (A ADDR), * *NEXT, BUTR(FD), * * J/ADDW10 * --> * J/ADDW09 * --> | | 10 4052 | 1589 | 516 | | | | |
| ***** | | 11 4053 | 1588 | 516 | | | | | |

```

4417
0000 00 00 00 00 00000001000
00000 000000 11100 001101011
  
```

```

4647
0100 00 00 00 11 011 100 0000 0
00000 000000 11100 010111101
  
```

```

4033
1101 01 11 10 00 110 000 0100 0
00000 000010 10111 000101010
  
```

E11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 515

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|--------------------------------------|----------------------|------------|-------|--------|-------|-----------|--------------|
| CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF | COUT CLOCKS |
| 1585 | DIFSFGDF:4646 F/DIFP | <-- 4333 1579 513 | | 4646 | | | | 000000001000 |
| | *(1) ADDW09, DOUBLE | | | 0100 | 00 00 | 00 11 | 010 100 | 0000 0 |
| | ----- SF) | | | 00000 | 000000 | 11100 | 011001001 | |
| | *DF, EXPONENT DIFFERENCE POSITIVE | | | | | | | |
| | *SF>DF, 2'S COMPLEMENT SMALLER | | | | | | | |
| | *FRACTION | | | | | | | |
| | *NEXT, CALL FDST2SC, | | | | | | | |
| | * RETURN+SUMSFGDF | | | | | | | |
| | ***** | | | | | | | |
| | | --> 4311 1634 532 | | | | | | |
| | | ***** | | | | | | |
| | | VV | | | | | | |
| | | 4032 1586 515 | | | | | | |
| 1586 | SUMSFGDF:4032 F/SUMP | <-- 4331 1578 512 | | 4032 | | | | 000000001000 |
| | * 2'S COMP R(EDIFF) 0 TO SR | | | 0011 | 00 00 | 00 00 | 000 010 | 0110 0 |
| | *D(C)+0 | | | 00000 | 000000 | 11000 | 010101100 | |
| | *P2, D+0, SR+0, GUARD+0, D(C)+ALU00, | | | | | | | |
| | *NEXT, J/SUMSFGDF1 | | | | | | | |
| | ***** | --> VV | | | | | | |
| 1587 | SUMSFGDF1:4254 F/SUMSFGDF | <-- VV | | 4254 | | | | 000000001000 |
| | * R(EDIFF) IS NEGATIVE RETAIN D(C) | | | 1101 | 01 11 | 00 00 | 110 111 | 0100 0 |
| | *BUT(FOVPSAVE H#FPS07) TARGETS (0) | | | 00000 | 011110 | 10111 | 000101010 | |
| | *ADDW10, | | | | | | | |
| | *SINGLE | | | | | | | |
| | *P2, D+SR MINUS R(EDIFF), D(C)+D(C), | | | | | | | |
| | *P3, R(EDIFF)+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | |
| | * J/ADDW10 | | | | | | | |
| | | --> 10 4052 1589 516 | | | | | | |
| | | --> 11 4053 1588 516 | | | | | | |
| | ***** | | | | | | | |

F11

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 516

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------------|--|--|--------------------------|----------------------|----------------------|-------------------|-------------|-----------|------------------|---|
| | | | | | | | | RIF | COUT | |
| 1588 | ADDW09:4053 | F/SUMDFGSF F/SUMSFGDF1 F/ADDW09 | <-- <-- <-- | 4033 4254 4053 | 1584 1587 1588 | 514 515 516 | | | | |
| | ***** *(1) ADDW09, DOUBLE ----- * *DOUBLE,,,DECIMAL *58 ----- * *P3, MD+72, *NEXT, * J/ADDW10 ***** | | | | | | | | | |
| | | | | | | | | 4053 | 0000 10 00 00 00 | 00000001000 00010 10000 11000 000101010 |
| 1589 | ADDW10:4052 | F/SUMDFGSF F/SUMSFGDF1 F/ADDW09 | <-- <-- <-- VV | 4033 4254 | 1584 1587 | 514 515 | | | | |
| | ***** * BIG EXPONENT DIFFERENCE? RETAIN *D(C) ----- * *P2, D+R(EDIFF) PLUS MD,D(C)+D(C), *NEXT, * J/ADDW11 ***** | | | | | | | | | |
| | | | | | | | | 4052 | 1001 11 10 11 01 | 00000001000 00000 000000 11000 010101101 |
| 1590 | ADDW11:4255 | F/ADDW10 | <-- VV | | | | | | | |
| | ***** * BUT(D(14-00) IS 0 * D15) TARGETS (0) *ADDW12, SMALL EXP *DIFFERENCE ----- * *NEXT, BUTR(D15), * J/ADDW12 * J/ADDW12 * J/BIGEXPDIFF ***** | | | | | | | | | |
| | | | | 10 4512 | 1594 | 518 | | | | |
| | | | | 11 4513 | 1591 | 517 | | | | |

G11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 517

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | EXTENSION | | | | CLOCKS | |
|--|---|--|--------------------------|---------------|------------------|------------|-------------|------------|--------|--|
| | | | | | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | | |
| .CASE 1591 | 2 OF BADDW11 | | | | | | | | | |
| | BIGEXPDI:4513 | F/ADDW11 | <-- | 4255 1590 516 | | | | | | |
| | ***** | | | | | | | | | |
| | *(1) BIGEXPDI, BIG EXP DIFFERENCE * -----* | | | | | | | | | |
| | *----- BIG * *EXPONENT DIFFERENCE SF>DF OR DF>SF? * *TARGETS (0) BIGEXPDI, SF>DF, BIG EXP * *DIF * -----* | | | | | | | | | |
| | *NEXT, BUTR(D(C)), * * J/BIGEXPDI * * J/BIGEXPDI * * J/BIGEXPDI * -----* | | | | | | | | | |
| | | | | --> | 01 4225 1593 517 | | | | | |
| | | | | --> | 11 4227 1592 517 | | | | | |
| | ***** | | | | | | | | | |
| | .CASE 1592 | 2 OF BBIGEXPDI | | | | | | | | |
| BIGEXPDI:4227 | | F/BIGEXPDI | <-- VV | 4227 | | | | | | |
| ***** | | | | | | | | | | |
| *(2) BIGEXPDI, DF>SF, BIG EXP DI MOVE * *FDST TO * *SF(AC) * -----* | | | | | | | | | | |
| *NEXT, CALL MOVFDSTSF, * * RETURN+NRND46 * -----* | | | | | | | | | | |
| ***** | | | | | | | | | | |
| | | | | --> | 4745 2235 738 | | | | | |
| ***** | | | | | | | | | | |
| .CASE 1593 | 1 OF BBIGEXPDI | | | | | | | | | |
| | BIGEXPDI:4225 | F/BIGEXPDI | <-- | 4513 1591 517 | | | | | | |
| | ***** | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+2, * * J/NRND46 * -----* | | | | | | | | | |
| | ***** | | | | | | | | | |
| | | | | --> | 2311 1951 630 | | | | | |
| | ***** | | | | | | | | | |
| | | | --> | 2311 1951 630 | | | | | | |

```

4513
0000 00 00 00 00 00000001000
00000 000000 10011 010010101
    
```

```

4227
0010 00 01 10 01 001 100 0000 0
00000 000000 11100 111100101
    
```

```

4225
0000 00 00 00 00 000 010 0000 0
00000 000000 11100 011001001
    
```


| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA LBF | EXTENSION | | CLOCK |
|------------|--|--|--------------------------------|------|---------|---------|----------|---|------|-------|
| | | | | | | | | RIF | COUT | |
| .CASE 1597 | 1 OF BADDSHFSF ADDSHFSFF:4306 | F/ADDSHFSF <-- | 4267 1596 518 | 4306 | | | | 100000001000 | | |
| | *(1) ADDSHFSFD, DOUBLE SINGLE D(C) = *SIGN OF SF EXTRA COUNT TARGETS (0) *ADDSHFSFF1, *SHIFT | | | | | | | 1111 10 00 10 11 000 100 0100 0 01000 010001 10101 000001000 | | |
| | ----- *P2, D+FAC3(SF), D(C)+ALU15, * RES+RESRIGHTGD *NEXT, BUT(COUNT IS -1), * J/ADDSHFSFF1 | | | | | | | | | |
| | | J/ADDSHFSFF1 --> | 0 4010 1598 519 | | | | | | | |
| | | J/ADDSHFSFF2 --> | 1 4011 1599 519 | | | | | | | |
| .CASE 1598 | 1 OF BADDSHFSFF ADDSHFSFF1:4010 | F/ADDSHFSFF <-- F/ADDSHFSFF1 <-- | 4306 1597 519 4010 1598 519 | 4010 | | | | 100000001000 | | |
| | *(1) ADDSHFSFF2, SHIFT END RIGHT SHIFT *RETAIN D(C) COUNT SHIFTS TARGETS (0) *ADDSHFSFF1, KEEP *SHIFTING | | | | | | | 1111 00 01 01 10 000 111 0110 0 00000 001010 10101 000001000 | | |
| | ----- *P2, D+D RIGHT 1, D(C)+D(C), * SHIFT SR *P3, FAC3(SF)+D (B ADDR), *NEXT, BUT(COUNT IS -1), * J/ADDSHFSFF1 | | | | | | | | | |
| | | J/ADDSHFSFF1 --> | 0 4010 1598 519 | | | | | | | |
| | | J/ADDSHFSFF2 --> | 1 4011 1599 519 | | | | | | | |
| .CASE 1599 | 2 OF BADDSHFSFF ADDSHFSFF2:4011 | F/ADDSHFSFF <-- F/ADDSHFSFF1 <-- VV | 4306 1597 519 | 4011 | | | | 100000001000 | | |
| | *(1) ADDSHFSFF2, SHIFT OVER RESTORE *FAC2(SF) | | | | | | | 1111 00 01 00 00 000 000 0100 0 00000 001100 11010 000110001 | | |
| | ----- *P2, D+SR, *P3, FAC2(SF)+D (B ADDR), *NEXT, BUTR(RESET RES), * J/ADDW20A | | | | | | | | | |
| | | J/ADDW20A --> | 4061 1602 520 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|------------|---|--|-----------------------|--------------------------------------|---------|---------|----------|--------------------|--|
| .CASE 1600 | 2 OF BADSHFSF ADDSHFSFD:4307 | F/ADDHFSF | <-- | 4267 1596 518 | | | | | |
| | ***** * DF>SF EXTRA COUNT, COUNT SHIFTS TARGETS * *(0) ADDSHFSFD1, KEEP *SHIFTING *-----* | | | | | | | 4307 | 00000001000 0010 10 10 00 00 000 000 0000 0 00010 100000 10101 000110000 |
| | *P3, MD+24000 *NEXT, BUT(COUNT IS -1), * J/ADDHFSFD1 * J/ADDW20A | J/ADDHFSFD1 J/ADDW20A | --> | 0 4060 1601 520 1 4061 1602 520 | | | | | |
| .CASE 1601 | 1 OF BADSHFSFD ADDHFSFD1:4060 | F/ADDHFSFD | <-- VV | | | | | | |
| | ***** *(1) ADDW20A, SHIFTING IS OVER RIGHT *SHIFT *SF *-----* | | | | | | | 4060 | 00000001000 0100 00 01 10 00 111 010 0000 0 00000 000000 11100 111010110 |
| | *NEXT, CALL RTSHFSFSN, * RETURN+ADDHFSFD ***** | | --> | 2726 2320 766 VV 4307 1600 520 | | | | | |
| .CASE 1602 | 2 OF BADSHFSFD ADDW20A:4061 | F/ADDHFSFD | <-- | 4307 1600 520 | | | | | |
| | ***** * SAVE FDST2 IN SR, DO FRACTION ADD *CIN=0 *-----* | | | | | | | 4061 | 00000001000 1010 00 11 00 00 011 000 0110 0 00000 000000 11000 010110010 |
| | *P2, D+FDST2 SR+FDST2,D(C)+CIN, * J/ADDW21 ***** | J/ADDW21 | --> | 4262 1610 523 | | | | | |

M11

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 523

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------|--|---------------------------------------|---------------------------------------|------|---------|---------|----------|---|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 1608 | 1 OF BADDSHDFD ADDSHDFD1:4130 F/ADDSHDFD | <-- | 4413 1607 522 | 4130 | | | | 00000000 | 1000 | |
| | ***** *(1) ADDW20, SHIFTING IS OVER RIGHT *SHIFT *FDST ----- *NEXT, CALL RSHFDSTN, * RETURN+ADDSHDFD ***** | | | | | | | 0100 00 10 00 01 011 010 0000 0 00000 000000 11100 111001101 | | |
| | | --> | ***** 2715 2299 758 ***** VV | | | | | | | |
| .CASE 1609 | 2 OF BADDSHDFD ADDW20:4131 F/ADDSHDFD | <-- | 4413 1607 522 | 4131 | | | | 00000000 | 1000 | |
| | ***** * SAVE FDST2 IN SR, DO FRACTION ADD *CIN=0 ----- *P2, D+FDST2,SR+FDST2,D(C)+CIN, *NEXT, * J/ADDW21 ***** | | | | | | | 1010 00 11 00 00 011 000 0110 0 00000 000000 11000 010110010 | | |
| | | --> | VV | | | | | | | |
| 1610 | ADDW21:4262 F/ADDW20A F/ADDW20 | <-- <-- VV | 4061 1602 520 | 4262 | | | | 00000000 | 1000 | |
| | ***** *STORE FDST3 IN FDST2, FRACTION ADD *RETAIN D(C)=0 BUT(FOVPSAVE H#FPS07) *TARGETS (0) ADDF01, *SINGLE ----- *P2, D+FDST3,D(C)+D(C), *P3, FDST2+D (B ADDR), *NEXT, BUTR(FD), * J/ADDF01 * J/ADDF01 * J/ADDD01 ***** | | | | | | | 1111 00 11 10 01 011 111 0100 0 00000 001100 10111 101010010 | | |
| | | --> | 10 4522 1615 525 | | | | | | | |
| | | --> | 11 4523 1611 524 | | | | | | | |

N11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 524

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1611 | ADDD01:4523 | F/ADDW21 F/ADDD04 | <-- <-- | 4262 4270 | 1610 1614 | 523 525 | | | | |
| | ***** *(1) AD0001, DOUBLE STORE FDSTO IN *FDST3,,,DOUBLE ***** | | | | | | | | | |
| | *F2, D+FDSTO, *P3, FDST3+D (A ADDR), *NEXT, * J/ADDD02 | | | | | | | | | |
| | ***** | | | | | | | | | |
| 1612 | ADDD02:4264 | F/ADDD01 | <-- VV | | | | | | | |
| | ***** *DOUBLE ***** | | | | | | | | | |
| | *P2, D+FDST3 PLUS FAC0(SF), * D(C)+COUT15, *P3, FAC0(SF)+D (B ADDR), *NEXT, * J/ADDD03 | | | | | | | | | |
| | ***** | | | | | | | | | |
| 1613 | ADDD03:4266 | F/ADDD02 | <-- VV | | | | | | | |
| | ***** * STORE FDST1 IN FDSTO,,,DOUBLE RETAIN *D(C) ***** | | | | | | | | | |
| | *P2, D+FDST1,D(C)+D(C), *P3, FDSTO+D (B ADDR), *NEXT, * J/ADDD04 | | | | | | | | | |
| | ***** | | | | | | | | | |

4523
1010 01 11 00 01 011 000 0100 0
00000 000010 11000 010110100

4264
1001 01 01 10 01 011 110 0100 0
00000 011100 11000 010110110

4266
1111 00 11 11 01 011 111 0100 0
00000 011100 11000 010111000

4270 1614 525

| BOX NO. | TAG: ADDRESS | F/ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|-----------------------|--|--------------------------|--|------------|-----------------------------|-------------------------------------|
| 1614 | ADDD04:4270 | F/ADDD03 | <-- | 4266 1613 524 | 4270 | | | 100000001000 |
| | * #DOUBLE * -----* *P2, * * D+ FAC1(SF) PLUS FDST0 * PLUS D(C), D(C)+COUT15, *P3, FAC1(SF)+D (A ADDR), *NEXT, * J/ADDF01 * ***** | | | | 0100 01 11 11 11 00000 010010 11000 | | 011 110 0100 0 101010010 | |
| | | | --> | VV | | | | |
| .CASE | 1 OF BADDW21 | | | | | | | |
| 1615 | ADDF01:4522 | F/ADDDW21 F/ADDD04 | <-- <-- VV | 4262 1610 523 | 4522 | | | 100000001000 |
| | * #SINGLE,DOUBLE * -----* *P2, D+ SR PLS FAC2(SF) PLUS D(C), * D(C)+COUT15 *P3, FAC2(SF)+D (B ADDR), *NEXT, * J/ADDF02 * ***** | | | | 0100 00 01 00 00 00000 001100 11000 | | 000 110 0100 0 010111001 | |
| | | | --> | VV | | | | |
| 1616 | ADDF02:4271 | F/ADDF01 | <-- VV | | 4271 | | | 100000001000 |
| | * SINGLE,DOUBLE D(C)=HIDDEN *BIT * -----* *P2, * * D+ FAC3(SF) PLUS FDST2 * PLUS D(C), D(C)+ALU07, *P3, FAC3(SF)+D (A ADDR), *NEXT, * J/ADDF03 * ***** | | | | 0100 00 11 10 11 00000 000010 11000 | | 011 011 0100 0 010111100 | |
| | | | --> | 4274 1617 526 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------|---|--|--------------------------|------|------------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 1617 | ADDF03:4274 ***** * SRO2, SRO1, SRO0, OFLW, HID, NEXT BITS, * RESP. TEST FOR DF/SF, WITH EXPS EQUAL * TARGETS (0) NROUNDEND, ADD, SUB * END ----- * P2, SR+D RIGHT 6, * NEXT, BUTR(D15), * J/NROUNDEND * J/NROUNDEND * J/ADDF04 ***** | <-- 4271 1616 525 | | 4274 | | | | 00000000 | 1000 | |
| | | | | | 1111 00 00 01 11 | 000 000 | 0010 0 | | | |
| | | | | | 01000 000000 | 01101 | 011010110 | | | |
| | | --> | 10 4326 1619 526 | | | | | | | |
| | | --> | 11 4327 1618 526 | | | | | | | |
| .CASE 1618 | 2 OF BADDF03 ADDF04:4327 ***** *(1) ADFF04, CHECK FOR NEG FRACTION * FRACTION IS * NEG ----- * NEXT, CALL SF2SCOMP, * RETURN+ADDF03 ***** | <-- VV | | 4327 | | | | 00000000 | 1000 | |
| | | | | | 0100 00 01 01 11 | 100 100 | 0000 0 | | | |
| | | | | | 00000 000000 | 11100 | 010111101 | | | |
| | | --> | 4275 1626 529 | | | | | | | |
| | | | VV | | | | | | | |
| | | | 4274 1617 526 | | | | | | | |
| .CASE 1619 | 1 OF BADDF03 NROUNDEND:4326 ***** ----- * PREREQ. FOR RTSHFSFSN, RSHFDSTSN FRACTION * OVERFLOW BIT TARGETS (0) NROUNDEND1, NO * OFLW ----- * P3, MD+24000, * NEXT, BUTR(SRO2), * J/NROUNDEND1 * J/NROUNDEND1 * J/NROUNDEND2 ***** | <-- | 4274 1617 526 | 4326 | | | | 00000000 | 1000 | |
| | | | | | 0010 10 10 00 00 | 000 000 | 0000 0 | | | |
| | | | | | 00010 100000 | 00000 | 101011011 | | | |
| | | --> | 1011 4533 1620 527 | | | | | | | |
| | | --> | 1111 4537 1621 527 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA LBF | EXTENSION | | CLOCKS |
|-------------------------|---|---------------------------------------|-----------------------|--------------|---------|----------|-----------|------|---------------------------------|
| | | | | | | | RIF | COUT | |
| .CASE 1620 | 1 OF BNROUNDEND | | | | | | | | |
| | NROUNDEND1:4533 | F/NROUNDEND | <-- | 4326 | 1619 | 526 | | | |
| | ***** | | | | | | 4533 | | 000000001000 |
| | *(4) NROUNDEND2, FRAC OFLW LEFT SHIFT? | | | | | | | | 1101 11 00 10 00 110 000 0100 0 |
| | *HID BIT # NEXT TO HID BIT TARGETS (0) | | | | | | | | 00000 000010 00000 101101100 |
| | *NROUNDEND3, | | | | | | | | |
| | *NROUND | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+R(ER) MINUS 1, | | | | | | | | |
| | *P3, R(ER)+D (A ADDR), | | | | | | | | |
| *NEXT, BUTR(SR01#SR00), | | | | | | | | | |
| * | J/NROUNDEND3 | | --> | 1100 | 4554 | 1622 | 527 | | |
| * | J/NROUNDEND4 | | --> | 1101 | 4555 | 1623 | 528 | | |
| * | J/NROUNDEND5 | | --> | 1110 | 4556 | 1624 | 528 | | |
| * | J/NROUNDEND6 | | --> | 1111 | 4557 | 1625 | 528 | | |
| ***** | | | | | | | | | |
| .CASE 1621 | 2 OF BNROUNDEND | | | | | | | | |
| | NROUNDEND2:4537 | F/NROUNDEND | <-- | 4326 | 1619 | 526 | | | |
| | ***** | | | | | | | | |
| | *(1) NROUNDEND4, NROUND32 (2) NROUNDEND5, | | | | | | | | |
| | *NROUND32 (3) NROUNDEND6, NROUND32 FRAC | | | | | | | | |
| | *OFLW, CHECK FOR EXP | | | | | | | | |
| | *OFLW | | | | | | | | |
| | ----- | | | | | | | | |
| | *NEXT, CALL RTSHFSFSN, | | | | | | | | |
| | * RETURN+NROUNDEND6 | | | | | | | | |
| ***** | | | --> | 2726 | 2320 | 766 | | | |
| ***** | | | | | | | | | |
| | | | | 4557 | 1625 | 528 | | | |
| .CASE 1622 | 1 OF BNROUNDEND1 | | | | | | | | |
| | NROUNDEND3:4554 | F/NROUNDEND1 | <-- | 4533 | 1620 | 527 | | | |
| | ***** | | | | | | | | |
| | * LEFT SHIFT | | | | | | | | |
| | *SF | | | | | | | | |
| | ----- | | | | | | | | |
| | *NEXT, CALL LEFTSHFSF, | | | | | | | | |
| | * RETURN+NROUND | | | | | | | | |
| | ***** | | | --> | 2626 | 2223 | 734 | | |
| | ***** | | | | | | | | |
| | | | | 2362 | 1906 | 615 | | | |

E12

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 528

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|--|---------------------------------------|-----------------------|---|---------|----------|---|
| .CASE 1623 | 2 OF BNROUNDEND1 NROUNDEND4:4555 | F/NROUNDEND1 | <-- | 4533 1620 527 | | | |
| | ***** * LEFT SHIFT *SF ----- *NEXT, CALL LEFTSHFSF * RETURN+NROUND32 ***** | | --> | 2626 2223 734 ***** VV 2216 1937 625 | | | |
| | | | <-- | 4533 1620 527 | | | 4555 0010 00 01 00 01 110 010 0000 0 00000 000000 11100 110010110 |
| .CASE 1624 | 3 OF BNROUNDEND1 NROUNDEND5:4556 | F/NROUNDEND1 | <-- | 4533 1620 527 | | | |
| | ***** * RESULTANT EXP,,,NO CHANGE NORMALIZE *FRACTION ----- *P2, D+R(ER) PLUS 1 *P3, R(ER)+D (A ADDR) *NEXT, BUT(GO TO),PAGE+2, * J/NROUND32 ***** | | --> | 2216 1937 625 | | | |
| | | | <-- | 4533 1620 527 | | | 4556 1001 11 00 10 00 110 010 0100 0 00000 000010 11100 010001110 |
| .CASE 1625 | 4 OF BNROUNDEND1 NROUNDEND6:4557 | F/NROUNDEND1 | <-- | 4533 1620 527 | | | |
| | ***** * RESULTANT EXP,,,FRAC OFLW NORMALIZE *FRACTION ----- *P2, D+R(ER) PLUS 1 *P3, R(ER)+D (A ADDR) *NEXT, BUT(GO TO),PAGE+2, * J/NROUND32 ***** | | --> | 2216 1937 625 | | | |
| | | | <-- | 4533 1620 527 | | | 4557 1001 11 00 10 00 110 010 0100 0 00000 000010 11100 010001110 |

F12

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 529

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---------------------|-----------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | COUT |
| | | F/DIEDEGSF | <-- | | | | | | | | | |
| | | F/ADDFD4 | <-- | 4647 | 1583 | 514 | | | | | | |
| | | | | 4327 | 1618 | 526 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE SF2SCOMP | | * | | | | | | | | | |
| | | RETURN/SUMDFGSF | * --> | 4033 | 1584 | 514 | | | | | | |
| | | RETURN/ADDF03 | * --> | 4274 | 1617 | 526 | | | | | | |
| ***** | | | | | | | | | | | | |

```

1626 SF2SCOMP:4275
*****
-----*
-----*
#SUBROUTINE, TWO'S COMPLEMENT SF(AC)
#CHANGE RESULTANT SIGN REVERSE
#SIGN
-----*
#P2,      D+CR1 XOR SIGNBIT,
#P3,      CR1+D (A ADDR),
#NEXT,
#          J/SF2SCOMP          --> VV
*****
1627 SF2SCOMP1:4300          F/SF2SCOMP      <-- VV
*****
# SET D(C)=1 CIN=1 NOT FAC3(SF) IN
#FAC3(SF)
-----*
#P2,      D+NOT FAC3(SF), D(C)+CIN,
#P3,      FAC3(SF)+D (B ADDR),
#NEXT,
#          J/SF2SCOMP1        --> VV
*****
1628 SF2SCOMP1:4301          F/SF2SCOMP      <-- VV
*****
# RESET SR, CIN=0 BUT(FOVPSAVE
#H#FPS07), SINGLE, DOUBLE TARGETS (0)
#SF2SCOMP2,
#SINGLE
-----*
#P2,      SR+0, GUARD+0,
#NEXT,    BUTR(FD),
#          J/SF2SCOMP2
#          J/SF2SCOMP2        --> 10 4506 1632 531
#          J/SF2SCOMP1        --> 11 4507 1629 530
*****

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```

4275
0110 10 00 10 00 101 000 0100 0
00101 000010 11000 011000000

```

```

4300
0000 00 01 10 11 000 000 0100 0
00000 001010 11000 011000001

```

```

4301
0011 00 00 00 00 000 000 0010 0
00000 000000 10111 101000110

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H12

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 530

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF UBF | EXTENSION COUT UPF | CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------------------------|---------|--------------|--------------------|--------|
| .CASE | 2 OF BSF2SCMPF1 | | | | | | | |
| 1629 | SF2SCMPD1:4507 | F/SF2SCMPF1 F/SF2SCMPD3 | <-- <-- | 4301 1628 529 4305 1631 530 | | | | |
| | ***** | | | | | | | |
| | * (1) SF2SCMPD1 DOUBLE DOUBLE, 0 MINUS | | | | | | | |
| | * FAC1(SF) D(C)=1, | | | | | | | |
| | * DOUBLE | | | | | | | |
| | ----- | | | | | | | |
| | * P2, D+SR MINUS FAC1(SF), | | | | | | | |
| | * D(C)+COUT15, | | | | | | | |
| | * P3, FAC1(SF)+D (B ADDR), | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/SF2SCMPD2 | | --> VV | | | | | |
| | ***** | | | | | | | |
| 1630 | SF2SCMPD2:4304 | F/SF2SCMPD1 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | * NOT ASP, , , , DOUBLE RETAIN D(C) NOT | | | | | | | |
| | * FAC1(SF) IN | | | | | | | |
| | * FAC1(SF) | | | | | | | |
| | ----- | | | | | | | |
| | * P2, D+NOT FAC1(SF), D(C)+D(C), | | | | | | | |
| | * P3, FAC1(SF)+D (B ADDR), | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/SF2SCMPD3 | | --> VV | | | | | |
| | ***** | | | | | | | |
| 1631 | SF2SCMPD3:4305 | F/SF2SCMPD2 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | * DOUBLE 0 PLUS NOT FAC1(SF) PLUS | | | | | | | |
| | * D(C), , , , DOUBLE | | | | | | | |
| | ----- | | | | | | | |
| | * P2, D+FAC1(SF) PLUS 0 PLUS D(C), | | | | | | | |
| | * D(C)+COUT15, | | | | | | | |
| | * P3, FAC1(SF)+D (B ADDR), | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/SF2SCMPF2 | | --> | 4506 1632 531 | | | | |
| | ***** | | | | | | | |

4507
 1101 01 01 00 00 000 110 0100 0
 00000 011100 11000 011000100

4304
 0000 00 01 11 11 000 111 0100 0
 00000 011010 11000 011000101

4305
 0100 11 01 11 11 000 110 0100 0
 00000 011010 11000 101000110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|-----------------------------------|---------------------------------------|-----------------------|--------------------------------|---------|---------|----------|-------------------|---------|--------|
| 1632 | SF2SCOMPF2:4506 | F/SF2SCOMPF1 F/SF2SCOMPD3 | <-- <-- | 4301 1628 529 4305 1631 530 | | | | | | |
| | *DOUBLE | | | 4506 | 0101 | 00 01 | 00 00 | 100000001000 | 000 110 | 0100 0 |
| | *P2, D+SR PLUS NOT FAC2(SF) | | | | 00000 | 001100 | 11000 | 011001000 | | |
| | *P3, PLUS D(C),D(C)+COUT15, | | | | | | | | | |
| | *NEXT, FAC2(SF)+D (B ADDR), | | | | | | | | | |
| | J/SF2SCOMPF3 | | --> VV | | | | | | | |
| 1633 | SF2SCOMPF3:4310 | F/SF2SCOMPF2 | <-- VV | | | | | | | |
| | *DOUBLE SIGN IN | | | 4310 | 0100 | 11 01 | 10 11 | 100000001000 | 000 100 | 0100 0 |
| | *D(C) | | | | 00000 | 001010 | 11111 | 000000000 | | |
| | *P2, D+FAC3(SF) PLUS 0 PLUS D(C), | | | | | | | | | |
| | *P3, D(C)+ALU15, | | | | | | | | | |
| | *NEXT, FAC3(SF)+D (B ADDR), | | | | | | | | | |
| | BUT(RETURN) | | --> VV | | | | | | | |


```

1634 FDST2SC:4311
*****
*-----*
*SUBROUTINE, , TWO'S COMPLEMENT FDST SET *
*D(C)=1 CIN=1 NOT FDST3 IN *
*FDST3 *
*-----*
*P2, D+NOT FDST3,D(C)+CIN, *
*P3, FDST3+D (A ADDR), *
*NEXT, *
* J/FDST2SCF1 --> VV
*****

```

```

4311 0000 00 00 10 01 011 000 0100 0
      00000 000010 11000 011001100

```

```

1635 FDST2SCF1:4314 F/FDST2SC <-- VV
*****
* RESET SR, CIN=0 SINGLE OR DOUBLE *
* TARGETS (0) FDST2SCF2, *
* SINGLE *
*-----*
*P2, SR+0, GUARD+0, *
*NEXT, BUTR(FD), *
* J/FDST2SCF2 *
* J/FDST2SCF2 --> 10 4526 1639 533
* J/FDST2SCD1 --> 11 4527 1636 532
*****

```

```

4314 0011 00 00 00 00 000 000 0010 0
      00000 000000 10111 101010110

```

.CASE 2 OF BFDST2SCF1

```

1636 FDST2SCD1:4527 F/FDST2SCF1 <-- 4314 1635 532
      F/FDST2SCD3 <-- 4320 1638 533
*****
*(1) FDST2SCD1, DOUBLE *
*-----*
*P2, D+SR MINUS FDST0,D(C)+COUT15, *
*P3, FDST0+D (B ADDR), *
*NEXT, *
* J/FDST2SCD2 --> 4315 1637 533
*****

```

```

4527 1101 01 11 00 00 011 110 0100 0
      00000 011100 11000 011001101

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA LBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|-------------------------------------|---------------------------------------|-----------------------|---------------|---------|---------|----------|------------------------|-----------|
| 1637 | FDST2SCD2:4315 | F/FDST2SCD1 | <-- | 4527 1636 532 | 4315 | 0000 | 00 00 | 11 01 011 111 | 0100 0 |
| | *P2, D+NOT FDST1, D(C)+D(C), | | | | | 00000 | 010010 | 11000 | 011010000 |
| | *P3, FDST1+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | J/FDST2SCD3 | | --> VV | | | | | | |
| 1638 | FDST2SCD3:4320 | F/FDST2SCD2 | <-- VV | | 4320 | 0100 | 11 01 | 11 01 011 110 | 0100 0 |
| | *P2, D+FDST1 PLUS 0 PLUS D(C), | | | | | 00000 | 010010 | 11000 | 101010110 |
| | * D(C)+COUT15, | | | | | | | | |
| | *P3, FDST1+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | J/FDST2SCF2 | | --> VV | | | | | | |
| .CASE | 1 OF BFDST2SCF1 | | | | | | | | |
| 1639 | FDST2SCF2:4526 | F/FDST2SCF1 F/FDST2SCD3 | <-- <-- VV | 4314 1635 532 | 4526 | 0101 | 00 11 | 00 00 011 110 | 0100 0 |
| | *P2, D+SR PLUS NOT FDST2 PLUS D(C), | | | | | 00000 | 001100 | 11000 | 011010001 |
| | * D(C)+COUT15, | | | | | | | | |
| | *P3, FDST2+D (B ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | J/FDST2SCF3 | | --> VV | | | | | | |
| 1640 | FDST2SCF3:4321 | F/FDST2SCF2 | <-- VV | | 4321 | 0100 | 11 01 | 10 01 011 100 | 0100 0 |
| | * SIMGLE, DOUBLE SIGN IN | | | | | 00000 | 000010 | 11111 | 000000000 |
| | *D(C) | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, D+FDST3 PLUS 0 PLUS D(C), | | | | | | | | |
| | * D(C)+ALU15, | | | | | | | | |
| | *P3, FDST3+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | BUT(RETURN) | | --> VV | | | | | | |

M12

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 534

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|--|--|--|--------------------------|------------------------------|------------|------------|-------------|-----------|-------------|--|
| | | | | | | | | RIF | COUT CLOCKS | |
| .TOC " FLOATING POINT LOAD INSTRUCTION ##FLPT##" | | | | | | | | | | |
| .CASE 11 OF BWFORK | | | | | | | | | | |
| 1641 | LOADZW:0352 | F/SETCLASS3 F/WFORK | <-- <-- | 207 1239 403 474 1318 429 | | | | | | |
| | ***** * FROM WFORK WHEN 0*07 LOAD * DMO TEST * *FOR ILLEGAL INSTR TARGETS * *- * *-----* *NEXT, BUTR(NOT DST REG 6-7), * * J/LOADZW2 * * J/LOADZW2 * --> 10 172 1642 534 * J/LOADZW2B * --> 11 173 1643 534 ***** | | | | | | | | 352 | 0000 00 00 00 00 00000001000 00000 000000 10001 000 000 0000 0 001111010 |
| .CASE 1 OF BLOADZW | | | | | | | | | | |
| 1642 | LOADZW2:0172 | F/LOADZW | <-- VV | | | | | | | |
| | ***** *0 - LOADZW2 1 - LOADZW2B ILLEGAL * *INSTRUCTION * *-----* *NEXT, BUT(GO TO),PAGE+2, * * RETURN+OPCODERR, * * J/TPREAMBLE * --> 2544 1969 637 ***** | | | | | | | | 172 | 0100 00 10 11 00 00000001000 00000 000000 11100 001 010 0000 0 101100100 |
| .CASE 2 OF BLOADZW | | | | | | | | | | |
| 1643 | LOADZW2B:0173 | F/LOADZW | <-- | 352 1641 534 | | | | | | |
| | ***** *P2, D+FAC3(DF), * *P3, FAC3(SF)+D (B ADDR), * *NEXT, BUT(GO TO),PAGE+3, * * J/LOADZW3 * --> 3665 1644 535 ***** | | | | | | | | 173 | 1111 00 01 10 10 10000001000 00000 001010 11100 110110101 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|---|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| 1644 | LOADZW3:3665 | F/LOADZW2B | <-- | 173 | 1643 | 534 | | | | |
| | ***** | | | | | | | | | |
| | * COMPLETE THE TRANSFER TARGETS - F - * | | | | | | | | | |
| | *#LOADZW4 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, D+*FAC2(D*F), | | | | | | | | | |
| | *P3, FAC2(S*F)+D' (A ADDR), | | | | | | | | | |
| | *NEXT, BUTR(F*D) | | | | | | | | | |
| | * J/LOADZW4 | | | | | | | | | |
| | | J/LOADZW4 | --> | 10 | 3222 | 1645 | 535 | | | |
| | | J/LDDW | --> | 11 | 3223 | 1646 | 535 | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BLOADZW3 | F/ADDDFEZ | <-- | 4416 | 1581 | 513 | | | | |
| | | F/LOADZW3 | <-- | 3665 | 1644 | 535 | | | | |
| 1645 | LOADZW4:3222 | F/LDDW2 | <-- | 3666 | 1647 | 536 | | | | |
| | ***** | | | | | | | | | |
| | *D - LDDW SET FLPT | | | | | | | | | |
| | *CC'S | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *NEXT, CALL SETFZFN, | | | | | | | | | |
| | * RETURN+BRADS | | | | | | | | | |
| | ***** | | | | | | | | | |
| | | | --> | 2727 | 2323 | 768 | | | | |
| | ***** | | | | | | | | | |
| | | | | VV | | | | | | |
| .CASE | 2 OF BLOADZW3 | F/ADDDFEZ | <-- | 4416 | 1581 | 513 | | | | |
| | | F/LOADZW3 | <-- | 3665 | 1644 | 535 | | | | |
| 1646 | LDDW:3223 | F/LDDW2 | <-- | 3666 | 1647 | 536 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+*FAC1(D*F), | | | | | | | | | |
| | *P3, FAC1(S*F)+D' (B ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LDDW2 | | | | | | | | | |
| | | J/LDDW2 | --> | 3666 | 1647 | 536 | | | | |
| | ***** | | | | | | | | | |

```

3665      1010 00 00 00 11 000 000 0100 0
          00000 000100 10111 010010010

```

```

3222      0000 00 00 00 00 011 010 0000 0
          00000 000000 11100 111010111

```

```

3223      1111 00 01 11 10 000 000 0100 0
          00000 011010 11000 110110110

```

| BOX NO. | TAG: ADDRESS | F/LOADW | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---------------------------------------|------------------------|---------------------------------------|-----------------------|--------------|---------|-----------|-------------------------------|
| 1647 | LDW2:3666 | F/LOADW | 3223 1646 535 | | 3666 | | | 10000001000 |
| | *P2, D+FACD(DF), | | | | 1010 01 00 | 00 11 | 000 000 | 0100 0 |
| | *P3, FACD(SF)+D (A ADDR), | | | | 00000 010100 | 11000 | 010010010 | |
| | *NEXT, J/LOADZW4 | | 3222 1645 535 | | | | | |
| .CASE | 12 OF BMFORK | | | | | | | |
| 1648 | LOADSIXM:0353 | F/SETCLASS3 F/WFORK | 207 1239 403 474 1318 429 | | 353 | | | 00000001000 |
| | * FROM WFORK WHEN | | | | 0100 00 01 | 10 10 | 100 100 | 0000 0 |
| | *0*08 | | | | 00000 000000 | 11100 | 110001110 | |
| | *NEXT, CALL FFLTDEFER, | | | | | | | |
| | * RETURN+LOADSIXM2 | | 4616 2040 662 | | | | | |
| | | | VV | | | | | |
| | | | 4324 1649 536 | | | | | |
| 1649 | LOADSIXM2:4324 | | | | 4324 | | | 00000001000 |
| | * PERFORM CHECK ON NEG ZERO BRANCH ON | | | | 0000 00 00 | 00 01 | 000 000 | 0000 0 |
| | *SR<00> TARGETS | | | | 11001 000000 | 00000 | 000111110 | |
| | *SELECT, EMIT, | | | | | | | |
| | *NEXT, BUT(CASE), | | | | | | | |
| | * J/LOADNZW2 | | 1110 4076 1651 537 | | | | | |
| | * J/LOADNZW3 | | 1111 4077 1652 537 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---------------------------------------|---------------------------------------|-----------------------|------------------------------|---------|----------|---------------------------------|
| .CASE | 13 OF BMFORK | | | | | | |
| 1650 | LOADNZH:0354 | F/SETCLASS3 F/MFORK | <-- <-- | 207 1239 403 474 1318 429 | | | |
| | ***** | | | | | | |
| | #0 - LOADNZH2 1 - LOADNZH3 FROM MFORK | | | | | | 354 00000001000 |
| | #WHEN | | | | | | 0100 00 01 10 10 100 100 0000 0 |
| | #0#D14 | | | | | | 00000 000000 11100 110001110 |
| | ----- | | | | | | |
| | *NEXT, CALL FFLTDEFER, | | | | | | |
| | * RETURN+LOADSIXM2 | | | | | | |
| | ***** | | | | | | |
| | | | --> | 4616 2040 662 | | | |
| | | | | 4324 1649 536 | | | |
| | | | | VV | | | |
| .CASE | 1 OF BLOADSIXM2 | | | | | | |
| 1651 | LOADNZH2:4076 | F/LOADSIXM2 | <-- | 4324 1649 536 | | | |
| | ***** | | | | | | |
| | *NEXT, CALL MOVFDSTSF, | | | | | | |
| | * RETURN+LOADZM4 | | | | | | |
| | ***** | | | | | | |
| | | | --> | 4745 2235 738 | | | |
| | | | | 3222 1645 535 | | | |
| | | | | 4324 1649 536 | | | |
| .CASE | 2 OF BLOADSIXM2 | | | | | | |
| 1652 | LOADNZH3:4077 | F/LOADSIXM2 | <-- | 4324 1649 536 | | | |
| | ***** | | | | | | |
| | * RETURN+LOADNZH2, PAGE+4, | | | | | | |
| | * BUT(GO TO) | | | | | | |
| | * J/LOADNZH3B | | | | | | |
| | ***** | | | | | | |
| | | | --> | 4325 1653 538 | | | |
| | | | | 4076 1651 537 | | | |
| | | | | VV | | | |
| | | | | 4076 1651 537 | | | |
| | | | | | | | 4076 00000001000 |
| | | | | | | | 0011 00 01 00 10 010 100 0000 0 |
| | | | | | | | 00000 000000 11100 111100101 |
| | | | | | | | 4077 00000001000 |
| | | | | | | | 0100 00 00 01 11 110 100 0000 0 |
| | | | | | | | 00000 000000 11100 011010101 |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|----------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| | F/LOADNZW3 | | | | | | | | | |
| | ***** | | | | | | | | | |
| * | SUBROUTINE LOADNZW3B | | | | | | | | | |
| | RETURN/LOADNZW2 | | | 4076 | 1651 | 537 | | | | |
| | ***** | | | | | | | | | |

E

E13

```

1653 LOADNZM38:4325
*****
# FETCH OF NEG ZERO OCCURRED SET
#CONDITION CODES FOR NEG ZERO
#FETCH
-----
#P3, MD+14 (BC),
#NEXT, J/LOADNZM4 --> VV
*****
1654 LOADNZM4:4330 F/LOADNZM38 <-- VV
*****
#GO SET COND CODES ** NOTE ** LOADNZM3
#CALLED AS SUBROUTINE FROM LDCP! *****
-----
#P2, D+MD,
#NEXT, J/LOADNZM5 --> VV
*****
1655 LOADNZM5:4332 F/LOADNZM4 <-- VV
*****
# SET FN AND FZ IN FPS GO CHECK IF TRAPS
#ENABLED
-----
#SELECT, FPSCC(DBUF),
#P3, FPSCC+DATA,
#NEXT, BUT(DIAGNOSE),
# J/NZERO2 -->
*****

```

```

4325
0000 10 00 00 00 001 100 0000 0
00010 100000 11000 011011000

```

```

4330
1010 11 10 00 00 000 000 0100 0
00000 000000 11000 011011010

```

```

4332
0000 00 00 00 00 000 000 0000 0
00000 000000 11011 011101101

```

4355 2193 723

Dewey

F13

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 539

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | CLOCK COUNT |
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------|-------------|
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------|-------------|

TOC = WARM FLOATING COMPARE INSTRUCTION ##FLPT##
CONDITION CODES ARE SET ACCORDING TO THE OPERATION FDST - FAC(SF)

FC+0
FV+0
FZ+1 IF FDST - FAC(SF) = 0 ELSE FZ+0
FN+1 IF FDST - FAC(SF) < 0 ELSE FN+0

INSTRUCTION IS USED TO DETERMINE LOGICAL GREATER QUANTITY
BY SUBTRACTING FDST FROM FAC3(SF)

CASE 16 OF BMFORK

| | | | | | | | | |
|------|------------------------|------------------------|------------|------------|--------------|------------|--|--|
| 1656 | CMPW:0357 | F/SETCLASS3 F/MFORK | <-- <-- | 207 474 | 1239 1318 | 403 429 | | |
| | ***** | | | | | | | |
| | * FETCH | | | | | | | |
| | * OPERANDS | | | | | | | |
| | ----- | | | | | | | |
| | * NEXT, CALL FETCHFLT, | | | | | | | |
| | * RETURN+CMW2 | | | | | | | |
| | ***** | | | | | | | |
| | | | --> | 4614 | 2039 | 661 | | |
| | | | | ***** | | | | |
| | | | | VV | | | | |
| | | | | 4334 | 1657 | 539 | | |
| 1657 | CMW2:4334 | | | | | | | |
| | ***** | | | | | | | |
| | *P2, D+FDST3, | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/CMW3 | | --> | VV | | | | |
| | ***** | | | | | | | |
| 1658 | CMW3:4335 | F/CMW2 | <-- | VV | | | | |
| | ***** | | | | | | | |
| | *P3, R(T1)+D (A ADDR), | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/CMW4 | | --> | 4340 | 1659 | 540 | | |
| | ***** | | | | | | | |

357
0100 00 01 10 11 100 100 0000 0
00000 000000 11100 110001100

4334
1111 00 00 10 01 011 000 0100 0
00000 000000 11000 011011101

4335
0000 00 00 00 00 110 000 0000 0
00000 010110 11000 011100000

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | CLOCKS |
|-------------------|---|--|---------------------------------------|------|----------------------------|-------|---------|--------------------------|--------|
| | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT | |
| 1659 | CMPW4:4340 ***** *P2, D+*FAC3(SE) MINUS R(T1), * D(C)+*COUT15, *NEXT, * J/CMPW5 ***** | <-- | 4335 1658 539 | 4340 | 1101 01 10 00000 000000 | 10 11 | 110 110 | 10000001000 011100010 | 0100 0 |
| 1660 | CMPW5:4342 ***** * CALL SUBROUTINE WORD *COMPARE *-----* *NEXT, CALL WORDCMP, * RETURN+*CMPW6 ***** | <-- VV --> VV | 2414 1670 543 VV 4344 1661 540 | 4342 | 0100 00 01 00000 000000 | 11 00 | 100 010 | 00000001000 100001100 | 0000 0 |
| 1661 | CMPW6:4344 ***** * DO SECOND WORD COMPARE TARGETS - F - *CMPW7 *-----* *P2, D+*SR MINUS FDST2,D(C)+*COUT15, *NEXT, BUTR(FD), * J/CMPW7 * J/CMPW8 ***** | --> 10 4056 1662 540 --> 11 4057 1663 541 | | 4344 | 1101 00 11 00000 000000 | 00 00 | 011 110 | 00000001000 000101110 | 0100 0 |
| .CASE 1 OF BCMPW6 | | | | | | | | | |
| 1662 | CMPW7:4056 ***** *D - CMPW8 IF 2ND WORDS *ARE *-----* *NEXT, CALL WORDCMP, * RETURN+*CMPWEQUAL ***** | <-- <-- | 4344 1661 540 4360 1669 542 | 4056 | 0010 00 10 00000 000000 | 00 01 | 110 010 | 00000001000 100001100 | 0000 0 |
| | | --> | 2414 1670 543 VV -1 -1 -1 2 1 1 | | | | | | |

H13

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 541

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | CLOCKS | |
|---------|---|---------------------|------------|--|-----|------|------|--------------|--------|--|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT UPF | | |
| 1663 | CMPW8:4057 | F/CMPW6 F/CMPW14 | <-- <-- | 4344 1661 540 4360 1669 542 | | | | | | |
| | ***** *EQUAL THEN SET Z BIT *-----* *NEXT, CALL WORDCMP, * RETURN+*CMPW9 ***** | | | | | | | | | |
| | | | --> | ***** 2414 1670 543 ***** VV 4345 1664 541 | | | | | | |
| 1664 | CMPW9:4345 | | | | | | | | | |
| | ***** *P2, D+FDST1, *NEXT, * J/CMPW10 ***** | | | | | | | | | |
| | | | --> VV | | | | | | | |
| 1665 | CMPW10:4350 | F/CMPW9 | <-- VV | | | | | | | |
| | ***** *P3, R(T2)+D (A ADDR), *NEXT, * J/CMPW11 ***** | | | | | | | | | |
| | | | --> VV | | | | | | | |
| 1666 | CMPW11:4352 | F/CMPW10 | <-- VV | | | | | | | |
| | ***** *P2, D+*FAC1(SF) MINUS R(T2), * D(C)+COUT15, *NEXT, * J/CMPW12 ***** | | | | | | | | | |
| | | | --> | 4354 1667 542 | | | | | | |

4057
0100 00 01 11 00 101 010 0000 0
00000 000000 11100 100001100

4345
1111 00 00 11 01 011 000 0100 0
00000 000000 11000 011101000

4350
0000 00 00 00 01 110 000 0000 0
00000 010110 11000 011101010

4352
1101 01 11 11 11 110 110 0100 0
00000 000000 11000 011101100

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|---|---------------------------------------|---|------|--------------|---------|-----------|--------------------|--------|
| 1667 | CMPW12:4354 ***** *NEXT, CALL WORDCMP * * RETURN+CMW13 * ***** | F/CMW11 <-- | 4352 1666 541 | 4354 | 0100 00 01 | 11 01 | 110 010 | 0000 0000 | 0 |
| | | | 2414 1670 543 ***** VV 4356 1668 542 | | 00000 000000 | 11100 | 100001100 | | |
| 1668 | CMPW13:4356 ***** * TEST 4TH WORD OF DOUBLE * *PRECISION * -----* *P2, D+FACO(SF), SR+FACO(SF), * *NEXT, * * J/CMW14 * --> VV ***** | | | 4356 | 1010 01 01 | 00 00 | 000 000 | 0110 0 | |
| | | | | | 00000 000000 | 11000 | 011110000 | | |
| 1669 | CMPW14:4360 ***** *P2, D+SR MINUS FDSTO, D(C)+COUT15, * *NEXT, * * J/CMW7 * --> ***** | F/CMW13 <-- VV | | 4360 | 1101 01 11 | 00 00 | 011 110 | 0100 0 | |
| | | | 4056 1662 540 | | 00000 000000 | 11000 | 000101110 | | |

J13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 543

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|--------------------|-------------------|--------------------|------|------|--------------------------|------|------------|------------|-------------|-----------|-----|------|
| | | | OFST | ADDR | BOX | | | | | | PAGE | RIF | COUT |
| | | F/CMPW5 | <-- | 4342 | 1660 | 540 | | | | | | | |
| | | F/CMPW7 | <-- | 4056 | 1662 | 540 | | | | | | | |
| | | F/CMPW8 | <-- | 4057 | 1663 | 541 | | | | | | | |
| | | F/CMPW12 | <-- | 4354 | 1667 | 542 | | | | | | | |
| ***** | | | | | | | | | | | | | |
| * | SUBROUTINE WORDCMP | | * | | | | | | | | | | |
| | | RETURN/CMPW6 | * --> | 4344 | 1661 | 540 | | | | | | | |
| | | RETURN/CMPW EQUAL | * --> | -1 | -1 | -1 | 2 | 1 | 1 | | | | |
| | | RETURN/CMPW9 | * --> | 4345 | 1664 | 541 | | | | | | | |
| | | RETURN/CMPW13 | * --> | 4356 | 1668 | 542 | | | | | | | |
| ***** | | | | | | | | | | | | | |

K13

```

1670 WORDCMP:2414
*****
* SUBROUTINE CALLED BY FLOATING COMPARE *
* INSTRUCTION TO TEST RESULT OF WORD *
* SUBTRACTION OPERATION THIS ROUTINE WILL *
* DETERMINE THE PROPER CONDITION CODES TO *
* SET MESH OPERANDS FAC3 AND FDST3 TARGETS *
*-
*-----*
*P2,      SR+DAC3(SF) OR R(T1), *
*NEXT,    BUT(D(14-00) IS 0 & D15), *
*         J/WORDCMP2 *
*         J/WORDCMP2 * -->
*         J/WORDCMP3 * -->
*         J/WORDCMP4 * -->
*         J/WORDCMP5 * -->
*****

```

```

2414      1110 01 10 10 11 110 000 0010 0
          00000 000000 01101 110100000

```

```

.CASE 1 OF BWORDCMP
1671 WORDCMP2:2640 F/WORDCMP <-- VV
*****
*00 - WORDCMP2 01 - WORDCMP3 10 - *
*WORDCMP4 11 - WORDCMP5 WORDS ARE NOT *
*EQUAL THEIR SIGNS ARE CONTAINED IN *
*D(C) *
*-----*
*P2,      D+SR AND SEXPMASK,D(C)+D(C), *
*P3,      R(T1)+D (B ADDR), *
*NEXT,    *
*         J/WORDCMP6 * -->
*****

```

```

00 2640 1671 543
01 2641 1672 544
10 2642 1673 544
11 2643 1674 544

```

```

2640      1011 10 10 00 00 110 111 0100 0
          00110 011110 11000 100001101

```

```

2415 1675 545

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|-----------|--|---------------------------------------|-----------------------|------|---------|---------|----------|--------------------|--------|
| CASE 1672 | 2 OF BWORDCMP WORDCMP3:2641 | F/WORDCMP | <-- | 2414 | 1670 | 543 | | | |
| | ***** * SAME AS *WORDCMP2 ***** | | | | | | | | |
| | *P2, D+SR AND SEXPMASK,D(C)+D(C), *P3, R(T1)+D (B ADDR), *NEXT, * J/WORDCMP6 ***** | | --> | 2415 | 1675 | 545 | | | |
| CASE 1673 | 3 OF BWORDCMP WORDCMP4:2642 | F/WORDCMP | <-- | 2414 | 1670 | 543 | | | |
| | ***** * LAST WORDS COMPARED ARE EQUAL, GO *TO ***** | | | | | | | | |
| | *P2, SR+FAC2(SF), *NEXT, * BUT(RETURN) ***** | | --> VV | | | | | | |
| CASE 1674 | 4 OF BWORDCMP WORDCMP5:2643 | F/WORDCMP | <-- | 2414 | 1670 | 543 | | | |
| | ***** *MAIN FLOWS AND COMPARE NEXT TWO WORDS *SAME AS *WORDCMP2 ***** | | | | | | | | |
| | *P2, D+SR AND SEXPMASK,D(C)+D(C), *P3, R(T1)+D (B ADDR), *NEXT, * J/WORDCMP6 ***** | | --> | 2415 | 1675 | 545 | | | |

2641
1011 10 10 00 00 110 111 0100 0
00110 011110 11000 100001101

2642
1010 00 01 00 00 000 000 0010 0
00000 000000 11111 00000000

2643
1011 10 10 00 00 110 111 0100 0
00110 011110 11000 100001101

W

N13

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | RIF | COUT | CLOCKS | |
|---------|--|--------------------|------|-----|-----------------------|------|---------|---------|----------|-----------|--------|-------|-----------|--------|
| | | OFST | ADDR | BOX | | | | | | PAGE | | | | UPF |
| 1678 | CMPWEQUAL:2416 | | | | | 2416 | | | | 00000000 | 1000 | | | |
| | ***** | | | | | | | | | | | | | |
| | * POINT ENTERED IF OPERANDS BEING | | | | | | 1011 | 10 00 | 11 00 | 110 000 | 0100 | 0 | | |
| | * COMPARED ARE EQUAL ISOLATE EXPONENT OF | | | | | | 01111 | 000000 | 11000 | 100010000 | | | | |
| 1679 | CMPWEQUAL2:2420 | F/CMPWEQUAL | <-- | VV | | 2420 | | | | 00000000 | 1000 | | | |
| | ***** | | | | | | | | | | | | | |
| | * TEST FOR ZERO EXP TARGETS | | | | | | 0011 | 00 00 | 00 00 | 000 000 | 0010 | 0 | | |
| | *- | | | | | | 00000 | 000000 | 01101 | 110111001 | | | | |
| 1680 | STIM:0360 | F/SETCLASS3 | <-- | | 01 | 2671 | 1676 | 545 | | | | | | |
| | ***** | F/WFORK | <-- | | 11 | 2673 | 1677 | 545 | | | | | | |
| | *0 - WORDCMP7 1 - WORDCMP8 FROM WFORK | | | | | | | | | | | | | |
| | *WHEN 1*DO LOAD RETURN REGISTER | | | | | | | | | | | | | |
| 1680 | ***** | | | | | | | | | 00000000 | 1000 | | | |
| | * NEXT, CALL MOVSFDDST, | | | | | | | | | | | | | |
| | * RETURN+STW | | | | | | | | | 0011 | 00 11 | 01 11 | 000 100 | 0000 0 |
| | ***** | | | | | | | | | 00000 | 000000 | 11100 | 111100111 | |
| | | | | | | | | | | ***** | | | | |
| | | | | | | 4747 | 2239 | 740 | ***** | | | | | |
| | | | | | | | | | VV | | | | | |
| | | | | | | -1 | -1 | -1 | a 1 1 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|--|--|------------------------------|--------|------|------|---|
| .CASE | 18 OF BMFORK | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 1681 | ST2M:0361 | F/SETCLASS3 F/MFORK | <-- <-- | 207 1239 403 474 1318 429 | | | | |
| | ***** * FROM MFORK WHEN 1*01 LOAD RETURN *REGISTER *-----* *NEXT, CALL MOVSFDDST, * RETURN+STSM ***** --> | ***** 4747 2239 740 ***** VV -1 -1 -1 2 1 1 | | 361 | | | | 000000001000 0011 00 11 01 11 000 100 0000 0 00000 000000 11100 111100111 |
| 1682 | STSM:3670 | ***** *NEXT, CALL STOREFLT, * RETURN+BRAS ***** --> | ***** 4654 2061 674 ***** VV 3 283 126 | | | | | |
| | | | | 3670 | | | | 000000001000 0000 00 00 00 00 011 100 0000 0 00000 000000 11100 110101100 |

S

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------|

.TOC = FLOATING POINT DIVISION ##FLPT##"
 :WARM FLOATING POINT DIVISION ROUTINE
 :ALGORITHM USED IN NON-RESTORING DIVIDE

TEMPORARY REGISTERS USED ARE AS FOLLOWS -
 DSORD - FAC0(DF)
 DSOR1 - R(T2B)
 DSOR2 - FAC2(DF)
 DSOR3 - R(T1B)
 RMDRD - FAC3(DF)
 RMDR1 - R(T2A)
 RMDR2 - FAC1(DF)
 RMDR3 - R(T1A)
 FLOATING POINT ACCUMULATOR REFERRED TO AS FAC(DF) IN THIS ROUTINE
 ARE ACCUMULATORS FDST3-FDST0.
 A FORCE TO ACCUMULATOR 7 IS PERFORMED SUCH THAT REFERENCE TO
 FDST ACCUMULATORS (RIF=7) AND R(T1B) AND R(T2B) (RIF=2) CAN
 BE MADE WITHOUT THE EXISTANCE OF CONFLICT IN MICRO FIELD CONTROL.
 THIS ALSO PERMITS THE DIVISION ROUTINE TO PROCEED QUICKER.
 QUOTIENT IS DEVELOPED IN FAC(SF) THROUGH LEFT SHIFTS OF THE
 CARRY OUT FOLLOWING AN ARITHMETIC OPERATION.
 26 BITS ARE ALWAYS DEVELOPED FOR SINGLE AND 58 BITS FOR DOUBLE

.CASE 19 OF BWFORK
 1683 DIVZM:0362 F/SETCLASS3 <-- 207 1239 403
 F/WFORK <-- 474 1318 429

 * FROM *
 *FLPDECODE *

 *P3, DBUF LATCH+D, *
 *NEXT, *
 * J/DIVFDW2 * --> 546 1685 549

362
 0100 00 00 00 00 00000001000
 11011 000000 11000 101100110

.CASE 20 OF BWFORK
 1684 DIVZM:0363 F/SETCLASS3 <-- 207 1239 403
 F/WFORK <-- 474 1318 429

 *WHEN 1#D11 DBUF LATCH GETS A COPY IF THE *
 *INSTRUCTION FROM FLPDECODE *
 *WHEN *

 *P3, DBUF LATCH+D, *
 *NEXT, *
 * J/DIVFDW2 * --> 546 1685 549

363
 0100 00 00 00 00 00000001000
 11011 000000 11000 101100110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|---|---------------------------------------|-----------------------|------------------------------|---------|------------------|-----------------|--------------------|--------|
| 1685 | DIVFDW2:0546 | F/DIVZM F/DIVZM | (-- (-- | 362 1683 548 363 1684 548 | | | | | |
| | ***** *1#012 DBUF LATCH GETS A COPY OF THE *INSTRUCTION SELECT EMIT EMITCON *GETS *-----* *P3, EMITCON+DBUF LATCH, *NEXT, BUT(CLEAR FLAGS), * J/DIVFDW3 ***** | | | | 546 | 0000 10 00 00 00 | 0000 000 0000 0 | 000000001000 | |
| | *-----* *NEXT, CALL FETCHLT, * RETURN+DIVFDW4 ***** | | | | | | | | |
| 1686 | DIVFDW3:0547 | F/DIVFDW2 | (-- VV | | | | | | |
| | ***** *INSTRUCTION DO OPERAND *FETCH *-----* *NEXT, CALL FETCHLT, * RETURN+DIVFDW4 ***** | | | | 547 | 0010 00 10 00 10 | 010 100 0000 0 | 000000001000 | |
| | *-----* *NEXT, CALL EXPTST, * RETURN+DIVFDW5 ***** | | | | | | | | |
| | ***** 4614 2039 661 ***** VV 2422 1687 549 | | | | | | | | |
| 1687 | DIVFDW4:2422 | | | | | | | | |
| | ***** * CHECK FOR ZERO *EXP *-----* *NEXT, CALL EXPTST, * RETURN+DIVFDW5 ***** | | | | 2422 | 0010 00 10 00 10 | 100 010 0000 0 | 000000001000 | |
| | *-----* *NEXT, CALL EXPTST, * RETURN+DIVFDW5 ***** | | | | | | | | |
| | ***** 2621 2213 730 ***** VV 2424 1688 549 | | | | | | | | |
| 1688 | DIVFDW5:2424 | | | | | | | | |
| | ***** * BRANCH ON SR<1:0> TARGETS *- *-----* *P2, D+FDST3, *NEXT, BUT(CASE), * J/DIVFDW6 * J/DIVFDW6 * J/DIVFDW7 * J/DIVFDW8 * J/DIVFDW9 ***** | | | | 2424 | 1111 00 00 10 01 | 011 000 0100 0 | 000000001000 | |
| | *-----* *P2, D+FDST3, *NEXT, BUT(CASE), * J/DIVFDW6 * J/DIVFDW6 * J/DIVFDW7 * J/DIVFDW8 * J/DIVFDW9 ***** | | | | | | | | |
| | ***** 1100 2354 1689 550 1101 2355 1690 550 1110 2356 1691 550 1111 2357 1692 551 ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|--|---------------------------------------|-----------------------|------|---------|---------|----------|---|
| .CASE 1689 | 1 OF BDIVFDW5 DIVFDW6:2354 | F/DIVFDW5 <-- | 2424 1688 549 | 2354 | 0000 | 00 00 | 00 00 | 00000001000 110 011 0000 0 00000 010110 11100 110111001 |
| | *00 - DIVFDW6 01 - DIVFDW7 10 - DIVFDW8 *11 - DIVFDW9 NONE OF THE OPERANDS HAVE *ZERO *EXPONENT | | | | | | | |
| | *P3, R(T1)+D (A ADDR), *NEXT, BUT(GO TO),PAGE+3, * J/DIVFDW10 | --> | 3671 1693 551 | | | | | |
| .CASE 1690 | 2 OF BDIVFDW5 DIVFDW7:2355 | F/DIVFDW5 <-- | 2424 1688 549 | 2355 | 0011 | 00 00 | 00 11 | 10000001000 000 000 0100 0 00000 000110 10111 000000110 |
| | * SOURCE OPERAND HAS ZERO EXPONENT * TARGETS *- | | | | | | | |
| | *P2, D+0, *P3, FAC32(SF)+D (A ADDR), *NEXT, BUTR(FD), * J/MULMODW11 | --> | 10 2006 1418 462 | | | | | |
| | * J/MULMODW12 | --> | 11 2007 1419 462 | | | | | |
| .CASE 1691 | 3 OF BDIVFDW5 DIVFDW8:2356 | F/DIVFDW5 <-- | 2424 1688 549 | 2356 | 0100 | 00 10 | 11 00 | 00000001000 010 010 0000 0 00000 000000 11100 101100100 |
| | *0 - MULMODW11 1 - MULMODW12 GO TO *MULMODW11 OR 12 TO CLEAR ACCUMULATORS *DESTINATION OPERAND IS ZERO DIVISION BY *ZERO IS BEING *ATTEMPTED | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+2, * RETURN+ZERODIV, * J/TPREAMBLE | --> | 2544 1969 637 | | | | | |

F14

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--|---|------|--|-----------------------------|--------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| 1692 | DIVFDW9:2357 ***** * BOTH OPERANDS ARE ZERO DIVISION BY ZERO * * IS BEING * * ATTEMPTED * ***** | <-- | 2424 1688 549 | 2357 | 0100 00 10 11 00 00000 000000 11100 | 010 010 0000 0 101100100 | 000000001000 | | | |
| | *NEXT, BUT(GO TO) PAGE+2, * RETURN+ZERODIV, * J/TPREXIBLE ***** | --> | 2544 1969 637 | | | | | | | |
| 1693 | DIVFDW10:3671 ***** *NEXT, CALL DATAPREP * RETURN+DIVFDW11 ***** | <-- | 2354 1689 550 | 3671 | 0011 00 11 01 11 00000 000000 11100 | 010 010 0000 0 101111001 | 000000001000 | | | |
| | ***** *NEXT, CALL DATAPREP * RETURN+DIVFDW11 ***** | --> | 2571 2196 725 ***** VV 3672 1694 551 | | | | | | | |
| 1694 | DIVFDW11:3672 ***** * PUT SIGN IN * * CR1 * ***** | | | 3672 | 1111 00 10 10 01 00000 001010 11000 | 101 000 0100 0 110111011 | 000000001000 | | | |
| | *P2, D+CR2, *P3, CR1+D' (B ADDR), *NEXT, ***** * J/DIVFDW12 ***** | --> VV | | | | | | | | |
| 1695 | DIVFDW12:3673 ***** * DO EXPONENT PROCESSING D(C) = * * 0 * ***** | <-- VV | | 3673 | 1001 10 00 11 00 00100 000010 11000 | 110 000 0100 0 110111100 | 000000001000 | | | |
| | *P2, D+R(ES) PLUS CNST200,D(C)+CIN, *P3, R(ER)+D (A ADDR), *NEXT, ***** * J/DIVFDW13 ***** | --> | 3674 1696 552 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|------------|--|--|--------------------------|-----------|---------------|-----------------|----------------|----------------------|-----------------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS |
| 1696 | DIVFDW13:3674 F/DIVFDW12 ***** * EXPONENT * * OPERATION * *-----* *P2, * * D+R(ER) PLUS NOT R(ED) * * PLUS D(C), * *P3, R(ER)+D (A ADDR), * *NEXT, * * J/DFRAC * ***** | <-- | 3673 1695 551 | 3674 | 0101 00000 | 01 11 000010 | 10 00 11000 | 110 000 11011101 | 0100 0 00000001000 |
| .CASE 1697 | 3 OF BRMDRLEFT10 DIVFDW14:2326 F/RMDRLEFT10 ***** * IS R(ES) MINUS R(ED) PLUS CNST200 MINUS * * I BY CONSTANT 200 AND INCREMENT BY ONE * * DUE TO FRACTION GENERATED IN DFRAC NOTE * * THAT EXPONENT IS RIGHT JUSTIFIED * * RESTORE THE IR TO BE REFERENCED BY ABORT * * FLOWS * *-----* *P2, D+EMITCON, * *NEXT, * * J/DIVFDW16 * ***** | <-- | 2465 1749 568 | 2326 | 1010 01001 | 10 00 000000 | 00 00 11000 | 000 000 100010101 | 0100 0 00000001000 |
| .CASE 1698 | 4 OF BRMDRLEFT10 DIVFDW15:2327 F/RMDRLEFT10 ***** * RESTORE THE IR TO BE REFERENCED BY * * ABORT * * FLOWS * *-----* *P2, D+EMITCON, * *NEXT, * * J/DIVFDW16 * ***** | <-- | 2465 1749 568 | 2327 | 1010 01001 | 10 00 000000 | 00 00 11000 | 000 000 100010101 | 0100 0 00000001000 |
| | | --> | 2425 1699 553 | | | | | | |
| | | --> | 2425 1699 553 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|--|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-------------------|------|--------|
| 1699 | DIVFDW16:2425 | F/DIVFDW14 F/DIVFDW15 | <-- <-- | 2326 2327 | 1697 1698 | 552 552 | | | | |
| | *P3, * DBUF LATCH+D AND *ENABLE CLKIR, *NEXT, * J/DIVFDW17 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | * CLEAR R(T1) TO ACCUMULATE SHIFTS GO TO *NROUND TO NORMALIZE *AND | | | | | | | | | |
| | ----- *P2, IR+DBUF LATCH,D+D, *P3, R(T1)+D (A ADDR), *NEXT, * J/NROUND13 | | | | | | | | | |
| | ***** | | | | | | | | | |
| 1700 | DIVFDW17:2426 | F/DIVFDW16 | <-- VV | | | | | | | |
| | *P2, *P3, *NEXT, * J/NROUND13 | | | 2141 | 1919 | 620 | | | | |
| | ***** | | | | | | | | | |
| 1701 | DFRAC:3675 | F/DIVFDW13 | <-- | 3674 | 1696 | 552 | | | | |
| | *ROUND - DIVFD GUARANTEES TO EXECUTED AT *LEAST ONE RIGHT SHIFT IN NROUND FLOWS AT *NROUND13 ; DIVISION FRACTION PROCESSING *ROUTINE FOR WARM ; FLOATING POINT ; THE *ALGORITHM USED IS NON - RESTORING *DIVIDE. ; DUE TO THE SOURCE OF THE *QUOTIENT BIT (SIGN BIT ; OF THE LAST *ARITHMETIC OPERATION), THE FRACTION * ; WILL HAVE THE FOLLOWING FORM ; EITHER OF *TWO FORMATS IS POSSIBLE - ; 01.XXXX * OR * ; 1X.XXXX | | | | | | | | | |
| | ----- *P2, D+EMITCON, SR+EMITCON, *NEXT, BUT(CLEAR FLAGS), * J/DFRAC2 | | | 3676 | 1702 | 554 | | | | |
| | ***** | | | | | | | | | |

```

2425      000000001000
0100 00 00 00 01 000 100 0000 0
11011 000000 11000 100010110

2426      000000001000
0011 00 00 00 00 110 000 0100 0
11010 010110 11000 001100001

3675      000000001000
1010 10 00 00 00 000 000 0110 0
01001 000000 11010 110111110

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS | |
|---------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|----------------------|--------------|--------|--|
| 1702 | DFRAC2:3676 ***** *P3, MD+7 (BC), * *NEXT, * * J/DFRAC3 * ***** | <-- | 3675 1701 553 | 3676 | 0000 00010 | 10 00 100000 | 00 00 11000 | 000 111 111000000 | 000000001000 | 0000 0 | |
| 1703 | DFRAC3:3700 ***** * FORCE * *IR * -----* *P2, D+SR OR MD, * *NEXT, * * J/DFRAC4 * ***** | <-- VV | | 3700 | 00000 | 11 10 000000 | 00 00 11000 | 000 000 111000001 | 000000001000 | 0100 0 | |
| 1704 | DFRAC4:3701 ***** *P3, * *ENABE DBUF LATCH+D AND * *NEXT, CLKIR, * * J/DFRAC5 * ***** | <-- VV | | 3701 | 0100 11011 | 00 00 000000 | 00 01 11000 | 000 100 111000010 | 000000001000 | 0000 0 | |
| 1705 | DFRAC5:3702 ***** * INSERT NEW IR INTO IR SELECT * *EMIT * -----* *P2, IR+DBUF LATCH, * *NEXT, BUT(CLEAR FLAGS), * * J/DFRAC6 * ***** | <-- VV | | 3702 | 0000 11010 | 00 00 000000 | 00 00 11010 | 000 000 111000011 | 000000001000 | 0000 0 | |
| | | --> | 3703 1706 555 | | | | | | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---------------------------------------|--|--------------------------|--------------------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1714 | DFRAC14:3712 | F/DFRAC9 F/DFRAC13 | <-- <-- | 3232 1709 555 3710 1713 556 | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+FAC2(SF), | | | | | | | | | |
| | *P3, RMDR2+D (A' ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/DFRAC15 | | --> | VV | | | | | | |
| 1715 | DFRAC15:3714 | F/DFRAC14 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * TARGETS - F - | | | | | | | | | |
| | *DFRAC16 | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+FAC3(SF), | | | | | | | | | |
| | *P3, RMDR3+D (B' ADDR), | | | | | | | | | |
| | *NEXT, BUTR(FD) | | | | | | | | | |
| | * J/DFRAC16 | | --> | 10 3432 1716 557 | | | | | | |
| | * J/DFRAC17 | | --> | 11 3433 1717 558 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BDFRAC15 | | | | | | | | | |
| 1716 | DFRAC16:3432 | F/DFRAC15 F/DFRAC17 | <-- <-- | 3714 1715 557 3433 1717 558 | | | | | | |
| | ***** | | | | | | | | | |
| | *D - DFRAC17 CLEAR GUARD AND FAC3(SF) | | | | | | | | | |
| | *AND | | | | | | | | | |
| | *FAC2(SF) | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+0, SR+0, GUARD+0, | | | | | | | | | |
| | *P3, FAC32(SF)+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+2, | | | | | | | | | |
| | * J/DFRAC18 | | --> | 2427 1718 558 | | | | | | |
| | ***** | | | | | | | | | |

3712 1010 00 01 00 10 10000001000
00000 010010 11000 111001100

3714 1111 00 10 10 11 11000001000
00000 011010 10111 100011010

3432 0011 00 00 00 11 00001001100
00000 000110 11100 100010111

M14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 558

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|--------------|--------------|------------|----------|---------------------------------|
| .CASE | 2 OF BDFRAC15 | | | | | | | |
| 1717 | DFRAC17:3433 | F/DFRAC15 F/DFRAC17 | <-- <-- | 3714 3433 | 1715 1717 | 557 558 | | |
| | ***** | | | | | | | |
| | *P2, D=0 | | | | | | | 3433 100000001000 |
| | *P3, FAC10(SF)+D (A ADDR), | | | | | | | 0011 00 00 00 11 000 000 0100 0 |
| | *NEXT, | | | | | | | 00000 010110 11000 100011010 |
| | * J/DFRAC16 | | --> | 3432 | 1716 | 557 | | |
| | ***** | | | | | | | |
| 1718 | DFRAC18:2427 | F/DFRAC16 | <-- | 3432 | 1716 | 557 | | |
| | ***** | | | | | | | |
| | * D(C)=1 LOAD COUNTER TARGETS - 0 - | | | | | | | 2427 000000001000 |
| | *DFRACSUB4 | | | | | | | 1111 11 10 01 01 000 000 0100 0 |
| | ----- | | | | | | | 00000 000101 10111 011111010 |
| | *P2, D=D, D(C)+CIN, COUNTER+MD, | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | |
| | * J/DFRACSUB4 | | --> | 10 2372 | 1722 | 559 | | |
| | * J/DFRACSUB2 | | --> | 11 2373 | 1720 | 559 | | |
| | ***** | | | | | | | |
| .CASE | 2 OF BMDRLEFT10 | | | | | | | |
| 1719 | DFRACSUB:2325 | F/RMDRLEFT10 | <-- | 2465 | 1749 | 568 | | |
| | ***** | | | | | | | |
| | *1 - DFRACSUB2 ROUTINE PERFORMS | | | | | | | 2325 000000001000 |
| | *SUBTRACTION OPERATION BETWEEN DIVISOR | | | | | | | 1111 00 00 01 01 000 000 0100 0 |
| | *AND REMAINDER TO GENERATE QUOTIENT BIT | | | | | | | 00000 000000 10111 011111010 |
| | *IN D(C) D(C)=1 TARGETS | | | | | | | |
| | *- | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D=D, D(C)+CIN, | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | |
| | * J/DFRACSUB4 | | --> | 10 2372 | 1722 | 559 | | |
| | * J/DFRACSUB2 | | --> | 11 2373 | 1720 | 559 | | |
| | ***** | | | | | | | |

N14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|--|----------------------|----------------------|----------------------|-------------------|----------|---|
| .CASE | 2 OF BDFRAC18 | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF COUT | CLOCKS |
| 1720 | DFRACSUB2:2373 | F/DFRAC18 F/DFRACSUB F/DFRACSUB3 | <-- <-- <-- | 2427 2325 2430 | 1718 1719 1721 | 558 558 559 | | |
| | ***** *F - DFRACSUB4 D - DFRACSUB2 *-----* *P2, D+RMDRO MINUS DSORO, * D(C)+COUT15, *P3, RMDRO+D (A ADDR), *NEXT, * J/DFRACSUB3 ***** | | | | | | | 2373 1101 01 00 10 10 000 110 0100 0 00000 000010 11000 100011000 |
| 1721 | DFRACSUB3:2430 | F/DFRACSUB2 | <-- VV | | | | | |
| | ***** *P2, * D+RMDR1 PLUS NOT DSOR1 * PLUS D(C),D(C)+COUT15, *P3, RMDR1+D (A ADDR), *NEXT, * J/DFRACSUB4 ***** | | | | | | | 2430 0101 01 11 11 01 110 110 0100 0 00000 010010 11000 011111010 |
| .CASE | 1 OF BDFRAC18 | | | | | | | |
| 1722 | DFRACSUB4:2372 | F/DFRAC18 F/DFRACSUB F/DFRACSUB3 | <-- <-- <-- VV | 2427 2325 | 1718 1719 | 558 558 | | |
| | ***** *P2, * D+RMDR2 PLUS NOT DSOR2 * PLUS D(C),D(C)+COUT15, *P3, RMDR2+D (A ADDR), *NEXT, BUTR(RESET RES), * J/DFRACSUB5 ***** | | | | | | | 2372 0101 00 00 11 10 000 110 0100 0 00000 010010 11010 100011001 |
| | | | | 2431 | 1723 | 560 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------|---|--|--------------------------|------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1723 | DFRACSUB5:2431 | F/DFRACSUB4 | <-- | 2372 1722 559 | | | | | | |
| | ***** | | | 2431 | | | | 00000000 | 1000 | |
| | * TARGETS - F - | | | | 0101 | 01 10 | 11 00 | 110 110 | 0100 | 0 |
| | *QUOLEFT7 | | | | 00000 | 010010 | 10111 | 100111010 | | |
| | ----- | | | | | | | | | |
| | *P2, | D+RMDR3 PLUS NOT DSOR3 | | | | | | | | |
| | * PLUS D(C),D(C)+COUT15, | | | | | | | | | |
| | *P3, RMDR3+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUTR(FD) | | | | | | | | | |
| | * J/QUOLEFT7 | | --> | 10 2472 1733 563 | | | | | | |
| | * J/QUOLEFT1 | | --> | 11 2473 1729 562 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 1724 | 1 OF BFRMDLEFT10 | F/RMDLEFT10 | <-- | 2465 1749 568 | | | | | | |
| | DFRACADD:2324 | | | | | | | | | |
| | ***** | | | 2324 | | | | 00000000 | 1000 | |
| | *D - QUOLEFT1 ROUTINE PERFORMS ADDITION | | | | 0011 | 00 00 | 00 00 | 000 010 | 0100 | 0 |
| | *OPERATION BETWEEN OPERANDS IN | | | | 00000 | 000000 | 10111 | 101110010 | | |
| | *NON-RESTORING DIVIDE ALOGORITHM BETWEEN | | | | | | | | | |
| | *DIVISOR AND REMAINDER D(C)=0 TARGETS - F | | | | | | | | | |
| | *- | | | | | | | | | |
| | *DFRACADD4 | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+D,D(C)+ALU00, | | | | | | | | | |
| | *NEXT, BUTR(FD) | | | | | | | | | |
| | * J/DFRACADD4 | | --> | 10 2562 1727 561 | | | | | | |
| | * J/DFRACADD2 | | --> | 11 2563 1725 560 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 1725 | 2 OF BDFRACADD | F/DFRACADD | <-- | 2324 1724 560 | | | | | | |
| | DFRACADD2:2563 | F/DFRACADD3 | <-- | 2432 1726 561 | | | | | | |
| | ***** | | | 2563 | | | | 10000000 | 1000 | |
| | *D - DFRACADD2 | | | | 1001 | 01 00 | 10 10 | 000 110 | 0100 | 0 |
| | ----- | | | | | | | | | |
| | *P2, D+RMDRO PLUS DSORO, | | | | | | | | | |
| | * D(C)+COUT15, | | | | | | | | | |
| | *P3, RMDRO+D (A ADDR), | | | | | | | | | |
| | *NEXT, J/DFRACADD3 | | --> | 2432 1726 561 | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|---------|--|--|-------------------|----------------------|----------------------|-------------------|------|-------------|----------------------------|
| .CASE | 2 OF BDFRACSUBS | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UPF | RIF | COUT CLOCKS | |
| 1729 | QUOLEFT1:2473 | F/DFRACSUBS F/DFRACADD5 F/QUOLEFT4 | <-- <-- <-- | 2431 2434 2443 | 1723 1728 1732 | 560 561 563 | | | |
| | ***** | | | | | | | 2473 | 100000001000 |
| | *D - QUOLEFT1 QUOTIENT LEFT SHIFT * | | | | | | | 1010 | 01 01 00 00 000 000 0010 0 |
| | *ROUTINE. D(C) SIGN BIT PRODUCED THROUGH * | | | | | | | 00000 | 000000 11000 100011101 |
| | *AN ARITHMETIC OPERATION IS PUSHED INTO * | | | | | | | | |
| | *FAC(SF) THROUGH A LEFT SHIFT * | | | | | | | | |
| | *OPERATION * | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, SR+FAC0(SF), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/QUOLEFT2 | | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 1730 | QUOLEFT2:2435 | F/QUOLEFT1 | <-- | VV | | | | | |
| | ***** | | | | | | | 2435 | 100000001000 |
| | *P2, D+SR PLUS FAC0(SF) PLUS D(C), * | | | | | | | 0100 | 01 01 00 00 000 000 0100 0 |
| | *P3, FAC0(SF)+D (B ADDR), * | | | | | | | 00000 | 011100 11000 100011110 |
| | *NEXT, * | | | | | | | | |
| | * J/QUOLEFT3 | | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 1731 | QUOLEFT3:2436 | F/QUOLEFT2 | <-- | VV | | | | | |
| | ***** | | | | | | | 2436 | 100000001000 |
| | * SAVE NEXT CARRY IN D(C) * | | | | | | | 1111 | 00 00 11 11 000 100 0100 0 |
| | *NOW * | | | | | | | 00000 | 000000 11000 100100011 |
| | *-----* | | | | | | | | |
| | *P2, D+FAC1(SF),D(C)+ALU15, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/QUOLEFT4 | | --> | 2443 | 1732 | 563 | | | |
| | ***** | | | | | | | | |

F15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 564

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|----------------------------------|---|--|--------------------------|------|------------|------------|-------------|-----------|---|
| | | | | | | | | RIF | COUT CLOCKS |
| .CASE 1735 | 2 OF BQUOLEFT8 | | | | | | | | |
| | QUOLEFT9:2707 | F/QUOLEFT8 | <-- | 2444 | 1734 | 563 | | | |
| | ***** | | | | 2707 | | | | 100000001000 |
| | *0 - QUOLEFT9B 1 - QUOLEFT9 | | | | | | | | 1111 00 01 01 00 000 000 0110 0 00000 001010 11010 100100101 |
| *P2, | D+D LEFT 1, SHIFT SR, | | | | | | | | |
| *P3, | FAC3(SF)+D (B ADDR), | | | | | | | | |
| *NEXT, | BUTR(RESET RES), | | | | | | | | |
| * | J/QUOLEFT10 | | --> | 2445 | 1737 | 564 | | | |
| ***** | | | | | | | | | |
| .CASE 1736 | 1 OF BQUOLEFT8 | | | | | | | | |
| | QUOLEFT9B:2703 | F/QUOLEFT8 | <-- | 2444 | 1734 | 563 | | | |
| | ***** | | | | 2703 | | | | 000000001000 |
| | * INSTRUCTION IS TO BE ABORTED RESTORE IR | | | | | | | | 1010 10 00 00 00 000 000 0100 0 01001 000000 11000 100100110 |
| *FOR RESTART FLOWS FETCH IR FROM | | | | | | | | | |
| *EMTICON | | | | | | | | | |
| *P2, | D+EMITCON, | | | | | | | | |
| *NEXT, | | | | | | | | | |
| * | J/QUOLEFT11 | | --> | 2446 | 1738 | 565 | | | |
| ***** | | | | | | | | | |
| 1737 | QUOLEFT10:2445 | F/QUOLEFT9 | <-- | 2707 | 1735 | 564 | | | |
| | ***** | | | | 2445 | | | | 100000001000 |
| | * D(C)=0 TARGETS | | | | | | | | 1001 10 01 00 00 000 000 0100 0 00001 001100 10111 011110110 |
| | *- | | | | | | | | |
| *P2, | D+SR PLUS 0(D) D(C)+CIN, | | | | | | | | |
| *P3, | FAC2(SF)+D (B ADDR), | | | | | | | | |
| *NEXT, | BUTR(FD) | | | | | | | | |
| * | J/RMDRLEFTS | | | | | | | | |
| * | J/RMDRLEFTS | | --> | 10 | 2366 | 1744 | 566 | | |
| * | J/RMDRLEFT1 | | --> | 11 | 2367 | 1740 | 565 | | |
| ***** | | | | | | | | | |

H15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 566

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---------------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|--------------|----------------------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 1742 | RMDRLEFT3:2460 | F/RMDRLEFT2 | <-- | 2456 | 1741 | 565 | 2460 | 00000000 | 1000 | |
| | *P2, D+D LEFT 1,D(C)+D(C),SHIFT SR, * | | | | | | | 1111 | 00 11 | 01 00 110 111 0110 0 |
| | *P3, RMDR1+D (B ADDR), * | | | | | | | 00000 | 011010 11000 | 100110001 |
| | *NEXT, * | | | | | | | | | |
| | * J/RMDRLEFT4 | | --> VV | | | | | | | |
| 1743 | RMDRLEFT4:2461 | F/RMDRLEFT3 | <-- VV | | | | 2461 | 10000000 | 1000 | |
| | *P2, D+SR,D(C)+D(C), * | | | | | | | 1111 | 00 00 | 00 00 000 111 0100 0 |
| | *P3, RMDR0+D (B ADDR), * | | | | | | | 00000 | 001010 11010 | 011110110 |
| | *NEXT, BUTR(RESET RES), * | | | | | | | | | |
| | * J/RMDRLEFT5 | | --> VV | | | | | | | |
| .CASE | 1 OF BQUOLEFT10 | F/QUOLEFT10 | <-- | 2445 | 1737 | 564 | | | | |
| 1744 | RMDRLEFT5:2366 | F/RMDRLEFT4 | <-- VV | | | | 2366 | 10000000 | 1000 | |
| | *P2, SR+RMDR2, * | | | | | | | 1111 | 00 00 | 11 10 000 000 0010 0 |
| | *NEXT, * | | | | | | | 00000 | 000000 11000 | 100110010 |
| | * J/RMDRLEFT6 | | --> VV | | | | | | | |
| 1745 | RMDRLEFT6:2462 | F/RMDRLEFT5 | <-- VV | | | | 2462 | 00000000 | 1000 | |
| | *P2, D+RMDR3,D(C)+D(C), * | | | | | | | 1111 | 10 00 | 11 00 110 111 0100 0 |
| | * RES+RESLEFTD(C), * | | | | | | | 01011 | 010001 11000 | 100110100 |
| | *NEXT, * | | | | | | | | | |
| | * J/RMDRLEFT7 | | --> | 2464 | 1746 | 567 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|--|---------------------------------------|-----------------------|--------------------------------|---------|----------------|---------------------------|
| 1749 | RMDRLEFT10:2465 | F/RMDRLEFT8 F/RMDRLEFT9 | <-- <-- | 2646 1747 567 2647 1748 567 | | | |
| | ***** | | | 2465 | | | 100000001000 |
| | * STORE RMDR2 TARGETS - 00 - | | | 1111 00 00 00 00 | | 000 111 0100 0 | |
| | *DFRACADD | | | 00000 011010 01111 011010100 | | | |
| | ----- | | | | | | |
| | *P2, D+SR D(C)+D(C) | | | | | | |
| | *P3, RMDR2+D (B ADDR) | | | | | | |
| | *NEXT, BUT(COUNT IS -1#D(C)), | | | | | | |
| | * J/DFRACADD | J/DFRACADD | --> | 00 2324 1724 560 | | | |
| | * J/DFRACSUB | J/DFRACSUB | --> | 01 2325 1719 558 | | | |
| | * J/DIVFDW14 | J/DIVFDW14 | --> | 10 2326 1697 552 | | | |
| | * J/DIVFDW15 | J/DIVFDW15 | --> | 11 2327 1698 552 | | | |
| | ***** | | | | | | |
| .TOC " | FLOATING POINT STORE EXPONENT ##FLPT##" | | | | | | |
| .CASE | 21 OF BMFORK | | | | | | |
| 1750 | STOREXPW:0364 | F/SETCLASS3 F/MFORK | <-- <-- | 207 1239 403 474 1318 429 | | | |
| | ***** | | | 364 | | | 100000001000 |
| | *01 - DFRACSUB 10 - DIVFDW14 11 - | | | 1011 10 00 10 11 | | 000 000 0100 0 | |
| | *DIVFDW15 INSTRUCTION EXTRACTS EXPONENT | | | 01111 000000 11000 110000000 | | | |
| | *FROM FAC3(SF) UNBIASES EXPONENT FROM | | | | | | |
| | *EXCESS 200 NOTATION AND CONVERTS TO 2'S | | | | | | |
| | *COMPLEMENT NOTATION AND STORED FAC(SF) | | | | | | |
| | *DATA IS LEFT INTACT EXTRACT EXP D(C) = | | | | | | |
| | *0 | | | | | | |
| | ----- | | | | | | |
| | *P2, D+FAC3(SF) AND EXPMSK, | | | | | | |
| | * D(C)+CIN, | | | | | | |
| | *NEXT, J/STEXP2 | J/STEXP2 | --> | 600 1753 569 | | | |
| | ***** | | | | | | |

K15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|--|---------------------------------------|--|--------------|---------|----------|--|
| .CASE | 22 OF BMFORK | | | | | | | |
| 1751 | STOREXPDM:0365 | F/SETCLASS3 F/BFORK | <-- <-- | 207 1239 403 474 1318 429 | | | | |
| | ***** * SECONDARY ENTRY POINT FROM FLPDECODE * WHEN * I#D1 *-----* * P2, D+FAC3(SF) AND EXPMSK, * D(C)+CIN, * NEXT, * J/STEXP2 ***** | | | | | | | 365 1011 10 00 10 11 000 000 0100 0 01111 000000 11000 110000000 |
| .CASE | 23 OF BMFORK | | | | | | | |
| 1752 | STOREXPXM:0366 | F/SETCLASS3 F/BFORK | <-- <-- | 207 1239 403 474 1318 429 | | | | |
| | ***** * THIRD ENTRY POINT FROM FLPDECODE WHEN * I#D15 *-----* * P2, D+FAC3(SF) AND EXPMSK, * D(C)+CIN, * NEXT, * J/STEXP2 ***** | | | | | | | 366 1011 10 00 10 11 000 000 0100 0 01111 000000 11000 110000000 |
| | | | | | | | | |
| 1753 | STEXP2:0600 | F/STEXPHT2 F/STOREXPW F/STOREXPDM F/STOREXPXM | <-- <-- <-- <-- | 411 1268 411 364 1750 568 365 1751 569 | | | | |
| | ***** * ENTRY FROM * HFPP *-----* * P2, D+D RIGHT 7 D(C)+D(C), * P3, R(T3)+D (B ADDR), * NEXT, * J/STEXP3 ***** | | | | | | | 600 1111 00 11 01 00 011 111 0100 0 00110 001110 11000 110001000 |

L15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 570

| BOX NO. | TAG: ADDRESS | F/STEXP | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|---------|-----------------------------|----------|--|-----------------------|------|-------|--------|-------|-----------|--------|
| | | | | | | BUS | SP | UBF | RIF | COUT |
| 1754 | STEXP3:0610 | F/STEXP2 | <-- | 600 1753 569 | 610 | | | | 00000000 | 1000 |
| | *P2, D+R(T3) MINUS CNST200, | | | | | 1101 | 10 00 | 10 01 | 011 111 | 0100 1 |
| | * D(C)+D(C) | | | | | 00100 | 000110 | 11000 | 110010000 | |
| | *P3, R(T3)+D (A ADDR), | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/STEXP4 | | --> | VV | | | | | | |
| 1755 | STEXP4:0620 | F/STEXP3 | <-- VV | | 620 | | | | 00000000 | 1000 |
| | *NEXT, CALL SETFZFN2, | | | | | 0001 | 00 11 | 00 10 | 010 010 | 0000 0 |
| | * RETURN+STEXP5 | | | | | 00000 | 000000 | 11100 | 111011000 | |
| | | | --> | 2730 2324 769 | | | | | | |
| | | | | VV | | | | | | |
| | | | | 1622 1756 570 | | | | | | |
| | | | | 544 1356 442 | | | | | | |
| 1756 | STEXP5:1622 | F/STFPS2 | <-- | | 1622 | | | | 00000000 | 1000 |
| | * POINT ALSO USED BY | | | | | 0000 | 00 00 | 00 00 | 011 010 | 0000 0 |
| | *STFPS | | | | | 00000 | 000000 | 11100 | 101101001 | |
| | *NEXT, CALL STOREINT, | | | | | | | | | |
| | * RETURN+BRA05 | | | | | | | | | |
| | | | --> | 2551 2010 651 | | | | | | |
| | | | | VV | | | | | | |
| | | | | 3 283 126 | | | | | | |

M15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 571

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|--|---|--|-----------------------|---|---------|----------|---|
| <pre> .TOC = STORE CONVERT FLOATING TO INTEGER ##FLPT## : THIS INSTRUCTION CONVERTS FROM FLOATING FORMAT TO INTEGER FORMAT; : CONVERSION MAY BE FROM SINGLE OR DOUBLE PRECISION (FD BIT OF FPS) : TO SHORT OR LONG INTEGER (FL BIT OF FPS) DEPENDENT ON FPS STATUS : BITS - : STORE COVERT INTEGER CONVERSION ERROR MAY EXIST IF NUMBER CONVERTED : IS OUTSIDE THE RANGE CAPABILITY OF THE INTEGER TYPE. : DESTINATION = C(XJ) IF -JL < C(XJ) < JL+1, ELSE DEST=0, : WHERE C(XJ) SPECIFIES CONVERSION FROM FLOATING MODE X TO INTEGER : MODE J, AND J=SHORT IF FL=0 OR LONG IF FL=1 AND X=SINGLE IF FD=0 : OR X=DOUBLE IF FD=1. : JL = IS THE LARGEST INTEGER 2**15-1 FOR FL=0 : 2**31-1 FOR FL=1 : CONDITION CODES - : C+FC+0 IF -JL-1 < C(XJ) < JL+1, ELSE FC+1 : V+FV+0 : Z+FZ+1 IF DEST=0 ELSE FZ=0 : N+FN+1 IF DEST < 0 ELSE FN .CASE 24 OF BMFORK </pre> | | | | | | | |
| 1757 | STCTW:0367 | F/SETCLASS3 F/BFORK | <-- <-- | 207 1239 403 474 1318 429 | | | |
| | ***** *NEXT, CALL MOVFFDST, * RETURN+STCTW2, ***** | | | 4747 2239 740 | | | 367 0100 00 01 11 10 010 100 0000 0 00000 000000 11100 111100111 |
| | | | | VV 4362 1758 571 4732 1289 417 4733 1290 417 | | | |
| 1758 | STCTW2:4362 | F/SICT5 F/SICT6 | <-- <-- | 4362 1758 571 4732 1289 417 4733 1290 417 | | | 4362 0000 10 00 11 01 000 000 0000 0 11001 100000 11000 011110100 |
| | ***** * READ FPS FOR * FL ----- *SELECT, FPS(READ) *P3, EMITCON+DATA, *NEXT, * J/STCTW3 ***** | | | 4364 1759 572 | | | |

N15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 572

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|--|---------------------------------------|-----------------------|---------------|--------------|---------|-----------|-------------------|------|--------|
| 1759 | STCTW3:4364 | F/STCTW2 | <-- | 4362 1758 571 | 4364 | | | 000000001000 | | |
| | *P2, D+EMITCON, | | | | 1010 10 00 | 00 00 | 000 000 | 0100 0 | | |
| | *NEXT, J/STCTW4 | | --> VV | | 01001 000000 | 11000 | 011110110 | | | |
| 1760 | STCTW4:4366 | F/STCTW3 | <-- VV | | 4366 | | | 000000001000 | | |
| | * ALIGN FL BIT TO | | | | 1111 00 00 | 01 11 | 000 000 | 0110 0 | | |
| | *SR<00> | | | | 01000 000000 | 11000 | 011111000 | | | |
| | *P2, D+D RIGHT 6,SR+D RIGHT 6, | | | | | | | | | |
| | *NEXT, J/STCTW5 | | --> VV | | | | | | | |
| 1761 | STCTW5:4370 | F/STCTW4 | <-- VV | | 4370 | | | 000000001000 | | |
| | * ISOLATE EXPONENT | | | | 1011 10 00 | 10 01 | 011 000 | 0100 0 | | |
| | *D(C)=0 | | | | 01111 000000 | 11000 | 011111010 | | | |
| | *P2, D+FDST3 AND EXPMASK,D(C)+CIN, | | | | | | | | | |
| | *NEXT, J/STCTW6 | | --> VV | | | | | | | |
| 1762 | STCTW6:4372 | F/STCTW5 | <-- VV | | 4372 | | | 000000001000 | | |
| | * RIGHT JUSTIFY EXPONENT D(C)=0 SELECT | | | | 1111 00 10 | 01 00 | 110 111 | 0100 0 | | |
| | *EMIT | | | | 00110 011110 | 11010 | 011111100 | | | |
| | *P2, D+D RIGHT 7,D(C)+D(C), | | | | | | | | | |
| | *P3, R(T1)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), | | | | | | | | | |
| | * J/STCTW7 | | --> | 4374 1763 573 | | | | | | |

| BOX NO. | TAG: ADDRESS | F/STCTW# | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---|----------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | | RIF | COUT | CLOCKS |
| 1763 | STCTW7:4374 | F/STCTW6 | <-- | 4372 1762 572 | 4374 | | | | 00000000 | 1000 | |
| | * UNBIAS EXPONENT D(C)=0 CHECK SIGN | | | | | 0101 | 10 00 | 11 00 | 110 100 | 0100 | 0 |
| | * OPERATION EQUIVALENT TO R(T1) MINUS | | | | | 00100 | 010110 | 11000 | 011111110 | | |
| | *#201 | | | | | | | | | | |
| | *P2, | | | | | | | | | | |
| | * D+R(T1) PLUS NOT CNST2 | | | | | | | | | | |
| | * 00 PLUS D(C), D(C)+ALU15, | | | | | | | | | | |
| | *P3, R(T1)+D (A ADDR), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/STCTW8 | | --> | VV | | | | | | | |
| 1764 | STCTW8:4376 | F/STCTW7 | <-- | VV | 4376 | | | | 00000000 | 1000 | |
| | * CHECK UNBIASED | | | | | 1111 | 00 00 | 10 01 | 011 111 | 1100 | 0 |
| | * EXPONENT | | | | | 00000 | 000000 | 01101 | 000000010 | | |
| | *P3, D+FDST3 (P3), D(C)+D(C), | | | | | | | | | | |
| | *NEXT, BUTR(D15), | | | | | | | | | | |
| | * J/STCTW9 | | --> | 10 4002 1765 573 | | | | | | | |
| | * J/STCTW10 | | --> | 11 4003 1766 574 | | | | | | | |
| | *#CASE 1 OF BSTCTW8 | | | | | | | | | | |
| 1765 | STCTW9:4002 | F/STCTW8 | <-- | VV | 4002 | | | | 00000000 | 1000 | |
| | * TARGETS - 00 - STCTW9 01 - STCTW10 LOAD | | | | | 0000 | 00 11 | 00 00 | 110 000 | 0001 | 0 |
| | * FL INTO BA<00> SAVE | | | | | 00000 | 011110 | 11000 | 100000000 | | |
| | * SIGN | | | | | | | | | | |
| | *P1, BA+SR, | | | | | | | | | | |
| | *P3, R(T2)+D (B ADDR), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/STCTW11 | | --> | 4400 1767 574 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|------|--------------|---------|-----------|-------------------------------|
| 1766 | STCTW10:4003 F/STCTW8 | <-- | 4376 1764 573 | 4003 | 0011 00 11 | 00 00 | 011 010 | 0101 1 |
| | * UNBIASED EXPONENT IS NEGATIVE INTEGER | | | | 00000 001110 | 11000 | 100011010 | |
| | * RESULT IS ZERO LOAD BA<00> WITH | | | | | | | |
| | * FL | | | | | | | |
| | * P1, BA+SR | | | | | | | |
| | * P2, D+0 D(C)+ALU00 | | | | | | | |
| | * P3, FDST3+D (B ADDR), | | | | | | | |
| | * DEFER, SET CC, | | | | | | | |
| | * NEXT, | | | | | | | |
| | * J/STCTW35 | --> | 4432 1791 581 | | | | | |
| 1767 | STCTW11:4400 F/STCTW9 | <-- | 4002 1765 573 | 4400 | 1110 10 00 | 10 01 | 011 111 | 0100 1 |
| | * INSERT HIDDEN BIT SET CC S = | | | | 00100 000000 | 11000 | 100000001 | |
| | * 0 | | | | | | | |
| | * P2, D+FDST3 OR HIDDENBIT, | | | | | | | |
| | * D(C)+D(C), | | | | | | | |
| | * DEFER, SET CC, | | | | | | | |
| | * J/STCTW12 | --> VV | | | | | | |
| 1768 | STCTW12:4401 F/STCTW11 | <-- VV | | 4401 | 1111 00 11 | 01 01 | 011 000 | 0100 0 |
| | * TARGETS - BUT(FL) 0 - | | | | 00101 001010 | 10011 | 000000110 | |
| | * STCTW13 | | | | | | | |
| | * P2, D+D SWAP | | | | | | | |
| | * P3, FDST3+D (B ADDR), | | | | | | | |
| | * NEXT, BUTR(BA00), | | | | | | | |
| | * J/STCTW13 | --> | 10 4006 1769 575 | | | | | |
| | * J/STCTW14 | --> | 11 4007 1770 575 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|-------------------------------------|---------------------------------------|-----------------------|------------------|---------|---------|----------|-------------------------------|
| .CASE 1769 | 1 OF BSTCTW12 STCTW13:4006 | F/STCTW12 | <-- | 4401 1768 574 | | | | |
| | ***** | | | | | | | |
| | *1 - STCTW14 FETCH 16 | | | | | | | |
| | *DECIMAL | | | | | | | |
| | ----- | | | | | | | |
| | *P3, MD+20 (BC), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/STCTW15 | | --> | 4404 1771 575 | | | | |
| | ***** | | | | | | | |
| .CASE 1770 | 2 OF BSTCTW12 STCTW14:4007 | F/STCTW12 | <-- | 4401 1768 574 | | | | |
| | ***** | | | | | | | |
| | * FETCH 32 | | | | | | | |
| | *DECIMAL | | | | | | | |
| | ----- | | | | | | | |
| | *P3, MD+40 (BC), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/STCTW15 | | --> VV | | | | | |
| | ***** | | | | | | | |
| 1771 | STCTW15:4404 | F/STCTW13 F/STCTW14 | <-- <-- VV | 4006 1769 575 | | | | |
| | ***** | | | | | | | |
| | * TEST FOR CONVERSION | | | | | | | |
| | *ERROR | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+R(T1) MINUS MD,D(C)+ALU15, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/STCTW16 | | --> VV | | | | | |
| | ***** | | | | | | | |
| 1772 | STCTW16:4405 | F/STCTW15 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | * STORE SHIFT COUNT TEST CONVERSION | | | | | | | |
| | *TARGETS | | | | | | | |
| | *- | | | | | | | |
| | ----- | | | | | | | |
| | *P3, FDSTO+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | |
| | * J/STCTW17 | | | | | | | |
| | * J/STCTW17 | | --> | 01 4021 1773 576 | | | | |
| | * J/STCTW18 | | --> | 11 4023 1774 576 | | | | |
| | ***** | | | | | | | |

4006
0000 10 00 00 00 00000001000
00010 100000 11000 100000100

4007
0000 10 00 00 00 100 000 0000 0
00010 100000 11000 100000100

4404
1101 11 10 11 00 110 100 0100 0
00000 000000 11000 100000101

4405
0000 00 11 00 00 011 000 0000 0
00000 011100 10011 000010001

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUF | CLOCKS |
|------------|--|---------------------------------------|-----------------------|---------------|--|---------|----------|--------------------|--------|
| .CASE 1773 | 1 OF BSTCTW16 STCTW17:4021 | F/STCTW16 | <-- | 4405 1772 575 | 4021 | | | 000000001000 | |
| | *0 - STCTW17 1 - STCTW18 D(C)=1 *CONVERSION ERROR HAS *OCCURRED | | | | 1111 00 00 01 01 00000 000000 11000 100011010 | | | 0100 0 | |
| | *P2, D+D,D(C)+CIN, *NEXT, * J/STCTW35 | | --> | 4432 1791 581 | | | | | |
| .CASE 1774 | 2 OF BSTCTW16 STCTW18:4023 | F/STCTW16 | <-- | 4405 1772 575 | 4023 | | | 000000001000 | |
| | * FETCH RIGHT SHIFT *CONTROL | | | | 0010 10 00 00 00 00010 100000 11000 100001000 | | | 0000 0 | |
| | *P3, MD+RESRIGHT, *NEXT, * J/STCTW19 | | --> VV | | | | | | |
| 1775 | STCTW19:4410 | F/STCTW18 | <-- VV | | 4410 | | | 000000001000 | |
| | * FOR SHIFT RIGHT *FOLLOWING | | | | 1010 00 11 00 00 00000 000000 11000 100001001 | | | 0100 0 | |
| | *P2, D+FDST2, *NEXT, * J/STCTW20 | | --> VV | | | | | | |
| 1776 | STCTW20:4411 | F/STCTW19 | <-- VV | | 4411 | | | 000000111000 | |
| | *BYTE SHIFT LEFT | | | | 1111 00 11 01 01 00101 001010 11000 100010000 | | | 0100 0 | |
| | *P2, D+D SWAP, *P3, FDST3(LBYTE)+D (B ADDR), *NEXT, * J/STCTW21 | | --> | 4420 1777 577 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---------------------------------|---------------------------------------|-----------------------|-----------------|---------|--------------|----------|-------------------------------|
| 1777 | STCTW21:4420 | F/STCTW20 | <-- | 4411 1776 576 | 4420 | 0000 00 00 | 00 01 | 011 000 0000 0 |
| | *P3, FDST2+D (A ADDR), | | | | | 00000 000100 | 11000 | 100010001 |
| | *NEXT, J/STCTW22 | | --> VV | | | | | |
| 1778 | STCTW22:4421 | F/STCTW21 | <-- VV | | 4421 | 1111 01 11 | 11 01 | 011 000 0100 0 |
| | * LOAD | | | | | 00000 000101 | 11000 | 100010100 |
| | *COUNTER | | | | | | | |
| | *P2, D+FDST1,COUNTER+FDST0, | | | | | | | |
| | *NEXT, J/STCTW23 | | --> VV | | | | | |
| 1779 | STCTW23:4424 | F/STCTW22 | <-- VV | | 4424 | 1111 00 11 | 01 01 | 011 000 0100 0 |
| | * TEST FOR NO SHIFT TARGETS | | | | | 00101 001100 | 10101 | 000000000 |
| | *- | | | | | | | |
| | *P2, D+D SWAP, | | | | | | | |
| | *P3, FDST2(LBYTE)+D (B ADDR), | | | | | | | |
| | *NEXT, BUT(COUNT IS -1), | | | | | | | |
| | * J/STCTW24 | | --> | 0 4000 1780 577 | | | | |
| | * J/STCTW28 | | --> | 1 4001 1784 579 | | | | |
| .CASE 1780 | 1 OF BSTCTW23 | F/STCTW23 | <-- VV | | 4000 | 1010 00 11 | 00 00 | 011 000 0110 0 |
| | *0 - STCTW24 1 - STCTW28 | | | | | 00000 000000 | 11000 | 100010101 |
| | *D(C)=0 | | | | | | | |
| | *P2, D+FDST2,D(C)+CIN,SR+FDST2, | | | | | | | |
| | *NEXT, J/STCTW25 | | --> | 4425 1781 578 | | | | |

G16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 578

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | | | | | |
|---------|-------------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|--------|--------|-----------|----------|----------|------|------|---|
| | | | | | | | | RIF | COUT | CLOCKS | | | | | | |
| 1781 | STCTW25:4425 | F/STCTW24 | <-- | 4000 | 1780 | 577 | | | | | | | | | | |
| | ***** | | | | | | | 4425 | | | | 00000000 | 1000 | | | |
| | * LOAD DATA TO BE SHIFTED TO PROPER | | | | | | | 1111 | 11 | 10 | 10 | 01 | 011 | 111 | 0100 | 0 |
| | * INTEGER LOAD RESIDUAL | | | | | | | 00000 | 010001 | 11000 | 000101000 | | | | | |
| | * CONTROL | | | | | | | | | | | | | | | |
| | ----- | | | | | | | | | | | | | | | |
| | *P2, | D+FDST3,D(C)+D(C),RES+MD, | | | | | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | | | | | | |
| | * | J/STCTW26 | --> VV | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | |
| .CASE | 1 OF BSTCTW26 | F/STCTW25 | <-- | 4425 | 1781 | 578 | | | | | | | | | | |
| 1782 | STCTW26:4050 | F/STCTW26 | <-- | 4050 | 1782 | 578 | | | | | | | | | | |
| | ***** | | | | | | | 4050 | | | | | 00000000 | 1000 | | |
| | * SHIFT DATA WHEN COUNT IS | | | | | | | 1111 | 00 | 11 | 01 | 10 | 011 | 111 | 0110 | 0 |
| | * SATISFIED | | | | | | | 00000 | 001010 | 10101 | 000101000 | | | | | |
| | ----- | | | | | | | | | | | | | | | |
| | *P2, | D+D RIGHT 1,D(C)+D(C), | | | | | | | | | | | | | | |
| | * | SHIFT SR, | | | | | | | | | | | | | | |
| | *P3, | FDST3+D (B ADDR), | | | | | | | | | | | | | | |
| | *NEXT, | BUT(COUNT IS -1), | | | | | | | | | | | | | | |
| | * | J/STCTW26 | | | | | | | | | | | | | | |
| | * | J/STCTW26 | --> | 0 | 4050 | 1782 | 578 | | | | | | | | | |
| | * | J/STCTW27 | --> | 1 | 4051 | 1783 | 578 | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | |
| .CASE | 2 OF BSTCTW26 | F/STCTW25 | <-- | 4425 | 1781 | 578 | | | | | | | | | | |
| 1783 | STCTW27:4051 | F/STCTW26 | <-- VV | | | | | | | | | | | | | |
| | ***** | | | | | | | 4051 | | | | | 00000000 | 1000 | | |
| | * GO TO STCTW27 STORE 2ND | | | | | | | 1111 | 00 | 11 | 00 | 00 | 011 | 000 | 0100 | 0 |
| | * WORD | | | | | | | 00000 | 001100 | 11010 | 000000001 | | | | | |
| | ----- | | | | | | | | | | | | | | | |
| | *P2, | D+SR, | | | | | | | | | | | | | | |
| | *P3, | FDST2+D (B ADDR), | | | | | | | | | | | | | | |
| | *NEXT, | BUT(CLEAR FLAGS), | | | | | | | | | | | | | | |
| | * | J/STCTW28 | --> | 4001 | 1784 | 579 | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | | |

H16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 579

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|---------|---------|---------|----------|---|
| .CASE 1784 | 2 OF BSTCTW23 STCTW28:4001 | F/STCTW23 | <-- | 4424 | 1779 | 577 | | |
| | ***** * LOOK AT ORIGINAL *SIGN *-----* | | | 4001 | | | | 000000001000 |
| | *P2, D+R(T2A),D(C)+ALU15, *NEXT, * J/STCTW29 ***** | | --> VV | | | | | 1111 00 00 11 01 110 100 0100 0 00000 000000 11000 100010110 |
| 1785 | STCTW29:4426 | F/STCTW28 | <-- VV | 4426 | | | | 000000001000 |
| | ***** * TEST ORIGINAL SIGN BIT TARGETS *-- *-----* | | | | | | | 0011 00 00 00 00 000 000 0010 0 00000 000000 10011 000100001 |
| | *P2, SR+0, *NEXT, BUTR(D(C)), * J/STCTW30 ***** | | --> | 01 4041 | 1786 | 579 | | |
| | * J/STCTW31 ***** | | --> | 11 4043 | 1787 | 580 | | |
| .CASE 1786 | 1 OF BSTCTW29 STCTW30:4041 | F/STCTW29 | <-- VV | 4041 | | | | 000000001000 |
| | ***** *0 - STCTW30 1 - STCTW31 *-----* | | | | | | | 1111 00 00 10 01 011 000 0100 0 00000 000000 11000 100011000 |
| | *P2, D+FDST3, *NEXT, * J/STCTW34 ***** | | --> | 4430 | 1790 | 581 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|------------|---------------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------------|--------|
| .CASE 1787 | STCTW31:4043 | F/STCTW29 | <-- | 4426 | 1785 | 579 | | | |
| | ***** | | | 4043 | | | | 000000001000 | |
| | * 2'S COMPLEMENT INTEGER BUT(FL), 0 - | | | | | | | 0000 00 00 10 01 011 111 0100 0 | |
| | *STCTW32 | | | | | | | 00000 000010 10011 000110010 | |
| | *P2, D+NOT FDST3,D(C)+D(C), | | | | | | | | |
| | *P3, FDST3+D (A ADDR), | | | | | | | | |
| | *NEXT, BUTR(BA00), | | | | | | | | |
| | * J/STCTW32 | | --> | 10 | 4062 | 1788 | 580 | | |
| | * J/STCTW33 | | --> | 11 | 4063 | 1789 | 580 | | |
| | ***** | | | | | | | | |
| .CASE 1788 | STCTW32:4062 | F/STCTW31 | <-- | 4043 | 1787 | 580 | | | |
| | STCTW33 | F/STCTW33 | <-- | 4063 | 1789 | 580 | | | |
| | ***** | | | 4062 | | | | 000000001000 | |
| | *1 - STCTW33 | | | | | | | 0100 11 01 10 01 011 001 0100 1 | |
| | *D(C)=0 | | | | | | | 00000 000010 11000 100011000 | |
| | *P2, D+FDST3 PLUS 0 PLUS D(C), | | | | | | | | |
| | * D(C)+PS(C), | | | | | | | | |
| | *P3, FDST3+D (A ADDR), | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | |
| | * J/STCTW34 | | --> | 4430 | 1790 | 581 | | | |
| | ***** | | | | | | | | |
| .CASE 1789 | STCTW33:4063 | F/STCTW31 | <-- | 4043 | 1787 | 580 | | | |
| | STCTW33 | F/STCTW33 | <-- | 4063 | 1789 | 580 | | | |
| | ***** | | | 4063 | | | | 000000001000 | |
| | *P2, D+SR MINUS FDST2,D(C)+COUT15, | | | | | | | 1101 00 11 00 00 011 110 0100 0 | |
| | *P3, FDST2+D (B ADDR), | | | | | | | 00000 001100 11000 000110010 | |
| | *NEXT, | | | | | | | | |
| | * J/STCTW32 | | --> | 4062 | 1788 | 580 | | | |
| | ***** | | | | | | | | |

J16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 581

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------------|--|--|--------------------------|--------------------------------------|--|------------|-----------------------------|--------------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| 1790 | STCTW34:4430 | F/STCTW30 F/STCTW32 | <-- <-- | 4041 1786 579 4062 1788 580 | | | | | |
| | ***** * DETECT SIGN CHANGE AND FINAL CONVERSION * *ERROR ***** | | | | 4430 | | | 000000001000 | |
| | *P2, D+D XOR R(T2),D(C)+ALU15, *NEXT, * J/STCTW35 | | | | 0110 01 11 01 01 00000 000000 11000 | | 110 100 0100 0 100011010 | | |
| 1791 | STCTW35:4432 | F/STCTW10 F/STCTW17 F/STCTW34 | <-- <-- <-- VV | 4003 1766 574 4021 1773 576 | | | | | |
| | ***** *P2, D+PC (A),D(C)+D(C), *P3, FPA+D (B ADDR), *NEXT, * J/STCTW36 | | | | 4432 | | | 000000001000 | |
| | | | | | 1111 00 10 10 01 00000 011100 11000 | | 111 111 0100 0 100011100 | | |
| 1792 | STCTW36:4434 | F/STCTW35 | <-- VV | | | | | | |
| | ***** * TARGETS *-- ***** | | | | 4434 | | | 000000001000 | |
| | *SELECT, PS(READ), *P3, EMITCON+DATA, *NEXT, BUTR(D(C)), * J/STCTW37 | | | | 0000 10 00 10 01 11001 100000 10011 | | 000 000 0000 0 000001101 | | |
| | * J/STCTW37 * J/STCTW41 | | --> --> | 01 4015 1793 581 11 4017 1797 583 | | | | | |
| .CASE 1793 | 1 OF BSTCTW36 STCTW37:4015 | F/STCTW36 | <-- VV | | | | | | |
| | ***** *0 - STCTW37 1 - STCTW41 DATA *OK ***** | | | | 4015 | | | 000000001000 | |
| | *P2, D+EMITCON, *NEXT, * J/STCTW38 | | | | 1010 10 00 00 00 01001 000000 11000 | | 000 000 0100 0 100011101 | | |
| | | | --> | 4435 1794 582 | | | | | |

K16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 582

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|------------|--------------------------------|--------------------|------------|-------|--------|-------|-----------|--------------|--|
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF COUT | CLOCKS | |
| 1794 | STCTW38:4435 | F/STCTW37 | <-- | 4015 | 1793 | 581 | | | |
| | ***** | | | | | | | | |
| | *GO SET FCC'S BUT(FL) TARGETS | | | 4435 | | | | 011000001000 | |
| | *- | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | *-----* | | | 00000 | 000000 | 10011 | 000011110 | | |
| | *SELECT, FPSCC(DBUF), | | | | | | | | |
| | *P3, FPSCC+DATA, | | | | | | | | |
| | *NEXT, BUTR(BA00), | | | | | | | | |
| | * J/STCTW39 | | | | | | | | |
| | * J/STCTW39 | | --> | 10 | 4036 | 1795 | 582 | | |
| | * J/STCTW40 | | --> | 11 | 4037 | 1796 | 582 | | |
| | ***** | | | | | | | | |
| .CASE 1795 | 1 OF BSTCTW38 | | | | | | | | |
| | STCTW39:4036 | F/STCTW38 | <-- VV | | | | | | |
| | ***** | | | | | | | | |
| | *0 - STCTW39 1 - STCTW40 | | | 4036 | | | | 000000001000 | |
| | *-----* | | | 0000 | 00 00 | 00 00 | 011 010 | 0000 0 | |
| | *NEXT, CALL STOREINT, | | | 00000 | 000000 | 11100 | 101101001 | | |
| | * RETURN+BRA05 | | | ***** | | | | | |
| | ***** | | | | | | | | |
| | | | --> | 2551 | 2010 | 651 | | | |
| | ***** | | | | | | | | |
| | | | | VV | | | | | |
| | | | | 3 | 283 | 126 | | | |
| .CASE 1796 | 2 OF BSTCTW38 | | | | | | | | |
| | STCTW40:4037 | F/STCTW38 | <-- | 4435 | 1794 | 582 | | | |
| | ***** | | | | | | | | |
| | *NEXT, CALL STOREINTLG, | | | 4037 | | | | 000000001000 | |
| | * RETURN+BRA05 | | | 0000 | 00 00 | 00 00 | 011 100 | 0000 0 | |
| | ***** | | | | | | | | |
| | | | --> | 4632 | 2048 | 667 | | | |
| | ***** | | | | | | | | |
| | | | | VV | | | | | |
| | | | | 3 | 283 | 126 | | | |

L16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 583

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | | |
|---|---|---------------------------------------|-----------------------|--------|---------|---------|----------|-----------|------|--------|--|--|
| | | | | | | | | RIF | COUT | | | |
| .CASE 1797 | STCTW41:4017 | F/STCTW36 | <-- | 4434 | 1792 | 581 | | | | | | |
| | ***** | | | | | | | | | | | |
| | * CONVERSION ERROR HAS OCCURRED * | | | | | | | | | | | |
| | -----* | | | | | | | | | | | |
| | *P2 D+D, D(C)+D(C), SR+D, * | | | | | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | | | | | |
| | *P3, FDST32+D (A ADDR), * | | | | | | | | | | | |
| | *NEXT, * | | | | | | | | | | | |
| | * J/STCTW42 * --> VV | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| 1798 | STCTW42:4436 | F/STCTW41 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *P2, D+FDST3 PLUS CNST4 PLUS 1, * | | | | | | | | | | | |
| | *NEXT, * | | | | | | | | | | | |
| | * J/STCTW43 * --> VV | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | 1799 | STCTW43:4440 | F/STCTW42 | <-- VV | | | | | | | | |
| | | ***** | | | | | | | | | | |
| | | * SET FZ AND FC BITS TARGETS * | | | | | | | | | | |
| | | *-----* | | | | | | | | | | |
| *SELECT, FPSCC(DBUF), FPSCC+DATA, * | | | | | | | | | | | | |
| *NEXT, BUTR(BA00), * | | | | | | | | | | | | |
| * J/STCTW44 * | | | | | | | | | | | | |
| * J/STCTW45 * --> 10 4046 1800 583 | | | | | | | | | | | | |
| * J/STCTW45 * --> 11 4047 1801 584 | | | | | | | | | | | | |
| ***** | | | | | | | | | | | | |
| .CASE 1800 | STCTW44:4046 | F/STCTW43 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *0 - STCTW44 1 - STCTW45 * | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | *NEXT, CALL STOREINT, * | | | | | | | | | | | |
| | * RETURN+STCTW46 * | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | * 2551 2010 651 * --> | | | | | | | | | | | |
| ***** | | | | | | | | | | | | |
| * VV * | | | | | | | | | | | | |
| * 4442 1802 584 * | | | | | | | | | | | | |

```

4017      0011 00 00 00 01 011 111 0110 1
          00000 000110 11000 100011110

4436      1100 10 00 10 01 011 000 0100 0
          01100 000000 11000 100100000

4440      0000 00 00 00 00 000 000 0000 0
          00000 000000 10011 000100110

4046      0100 00 10 01 00 010 010 0000 0
          00000 000000 11100 101101001
    
```

M16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 584

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|--|--|---------------------------------------|--------------------------------------|------|---------------|-----------------|----------------|---|
| .CASE 1801 | 2 OF BSTCTW43 STCTW45:4047 | F/STCTW43 <-- | 4440 1799 583 | 4047 | 0100 00000 | 00 10 000000 | 01 00 11100 | 000000001000 010 100 0000 0 110011010 |
| | *NEXT, CALL STOREINTLG, * RETURN+STCTW46 ***** --> | | 4632 2048 667 VV 4442 1802 584 | | | | | |
| 1802 | STCTW46:4442 ***** * GO TO TRAPS TO PROCESS CONVERSION *ERROR *-----* *NEXT, BUT(GO TO),PAGE+2, * RETURN+CONVTRAP, * J/TPREAMBLE ***** --> | | 2544 1969 637 | 4442 | 0100 00000 | 00 10 000000 | 11 00 11100 | 000000001000 011 010 0000 0 101100100 |
| .TOC " STORE CONVERT PRECISION ##FLPT##" : INSTRUCTION PERFORMS CONVERSION OF OF DATA IN FAC(SF) : FROM PRECISION SPECIFIED IN FD BIT TO OPPOSITE PRECISION : DATA IN FAC(SF) IS LEFT UNCHANGED : IF THE EXPONENT FIELD IS EQUAL TO ZERO, AND EXACT ZERO : BECOMES STORED | | | | | | | | |
| .CASE 1803 | 25 OF BIFORK STCPZW:0370 | F/SETCLASS3 F/WFORK <-- | 207 1239 403 474 1318 429 | 370 | 1011 01111 | 10 00 000000 | 10 11 10001 | 100000001000 000 000 0100 0 001100010 |
| | * FROM FLPDECODE *1*DS *-----* *P2, D+FAC3(SF) AND EXPMASK, *NEXT, BUTR(NOT DST REG 6-7), * J/STCPW2 * J/STCPW2 * J/STCPW3 ***** --> | | 10 142 1804 585 11 143 1805 585 | | | | | |

B01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 585

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|--|--|---------------------------------------|--|------------|-------------|---|
| .CASE 1804 | 1 OF BSTCPZW STCPW2:0142 | F/STCPZW <-- | 370 1803 584 | | | | |
| | ***** *NEXT, BUT(GO TO), PAGE+2, * RETURN+OPC0DERR, * J/TPREAMBLE ***** | --> | 2544 1969 637 | 142 0100 00 10 11 00 00000 000000 11100 | | | 000000001000 001 010 0000 0 101100100 |
| .CASE 1805 | 2 OF BSTCPZW STCPW3:0143 | F/STCPZW <-- | 370 1803 584 | | | | |
| | ***** *NEXT, CALL MOVSFDDST, * RETURN+STCPW4 ***** | --> | 4747 2239 740 VV 4444 1807 585 | 143 0100 00 10 01 00 00000 000000 11100 | | | 000000001000 100 100 0000 0 111100111 |
| .CASE 1806 | 26 OF BWFORK STCPWZ:0371 | F/SETCLASS3 F/WFORK <-- | 207 1239 403 474 1318 429 | | | | |
| | ***** * FROM FLPDECODE * 1*06 *-----* *NEXT, CALL MOVSFDDST, * RETURN+STCPW4 ***** | --> | 4747 2239 740 VV -1 -1 -1 0 1 1 | 371 0100 00 10 01 00 00000 000000 11100 | | | 000000001000 100 100 0000 0 111100111 |
| 1807 | STCPW4:4444 | | | | | | |
| | ***** *P2, D+FDST3 AND EXPMASK, *NEXT, J/STCPW5 ***** | --> | 4445 1808 586 | 4444 1011 10 00 10 01 01111 000000 11000 | | | 000000001000 011 000 0100 0 100100101 |

DO1

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA USE | EXTENSION RIF COUT CLOCKS UPF |
|------------|--|---------------------------------------|--|---------------------------------|---------|----------|-------------------------------|
| .CASE 1812 | 1 OF BSTCPW6 STCPW9:4132 | F/STCPW6 | <-- 4121 1809 586 | 4132 | | | 000000001000 |
| | * CONVERT FROM SINGLE TO * *DOUBLE * -----* | | | 0011 00 00 00 01 011 000 0100 0 | | | 00000 010110 11000 001011101 |
| | *P2, D+0, * *P3, FDST10+D (A ADDR), * *NEXT, * * J/STCPW10 * --> VV | | | | | | |
| .CASE 1813 | 1 OF BSTCPW12 STCPW10:4135 | F/STCPW9 F/STCPW12 | <-- 4132 1812 587 <-- 4452 1815 588 | 4135 | | | 000000001000 |
| | * SET * *FCC'S * -----* | | | 0100 00 10 01 11 10 010 0000 0 | | | 00000 000000 11100 111010111 |
| | *NEXT, CALL SETFZFN, * * RETURN+STCPW31 * --> | | ***** 2727 2323 768 ***** | | | | |
| | | | VV 4476 1834 593 | | | | |
| .CASE 1814 | 2 OF BSTCPW6 ST.PW11:4133 | F/STCPW6 | <-- 4121 1809 586 | 4133 | | | 100000001000 |
| | * CONVERT DOUBLE TO * *SINGLE * -----* | | | 1111 00 00 11 11 000 100 0100 0 | | | 00000 000000 11000 100101010 |
| | *P2, D+FAC1(SF),D(C)+ALU15, * *NEXT, * * J/STCPW12 * --> | | 4452 1815 588 | | | | |

EO1

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 588

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | |
|---------|-------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|-------|-----------|--------------|--|
| | | | | | | | | RIF | COUT | CLOCKS | | |
| 1815 | STCPW12:4452 | F/STCPW11 | <-- | 4133 | 1814 | 587 | | | | | | |
| | ***** | | | | | | | 4452 | | | 000000001000 | |
| | * BRANCH ON ROUND BIT TARGETS | | | | | | 0011 | 00 00 | 00 00 | 000 000 | 0010 0 | |
| | *- | | | | | | 00000 | 000000 | 10011 | 001011101 | | |
| | ***** | | | | | | | | | | | |
| | *P2, SR+D, | | | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | | | |
| | * J/STCPW10 | | --> | 01 | 4135 | 1813 | 587 | | | | | |
| | * J/STCPW13 | | --> | 11 | 4137 | 1816 | 588 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE | 2 OF BSTCPW12 | F/STCPW9 | <-- | 4132 | 1812 | 587 | | | | | | |
| 1816 | STCPW13:4137 | F/STCPW12 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | 4137 | | | 000000001000 | |
| | *0 - STCPW10 1 - STCPW13 | BRANCH ON FT | | | | | 0000 | 00 00 | 00 01 | 000 000 | 0000 0 | |
| | *BIT TARGETS | | | | | | 11001 | 000000 | 01000 | 001100110 | | |
| | *- | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *SELECT, EMIT, | | | | | | | | | | | |
| | *NEXT, BUTR(FPS05), | | | | | | | | | | | |
| | * J/STCPW14 | | --> | 110 | 4146 | 1817 | 588 | | | | | |
| | * J/STCPW15 | | --> | 111 | 4147 | 1818 | 589 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE | 1 OF BSTCPW13 | F/STCPW13 | <-- VV | | | | | | | | | |
| 1817 | STCPW14:4146 | F/STCPW13 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | 4146 | | | 000000001000 | |
| | *0 - STCPW14 1 - STCPW15 | | | | | | 1100 | 00 11 | 00 00 | 011 110 | 0100 0 | |
| | *- | | | | | | 00000 | 001100 | 11000 | 100101100 | | |
| | ***** | | | | | | | | | | | |
| | *P2, D+SR PLUS FDST2 PLUS 1, | | | | | | | | | | | |
| | * D(C)+COUT15, | | | | | | | | | | | |
| | *P3, FDST2+D (B ADDR), | | | | | | | | | | | |
| | *NEXT, J/STCPW16 | | --> | 4454 | 1819 | 589 | | | | | | |
| | ***** | | | | | | | | | | | |

F01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 589

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---------------------------------|---------------------------------------|-----------------------|--------------------------------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 1818 | STCPW15:4147 | F/STCPW13 | <-- | 4137 1816 588 | | | | | | |
| | * TRUNCATE | | | | | | | | | |
| | * MODE | | | | | | | | | |
| | * NEXT, CALL SETFZFN, | | | | | | | | | |
| | * RETURN+STCPW31 | | --> | 2727 2323 768 | | | | | | |
| 1819 | STCPW16:4454 | F/STCPW14 | <-- | 4476 1834 593 4146 1817 588 | | | | | | |
| | * FINISH | | | | | | | | | |
| | * ROUNDING | | | | | | | | | |
| | * P2, D+FDST3 PLUS 0 PLUS D(C), | | | | | | | | | |
| | * P3, FDST3+D (A ADDR), | | | | | | | | | |
| | * NEXT, J/STCPW17 | | --> | VV | | | | | | |
| 1820 | STCPW17:4456 | F/STCPW16 | <-- | VV | | | | | | |
| | * CHECK | | | | | | | | | |
| | * OVERFLOW | | | | | | | | | |
| | * P2, D+D XOR R(T1),D(C)+ALU15, | | | | | | | | | |
| | * NEXT, J/STCPW18 | | --> | VV | | | | | | |
| 1821 | STCPW18:4460 | F/STCPW17 | <-- | VV | | | | | | |
| | * BRANCH ON OVERFLOW TARGETS | | | | | | | | | |
| | * P2, D+FDST3,D(C)+D(C), | | | | | | | | | |
| | * NEXT, BUTR(D(C)), | | | | | | | | | |
| | * J/STCPW19 | | --> | 01 4141 1822 590 | | | | | | |
| | * J/STCPW20 | | --> | 11 4143 1823 590 | | | | | | |

GO1

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 590

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------------------|---|--|--------------------------|--------------------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| .CASE 1 OF BSTCPW18 | | | | | | | | | | |
| 1822 | STCPW19:4141 | F/STCPW8 F/STCPW18 | <-- <-- | 4450 1811 586 4460 1821 589 | | | | | | |
| | ***** | | | | | | | | | |
| | *0 - STCPW19 1 - STCPW20 NO OVERFLOW | | | | | | | | | |
| | *OCCURRED | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+2, | | | | | | | | | |
| | * RETURN+STCPW31, | | | | | | | | | |
| | * J/SETFZFN2 | | --> | 2730 2324 769 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 2 OF BSTCPW18 | | | | | | | | | | |
| 1823 | STCPW20:4143 | F/STCPW8 F/STCPW18 | <-- <-- | 4450 1811 586 4460 1821 589 | | | | | | |
| | ***** | | | | | | | | | |
| | * OVERFLOW OCCURRED REFLIP | | | | | | | | | |
| | *SIGN | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+FDST3 XOR SIGNBIT, | | | | | | | | | |
| | * D(C)+ALU15, | | | | | | | | | |
| | *P3, FDST3+D (A ADDR), | | | | | | | | | |
| | *NEXT, J/STCPW21 | | --> | VV | | | | | | |
| | ***** | | | | | | | | | |
| 1824 | STCPW21:4462 | F/STCPW20 | <-- | VV | | | | | | |
| | ***** | | | | | | | | | |
| | * FOR COND CODES BRANCH ON SIGN TARGETS | | | | | | | | | |
| | *- | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P3, MD+6 (BC), | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | |
| | * J/STCPW22 | | --> | 01 4151 1825 591 | | | | | | |
| | * J/STCPW23 | | --> | 11 4153 1826 591 | | | | | | |
| | ***** | | | | | | | | | |

```

4141
0100 00 10 01 11 110 010 0000 0
0000 000000 11100 111011000
    
```

```

4143
0110 10 00 10 01 011 100 0100 0
00101 000010 11000 100110010
    
```

```

4462
0000 10 00 00 00 000 110 0000 0
00010 100000 10011 001101001
    
```

H01

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|---------|--------------------------|------------------------|------------|--------------|--------------|------------|------|-----------------|----------------------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | UPF | RIF COUT CLOCKS | |
| 1825 | STCPW22:4151 | F/STCPW21 F/STCPW23 | <-- <-- | 4462 4153 | 1824 1826 | 590 591 | | | |
| | ***** | | | | | | | 4151 | 000000001000 |
| | *0 - STCPW22 1 - STCPW23 | | | | | | | 1010 | 11 10 00 00 000 000 0100 0 |
| | *-----* | | | | | | | 00000 | 000000 11000 100110100 |
| | *P2, D+MD, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/STCPW24 | | --> | 4464 | 1827 | 591 | | | |
| | ***** | | | | | | | | |
| 1826 | STCPW23:4153 | F/STCPW21 F/STCPW23 | <-- <-- | 4462 4153 | 1824 1826 | 590 591 | | | |
| | ***** | | | | | | | 4153 | 000000001000 |
| | * FOR COND | | | | | | | 0000 | 10 00 00 00 001 110 0000 0 |
| | *CODES | | | | | | | 00010 | 100000 11000 001101001 |
| | *-----* | | | | | | | | |
| | *P3, MD+16 (BC), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/STCPW22 | | --> | 4151 | 1825 | 591 | | | |
| | ***** | | | | | | | | |
| 1827 | STCPW24:4464 | F/STCPW22 | <-- | 4151 | 1825 | 591 | | | |
| | ***** | | | | | | | 4464 | 011000001000 |
| | * LOAD COND | | | | | | | 0000 | 00 00 00 00 000 000 0000 0 |
| | *CODES | | | | | | | 00000 | 000000 11000 100110110 |
| | *-----* | | | | | | | | |
| | *SELECT, FPSCC(DBUF), | | | | | | | | |
| | *P3, FPSCC+DATA, | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/STCPW25 | | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 1828 | STCPW25:4466 | F/STCPW24 | <-- VV | | | | | | |
| | ***** | | | | | | | 4466 | 000000001000 |
| | * CHECK ON INTERRUPT | | | | | | | 1111 | 00 00 11 00 011 000 0100 0 |
| | *ENABLED | | | | | | | 00000 | 000000 11010 100111000 |
| | *-----* | | | | | | | | |
| | *P2, D+FPSHIFEC, | | | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), | | | | | | | | |
| | * J/STCPW26 | | --> | 4470 | 1829 | 592 | | | |
| | ***** | | | | | | | | |

J01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 593

| BOX NO. CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------------|--|--|---|------|------------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1832 | STCPW29:4157 F/STCPW27 ***** * INTERRUPT ENABLED STORE * * DATA * *-----* *NEXT, CALL STCFLT, * RETURN+STCPW30 * ***** | <-- | 4472 1830 592 | 4157 | | | | 00000000 | 1000 | |
| | | | | | 0100 00 10 01 11 | 100 100 | 0000 0 | | | |
| | | | | | 00000 000000 | 11100 | 110010001 | | | |
| | | | ***** 4621 2042 664 ***** VV -1 -1 -1 0 1 1 | | | | | | | |
| 1833 | STCPW30:4474 ***** *NEXT, BUT(GO TO) PAGE+2, * RETURN+OFL0TRAP, * J/TPREAMBLE * ***** | --> | 2544 1969 637 | 4474 | | | | 00000000 | 1000 | |
| | | | | | 0100 00 10 11 10 | 000 010 | 0000 0 | | | |
| | | | | | 00000 000000 | 11100 | 101100100 | | | |
| 1834 | STCPW31:4476 F/STCPW28 ***** * STORE * * DATA * *-----* *NEXT, CALL STCFLT, * RETURN+BRA05 * ***** | <-- | 4155 1831 592 | 4476 | | | | 00000000 | 1000 | |
| | | | | | 0000 00 00 00 00 | 011 100 | 0000 0 | | | |
| | | | | | 00000 000000 | 11100 | 110010001 | | | |
| | | | ***** 4621 2042 664 ***** VV 3 283 126 | | | | | | | |

K01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 594

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|--|--|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|------|---------------------------------|
| | | OFST | ADDR | PAGE | | | | | RIF | COUT | |
| .TOC " LOAD EXPONENT INSTRUCTION ##FLPT##" .INSTRUCTION LOADS EXPONENT INTO FAC3(SF) .OVERFLOW OR UNDERFLOW MAY OCCUR DEPENDENT ON SIZE OF EXPONENT .FETCHED .-200 < EXPONENT < 200 ELSE UNDERFLOW OR OVERFLOW | | | | | | | | | | | |
| .CASE 27 OF BWFORK | | | | | | | | | | | |
| 1835 | LDEXPZW:0372 | F/SETCLASS3 | <-- | 207 | 1239 | 403 | | | | | |
| | | F/WFORK | <-- | 474 | 1318 | 429 | | | | | |
| | ***** | | | | | | | | | | 372 |
| | * HERE FROM FLPDECODE AND 1*D7 PREPARE | | | | | | | | | | 1111 00 10 10 01 111 011 0100 0 |
| | *FOR FPA | | | | | | | | | | 00000 011100 11100 111001101 |
| | *LOAD | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+PC (A), | | | | | | | | | | |
| | *P3, FPA+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | | | |
| | * J/LDEXP3 | | --> | 3715 | 1838 | 595 | | | | | |
| ***** | | | | | | | | | | | |
| .CASE 28 OF BWFORK | | | | | | | | | | | |
| 1836 | LDEXPDM6W:0373 | F/SETCLASS3 | <-- | 207 | 1239 | 403 | | | | | |
| | | F/WFORK | <-- | 474 | 1318 | 429 | | | | | |
| | ***** | | | | | | | | | | 373 |
| | * HERE FROM FLPDECODE AND | | | | | | | | | | 1111 00 10 10 01 111 011 0100 0 |
| | *1*D8 | | | | | | | | | | 00000 011100 11100 111001101 |
| | ----- | | | | | | | | | | |
| | *P2, D+PC (A), | | | | | | | | | | |
| | *P3, FPA+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | | | |
| | * J/LDEXP3 | | --> | 3715 | 1838 | 595 | | | | | |
| ***** | | | | | | | | | | | |
| .CASE 29 OF BWFORK | | | | | | | | | | | |
| 1837 | LDEXPNZW:0374 | F/SETCLASS3 | <-- | 207 | 1239 | 403 | | | | | |
| | | F/WFORK | <-- | 474 | 1318 | 429 | | | | | |
| | ***** | | | | | | | | | | 374 |
| | * HERE FROM FLPDECODE AND | | | | | | | | | | 1111 00 10 10 01 111 011 0100 0 |
| | *1*D14 | | | | | | | | | | 00000 011100 11100 111001101 |
| | ----- | | | | | | | | | | |
| | *P2, D+PC (A), | | | | | | | | | | |
| | *P3, FPA+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+3, | | | | | | | | | | |
| | * J/LDEXP3 | | --> | 3715 | 1838 | 595 | | | | | |
| ***** | | | | | | | | | | | |

L01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 595

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | EXTENSION | | | | |
|---------|--|--|--|--------------------|--------|------|------|----------------|
| | | | | ADDR | ALU | BUSB | BUSA | RIF |
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | |
| 1838 | LDEXP3:3715 | F/LDEXPZW <-- F/LDEXPDMbW <-- F/LDEXPNZW <-- | 372 1835 594 373 1836 594 374 1837 594 | 3715 | | | | 000000001000 |
| | *NEXT, CALL FETCHINT, * RETURN+LDEXP4 | | | 0011 00 11 10 10 | | | | 010 010 0000 0 |
| | ***** | | | 00000 000000 11100 | | | | 101101000 |
| | ***** | | | 2550 2009 650 | | | | |
| | ***** | | | VV | | | | |
| | ***** | | | 3722 1839 595 | | | | |
| 1839 | LDEXP4:3722 | | | 3722 | | | | 000000001000 |
| | *D(C)=0 | | | 1001 10 10 11 01 | | | | 110 000 0100 0 |
| | *-----* | | | 00100 011110 11000 | | | | 111010011 |
| | *P2, D+(P2) PLUS CNST200,D(C)+CIN, *P3, R(T1)+D (B ADDR), *NEXT, J/LDEXP5 | | | | | | | |
| | ***** | | | | | | | |
| 1840 | LDEXP5:3723 | F/LDEXP4 <-- VV | | 3723 | | | | 000000001000 |
| | * DETECT SIGN CHANGE D(C)=0 TARGETS | | | 0110 01 10 11 01 | | | | 110 111 1100 0 |
| | *-----* | | | 00000 000000 01101 | | | | 001100000 |
| | *P3, D+(P3) R(T2) XOR R(T1), * D(C)+D(C), *NEXT, BUT(D(14-00) IS 0 # D15), * J/LDEXP6 | | | | | | | |
| | ***** | | | | | | | |
| | ***** | | | 00 3140 1841 596 | | | | |
| | ***** | | | 01 3141 1842 596 | | | | |
| | ***** | | | 10 3142 1843 596 | | | | |
| | ***** | | | 11 3143 1844 596 | | | | |

MO1

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | |
|---------------------------------------|---|--|--------------------------|-----------|------------|------------|-------------|--------------|---------------------------------|
| | | | | ADDR | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS |
| .CASE 1841 | 1 OF BLDEXPS | | | | | | | | |
| | LDEXP6:3140 | F/LDEXP5 | <-- | 3723 | 1840 | 595 | | | |
| | ***** | | | | 3140 | | | | 000000001000 |
| | *00 - LDEXP6 01 - LDEXP7 10 - LDEXP8 11 - * | | | | | | | | 1011 10 00 11 00 110 000 0100 0 |
| | *LDEXP9 CHECK OVERFLOW D(C) = * | | | | | | | | 00111 000000 11000 111010110 |
| | *0 * | | | | | | | | |
| | -----* | | | | | | | | |
| | *P2, D+R(T1) AND HIBYTE MASK, * | | | | | | | | |
| | *NEXT, D(C)+CIN, * | | | | | | | | |
| | * J/LDEXP10 * | | --> | 3726 | 1845 | 597 | | | |
| .CASE 1842 | 2 OF BLDEXPS | | | | | | | | |
| | LDEXP7:3141 | F/LDEXP5 | <-- | 3723 | 1840 | 595 | | | |
| | ***** | | | | 3141 | | | | 000000001000 |
| | * OVERFLOW OR * | | | | | | | | 1010 10 00 00 00 000 000 0010 0 |
| | * UNDERFLOW * | | | | | | | | 01100 000000 11000 111010111 |
| | -----* | | | | | | | | |
| | *P2, SR+CNST4, * | | | | | | | | |
| | *NEXT, * | | | | | | | | |
| | * J/LDEXP13 * | | --> | 3727 | 1848 | 597 | | | |
| | .CASE 1843 | 3 OF BLDEXPS | | | | | | | |
| LDEXP8:3142 | | F/LDEXP5 | <-- | 3723 | 1840 | 595 | | | |
| ***** | | | | 3142 | | | | 000000001000 | |
| * ZERO EXPONENT RESULT SET UNDEFLOW * | | | | | | | | | 1010 10 00 00 00 000 000 0010 0 |
| * FLAG * | | | | | | | | | 01100 000000 11000 100000111 |
| -----* | | | | | | | | | |
| *P2, SR+CNST4, * | | | | | | | | | |
| *NEXT, * | | | | | | | | | |
| * J/LDEXP12 * | | | --> | 3407 | 1847 | 597 | | | |
| .CASE 1844 | | 4 OF BLDEXPS | | | | | | | |
| | LDEXP9:3143 | F/LDEXP5 | <-- | 3723 | 1840 | 595 | | | |
| | ***** | | | | 3143 | | | | 000000001000 |
| | * OVERFLOW OR * | | | | | | | | 1010 10 00 00 00 000 000 0010 0 |
| | * UNDERFLOW * | | | | | | | | 01100 000000 11000 111010111 |
| | -----* | | | | | | | | |
| | *P2, SR+CNST4, * | | | | | | | | |
| | *NEXT, * | | | | | | | | |
| | * J/LDEXP13 * | | --> | 3727 | 1848 | 597 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|-----------------------------------|------------------------|------------|--------------|--------------|------------|------|-----------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| 1849 | LDEXP14:3332 | F/LDEXP13 F/LDEXP15 | <-- <-- | 3727 3333 | 1848 1850 | 597 598 | | |
| | ***** | | | | | | | |
| | *0 - LDEXP14 1 - LDEXP15 | | * | | | | | |
| | *P2, D+R(T1) AND NOT HIBYTE MASK, | | * | | | | | |
| | * D(C)+D(C), | | * | | | | | |
| | *NEXT, | | * | | | | | |
| | * J/LDEXP16 | | * --> | 3731 | 1851 | 598 | | |
| | ***** | | | | | | | |
| .CASE | 2 OF BLDEXP13 | | | | | | | |
| 1850 | LDEXP15:3333 | F/LDEXP13 F/LDEXP15 | <-- <-- | 3727 3333 | 1848 1850 | 597 598 | | |
| | ***** | | | | | | | |
| | * SET OVERFLOW | | * | | | | | |
| | *FLAG | | * | | | | | |
| | *P2, SR+2, | | * | | | | | |
| | *NEXT, | | * | | | | | |
| | * J/LDEXP14 | | * --> | 3332 | 1849 | 598 | | |
| | ***** | | | | | | | |
| 1851 | LDEXP16:3731 | F/LDEXP12 F/LDEXP14 | <-- <-- | 3407 3332 | 1847 1849 | 597 598 | | |
| | ***** | | | | | | | |
| | * TARGETS - WARM - | | * | | | | | |
| | *LDEXP17 | | * | | | | | |
| | *P2, D+D SWAP RIGHT 1, D(C)+D(C), | | * | | | | | |
| | *P3, R(T1)+D (B ADDR), | | * | | | | | |
| | *NEXT, BUTR(HOTWARM), | | * | | | | | |
| | * J/LDEXP17 | | * | | | | | |
| | * J/LDEXP17 | | * --> | 10 3052 | 1852 | 599 | | |
| | * J/LDEXPHOT | | * --> | 11 3053 | 1855 | 599 | | |
| | ***** | | | | | | | |

```

3332          000000001000
0111  10 00  11 00  110 111  0100 0
00111 000000 11000 111011001

3333          000000001000
1010  11 11  00 00  000 000  0010 0
00000 000000 11000 011011010

3731          000000001000
1111  00 10  01 10  110 111  0100 0
00101 011110 10100 000101010
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|---------------------|---------|---------|----------|---|
| .CASE 1852 | 1 OF BLDEXP16 LDEXP17:3052 | F/LDEXP16 | <-- | 3731 1851 598 | | | | |
| | ***** *HOT - LDEXPHOT *----- *P2, D+NOT EXPMSK AND FAC3(SF), *P3, FAC3(SF)+D (A ADDR), *NEXT, * J/LDEXP18 | | | | | | | 3052 100000001000 0111 10 00 10 11 000 000 0100 0 01111 000010 11000 111011010 |
| 1853 | LDEXP18:3732 | F/LDEXP17 | <-- VV | | | | | |
| | ***** * ASSEMBLE *EXP *----- *P2, D+FAC3(SF) OR R(T1), *P3, FAC3(SF)+D (A ADDR), *NEXT, * J/LDEXP19 | | | | | | | 3732 100000001000 1110 01 10 10 11 110 000 0100 0 00000 000010 11000 111011011 |
| 1854 | LDEXP19:3733 | F/LDEXP18 | <-- VV | | | | | |
| | ***** *NEXT, CALL SETFZFN, * RETURN+FINISH4 ***** | | | | | | | 3733 000000001000 0011 00 11 11 00 000 010 0000 0 00000 000000 11100 111010111 |
| | | | --> | 2727 2323 768 | | | | |
| | | | | VV 3740 1965 634 | | | | |
| .CASE 1855 | 2 OF BLDEXP16 LDEXPHOT:3053 | F/LDEXP16 | <-- | 3731 1851 598 | | | | |
| | ***** * HOT FPP UNIT ACCEPTS 8 BIT EXPONENT AT *P2 AND ACCEPTS CODE ON EXP IN NEXT CYCLE *AT *P2 *----- *P3, D+SR (P3), FLPGO, *NEXT, BUT(GO TO), PAGE+0, * J/BRA05 | | | | | | | 3053 000000001000 1111 00 00 00 00 000 000 1100 0 11100 000000 11100 00000011 |
| | ***** | | --> | 3 283 126 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---|-----------------------|---------------------------------------|-----------------------|------------------------------|---------|----------|------------------------|---------------------------------|
| .TOC " LOAD AND CONVERT TYPE ##FLPT##" .: INSTRUCTION PERFORMS LOAD OF 2'S COMPLEMENT DATA SHORT OR .: LONG INTEGER DEPENDENT ON FL BIT OF FPS AND CONVERTS TO .: FLOATING POINT DATA FORMAT .: NO INTERRUPTS CAN OCCUR IN THIS INSTRUCTION .CASE 30 OF BWFORK | | | | | | | | |
| 1856 | LDCTZW:0375 | F/SETCLASS3 F/WFORK | <-- <-- | 207 1239 403 474 1318 429 | | | | |
| | ***** | | | | | | 375 | 000000001000 |
| | * HERE FROM FLPDECODE | | | | | | | 0100 10 10 00 00 000 000 0000 0 |
| | *1#D9 | | | | | | | 01001 100000 11000 110011000 |
| | ***** | | | | | | | |
| | *P3, | | | | | | | |
| | * EMITCON+GUARD | | | | | | | |
| | *ENABLE, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/LDCTW2 | | --> | 630 1858 600 | | | | |
| ***** | | | | | | | | |
| .CASE 31 OF BWFORK | | | | | | | | |
| 1857 | LDCTNZW:0376 | F/SETCLASS3 F/WFORK | <-- <-- | 207 1239 403 474 1318 429 | | | | |
| | ***** | | | | | | 376 | 000000001000 |
| | * HERE FROM FLPDECODE | | | | | | | 0100 10 10 00 00 000 000 0000 0 |
| | *1#D10 | | | | | | | 01001 100000 11000 110011000 |
| | ***** | | | | | | | |
| | *P3, | | | | | | | |
| | * EMITCON+GUARD | | | | | | | |
| | *ENABLE, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/LDCTW2 | | --> VV | | | | | |
| ***** | | | | | | | | |
| | | F/LDCTZ | <-- | 275 1275 413 | | | | |
| | | F/LDCTNZ | <-- | 276 1276 414 | | | | |
| | | F/LDCTZW | <-- | 375 1856 600 | | | | |
| | | F/LDCTNZW | <-- VV | | | | | |
| 1858 | LDCTW2:0630 | | | | | | 630 | 000000001000 |
| | ***** | | | | | | | |
| | *SELECT, FPS(READ), | | | | | | | 0000 10 00 11 01 000 000 0000 0 |
| | *P2, RES+EMITCON, | | | | | | | 11001 110001 11000 110100000 |
| | *P3, EMITCON+FPS, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/LDCTW3 | | --> | 640 1859 601 | | | | |
| ***** | | | | | | | | |

E02

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 601

| BC/NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--------|--|--|--------------------------|------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1859 | LDCTW3:0640 | F/LDCTW2 | <-- | 630 1858 600 | 640 | | | | | |
| | ***** | | | | | | | | | |
| | *FPS IS FETCHED SR DOESN'T MATTER - THIS * | | | | | | | | | |
| | *SETS GUARD REG TO | | | | | | | | | |
| | *0 | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, | D+EMITCON,SHIFT SR, | | | | | | | | |
| | *NEXT, | BUT(GO TO),PAGE+4, | | | | | | | | |
| | * | J/LDCTW4 | --> | VV | | | | | | |
| | ***** | | | | | | | | | |
| 1860 | LDCTW4:4500 | F/LDCTW3 | <-- | VV | 4500 | | | | | |
| | ***** | | | | | | | | | |
| | * D(C)+FL FETCHINTLG NEEDS | | | | | | | | | |
| | *EMIT | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, | D+D RIGHT 6,D(C)+ALU00, | | | | | | | | |
| | *NEXT, | BUT(CLEAR FLAGS), | | | | | | | | |
| | * | J/LDCTW5 | --> | VV | | | | | | |
| | ***** | | | | | | | | | |
| 1861 | LDCTW5:4502 | F/LDCTW4 | <-- | VV | 4502 | | | | | |
| | ***** | | | | | | | | | |
| | * TARGETS | | | | | | | | | |
| | *- | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, | D+PC (A),D(C)+D(C), | | | | | | | | |
| | *P3, | FPA+D (B ADDR), | | | | | | | | |
| | *NEXT, | BUTR(HOTWARM), | | | | | | | | |
| | * | J/LDCTW6 | --> | 10 4712 1862 602 | | | | | | |
| | * | J/LDCTW7 | --> | 11 4713 1863 602 | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------------------------|---|--|--------------------------|------|------------|------------|-------------|-----------|-----|--------|
| | | | | | | | | RIF | COU | |
| .CASE 1862 | 1 OF BLDCTW5 | | | | | | | | | |
| | LDCTW6:4712 | F/LDCTW5 | <-- | 4502 | 1861 | 601 | | | | |
| | ***** | | | | | | | | | |
| | *WARM - LDCTW6 HOT - LDCTW7 BUT(FL) * | | | | | | | | | |
| | *TARGETS * | | | | | | | | | |
| | *- * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *NEXT, BUTR(D(C)), * | | | | | | | | | |
| | * J/LDCTW8 * | | | | | | | | | |
| | * J/LDCTW16 * --> | | | | | | | | | |
| ***** | | | | | | | | | | |
| *-----* | | | | | | | | | | |
| *NEXT, CALL HOTSINC, * | | | | | | | | | | |
| * RETURN+LDCT2 * | | | | | | | | | | |
| ***** --> | | | | | | | | | | |
| ***** | | | | | | | | | | |
| 4565 1297 421 | | | | | | | | | | |
| VV | | | | | | | | | | |
| -1 -1 -1 @ 1 1 | | | | | | | | | | |
| .CASE 1863 | 2 OF BLDCTW5 | | | | | | | | | |
| | LDCTW7:4713 | F/LDCTW5 | <-- | 4502 | 1861 | 601 | | | | |
| | ***** | | | | | | | | | |
| | *0 - LDCTW8 1 - LDCTW16 PERFORM * | | | | | | | | | |
| | *SYNC * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *NEXT, CALL HOTSINC, * | | | | | | | | | |
| | * RETURN+LDCT2 * | | | | | | | | | |
| | ***** --> | | | | | | | | | |
| | ***** | | | | | | | | | |
| 4565 1297 421 | | | | | | | | | | |
| VV | | | | | | | | | | |
| -1 -1 -1 @ 1 1 | | | | | | | | | | |
| .CASE 1864 | 1 OF BLDCTW6 | | | | | | | | | |
| | LDCTW8:4441 | F/LDCTW6 | <-- | 4712 | 1862 | 602 | | | | |
| | ***** | | | | | | | | | |
| | *OPERATION THEN RETURN TO HOT LDCT * | | | | | | | | | |
| | *HANDLER TH FETCH THE DATA FETCH SINGLE * | | | | | | | | | |
| | *OPERAND * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *NEXT, CALL FETCHINT, * | | | | | | | | | |
| | * RETURN+LDCTW9 * | | | | | | | | | |
| | ***** --> | | | | | | | | | |
| ***** | | | | | | | | | | |
| 2550 2009 650 | | | | | | | | | | |
| VV | | | | | | | | | | |
| 4504 1865 602 | | | | | | | | | | |
| 1865 | LDCTW9:4504 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P3, FDST3+D (A ADDR), * | | | | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), * | | | | | | | | | |
| | * J/LDCTW10 * --> | | | | | | | | | |
| | ***** | | | | | | | | | |
| | ***** | | | | | | | | | |
| | 4504 | | | | | | | | | |
| | 0000 00 00 00 01 011 000 0000 0 | | | | | | | | | |
| 00000 000010 11010 101000101 | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------|---|---------------------------------------|-----------------------|--------------------|---------|---------|----------|-----------|--------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 1866 | LDCTW10:4505 | F/LDCTW9 | <-- | 4504 1865 602 | 4505 | | | 00000000 | 1000 | |
| | * SET UP ASP NOT | | | | 1110 | 10 00 | 11 00 | 101 000 | 0100 0 | |
| | *EQUAL | | | | 01110 | 010010 | 11000 | 101001000 | | |
| | *P2, D+WHAMI OR CNST8, | | | | | | | | | |
| | *P3, WHAMI+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LDCTW10B | | --> VV | | | | | | | |
| 1867 | LDCTW10B:4510 | F/LDCTW10 | <-- VV | | 4510 | | | 00000000 | 1000 | |
| | * TARGETS - BRANCH ON | | | | 0011 | 00 00 | 00 01 | 110 000 | 0100 0 | |
| | *IR<5:4> | | | | 00000 | 000010 | 00101 | 100101001 | | |
| | *P2, D+D, | | | | | | | | | |
| | *P3, R(GRINC-SAV)+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUTR(DM) | | | | | | | | | |
| | * J/LDCTW11 | | --> | 1001 4451 1868 603 | | | | | | |
| | * J/LDCTW12 | | --> | 1011 4453 1869 604 | | | | | | |
| | * J/LDCTW13 | | --> | 1101 4455 1870 604 | | | | | | |
| | * J/LDCTW14 | | --> | 1111 4457 1871 604 | | | | | | |
| .CASE 1868 | 1 OF BLDCTW10B | F/LDCTW10B | <-- VV | | 4451 | | | 00000000 | 1000 | |
| | LDCTW11:4451 | | | | 0011 | 00 00 | 00 01 | 011 000 | 0100 0 | |
| | *00 - LDCTW11 01 - LDCTW12 10 - LDCTW13 | | | | 00000 | 000100 | 11000 | 101001001 | | |
| | *11 - LDCTW14 | | | | | | | | | |
| | *P2, D+D, | | | | | | | | | |
| | *P3, FDS12+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/LDCTW15 | | --> | 4511 1872 605 | | | | | | |

H02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 604

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSB UBF | EXTENSION RIF COUT CLOCKS |
|------------|--|--|--------------------------|---------------|------------|------------|-------------|--|
| | | | | | | | | |
| .CASE 1869 | 2 OF BLDCTW10B LDCTW12:4453 | F/LDCTW10B | <-- | 4510 1867 603 | | | | |
| | ***** * FOR INTERRUPT *LATENCY *-----* | | | | | | | 4453 000000001000 1010 11 11 00 01 110 000 0100 0 00000 000010 11000 100101111 |
| | *P2, D+2, *P3, R(GRINC-SAV)+D (A ADDR), *NEXT, * J/LDCTW14 | | --> | 4457 1871 604 | | | | |
| .CASE 1870 | 3 OF BLDCTW10B LDCTW13:4455 | F/LDCTW10B | <-- | 4510 1867 603 | | | | |
| | ***** *R(GRINC-SAV)+-2 *-----* | | | | | | | 4455 000000001000 1101 11 11 10 01 110 000 0100 0 00000 000010 11000 100101111 |
| | *P2, D+R(GRINC-SAV) MINUS 2, *P3, R(GRINC-SAV)+D (A ADDR), *NEXT, * J/LDCTW14 | | --> VV | | | | | |
| .CASE 1871 | 4 OF BLDCTW10B LDCTW14:4457 | F/LDCTW10B | <-- | 4510 1867 603 | | | | |
| | ***** *P2, D+0, *P3, FDST2+D (A ADDR), *NEXT, * J/LDCTW15 | | --> | 4511 1872 605 | | | | 4457 000000001000 0011 00 00 00 01 011 000 0100 0 00000 000100 11000 101001001 |

J02

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 606

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--------------------------|------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 1876 | LDCTW19:4520 | F/LDCTW18 | <-- | 4516 1875 605 | 4520 | | | 00000000 | 1000 | |
| | * GENERATE DUMMY EXPONENT TARGETS - F - | | | | 0000 | 10 00 | 00 10 | 011 000 | 0000 | 0 |
| | *LDCTW20 | | | | 00010 | 100000 | 10111 | 111110010 | | |
| | *P3, MD+230 (BC), | | | | | | | | | |
| | *NEXT, BUTR(FD) | | | | | | | | | |
| | * J/LDCTW20 | J/LDCTW20 | --> | 10 4762 1877 606 | | | | | | |
| | * J/LDCTW22 | J/LDCTW22 | --> | 11 4763 1879 607 | | | | | | |
| .CASE | 1 OF BLDCTW15 | | | | | | | | | |
| 1877 | LDCTW20:4762 | F/LDCTW15 F/LDCTW19 | <-- <-- VV | 4511 1872 605 | 4762 | | | 10000000 | 1000 | |
| | *D - LDCTW22 FAC3(SF) AND FAC2(SF) ARE | | | | 1111 | 00 10 | 11 11 | 111 000 | 0100 | 0 |
| | *NOT SAVED AS THIS IS A LOAD | | | | 00000 | 001010 | 11000 | 101010001 | | |
| | *INSTRUCTION | | | | | | | | | |
| | *P2, D+FAC1(SF) | | | | | | | | | |
| | *P3, FAC1(SAV)+D (B ADDR), | | | | | | | | | |
| | *NEXT, J/LDCTW21 | J/LDCTW21 | --> VV | | | | | | | |
| 1878 | LDCTW21:4521 | F/LDCTW20 | <-- VV | | 4521 | | | 10000000 | 1000 | |
| | *P2, D+FAC0(SF) | | | | 1010 | 01 01 | 00 01 | 111 000 | 0100 | 0 |
| | *P3, FAC0(SAV)+D (A ADDR), | | | | 00000 | 000010 | 11000 | 111110011 | | |
| | *NEXT, J/LDCTW22 | J/LDCTW22 | --> | 4763 1879 607 | | | | | | |

K02

PROGRAM FLOWS 11/60 MICROCODE ON: 09-Mar-77 BY ADSYS 020377 PAGE 607

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|---------------------------------------|-----------------------|--------------------------------------|---------|---------|----------|---|-------------|-------|
| | | | | | | | | RIF | COUT | |
| .CASE | 2 OF BLDCTW15 | | | | | | | | | |
| 1879 | LDCTW22:4763 | F/LDCTW15 F/LDCTW19 | <-- <-- | 4511 1872 605 4520 1876 606 | | | | | | |
| | ***** * HOLD SIGN FOR COMPLEMENT *CHECK *-----* | | | | | | | 4763 | 10000001000 | |
| | *P2, D+FDST3,D(C)+ALU15, *P3, FAC3(SF)+D (B ADDR), *NEXT, * J/LDCTW23 | | | | | | | 1111 00 01 10 01 011 100 0100 0 00000 001010 11000 101010100 | | |
| 1880 | LDCTW23:4524 | F/LDCTW22 | <-- VV | | | | | | | |
| | ***** *TARGETS- *-----* | | | | | | | | | |
| | *P2, D+FDST2,D(C)+D(C), *P3, FAC2(SF)+D (A ADDR), *NEXT, BUTR(FD) * J/LDCTW24 | | | | | | | | | |
| | | J/LDCTW24 J/LDCTW25 | --> --> | 10 4312 1881 607 11 4313 1882 608 | | | | | | |
| .CASE | 1 OF BLDCTW23 | | | | | | | | | |
| 1881 | LDCTW24:4312 | F/LDCTW23 F/LDCTW25 | <-- <-- | 4524 1880 607 4313 1882 608 | | | | | | |
| | ***** *F - LDCTW24 D - LDCTW25 FOR TWO'S COMP *IN *LDCTW28 *-----* | | | | | | | 4312 | 00000001000 | |
| | * CLEAR CR2,D(C)+D(C),SR+0, *NEXT, * J/LDCTW26 | | | | | | | 0011 00 00 00 01 101 111 0110 0 00000 000010 11000 101010101 | | |
| | | | --> | 4525 1883 608 | | | | | | |

L02

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 608

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|--------------------|--------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE | 2 OF BLDCTW23 | | | | | | | | | |
| 1882 | LDCTW25:4313 | F/LDCTW23 F/LDCTW25 | <-- <-- | 4524 4313 | 1880 1882 | 607 608 | | | | |
| | ***** * DOUBLE PRECISION ENTRY LOAD ZEROS IN LO * *END *-----* | | | | | | | | | |
| | *P2, D←D, D(C)+D(C), *P3, FAC10(SF)+D (A ADDR), *NEXT, * J/LDCTW24 | | | | | | | | | |
| | | | --> | 4312 | 1881 | 607 | | | | |
| 1883 | LDCTW26:4525 | F/LDCTW24 | <-- | 4312 | 1881 | 607 | | | | |
| | ***** * TARGETS - BUT(SIGN BIT) 0 - *LDCTW27 *-----* | | | | | | | | | |
| | *P2, D←MD, D(C)+D(C), *P3, R(ER)+D (A ADDR), *NEXT, BUTR(D(C)), * J/LDCTW27 | | | | | | | | | |
| | | J/LDCTW27 J/LDCTW28 | --> --> | 01 4341 11 4343 | 1884 1885 | 608 609 | | | | |
| .CASE | 1 OF BLDCTW26 | | | | | | | | | |
| 1884 | LDCTW27:4341 | F/LDCTW26 | <-- VV | | | | | | | |
| | ***** *1 - LDCTW28 GO ROUND THE *DATA *-----* | | | | | | | | | |
| | * CLEAR CR1, *NEXT, BUT(GO TO), PAGE+2, * J/NROUND | | --> | 2362 | 1906 | 615 | | | | |
| | ***** | | | | | | | | | |

4313 100000001000
0011 00 00 00 11 000 111 0100 0
00000 010110 11000 011001010

4525 000000001000
1010 11 10 00 00 110 111 0100 0
00000 000010 10011 011100001

4341 000000001000
0011 00 00 00 00 101 010 0100 0
00000 000010 11100 011110010

M02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 609

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCKS |
|---------|------------------------------------|--------------------|------------|------|-------|--------|-------|-----------|--------------|--------|
| | | | | | | | | OFST | ADDR | |
| 1885 | LDCTW28:4343 | F/LDCTW26 | <-- | 4525 | 1883 | 608 | | | | |
| | * PERFORM 2'S | | | 4343 | | | | | 100000001000 | |
| | * COMPLEMENT | | | | 1101 | 00 01 | 00 00 | 000 110 | 0100 0 | |
| | | | | | 00000 | 001100 | 11000 | 101011000 | | |
| | *P2, D+SR MINUS FAC2(SF), | | | | | | | | | |
| | * D(C)+COUT15 | | | | | | | | | |
| | *P3, FAC2(SF)+D (B ADDR), | | | | | | | | | |
| | * NEXT, | | | | | | | | | |
| | * J/LDCTW29 | | --> | VV | | | | | | |
| 1886 | LDCTW29:4530 | F/LDCTW28 | <-- | VV | | | | | | |
| | *P2, D+NOT FAC3(SF), D(C)+D(C), | | | 4530 | | | | | 100000001000 | |
| | *P3, FAC3(SF)+D (A ADDR), | | | | 0000 | 00 00 | 10 11 | 000 111 | 0100 0 | |
| | * NEXT, | | | | 00000 | 000010 | 11000 | 101011001 | | |
| | * J/LDCTW30 | | --> | VV | | | | | | |
| 1887 | LDCTW30:4531 | F/LDCTW29 | <-- | VV | | | | | | |
| | *P2, D+FAC3(SF) PLUS 0 PLUS D(C), | | | 4531 | | | | | 100000001000 | |
| | *P3, FAC3(SF)+D (A ADDR), | | | | 0100 | 11 01 | 10 11 | 000 000 | 0100 0 | |
| | * NEXT, | | | | 00000 | 000010 | 11000 | 101011010 | | |
| | * J/LDCTW31 | | --> | VV | | | | | | |
| 1888 | LDCTW31:4532 | F/LDCTW30 | <-- | VV | | | | | | |
| | * SET SIGN BIT IN CR1 GO NORMALIZE | | | 4532 | | | | | 000000001000 | |
| | * RESULT | | | | 1010 | 10 00 | 00 00 | 101 010 | 0100 0 | |
| | *P2, D+CNST100000, | | | | 00101 | 000010 | 11100 | 011110010 | | |
| | *P3, CR1+D (A ADDR), | | | | | | | | | |
| | * NEXT, BUT(GO TO), PAGE+2, | | | | | | | | | |
| | * J/NROUND | | --> | 2362 | 1906 | 615 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---|--|---------------------------------------|-----------------------|------------------------------|---------|----------|---------------------------|
| .TOC " LOAD AND CONVERT PRECISION ##FLPT##" | | | | | | | |
| .CASE 32 OF BWFORK | | | | | | | |
| 1889 | LDCPW1:0377 | F/SETCLASS3 F/WFORK | <-- <-- | 207 1239 403 474 1318 429 | | | |
| | ***** | | | | | | |
| | *NEXT, CALL LDCFETH, | | | | | | |
| | * RETURN+LDCPW2 | | | | | | |
| | ***** | | | | | | |
| | | | --> | 4620 2041 663 | | | |
| | | | | VV | | | |
| | | | | 2466 1890 610 | | | |
| 1890 | LDCPW2:2466 | | | | | | |
| | ***** | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), | | | | | | |
| | * J/LDCPW3 | | --> VV | | | | |
| | ***** | | | | | | |
| 1891 | LDCPW3:2470 | F/LDCPW2 | <-- VV | | | | |
| | ***** | | | | | | |
| | * ISOLATE EXPONENT TEST FETCH OF -0 TEST | | | | | | |
| | *SR<00> | | | | | | |
| | ----- | | | | | | |
| | *P2, D+FDST3 AND EXPMASK, | | | | | | |
| | *NEXT, BUT(CASE), | | | | | | |
| | * J/LDCPW4 | | | | | | |
| | | J/LDCPW4 | --> | 1110 2316 1892 610 | | | |
| | | J/LDCPW5 | --> | 1111 2317 1893 611 | | | |
| | ***** | | | | | | |
| .CASE 1892 | 1 OF B LDCPW3 | | | | | | |
| | LDCPW4:2316 | F/LDCPW3 | <-- VV | | | | |
| | ***** | | | | | | |
| | *TARGETS - 0 - LDCPW4 1 - LDCPW5 TEST | | | | | | |
| | *EXP = 0 TARGETS | | | | | | |
| | *- | | | | | | |
| | ----- | | | | | | |
| | *NEXT, BUTR(D(14-00) IS 0), | | | | | | |
| | * J/LDCPW6 | | | | | | |
| | | J/LDCPW6 | --> | 01 2545 1894 611 | | | |
| | | J/LDCPW7 | --> | 11 2547 1895 611 | | | |
| | ***** | | | | | | |

| ADDR | ALU | BUSB | SP | BUSA | UBF | EXTENSION | RIF | COUT | CLOCKS |
|------|-------|--------|-------|-------|-------|-----------|------|------|--------|
| 377 | 0010 | 00 | 10 | 01 | 10 | 00000000 | 1000 | | |
| | 0000 | 000000 | 11100 | 1100 | 1000 | 0000 | 0 | | |
| 2466 | 0000 | 00 | 00 | 00 | 00 | 00000000 | 1000 | | |
| | 0000 | 000000 | 11010 | 1001 | 11000 | 0000 | 0 | | |
| 2470 | 1011 | 10 | 00 | 10 | 01 | 00000000 | 1000 | | |
| | 01111 | 000000 | 00000 | 01100 | 0100 | 0100 | 0 | | |
| 2316 | 0000 | 00 | 00 | 00 | 00 | 00000000 | 1000 | | |
| | 0000 | 000000 | 01101 | 1011 | 00101 | 0000 | 0 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS | |
|---------------|---|---------------------------------------|-----------------------|---------------|---------|----------|---------------------------------|---------------|
| .CASE 1893 | 2 OF BLDCPW3 | F/LDCPW3 | <-- | 2470 1891 610 | | | | |
| | LDCPW5:2317 | | | | | | 2317 00000001000 | |
| | *0 - LDCPW6 1 - LDCPW7 | FETCH OF MINUS | * | | | | 0010 00 10 11 00 111 100 0000 0 | |
| | *ZERO HAS OCCURRED GO SET FN AND FZ IN | | * | | | | 00000 000000 11100 011010101 | |
| | *FPS THEN TO | | * | | | | | |
| | *TRAPS | | * | | | | | |
| | ----- | | | | | | | |
| | *NEXT, BUT(GO TO), PAGE+4, | | * | | | | | |
| | * RETURN+LDCPW7, | | * | | | | | |
| | * J/LOADNZW3B | | * --> | 4325 1653 538 | | | | |
| .CASE 1894 | 1 OF BLDCPW4 | F/LDCPW4 | <-- | 2316 1892 610 | | | | |
| | LDCPW6:2545 | | | | | | 2545 00000001000 | |
| | * MOVE DATA | | * | | | | 0100 00 10 10 11 100 100 0000 0 | |
| | * INTO | | * | | | | 00000 000000 11100 111100101 | |
| | ----- | | | | | | | |
| | *NEXT, CALL MOVFDSTSF, | | * | | | | | |
| | * RETURN+LDCPW8 | | * | | | | | |
| | ----- | | | | | | | |
| | | | | | ***** | | | 4745 2235 738 |
| | | | | | ***** | | | |
| .CASE 1895 | 2 OF BLDCPW4 | F/LDCPW4 | <-- | 2316 1892 610 | | | | |
| | LDCPW7:2547 | | | | | | 2547 10000001000 | |
| | *ACCUMILATORS EXPONENT IS ZERO , GO SET | | * | | | | 0011 00 00 00 11 000 000 0100 0 | |
| | *EXACT ZERO GO TO MULMODW | | * | | | | 00000 000110 10111 000000110 | |
| | *TO | | * | | | | | |
| | ----- | | | | | | | |
| | *P2, D+0, | | * | | | | | |
| | *P3, FAC32(SF)+D (A ADDR), | | * | | | | | |
| | *NEXT, BUTR(FD), | | * | | | | | |
| | * J/MULMODW11 | | * | | | | | |
| * J/MULMODW11 | | * --> | 10 2006 1418 462 | | | | | |
| * J/MULMODW12 | | * --> | 11 2007 1419 462 | | | | | |
| ----- | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|-----------|---|---------------------------------------|-----------------------|------|---------|---------|----------|--------------------------|--------|
| 1896 | LDCPW8:4534 | | | 4534 | | | | 000000001000 | |
| | *CLEAR FAC10(SF) AND SET FCC'S SET ASP | | | | 1110 | 10 00 | 11 00 | 101 000 | 0100 0 |
| | *NOT EQUAL TARGETS - F - | | | | 01110 | 010010 | 10111 | 001000110 | |
| | *LDCPW9 | | | | | | | | |
| | *P2, D+WHAMI OR CNST8, | | | | | | | | |
| | *P3, WHAMI+D (A ADDR), | | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | | |
| | * J/LDCPW9 | --> | 10 4106 1897 612 | | | | | | |
| | * J/LDCPW10 | --> | 11 4107 1898 612 | | | | | | |
| CASE 1897 | 1 OF BLDCPW8 LDCPW9:4106 | F/LDCPW8 | <-- VV | 4106 | | | | 000000001000 | |
| | *D - LDCPW10 TEST FT BIT IN FPS TARGETS | | | | 1011 | 10 00 | 10 01 | 011 000 | 0100 0 |
| | *- | | | | 00101 | 000000 | 01000 | 001010110 | |
| | *P2, D+FDST3 * SIGNBIT, | | | | | | | | |
| | *NEXT, BUTR(FPS05), | | | | | | | | |
| | * J/LDCPW11 | --> | 110 4126 1899 613 | | | | | | |
| | * J/LDCPW16 | --> | 111 4127 1904 614 | | | | | | |
| CASE 1898 | 2 OF BLDCPW8 LDCPW10:4107 | F/LDCPW8 | <-- | 4534 | | | | 100000001000 | |
| | *0 - LDCPW11 1 - LDCPW16 | | | 4107 | | | | 0011 00 00 00 11 000 000 | 0100 0 |
| | *P2, D+0, | | | | 00000 | 010110 | 11000 | 001010111 | |
| | *P3, FAC10(SF)+D (A ADDR), | | | | | | | | |
| | *NEXT, J/LDCPW16 | --> | 4127 1904 614 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---|---------------------------------------|-----------------------|------|---------------|-----------------|----------------|---|
| 1899 | LDCPW11:4126 * SAVE *SIGN *-----* *P3, CR1+D (B ADDR), *NEXT, * J/LDCPW12 | <-- | 4106 1897 612 | 4126 | 0000 00000 | 00 10 001010 | 00 00 11000 | 000000001000 101 000 0000 0 101011101 |
| 1900 | LDCPW12:4535 *NEXT, CALL DATAPREP2, * RETURN+LDCPW13 *-----* *P2, D+R(ES) (A), *P3, R(ER)+D (B ADDR), *NEXT, * J/LDCPW14 | <-- VV --> VV | 4536 1901 613 | 4535 | 0100 00000 | 00 10 000000 | 10 11 11100 | 000000001000 110 010 0000 0 110000010 |
| 1901 | LDCPW13:4536 * SAVE *EXPONENT *-----* *P2, D+R(ES) (A), *P3, R(ER)+D (B ADDR), *NEXT, * J/LDCPW14 | <-- VV --> VV | 4536 1901 613 | 4536 | 1111 00000 | 00 10 001010 | 11 00 11000 | 000000001000 110 000 0100 0 101100000 |
| 1902 | LDCPW14:4540 *P2, D+D, *P3, CR2+D (A ADDR), *NEXT, BUT(GO TO),PAGE+2, * J/LDCPW15 | <-- VV --> | 2471 1903 614 | 4540 | 0011 00000 | 00 00 000010 | 00 01 11100 | 000000001000 101 010 0100 0 100111001 |

E03

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|------------|---|---------------------------------------|---------------------------------------|------|----------------------------|---------|----------|--------------------|--------------|
| 1903 | LDCPW15:2471 ***** * FETCH ROUNDING *BIT *-----* *P2, D+FDST1,D(C)+ALU15, *NEXT, J/NROUND35 ***** | <-- | 4540 1902 613 | 2471 | 1111 00 00 00000 000000 | 11 01 | 011 100 | 0100 0 | 000000001000 |
| .CASE 1904 | 2 OF BLDCPW9 LDCPW16:4127 ***** * CLEAR WHAMI FLAG SET *PREVIOUSLY *-----* *P2, D+WHAMI AND NOT CNSTB, *P3, WHAMI+D (A ADDR), *NEXT, J/LDCPW17 ***** | <-- | 4106 1897 612 | 4127 | 0111 10 00 01110 010010 | 11 00 | 101 000 | 0100 0 | 000000001000 |
| 1905 | LDCPW17:4550 ***** * CHECK ADD-SUB *FOR *-----* *NEXT, CALL SETFZFN, * RETURN+BRA05 ***** | <-- VV | 2727 2323 768 VV -1 -1 -1 0 1 1 | 4550 | 0000 00 00 00000 000000 | 00 00 | 011 010 | 0000 0 | 000000001000 |

F03

| | | | | | | | |
|---------|--------------|--------------------|------------|----------|------|------|------------------------|
| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR ALU | BUSB | BUSA | EXTENSION |
| | | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | RIF COUT CLOCKS UPF |

```

.TOC = ROUTINE FOR NORMALIZATION AND ROUNDING  ##FLPT##"
:ROUTINE USED FOR NORMALIZATION AND ROUNDING
:OF DATA IN FAC(SF).
:ROUTINE WILL PERFORM LEFT OR RIGHT SHIFTS REQUIRED
:TO NORMALIZE FRACTION.
:CHECKS ARE ALSO MADE IF FRACTION IS ZERO
:IF THIS CONDITION EXISTS, NUMBER IS DECLARED AN
:AN EXACT ZERO.

:EXPONENT IS MODIFIED APPROPRIATELY DEPENDENT ON
:SHIFT DIRECTION
:UFLO AND OFLO CONDITIONS ARE MONITORED AND WILL
:BE READJUSTED IF REQUIRED

:ROUTINE WILL FLOW INTO ROUNDING PROCEDURE WHERE
:CHECK ON FT BIT OF FPS IS PERFORMED AND ROUNDING
:WILL TAKE PLACE IF REQUIRED.

:REASSEMBLING OF FRACTION, EXPONENT, AND SIGN ALSO
:TAKES PLACE IN THIS ROUTINE

:EXIT FROM THIS ROUTINE WILL LEAD TO FINISH ROUTINE
:WHERE THE FOLLOWING WILL TAKE PLACE:
:SET CONDITION CODES FZ AND FN
:SAVE OFLO AND UFLO CONDITIONS
:RESTORE ALL GENERAL REGISTERS OF A SIDE
:EXIT WILL THEN BE TO OFLOTRAP CHECK,
:OR UFLOTRAP CHECK, OR TO FETO1 DEPENDING
:ON CONDITIONS OF NORMALIZATION
    
```

- PREQUISITES-
1. UPON ENTRY INTO THIS POINT, FAC(SF) CONTAINS THE FRACTION.
 2. R(ER) CONTAINS THE PRESENT EXPONENT
 3. CONDITION REGISTER CR1 CONTAINS SIGN
 4. CONDITION REGISTER CR2 CONTAINS UFLO OR OFLO CONDITIONS UP TO THIS POINT

```

.CASE 1 OF BMOD3CLSS27
          F/MOD3CLSS27  <--  2637  1547  502
          F/LDCTW27    <--  4341  1864  608
1906     F/LDCTW31     <--  4532  1888  609
    
```

```

2362      0000  00 00  00 01  000 000  0000 0
          11001 000000 10111 001011010
    
```

```

*****
*EQUIVALENT STEP TARGETS - F -
*NROUND2
*-----*
*SELECT,   EMIT,
*NEXT,     BUTR(FD),
*          J/NROUND2
*
*          J/NROUND2  * -->  10 2132  1907  617
*          J/NROUND3  * -->  11 2133  1908  617
*****
    
```

G03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 616

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

H03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 617

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|-----------|--|---------------------------------------|-----------------------|---------------|---------------------------------|------------------------------|----------|-------------------|------|--------|
| CASE 1907 | 1 OF BNROUND NROUND2:2132 | F/NROUND | <-- | 2362 1906 615 | 2132 | | | 000000001000 | | |
| | *D - NROUND3 FETCH -2 FOR *COUNTER | | | | 1111 10 11 11 11 11 11 11 | 100000 11000 100111100 | 0000 0 | | | |
| | *P3, MD+-2 (BC), *NEXT, * J/NROUND4 | | --> | 2474 1909 617 | | | | | | |
| CASE 1908 | 2 OF BNROUND NROUND3:2133 | F/NROUND | <-- | 2362 1906 615 | 2133 | | | 000000001000 | | |
| | * FETCH -4 FOR *COUNTR | | | | 1111 10 11 11 11 11 11 11 | 100000 11000 100111100 | 0000 0 | | | |
| | *P3, MD+-4 (BC), *NEXT, * J/NROUND4 | | --> VV | | | | | | | |
| 1909 | NROUND4:2474 | F/NROUND2 F/NROUND3 | <-- <-- VV | 2132 1907 617 | 2474 | | | 000000001000 | | |
| | * LOAD COUNTER FOR WORD *SHIFTS | | | | 0000 11 10 00 00 000 000 0000 0 | 00000 000101 11000 100111101 | | | | |
| | *P2, COUNTER+MD, *NEXT, * J/NROUND4B | | --> VV | | | | | | | |
| 1910 | NROUND4B:2475 | F/NROUND4 | <-- VV | | 2475 | | | 000000001000 | | |
| | * D(C)=0 INITIALIZE EXP *DELTA | | | | 0011 00 00 00 00 110 010 0100 0 | 00000 010110 11000 101000000 | | | | |
| | *P2, D+D, D(C)+ALU00, *P3, R(T1)+D (A ADDR), *NEXT, * J/NROUND5 | | --> | 2500 1911 618 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|---|------------------------|----------|------|-----------------------|------|---------|---------|----------|-----------|-----|-------|
| | | OFST | ADDR | BOX | | | | | | PAGE | RIF | |
| 1911 | NROUND5:2500 | F/NROUND4B | <-- | 2475 | 1910 | 617 | | | | | | |
| | | F/NROUND12 | <-- | 2504 | 1918 | 620 | | | | | | |
| | ***** | | | | | | | | | | | |
| | * TEST FOR ALL * | | | | | | | | | | | |
| | *ZEROS * | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | *P2, * | | | | | | | | | | | |
| | | D+FAC3(SF) PLUS NOT 0 | * | | | | | | | | | |
| | | PLUS D(C),D(C)+COUT15, | * | | | | | | | | | |
| | | *NEXT, * | | | | | | | | | | |
| | | J/NROUND6 | * --> VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| 1912 | NROUND6:2501 | F/NROUND5 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | * FETCH 16 FOR WORD SHIFTS CORRECTION OF * | | | | | | | | | | | |
| | *EXPONENT TARGETS * | | | | | | | | | | | |
| | *- * | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | | MD+20 (BC) | * | | | | | | | | | |
| | | BUT(COUNT IS -1#D(C)), | * | | | | | | | | | |
| | | J/NROUND7 | * | | | | | | | | | |
| | | J/NROUND7 | * --> | 00 | 2140 | 1913 | 618 | | | | | |
| | | J/NROUND13 | * --> | 01 | 2141 | 1919 | 620 | | | | | |
| | | J/NROUND14 | * --> | 10 | 2142 | 1920 | 620 | | | | | |
| | | J/NROUND15 | * --> | 11 | 2143 | 1921 | 621 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE | 1 OF BNROUND6 | | | | | | | | | | | |
| 1913 | NROUND7:2140 | F/NROUND6 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *00 - NROUND7 01 - NROUND13 10 - NROUND14 * | | | | | | | | | | | |
| | *11 - NROUND15 POINT ENTERED WHERE COUNT * | | | | | | | | | | | |
| | *IS NOT SATISFIED BUT WORD IS STILL ZERO * | | | | | | | | | | | |
| | *- DO ANOTHER WORD SHIFT TAARGETS * | | | | | | | | | | | |
| | *- * | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | | D+FAC2(SF), | * | | | | | | | | | |
| | | FAC3(SF)+D' (A ADDR), | * | | | | | | | | | |
| | | BUTR(FD) | * | | | | | | | | | |
| | | J/NROUND8 | * | | | | | | | | | |
| | | J/NROUND8 | * --> | 10 | 2162 | 1914 | 619 | | | | | |
| | | J/NROUND9 | * --> | 11 | 2163 | 1915 | 619 | | | | | |
| | ***** | | | | | | | | | | | |

2500
 0101 11 01 10 11 000 110 0100 0
 00000 000000 11000 101000001

2501
 0000 10 00 00 00 010 000 0000 0
 00010 100000 01111 001100000

2140
 1010 00 01 00 11 000 000 0100 0
 00000 000010 10111 001110010

L03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 621

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|-------------------------------------|--|---------------------------------------|-----------------------|-------|---------|---------|-----------|-----------|--------------|--|
| | | | | | | | | RIF | COUT CLOCKS | |
| .CASE 1921 | 4 OF BNROUND6 | | | | | | | | | |
| | NROUND15:2143 | F/NROUND6 | <-- | 2501 | 1912 | 618 | | | | |
| | ***** | | | | 2143 | | | | 100000001000 | |
| | * POINT REACHED WHERE COUNT IS SATISFIED * | | | | 1011 | 10 00 | 10 11 | 000 000 | 0010 0 | |
| *AND WORD IS NO LONGER * | | | | 00111 | 000000 | 11000 | 101001001 | | | |
| *ZERO * | | | | | | | | | | |
| *-----* | | | | | | | | | | |
| *P2, SR+FAC3(SF) AND HIBYTE MASK, * | | | | | | | | | | |
| *NEXT, * | | | | | | | | | | |
| * J/NROUND23 * | | | | --> | 2511 | 1929 | 623 | | | |
| ***** | | | | | | | | | | |
| 1922 | NROUND16:2505 | F/NROUND14 | <-- | 2142 | 1920 | 620 | | | | |
| | ***** | | | | 2505 | | | | 000000001000 | |
| | * BRANCH ON SR<00> FOR MOD 0 - * | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | *NROUND17 * | | | | 00000 | 000000 | 00000 | 011111110 | | |
| *-----* | | | | | | | | | | |
| *NEXT, BUT(CASE), * | | | | | | | | | | |
| * J/NROUND17 * | | | | --> | 1110 | 2376 | 1923 | 621 | | |
| * J/NROUND18 * | | | | --> | 1111 | 2377 | 1924 | 621 | | |
| ***** | | | | | | | | | | |
| .CASE 1923 | 1 OF BNROUND16 | | | | | | | | | |
| | NROUND17:2376 | F/NROUND16 | <-- VV | | | | | | | |
| | ***** | | | | 2376 | | | | 000000001000 | |
| | *1 - NROUND18 SET CONDITION * | | | | 0011 | 00 11 | 10 11 | 100 010 | 0000 0 | |
| *CODES * | | | | 00000 | 000000 | 11100 | 000011010 | | | |
| *-----* | | | | | | | | | | |
| *NEXT, RETURN+FINISH2,BUT(GO TO), * | | | | | | | | | | |
| * PAGE+2, * | | | | | | | | | | |
| * J/FCCHEX2 * | | | | --> | 2032 | 2327 | 770 | | | |
| ***** | | | | | | | | | | |
| .CASE 1924 | 2 OF BNROUND16 | | | | | | | | | |
| | NROUND18:2377 | F/NROUND16 | <-- | 2505 | 1922 | 621 | | | | |
| | ***** | | | | 2377 | | | | 000000001000 | |
| | * MOD INSTRUCTION TARGETS - * | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| *BUT(FD) * | | | | 00000 | 000000 | 10011 | 010010010 | | | |
| *-----* | | | | | | | | | | |
| *NEXT, BUTR(BA00), * | | | | | | | | | | |
| * J/NROUND19 * | | | | --> | 10 | 2222 | 1925 | 622 | | |
| * J/NROUND20 * | | | | --> | 11 | 2223 | 1926 | 622 | | |
| ***** | | | | | | | | | | |

N03

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 623

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | EXTENSION | | | | | | | | | |
|---------|--|--|--------------------------|--------------|--------------|------------|-------------|------------|----------------|-------|-------------|--------|--|
| | | | | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT CLOCKS | | | | |
| 1929 | NROUND23:2511 | F/NROUND13 F/NROUND15 | <-- <-- | 2141 2143 | 1919 1921 | 620 621 | | | | | | | |
| | ***** * D(C)=0 IF SR WAS 0, ELSE *1 *-----* | | | | | | 2511 | | | | 00000001000 | | |
| | *P2, D+SR MINUS 1,D(C)+COUT15, * J/NROUND24 | | --> VV | | | | | 1101 | 11 00 | 00 00 | 000 110 | 0100 0 | |
| | ***** | | | | | | | 00000 | 000000 | 11000 | 101001010 | | |
| 1930 | NROUND24:2512 | F/NROUND23 | <-- VV | | | | | | | | | | |
| | ***** * INCREMENT EXP DELTA TARGETS - 0 - *NROUND26, 1 - *NROUND27 *-----* | | | | | | 2512 | | | | 00000001000 | | |
| | *P2, D+R(T1) PLUS 1 D(C)+D(C), *P3, R(T1)+D (A ADDR), *NEXT, BUTR(D(C)), * J/NROUND26 | | --> | 01 2201 | 1931 | 623 | | | | | | | |
| | ***** * J/NROUND27 | | --> | 11 2203 | 1932 | 624 | | | | | | | |
| .CASE | 1 OF BNROUND24 | | | | | | | | | | | | |
| 1931 | NROUND26:2201 | F/MULFDW F/MFRACF25 F/NROUND24 | <-- <-- <-- VV | 2273 2270 | 407 1478 | 458 480 | | | | | | | |
| | ***** * CHECK IF *NORMALIZED *-----* | | | | | | 2201 | | | | 10000001000 | | |
| | *P2, D+FAC3(SF),D(C)+ALU07, *NEXT, J/NROUND28 | | --> | 2513 | 1933 | 624 | | 1111 | 00 00 | 10 11 | 000 011 | 0100 0 | |
| | ***** | | | | | | | 00000 | 000000 | 11000 | 101001011 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|------------|---|--|-----------------------|--------------|--------------|------------|----------|--------------------|--------|
| .CASE 1935 | NROUND30:2113 | F/NROUND28 | <-- | 2513 | 1933 | 624 | | | |
| | * ***** | | | | | | | | |
| | * FETCH CONDITION | | | | | | | | |
| | * REGISTER | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, SR+CR2, | | | | | | | | |
| | *NEXT, J/NROUND31 | | --> VV | | | | | | |
| | * ***** | | | | | | | | |
| 1936 | NROUND31:2514 | F/NROUND30 | <-- VV | | | | | | |
| | * ***** | | | | | | | | |
| | * CORRECT EXPONENT BY EXP DELTA D(C)=1 | | | | | | | | |
| | * DUE TO NORMALIZATION BUT(SR<00) 0 - | | | | | | | | |
| | * NROUND32 | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, D+R(ER) PLUS R(T1),D(C)+D(C), | | | | | | | | |
| | *P3, R(ER)+D (A ADDR), | | | | | | | | |
| | *NEXT, BUT(CASE) | | | | | | | | |
| | * J/NROUND32 | | --> | 1110 | 2216 | 1937 | 625 | | |
| | * J/NROUND52 | | --> | 1111 | 2217 | 1957 | 632 | | |
| | * ***** | | | | | | | | |
| .CASE 1937 | NROUND32:2216 | F/NROUNDEND5 F/NROUNDEND6 F/NROUND31 | <-- VV | 4556 4557 | 1624 1625 | 528 528 | | | |
| | * ***** | | | | | | | | |
| | *1 - NROUND52 D(C)=1 FOR ROUNDING CHECK | | | | | | | | |
| | * FOR ROUNDING | | | | | | | | |
| | * BIT | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, D+D, D(C)+CIN, | | | | | | | | |
| | *NEXT, BUTR(GD03), | | | | | | | | |
| | * J/NROUND33 | | --> | 01 | 2455 | 1938 | 626 | | |
| | * J/NROUND34 | | --> | 11 | 2457 | 1939 | 626 | | |
| | * ***** | | | | | | | | |

2113
 1111 00 00 10 01 101 000 0010 0
 00000 000000 11000 101001100

2514
 1001 01 10 10 00 110 111 0100 0
 00000 000010 00000 010001110

2216
 1111 00 00 01 01 000 000 0100 0
 00000 000000 01010 100101101

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|--|-----------------------|----------------------|----------------------|-------------------|----------|---------------------------------|
| .CASE | 1 OF BNROUND32 | | | | | | | |
| 1938 | NROUND33:2455 | F/NROUND32 F/NROUND40 F/NROUND54 | <-- <-- <-- | 2216 2522 2553 | 1937 1945 1959 | 625 628 632 | | |
| | ***** | | | | | | | |
| | *TARGETS - 0 - NROUND33 1 - NROUND34 DO | | | | | | | 2455 000000001000 |
| | *CHECK ON | | | | | | | 1011 10 00 10 00 110 000 0100 0 |
| | *EXCEPTIONS | | | | | | | 00111 000000 11000 100000111 |
| | ----- | | | | | | | |
| | *P2, D+R(ER) AND HIBYTE MASK, | | | | | | | |
| | *NEXT, | | | | | | | |
| | * J/NROUND41 | | --> | 2407 | 1946 | 628 | | |
| .CASE | 2 OF BNROUND32 | | | | | | | |
| 1939 | NROUND34:2457 | F/NROUND32 F/NROUND40 F/NROUND54 | <-- <-- <-- | 2216 2522 2553 | 1937 1945 1959 | 625 628 632 | | |
| | ***** | | | | | | | |
| | * CHECK FT BIT TARGETS | | | | | | | 2457 000000001000 |
| | *- | | | | | | | 1011 10 00 10 00 110 111 0100 0 |
| | ----- | | | | | | | 00111 000000 01000 100000110 |
| | *P2, D+R(ER) AND HIBYTE MASK, | | | | | | | |
| | * D(C)+D(C), | | | | | | | |
| | *NEXT, BUTR(FPS05), | | | | | | | |
| | * J/NROUND35 | | --> | 110 2406 | 1940 | 626 | | |
| | * J/NROUND41 | | --> | 111 2407 | 1946 | 628 | | |
| .CASE | 1 OF BNROUND34 | | | | | | | |
| 1940 | NROUND35:2406 | F/LDCPW15 F/NROUND34 | <-- <-- VV | 2471 | 1903 | 614 | | |
| | ***** | | | | | | | |
| | *0 - ROUND - NROUND35 1 - TRUNCATE - | | | | | | | 2406 000000001000 |
| | *NROUND41 POINT REACHED WHERE ROUNDING | | | | | | | 0011 00 00 00 01 110 111 0100 0 |
| | *OCCURS TARGETS | | | | | | | 00000 010110 10111 000100010 |
| | *- | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+0, D(C)+D(C), | | | | | | | |
| | *P3, R(T2)+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | |
| | * J/NROUND38 | | --> | 10 2042 | 1943 | 627 | | |
| | * J/NROUND36 | | --> | 11 2043 | 1941 | 627 | | |
| | ***** | | | | | | | |

E04

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 627

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|--------------------------------------|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-----------|------|--------|
| | | | | | | | | RIF UPF | COUT | CLOCKS |
| .CASE | 2 OF BROUND35 | | | | | | | | | |
| 1941 | NROUND36:2043 | F/NROUND35 F/NROUND37 | <-- <-- | 2406 2515 | 1940 1942 | 626 627 | | | | |
| | ***** | | | | | | | | | |
| | *0 - F - NROUND38 1 - D - NROUND36 * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, | D+R(T2) PLUS FAC0(SF) PLUS 1, | * | | | | | | | |
| | * | D(C)+COUT15, | * | | | | | | | |
| | *P3, | FAC0(SF)+D (B ADDR), | * | | | | | | | |
| | *NEXT, | | * | | | | | | | |
| | * | J/NROUND37 | * --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 1942 | NROUND37:2515 | F/NROUND36 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, | D+FAC1(SF) PLUS R(T2) | * | | | | | | | |
| | * | PLUS D(C) D(C)+COUT15, | * | | | | | | | |
| | *P3, | FAC1(SF)+D (A ADDR), | * | | | | | | | |
| | *NEXT, | | * | | | | | | | |
| | * | J/NROUND38 | * --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BROUND35 | | | | | | | | | |
| 1943 | NROUND38:2042 | F/NROUND35 F/NROUND37 | <-- <-- VV | 2406 2520 | 1940 1944 | 626 628 | | | | |
| | ***** | | | | | | | | | |
| | *P2, | D+R(T2) PLUS D(C) PLUS | * | | | | | | | |
| | * | FAC2(SF) D(C)+COUT15, | * | | | | | | | |
| | *P3, | FAC2(SF)+D (B ADDR), | * | | | | | | | |
| | *NEXT, | | * | | | | | | | |
| | * | J/NROUND39 | * --> | | | | | | | |
| | ***** | | | | | | | | | |

```

2043
1100 01 01 11 01 110 110 0100 0
0000 011100 11000 101001101

```

```

2515
0100 01 11 11 11 110 110 0100 0
0000 010010 11000 000100010

```

```

2042
0100 00 01 11 01 110 110 0100 0
0000 001100 11000 101010000

```


| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS | |
|-----------------------------|-----------------------------------|---------------------------------------|-----------------------|--------|---------|---------|----------|--------------------|--------|--|
| .CASE 1947 | 1 OF BNROUND41 | | | | | | | | | |
| | NROUND42:2440 | F/NROUND41 | <-- | 2407 | 1946 | 628 | | | | |
| | ***** | | | | | | | | | |
| | *01 - NROUND43 10 - NROUND44 11 - | | | | | | | | | |
| | *IMPOSSIBLE OVERFLOW | | | | | | | | | |
| | *OCCURRED | | | | | | | | | |
| | ----- | | | | | | | | | |
| | * SET CR2.OFLO, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/NROUND46 | | --> | 2311 | 1951 | 630 | | | | |
| ***** | | | | | | | | | | |
| .CASE 1948 | 2 OF BNROUND41 | | | | | | | | | |
| | NROUND43:2441 | F/NROUND41 | <-- | 2407 | 1946 | 628 | | | | |
| | ***** | | | | | | | | | |
| | * UNDERFLOW | | | | | | | | | |
| | *OCCURRED | | | | | | | | | |
| | ----- | | | | | | | | | |
| | * SET CR2.UFLO, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/NROUND46 | | --> | 2311 | 1951 | 630 | | | | |
| | ***** | | | | | | | | | |
| .CASE 1949 | 3 OF BNROUND41 | | | | | | | | | |
| | NROUND44:2442 | F/NROUND41 | <-- | 2407 | 1946 | 628 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+R(ER), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/NROUND45 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| | 1950 | NROUND45:2524 | F/NROUND44 | <-- VV | | | | | | |
| | | ***** | | | | | | | | |
| | | * TARGETS - 0 - | | | | | | | | |
| *NROUND46 | | | | | | | | | | |
| ----- | | | | | | | | | | |
| *NEXT, BUTR(D(14-00) IS 0), | | | | | | | | | | |
| * J/NROUND46 | | | | | | | | | | |
| * J/NROUND46 | | | --> | 01 | 2311 | 1951 | 630 | | | |
| * J/NROUND47 | | | --> | 11 | 2313 | 1952 | 630 | | | |
| ***** | | | | | | | | | | |

```

2440      000000001000
      1110 11 11 10 01 101 000 0100 0
      00000 000010 11000 011001001

2441      000000001000
      1110 10 00 10 01 101 000 0100 0
      01100 000010 11000 011001001

2442      000000001000
      1111 00 00 10 00 110 000 0100 0
      00000 000000 11000 101010100

2524      000000001000
      0000 00 00 00 00 000 000 0000 0
      00000 000000 01101 011001001
    
```


| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|------|------------------|--------------------|----------------|--------------|-----------|--------|
| | | | | | BUS | SP | UBF | RIF | COUT | |
| 1954 | NROUND49:2530 ***** * ALIGN EXP AND * *SIGN * -----* *P2, D+D SWAP RIGHT 1, * *P3, R(T1)+D (B ADDR), * *NEXT, * * J/NROUND50 * ***** | <-- | 2525 1953 630 | 2530 | 1111 00 10 01 10 | 00101 011110 11000 | 110 000 0100 0 | 000000001000 | 101011001 | |
| 1955 | NROUND50:2531 ***** * REMOVE HIDDEN BIT AND FRAC * *OVERFLOW * -----* *P2, D+FAC3(SF) * - SEXPMASK, * *P3, FAC3(SF)+D (A ADDR), * *NEXT, * * J/NROUND51 * ***** | <-- VV | | 2531 | 0111 10 00 10 11 | 00110 000010 11000 | 000 000 0100 0 | 100000001000 | 101011100 | |
| 1956 | NROUND51:2534 ***** * MERGE * *FRAC, SIGN, EXP * -----* *P2, D+FAC3(SF) OR R(T1), * *P3, FAC3(SF)+D (A ADDR), * *NEXT, * * J/FINISH * ***** | <-- VV | | 2534 | 1110 01 10 10 11 | 00000 000010 11000 | 110 000 0100 0 | 100000001000 | 101100010 | |
| | | --> | 2542 1962 633 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---|--|-----------------------|---|---------|----------|-----------|------|--------|
| | | | | | | | RIF | COUT | CLOCKS |
| .CASE | 2 OF BROUND31 | | | | | | | | |
| 1957 | NROUND52:2217 | F/NROUNDEND5 F/NROUNDEND6 F/NROUND31 | <-- <-- <-- | 4556 1624 528 4557 1625 528 2514 1936 625 | | | | | |
| | ***** | | | | | | | | |
| | * ROUNDING OPERATION PERFORMED FOR MOD | | | | | | | | |
| | * INSTRUCTION CHECK ON SINGLE OR DOUBLE | | | | | | | | |
| | * TARGETS | | | | | | | | |
| | * - | | | | | | | | |
| | * ----- | | | | | | | | |
| | *P2, | D+FAC1(SF),D(C)+ALU15, | | | | | | | |
| | *NEXT, | BUTR(BA00), | | | | | | | |
| | | J/NROUND53 | * --> | 10 2552 1958 632 | | | | | |
| | | J/NROUND54 | * --> | 11 2553 1959 632 | | | | | |
| | ***** | | | | | | | | |
| .CASE | 1 OF BMOD5CLSS9 | | | | | | | | |
| 1958 | NROUND53:2552 | F/MOD5CLSS7B F/MOD5CLSS9 F/NROUND52 | <-- <-- <-- VV | 2232 1561 507 2137 1564 508 | | | | | |
| | ***** | | | | | | | | |
| | * 0 - NROUND53 1 - NROUND54 | | | | | | | | |
| | * ----- | | | | | | | | |
| | *NEXT, | CALL FD-TOGGLE, | | | | | | | |
| | | RETURN+NROUND55 | | | | | | | |
| | ***** | | | | | | | | |
| | | | | 1623 2219 732 | | | | | |
| | | | | VV | | | | | |
| | | | | 2535 1960 633 | | | | | |
| .CASE | 2 OF BMOD5CLSS9 | | | | | | | | |
| 1959 | NROUND54:2553 | F/MOD5CLSS7B F/MOD5CLSS9 F/NROUND52 | <-- <-- <-- | 2232 1561 507 2137 1564 508 2217 1957 632 | | | | | |
| | ***** | | | | | | | | |
| | * TARGETS- 0 - | | | | | | | | |
| | * NROUND33 | | | | | | | | |
| | * ----- | | | | | | | | |
| | *NEXT, | BUTR(G003), | | | | | | | |
| | | J/NROUND33 | * --> | 01 2455 1938 626 | | | | | |
| | | J/NROUND34 | * --> | 11 2457 1939 626 | | | | | |
| | ***** | | | | | | | | |

2217
 1111 00 00 11 11 1000 100 0100 0
 00000 000000 10011 101101010

2552
 0010 00 10 10 11 00000001000
 00000 000000 11100 110010011

2553
 0000 00 00 00 00 00000001000
 00000 000000 01010 100101101

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | | BUSB | | BUSA | | EXTENSION | |
|------------|---------------------------------|---------------------------------------|-----------------------|------|-------|--------|-------|-----------|--------|------|-----------|--------------|
| | | | | | BUS | SP | UBF | UPF | RIF | COUT | CLOCKS | |
| 1964 | FINISH3:3735 | F/FINISH2 | | 3735 | | | | | | | | 000000001000 |
| | * RESTORE GENERAL | | | | 0011 | 00 11 | 11 00 | 000 011 | 0000 0 | | | |
| | *REGISTERS | | | | 00000 | 000000 | 11100 | 101011111 | | | | |
| | *NEXT, BUT(GO TO), PAGE+3, | | | | | | | | | | | |
| | * RETURN+FINISH4, | | | | | | | | | | | |
| | * J/REGINITO1 | | --> | 3537 | 896 | 301 | | | | | | |
| 1965 | FINISH4:3740 | | | 3740 | | | | | | | | 000000001000 |
| | * TARGETS - SR<2:1> 00 - | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | | | |
| | *FINISH5 | | | | 00000 | 000000 | 00000 | 101101001 | | | | |
| | *NEXT, BUT(CASE), | | | | | | | | | | | |
| | * J/FINISH5 | | --> | 1001 | 3551 | 1966 | 634 | | | | | |
| | | J/FINISH6 | --> | 1011 | 3553 | 1967 | 634 | | | | | |
| | | J/FINISH7 | --> | 1101 | 3555 | 1968 | 635 | | | | | |
| | * UNDEFINED CASE | | | | | | | | | | | |
| .CASE 1966 | 1 OF BFINISH4 FINISH5:3551 | F/FINISH4 | <-- VV | 3551 | | | | | | | | 000000001000 |
| | *01 - FINISH6 10 - FINISH7 11 - | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | | | |
| | *IMPOSSIBLE | | | | 00000 | 000000 | 11100 | 000000011 | | | | |
| | *NEXT, BUT(GO TO), PAGE+0, | | | | | | | | | | | |
| | * J/BRA05 | | --> | 3 | 283 | 126 | | | | | | |
| .CASE 1967 | 2 OF BFINISH4 FINISH6:3553 | F/FINISH4 | <-- | 3740 | 1965 | 634 | | | | | | 000000001000 |
| | *NEXT, BUT(GO TO), PAGE+2, | | | | | | | | | | | |
| | * RETURN+OFL0TRAP, | | | | | | | | | | | |
| | * J/TPREAMBLE | | --> | 2544 | 1969 | 637 | | | | | | |

M04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 635

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|-------------------------------|--|--------------------------|-----------------|------------|-------------|-----------|------|--------|
| | | | | | | | RIF | COUT | |
| .CASE 1968 | 3 OF BFINISH4 FINISH7:3555 | | | | | | | | |
| | F/FINISH4 | <-- | 3740 1965 634 | | | | | | |
| | ***** | | | | | | | | |
| | *NEXT, BUT(GO TO) PAGE+2, | | | | | | | | |
| | * RETURN+UFL0TRAP, | | | | | | | | |
| | * J/TPREAMBLE | --> | 2544 1969 637 | | | | | | |
| | ***** | | | | | | | | |

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3555
0100 00 10 11 00 101 010 0000 0
00000 000000 11100 101100100
    
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N04

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 636

BOX
NO. TAG:ADDRESS

SOURCE/DESTINATION
OFST ADDR BOX PAGE

MICROFICHE
COORD CARD

ADDR ALU
BUS

BUSB
SP

BUSA
UBF

EXTENSION
RIF COUT CLOCKS
UPF

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-------------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|
|---------|-------------|--|--------------------------|-----------------|------------|-------------|-------------------------------------|

..TOC = TRAPS ##FLPT##"
 ..I. FLOATING POINT EXCEPTIONS -
 ..=====

..1. TRAP VECTOR 244

..2. TYPES OF ERROR (BY ORDER OF FEC ASSIGNMENT)

..2 OPCODE ERROR CLASS C

..4 DIVIDE BY ZERO CLASS B

OVERFLOW CLASS A

..U 12 UNDERFLOW CLASS A

..UV 14 UNDEFINED VARIABLE CLASS A

..16 MICROBREAK TRAP CLASS D

..3. ACTIONS ON THE OCCURRENCE OF THE EXCEPTION CONDITION

..CLASS A
 ..=====

..ON EXCEPTIONS DUE TO OVERFLOW AND UNDERFLOW, STORING OF A
 EXACT ZERO WILL OCCUR IN THE SPECIFIED ACCUMULATOR (IR<7:6>).

..IF THE CORRESPONDING INTERRUPT IS DISABLED (FIV,FIU = 0) AS
 SET IN THE FLOATING POINT STATUS REGISTER (FPS).

..IN THE CASE OF AN UNDEFINED VARIABLE, IF THE FIUV BIT IS
 DISABLED, PASSAGE OF CONTROL IS RETURNED TO THE INSTRUCTION
 WHICH FETCHED THE UNDEFINED VARIABLE AND WILL BE USED AS AN
 OPERAND IN THAT INSTRUCTION.

..ON THE OCCURANCE OF A CONVERSION ERROR IN THE STCT
 INSTRUCTION AN EXACT ZERO WILL BE STORED IN THE SPECIFIED
 DESTINATION (IR<5:0>) IF THE FIC BIT IS DISABLED (FIC=0).

..IF THE CORRESPONDING INTERRUPTS ARE ENABLED (1) NO ACTION
 IS TAKEN IN THE ACCUMULATORS AS ABOVE AND THE CALCULATED
 ANSWERS WILL BE LEFT INTACT. THE ADDRESS OF THE OFFENDING
 INSTRUCTION IS STORED IN THE FLOATING EXCEPTION ADDRESS
 (FEA) AND THE CORRESPONDING EXCEPTION CODE IS STORED IN
 THE FLOATING EXCEPTION CODE REGISTER (FEC). A TEST IS THEN
 MADE ON THE FLOATING INTERRUPT DISABLE BIT OF THE FPS
 (FPS<14>).

..IF FID IS DISABLED (1) PASSAGE OF CONTROL IS GIVEN TO
 THE NEXT INSTRUCTION. IF FID IS ENABLED (0), A TRAP TO
 VECTOR 244 OCCURS AND CONTROL PASSES TO THE TRAP FLOWS.

..CLASS B,C,D
 ..=====

..FOR ALL EXCEPTIONS IN THESE CLASSES, UPDATE OF THE FEA
 AND FEC OCCURS. THE FEA IS LOADED WITH THE ADDRESS OF
 THE OFFENDING INSTRUCTION AND THE CORRESPONDING FEC
 CODE IS LOADED IN THE FLOATING EXCEPTION CODE REGISTER.
 A TEST IS MADE ON FID (INTERRUPT DIABLE). IF FID = 1
 THEN THE INTERRUPT IS DIABLED AND CONTROL IS GIVEN TO
 THE NEXT INSTRUCTION. IF FID = 0 THEN A TRAP TO VECTOR
 244 OCCURS.

..ALL EXCEPTIONS WHICH CAUSE AN UPDATE OF THE FEA AND
 FEC TO OCCUR WILL ALSO SET THE FER BIT IN THE FPS (FPS<15>).

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|----------------------|---------------------------------------|-----------------------|--------------|---------|----------|-----------|------|--------|
| | | | | | | | RIF | COUT | CLOCKS |
| ;; | | F/HFPTRAP6 <-- | 4220 1313 426 | | | | | | |
| * | SUBROUTINE TPREAMBLE | | | | | | | | |
| | | RETURN/HFPTRAP7 * --> | 4222 1314 426 | | | | | | |

1969 TPREAMBLE:2544

 * TRAPS PREAMBLE LOADS SR WITH *
 *FPSHI,FEC. SETS R(TRAPSEN) TO FPS.FID *
 *SELECTS EMIT THEN JUMPS TO ONE OF THE *
 *SEVEN TRAP TYPES FOR TRAP SPECIFIC *
 *PROCESSING NOTE - HFPP REQUIRES SR TO BE *
 *INTACT SELECT *
 *EMIT *

2544 000000001000
 1111 00 00 11 00 011 000 0100 0
 00000 000000 11010 101100110

 *P2, D+FPSHIFEC, *
 *NEXT, BUT(CLEAR FLAGS), *
 * J/TRPE2 * --> 2546 1970 638

1970 TRPE2:2546 F/TPREAMBLE <-- 2544 1969 637

2546 000000001000
 1111 00 00 01 00 000 100 0100 0
 00000 000000 11111 000000000

* SHIFT FID INTO D(C) D(C) GETS *
 *FID *

*P2, D+D LEFT 1,D(C)+ALU15, *
 *NEXT, *
 * BUT(RETURN) * --> VV

 *CASE 2 OF BHFPTRAP7
 1971 OPCODERR:4541 F/HFPTRAP7 <-- 4222 1314 426

4541 000000001000
 0000 10 00 00 00 000 010 0000 0
 00010 100000 10100 110000010

* TARGETS *

*P3, MD+FEC2, *
 *NEXT, BUTR(HOTWARM), *
 * J/OPERR2 * --> 10 4602 1972 639

* J/OPERRHOT * --> 11 4603 1973 639

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|------------|---|---------------------------------------|-----------------------|------|----------------------------|----------------|----------------------|------------------------|--------|
| .CASE 1972 | OPERR2:4602 F/OPCODERR ***** *F - OPERR2 H - OPERRHOT *-----* *P2, D+PC (A),D(C)+D(C), *P3, FPA+D (B ADDR), *NEXT, * J/STATUPDT1 ***** | <-- | 4541 1971 638 | 4602 | 1111 00 10 00000 011100 | 10 01 11000 | 111 111 101001111 | 000000001000 0100 0 | |
| .CASE 1973 | OPERRHOT:4603 F/OPCODERR ***** * INSERT FER IN *FPS<15> *-----* *P2, D+FPSHIFEC OR CNST100000, * D(C)+D(C), *P3, FPSHIFEC+D (A ADDR), *NEXT, * J/STATUPDT2 ***** | <-- | 4541 1971 638 | 4603 | 1110 10 00 00101 010010 | 11 00 11000 | 011 111 110000001 | 000000001000 0100 0 | |
| .CASE 1974 | ZERODIV:4542 F/HFPPTRAP7 ***** *P3, MD+FEC4, *NEXT, * J/STATUPDT1 ***** | <-- | 4222 1314 426 | 4542 | 0000 10 00 00010 100000 | 00 00 11000 | 000 100 101001111 | 000000001000 0000 0 | |
| .CASE 1975 | CONVTRAP:4543 F/HFPPTRAP7 ***** *P3, MD+FEC6, *NEXT, * J/CTRAP2 ***** | <-- | 4222 1314 426 | 4543 | 0000 10 00 00010 100000 | 00 00 11000 | 000 110 101101001 | 000000001000 0000 0 | |
| | | --> | 4517 2001 647 | | | | | | |
| | | --> | 4601 2002 647 | | | | | | |
| | | --> | 4517 2001 647 | | | | | | |
| | | --> | 4551 1976 640 | | | | | | |

F05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 640

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|--------------|--------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COU | |
| 1976 | CTRAP2:4551 | F/CONVTRAP F/VTRAP6 | <-- <-- | 4543 4570 | 1975 1982 | 639 641 | | | | |
| | ***** * LINE UP FIC OR FIV ON *D7 *-----* *P2, D+D RIGHT 2,D(C)+D(C), *NEXT, * J/VTRAPEND ***** | | | 4551 | | | | 00000000 | 1000 | |
| | | | | 1111 | 00 00 | 01 11 | 000 111 | 0100 | 0 | |
| | | | | 00000 | 000000 | 11000 | 101111110 | | | |
| | | | --> | 4576 | 1988 | 643 | | | | |
| 1977 | OFLOTRAP:4560 | | | | | | | | | |
| | ***** *SELECT, FPS(READ), *P3, EMITCON+FPS, *NEXT, * J/VTRAP2 ***** | | | 4560 | | | | 00000000 | 1000 | |
| | | | | 0000 | 10 00 | 11 01 | 000 000 | 0000 | 0 | |
| | | | | 11001 | 100000 | 11000 | 101110001 | | | |
| | | | --> VV | | | | | | | |
| 1978 | VTRAP2:4561 | F/OFLOTRAP | <-- VV | | | | | | | |
| | ***** * SET V *BIT *-----* *P2, SR+2, *NEXT, * J/VTRAP3 ***** | | | 4561 | | | | 00000000 | 1000 | |
| | | | | 1010 | 11 11 | 00 00 | 000 000 | 0010 | 0 | |
| | | | | 00000 | 000000 | 11000 | 101110100 | | | |
| | | | --> VV | | | | | | | |
| 1979 | VTRAP3:4564 | F/VTRAP2 | <-- VV | | | | | | | |
| | ***** *P2, D+SR OR EMITCON,D(C)+D(C), *NEXT, * J/VTRAP4 ***** | | | 4564 | | | | 00000000 | 1000 | |
| | | | | 1110 | 10 00 | 00 00 | 000 111 | 0100 | 0 | |
| | | | | 01001 | 000000 | 11000 | 101110110 | | | |
| | | | --> | 4566 | 1980 | 641 | | | | |

H05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 642

| BOX NO. | TAG: ADDRESS | F/ | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | EXTENSION | | | |
|-----------|----------------------------------|-------------|---------------------------------------|-----------------------|------|---------|-----------|----------|-----------|--------------|
| | | | | | | | BUS SP | BUSA UPF | RIF | COUT CLOCKS |
| 1984 | UTRAP2:4571 | F/UFLOTRAP | <-- | 4545 1983 641 | 4571 | | | | | 000000001000 |
| | * LINE UP FIU ON | | | | | 1111 | 00 00 | 01 01 | 000 111 | 0100 0 |
| | *D7 | | | | | 01000 | 000000 | 11000 | 101111110 | |
| | *P2, D+D RIGHT 4,D(C)+D(C), | | | | | | | | | |
| | *NEXT, J/TRAPEND | | --> | 4576 1988 643 | | | | | | |
| CASE 1985 | 7 OF BHFPTRAP7 NZEROTRAP:4546 | F/HFPTRAP7 | <-- | 4222 1314 426 | 4546 | | | | | 000000001000 |
| | *P3, MD+FEC12, | | | | | 0000 | 10 00 | 00 00 | 001 100 | 0000 0 |
| | *NEXT, J/NZTRAP2 | | --> | VV | | 00010 | 100000 | 11000 | 101111100 | |
| 1986 | NZTRAP2:4574 | F/NZEROTRAP | <-- | VV | 4574 | | | | | 000000001000 |
| | * LINE UP FIUV ON | | | | | 1111 | 00 00 | 01 10 | 000 111 | 0100 0 |
| | *D7 | | | | | 01000 | 000000 | 11000 | 101111110 | |
| | *P2, D+D RIGHT 5,D(C)+D(C), | | | | | | | | | |
| | *NEXT, J/TRAPEND | | --> | 4576 1988 643 | | | | | | |
| CASE 1987 | 8 OF BHFPTRAP7 MAINTTRAP:4547 | F/HFPTRAP7 | <-- | 4222 1314 426 | 4547 | | | | | 000000001000 |
| | * GO FINISH IN HOT | | | | | 0000 | 10 00 | 00 00 | 001 110 | 0000 0 |
| | *OPCODE | | | | | 00010 | 100000 | 11000 | 110000011 | |
| | *P3, MD+FEC14, | | | | | | | | | |
| | *NEXT, J/OPERRHOT | | --> | 4603 1973 639 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|------------|---|--------------------|--------|------|-----------------------|--------------|---------|----------|-----------|-----|------|--------|
| | | OFST | ADDR | BOX | | | | | PAGE | RIF | COUT | CLOCKS |
| 1988 | TRAPEND:4576 | F/CTRAP2 | <-- | 4551 | 1976 | 640 | | | | | | |
| | | F/UTRAP2 | <-- | 4571 | 1984 | 642 | | | | | | |
| | | F/NZTRAP2 | <-- | 4574 | 1986 | 642 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *ERROR FLOWS GET FEC CODE BRANCH ON | | | | | | | | | | | |
| | *COND-ENABLED (007) TARGETS - | | | | | | | | | | | |
| | *BUT(007) | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | *P2, SR+MD, | | | | | | | | | | | |
| | *NEXT, BUT(FNORM), | | | | | | | | | | | |
| | * J/DISAB | | | | | | | | | | | |
| | | J/DISAB | --> | 101 | 4515 | 1989 | 643 | | | | | |
| | | J/STATUPDT1 | --> | 111 | 4517 | 2001 | 647 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 1989 | 1 OF BTRAPEND | | | | | | | | | | | |
| | DISAB:4515 | F/TRAPEND | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *0 - DISAB 1 - STATUPDT1 FOR COND CODES | | | | | | | | | | | |
| | *SR<2:1> | | | | | | | | | | | |
| | *00 V | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | *P3, MD+6 (BC), | | | | | | | | | | | |
| | *NEXT, BUT(CASE), | | | | | | | | | | | |
| | * J/VDIS | | | | | | | | | | | |
| | | J/VDIS | --> | 1001 | 4611 | 1990 | 643 | | | | | |
| | | J/UDIS | --> | 1011 | 4613 | 1991 | 644 | | | | | |
| | | J/UVDIS | --> | 1101 | 4615 | 1997 | 646 | | | | | |
| | | J/CDIS | --> | 1111 | 4617 | 2000 | 646 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 1990 | 1 OF BDISAB | | | | | | | | | | | |
| | VDIS:4611 | F/DISAB | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *01 C TARGETS | | | | | | | | | | | |
| | *- | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | *P2, D+MD, | | | | | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | | | | | |
| | * J/WARMDIS | | | | | | | | | | | |
| | | J/WARMDIS | --> | 10 | 4446 | 1992 | 644 | | | | | |
| | | J/HOTDIS | --> | 11 | 4447 | 1996 | 645 | | | | | |
| | ***** | | | | | | | | | | | |

4576
 1010 11 10 00 00 000 000 0010 0
 00000 000000 01000 101001101

4515
 0000 10 00 00 00 000 110 0000 0
 00010 100000 00000 110001001

4611
 1010 11 10 00 00 000 000 0100 0
 00000 000000 10100 100100110

J05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 644

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|------------|-------------------------------------|--------------------|------------|------|------|------|------|-----------|------|
| | | | | | | | | OFST | ADDR |
| .CASE 1991 | UDIS:4613 | F/DISAB | <-- | 4515 | 1989 | 643 | | | |
| | ***** | | | | | | | | |
| | *F - WARMDIS D - HOTDIS TARGETS F - | | | | | | | | |
| | *WARMDIS | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+CNST4, | | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | | |
| | * J/WARMDIS | | | | | | | | |
| | * J/WARMDIS | | --> | 10 | 4446 | 1992 | 644 | | |
| | * J/HOTDIS | | --> | 11 | 4447 | 1996 | 645 | | |
| | ***** | | | | | | | | |
| .CASE 1992 | WARMDIS:4446 | F/VDIS | <-- | 4611 | 1990 | 643 | | | |
| | | F/UDIS | <-- VV | | | | | | |
| | ***** | | | | | | | | |
| | *D - HOTDIS | | | | | | | | |
| | ----- | | | | | | | | |
| | *SELECT, FPSCC(DBUF),FPSCC+DATA, | | | | | | | | |
| | *NEXT, J/WARMDIS2 | | --> VV | | | | | | |
| | ***** | | | | | | | | |
| .CASE 1993 | WARMDIS2:4600 | F/WARMDIS | <-- | | | | | | |
| | | | VV | | | | | | |
| | ***** | | | | | | | | |
| | * TARGETS - 0 - | | | | | | | | |
| | *WARMDIS3 | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+0, | | | | | | | | |
| | *P3, FAC32(SF)+D (A ADDR), | | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | | |
| | * J/WARMDIS3 | | --> | 10 | 4406 | 1994 | 645 | | |
| | * J/WARMDIS4 | | --> | 11 | 4407 | 1995 | 645 | | |
| | ***** | | | | | | | | |

```

4613
1010 10 00 00 00 00000001000
01100 000000 10100 100100110

```

```

4446
0000 00 00 00 00 011000001000
00000 000000 11000 110000000

```

```

4600
0011 00 00 00 11 10000001000
00000 000110 10111 100000110

```

K05

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 645

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------------|-----------------------------|--|--------------------------|--------------|--------------|------------|-------------|--------------|--------------------|--|
| | | | | | | | | RIF | COUT CLOCKS UPF | |
| .CASE 1994 | 1 OF BWARMDIS2 | | | | | | | | | |
| | WARMDIS3:4406 | F/WARMDIS2 | <-- | 4600 | 1993 | 644 | | | | |
| | ***** | | | | | | | 4406 | 000000001000 | |
| | *1 - WARMDIS4 GO FETCH NEXT | | | | | | | 000000000000 | 0 | |
| | *INSTRUCTION | | | | | | | 00000 | 00000000 | |
| | ----- | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FETO1F | | | | | | | | | |
| | * J/FETO1F | | --> | 10 | 4722 | 1316 | 427 | | | |
| | * J/SERO2F | | --> | 11 | 4723 | 1317 | 428 | | | |
| ***** | | | | | | | | | | |
| .CASE 1995 | 2 OF BWARMDIS2 | | | | | | | | | |
| | WARMDIS4:4407 | F/WARMDIS2 | <-- | 4600 | 1993 | 644 | | | | |
| | ***** | | | | | | | 4407 | 100000001000 | |
| | * GO FETCH NEXT | | | | | | | 001100000100 | 0 | |
| | *INSTRUCTION | | | | | | | 00000 | 010110 | |
| | ----- | | | | | | | | | |
| | *P2, D+0 | | | | | | | | | |
| | *P3, FAC10(SF)+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FETO1F | | --> | 10 | 4722 | 1316 | 427 | | | |
| * J/SERO2F | | --> | 11 | 4723 | 1317 | 428 | | | | |
| ***** | | | | | | | | | | |
| .CASE 1996 | 2 OF BVDIS | | | | | | | | | |
| | HOTDIS:4447 | F/VDIS F/UDIS | <-- <-- | 4611 4613 | 1990 1991 | 643 644 | | | | |
| | ***** | | | | | | | 4447 | 011000001000 | |
| | * GO FETCH NEXT | | | | | | | 000000000000 | 0 | |
| | *INSTRUCTION | | | | | | | 00000 | 00000000 | |
| | ----- | | | | | | | | | |
| | *SELECT, FPSCC(DBUF), | | | | | | | | | |
| | *P3, FPSCC+DATA, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/FETO1F | | --> | 10 | 4722 | 1316 | 427 | | | |
| * J/SERO2F | | --> | 11 | 4723 | 1317 | 428 | | | | |
| ***** | | | | | | | | | | |

L05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 646

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------------|-----------------------|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------------|
| .CASE 1997 | 3 OF BDISAB | | | | | | | |
| | UVDIS:4615 | F/DISAB | <-- | 4515 | 1989 | 643 | | |
| | ***** | | | 4615 | | | | 000000001000 |
| | * TARGETS - 0 - | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | *UVIDS2 | | | | | | | 00000 000000 10100 110100010 |
| | *NEXT, BUTR(HOTWARM), | | | | | | | |
| | J/UVDIS2 | | | | | | | |
| | J/UVDIS2 | --> | 10 | 4642 | 1998 | 646 | | |
| | J/UVDIS3 | --> | 11 | 4643 | 1999 | 646 | | |
| ***** | | | | | | | | |
| .CASE 1998 | 1 OF BUVDIS | | | | | | | |
| | UVDIS2:4642 | F/UVDIS | <-- VV | | | | | |
| | ***** | | | 4642 | | | | 000000001000 |
| | *1 - UVIDS3 | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | *NEXT, BUT(RTURN) | | | | | | | 00000 000000 11111 000000000 |
| ***** | | | | | | | | |
| .CASE 1999 | 2 OF BUVDIS | | | | | | | |
| | UVDIS3:4643 | F/UVDIS | <-- | 4615 | 1997 | 646 | | |
| | ***** | | | 4643 | | | | 000000001000 |
| | * FETCH NEXT | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | *INSTRUCTIONH | | | | | | | 00000 000000 10000 111010010 |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | J/FETO1F | | | | | | | |
| | J/FETO1F | --> | 10 | 4722 | 1316 | 427 | | |
| | J/SERO2F | --> | 11 | 4723 | 1317 | 428 | | |
| ***** | | | | | | | | |
| .CASE 2000 | 4 OF BDISAB | | | | | | | |
| | CDIS:4617 | F/DISAB | <-- | 4515 | 1989 | 643 | | |
| | ***** | | | 4617 | | | | 000000001000 |
| | * GO FOR NEXT | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | *INSTRUCTION | | | | | | | 00000 000000 10000 111010010 |
| | *NEXT, BUTR(SERVICE), | | | | | | | |
| | J/FETO1F | | | | | | | |
| | J/FETO1F | --> | 10 | 4722 | 1316 | 427 | | |
| | J/SERO2F | --> | 11 | 4723 | 1317 | 428 | | |
| ***** | | | | | | | | |

M05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 647

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|-----------------------------------|---------------------------------------|-----------------------|---------------|---------|---------|----------|-------------------|------|--------|
| 2001 | STATUPDT1:4517 | F/TRAPEND | <-- | 4576 1988 643 | | | | | | |
| | * UPDATE | | | | | | | | | |
| | * FER | | | | | | | | | |
| | * P2, D+FPSHIFEC OR CNST100000, | | | | | | | | | |
| | * D(C)+D(C) | | | | | | | | | |
| | * P3, FPSHIFEC+D (A ADDR), | | | | | | | | | |
| | * NEXT, | | | | | | | | | |
| | * J/STATUPDT2 | | --> VV | | | | | | | |
| 2002 | STATUPDT2:4601 | F/OPERRHOT | <-- | 4603 1973 639 | | | | | | |
| | * CLEAR | | | | | | | | | |
| | * FEC | | | | | | | | | |
| | * P2, D+FPSHIFEC AND HIBYTE MASK, | | | | | | | | | |
| | * D(C)+D(C) | | | | | | | | | |
| | * P3, FPSHIFEC+D (A ADDR), | | | | | | | | | |
| | * NEXT, | | | | | | | | | |
| | * J/STATUPDT3 | | --> VV | | | | | | | |
| 2003 | STATUPDT3:4604 | F/STATUPDT2 | <-- VV | | | | | | | |
| | * UPDATE | | | | | | | | | |
| | * FEC | | | | | | | | | |
| | * P2, D+FPSHIFEC OR MD D(C)+D(C), | | | | | | | | | |
| | * P3, FPSHIFEC+D (A ADDR), | | | | | | | | | |
| | * NEXT, | | | | | | | | | |
| | * J/STATUPDT4 | | --> | 4605 2004 648 | | | | | | |

N05

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 648

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|--|--|--------------------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 2004 | STATUPDT4:4605 ***** * FETCH FLOATING POINT *ADDRESS *-----* *P2, D+FPA,SR+FPA,D(C)+D(C), *NEXT, * J/STATUPDT5 ***** | <-- | 4604 2003 647 | 4605 | | | | 00000000 | 1000 | |
| | | | | | 1010 | 01 10 | 00 00 | 111 111 | 0110 | 0 |
| | | | | | 00000 | 000000 | 11000 | 11000 | 1000 | |
| 2005 | STATUPDT5:4610 ***** * BACK UP TO ADDRESS OF EXCEPTION UPDATE *THE FEA TARGETS - 0 - *FLTPTRAP *-----* *P2, D+SR MINUS 2(D) D(C)+D(C), *P3, R(FEA)+D (B ADDR), *NEXT, BUTR(D(C)), * J/FLTPTRAP * J/FLTPTRAP * J/NOTRAP ***** | <-- VV | | 4610 | | | | 00000000 | 1000 | |
| | | | | | 1101 | 10 10 | 00 00 | 011 111 | 0100 | 0 |
| | | | | | 00011 | 011100 | 10011 | 00001 | 0101 | |
| | | | 01 4025 2006 648 11 4027 2008 649 | | | | | | | |
| CASE 2006 | 1 OF BSTATUPDT5 FLTPTRAP:4025 ***** *1 - NOTRAP FLOATING POINT *TRAP *-----* *P3, MD+244 (BC), *NEXT, * J/FLTPTRAP2 ***** | <-- VV | | 4025 | | | | 00000000 | 1000 | |
| | | | | | 0000 | 10 00 | 00 10 | 100 100 | 0000 | 0 |
| | | | | | 00010 | 100000 | 11000 | 11000 | 1010 | |
| 2007 | FLTPTRAP2:4612 ***** * GO TO *TRAPS *-----* *NEXT, BUT(GO TO),PAGE+0, * J/TRPOO ***** | <-- VV | | 4612 | | | | 00000000 | 1000 | |
| | | | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 | 0 |
| | | | | | 00000 | 000000 | 11100 | 00101 | 0111 | |
| | | | 127 357 151 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|----------------------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .TOC | = I/O SUBROUTINES | ##FLPT##" | | | | | |
| .TOC | = FETCH STORE INTEGER SUBROUTINE | ##FLPT##" | | | | | |
| | F/LDCT3 | <-- | 1251 1278 414 | | | | |
| | F/LDFPS | <-- | 505 1346 439 | | | | |
| | F/LDEXP3 | <-- | 3715 1838 595 | | | | |
| | F/LDCTW8 | <-- | 4441 1864 602 | | | | |
| | F/EIS01 | <-- | 42 2331 771 | | | | |
| ***** | | | | | | | |
| * | SUBROUTINE FETCHINT | * | | | | | |
| | RETURN/LDCT4 | * --> | 424 1279 415 | | | | |
| | RETURN/LDFPS2 | * --> | 472 1347 439 | | | | |
| | RETURN/LDEXP4 | * --> | 3722 1839 595 | | | | |
| | RETURN/LDCTW9 | * --> | 4504 1865 602 | | | | |
| | RETURN/EIS02 | * --> | 1627 2332 771 | | | | |
| ***** | | | | | | | |

2009 FETCHINT:2550

2550 000000001011
 1010 00 00 10 10 000 000 0111 0
 00000 000000 00101 000101000

```

*****
*SUBROUTINE PERFORMS A FETCH OR STORE OF *
*A SINGLE OPERAND FROM MEMORY OR GENERAL *
*REGISTER DEPENDENT ON THE DESTINATION *
*MODE FETCH OPERATION PLACES THE OPERAND *
*IN R(DST) = R(T2) STORE OPERATION *
*PERFORMS A STORE INTO MEMORY FROM R(T3) *
*ENTRY POINT TO PERFORM A FETCH OPERATION *
*D(C)=0 FOR FETCH INDICATOR TARGETS *
*- *
*-----*
*P1, BA+R(DF), CURRENT MODE *
*P2, SR+R(DF) (B), D+R(DF) (B), *
* D(C)+CIN, *
*NEXT, BUTR(DM), *
* J/FDMOINT *
* *
* J/FDM1INT *
* J/FDM2INT *
* J/FDM3INT *
* J/FDM4INT *
* J/FDM5INT *
* J/FDM6INT *
* J/FDM7INT *
*****

```

| | | | | |
|-----|------|------|------|-----|
| --- | 1000 | 2050 | 2011 | 651 |
| --- | 1001 | 2051 | 2012 | 652 |
| --- | 1010 | 2052 | 2013 | 652 |
| --- | 1011 | 2053 | 2014 | 652 |
| --- | 1100 | 2054 | 2015 | 653 |
| --- | 1101 | 2055 | 2016 | 653 |
| --- | 1110 | 2056 | 2017 | 653 |
| --- | 1111 | 2057 | 2018 | 654 |

E06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 651

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|---------------------|----------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | COUT |
| | | F/STEXP5 | <-- | 1622 | 1756 | 570 | | | | | | |
| | | F/STCTW39 | <-- | 4036 | 1795 | 582 | | | | | | |
| | | F/STCTW44 | <-- | 4046 | 1800 | 583 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE STOREINT | | * | | | | | | | | | |
| | | RETURN/BRA05 | * --> | 3 | 283 | 126 | | | | | | |
| | | RETURN/BRA05 | * --> | 3 | 283 | 126 | | | | | | |
| | | RETURN/STCTW46 | * --> | 4442 | 1802 | 584 | | | | | | |
| ***** | | | | | | | | | | | | |

2010 STOREINT:2551

```

*****
*FDMOINT - FDM7INT
*-----*
*----- ENTRY POINT TO
*PERFORM A STORE OPERATION TO MEMORY OR
*GENERAL REGISTER USED TO SATISFY STCT
*HOT CODE FOR A DOUBLE FLPGO IN SHORT AND
*LONG INTEGER D(C)=1 FOR STORE INDICATOR
*TARGETS - STDMOINT -
*STDM7INT
*-----*
*          FLPGO
*P1,      BA+R(DF), CURRENT MODE,
*P2,      SR+R(DF) (A), D+R(DF) (A),
*          D(C)+CIN,
*NEXT,    BUTR(DM),
*          J/STDMOINT
*          J/STDMOINT  --> 1000 2010 2019 654
*          J/STDM1INT --> 1001 2011 2020 654
*          J/STDM2INT --> 1010 2012 2021 655
*          J/STDM3INT --> 1011 2013 2022 655
*          J/STDM4INT --> 1100 2014 2023 655
*          J/STDM5INT --> 1101 2015 2024 656
*          J/STDM6INT --> 1110 2016 2025 656
*          J/STDM7INT --> 1111 2017 2026 656
*****

```

```

2551 1111 00 00 10 10 000 000 0111 0
      11100 000000 00101 000001000

```

.CASE 2011

```

1 OF BFETCHINT
FDMOINT:2050          F/FETCHINT  <--
*****
*-----*
*----- DESTINATION MODE
*0 FETCH OPERATION SR GETS DATA FOR 9SH
*INSTRUCTION
*-----*
*P2,      D+R(DF) (A), SR+R(DF) (A),
*P3,      R(DST)+D (B ADDR),
*NEXT,
*          BUT(RETURN)  --> VV
*****

```

2550 2009 650

```

2050 1111 00 11 10 10 110 000 0110 0
      00000 011110 11111 000000000

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-------------------|---------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF UPF | COUT | |
| .CASE 2012 | 2 OF BFETCHINT | | | | | | | | | |
| | FDM1INT:2051 | F/FETCHINT | <-- | 2550 | 2009 | 650 | | | | |
| | ***** | | | | | | | | | |
| | ----- DESTINATION MODE ----- | | | | | | | | | |
| | *1 FETCH | | | | | | | | | |
| | *OPERATION | | | | | | | | | |
| | *----- | | | | | | | | | |
| | *P3 U,DATI NOINT, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/FETCH2 --> | | | | | | | | | |
| .CASE 2013 | 3 OF BFETCHINT | | | | | | | | | |
| | FDM2INT:2052 | F/FETCHINT | <-- | 2550 | 2009 | 650 | | | | |
| | ***** | | | | | | | | | |
| | ----- DESTINATION MODE ----- | | | | | | | | | |
| | *2 FETCH | | | | | | | | | |
| | *OPERATION | | | | | | | | | |
| | *----- | | | | | | | | | |
| | *P2, D+R(DF) PLUS 2, | | | | | | | | | |
| | * SR+R(DF) PLUS 2, | | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | | |
| *P3 U,DATI NOINT, | | | | | | | | | | |
| *NEXT, | | | | | | | | | | |
| * J/FETCH2 --> | | | | | | | | | | |
| .CASE 2014 | 4 OF BFETCHINT | | | | | | | | | |
| | FDM3INT:2053 | F/FETCHINT | <-- | 2550 | 2009 | 650 | | | | |
| | ***** | | | | | | | | | |
| | *CONTINUE | | | | | | | | | |
| | *----- | | | | | | | | | |
| | *P2, D+R(DF) PLUS 2, D(C)+D(C), | | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | | |
| | *P3 U,DATI NOINT, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/FSDM3INT --> | | | | | | | | | |
| ***** | | | | | | | | | | |

```

2051          000000001000
0000 00 00 00 00  00 000 0000 0
10001 000000 11000 01110100

2052          000000001000
1001 11 11 10 10 000 000 0110 0
10001 000110 11000 101110100

2053          000000001000
1001 11 11 10 10 000 111 0100 0
10001 000110 11000 101101100

```

H06

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | | | | | |
|---|---|---------------------------------------|-----------------------|------|----------------|---------|------------|-----------|------|--------|------|----------|------|---|---|
| | | | | | | | | RIF | COUT | CLOCKS | | | | | |
| .CASE 2015 | 5 OF BFETCHINT | <-- | F/FETCHINT | 2550 | 2009 | 650 | 2054 | 00000000 | 1000 | 0 | 0 | | | | |
| | FDM4INT:2054 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | | |
| | *TO FETCH ADDRESS OF OPERANDS | | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | | |
| | *----- DESTINATION MODE 4 | | | | | | | | | | | | | | |
| | *FETCH | | | | | | | | | | | | | | |
| | *OPERATION | | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | | |
| *P2, D+R(DF) MINUS 2, D(C)+D(C), | --> | 2171 | 2033 | 659 | | | | | | | | | | | |
| * SR+R(DF) MINUS 2, | | | | | | | | | | | | | | | |
| *P3, R(DF)+L (A ADDR), | | | | | | | | | | | | | | | |
| *NEXT, | | | | | | | | | | | | | | | |
| * J/FETCH | | | | | | | | | | | | | | | |
| ***** | | | | | | | | | | | | | | | |
| .CASE 2016 | | | | | 6 OF BFETCHINT | <-- | F/FETCHINT | 2550 | 2009 | 650 | 2055 | 00000000 | 1000 | 0 | 0 |
| | | | | | FDM5INT:2055 | | | | | | | | | | |
| | | | | | ***** | | | | | | | | | | |
| | | | | | *-----* | | | | | | | | | | |
| | *----- DESTINATION MODE | | | | | | | | | | | | | | |
| | *5 FETCH | | | | | | | | | | | | | | |
| | *OPERATION | | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | | |
| | *P2, D+R(DF) MINUS 2, D(C)+D(C), | | | | | | | | | | | | | | |
| | * SR+R(DF) MINUS 2, | | | | | | | | | | | | | | |
| *P3, R(DF)+D (A ADDR), | | | | | | | | | | | | | | | |
| *NEXT, | | | | | | | | | | | | | | | |
| * J/FSDMSINT | | | | | | | | | | | | | | | |
| ***** | | | | | | | | | | | | | | | |
| .CASE 2017 | 7 OF BFETCHINT | <-- | F/FETCHINT | 2550 | 2009 | 650 | 2056 | 00000000 | 1011 | 0 | 0 | | | | |
| | FDM6INT:2056 | | | | | | | | | | | | | | |
| | ***** | | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | | |
| | *----- DESTINATION MODE | | | | | | | | | | | | | | |
| | *6 FETCH OPERATION FETCH THE | | | | | | | | | | | | | | |
| | *INDEX | | | | | | | | | | | | | | |
| | *-----* | | | | | | | | | | | | | | |
| | *P1, BA+PC CURRENT MODE, | | | | | | | | | | | | | | |
| | *P2, D+PC PLUS 2, D(C)+D(C), | | | | | | | | | | | | | | |
| *P3, PC+D (A ADDR), | | | | | | | | | | | | | | | |
| *P3, U,DATI NOINT, | | | | | | | | | | | | | | | |
| *NEXT, | | | | | | | | | | | | | | | |
| * J/FSDM6INT | | | | | | | | | | | | | | | |
| ***** | | | | | | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|--|---------------------------------------|-----------------------|--------------|---------|----------|---|
| .CASE 2018 | 8 OF BFETCHINT FDM7INT:2057 | <-- | 2550 2009 650 | 2057 | | | 000000001011 1001 11 11 10 01 111 111 0101 0 10001 000110 11000 101110001 |
| | ***** ----- DESTINATION MODE ***** *7 FETCH OPERATION FETCH INDEX *OF ***** | | | | | | |
| | *P1, BA+PC CURRENT MODE, *P2, D+PC PLUS 2 D(C)+D(C), *P3, PC+D (A ADDR), *P3, U,DATI NOINT, *NEXT, * J/FSDM6INT | --> | 2561 2030 658 | | | | |
| .CASE 2019 | 1 OF BSTOREINT STDMOINT:2010 | <-- | 2551 2010 651 | 2010 | | | 000000001000 1111 00 00 10 01 011 000 0100 0 00000 001110 11111 000000000 |
| | ***** ----- DESTINATION MODE ***** *0 STORE *OPERATION ***** | | | | | | |
| | *P2, D+R(T3) (A), *P3, R(DF)+D (B ADDR), *NEXT, * BUT(RETURN) | --> VV | | | | | |
| .CASE 2020 | 2 OF BSTOREINT STDM1INT:2011 | <-- | 2551 2010 651 | 2011 | | | 000001001000 1111 00 00 10 01 011 000 0100 0 10010 000000 11000 101111000 |
| | ***** ----- DESTINATION MODE ***** *1 STORE *OPERATION ***** | | | | | | |
| | *P2, D+R(T3) (A), *P3, U,DATO, *ENABLE, KJ, *NEXT, * J/STORE3 | --> | 2570 2038 660 | | | | |
| | ***** | | | | | | |

J06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 655

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------------------------------|---------------------------------|---------------------------------------|-----------------------|--------------|---------|---------|----------|--------------------|--------|
| .CASE 2021 | 3 OF BSTOREINT | | | | | | | | |
| | STDM2INT:2012 | F/STOREINT | <-- | 2551 | 2010 | 651 | | | |
| | ***** | | | | | | | | |
| | ----- | | | | | | | | |
| | DESTINATION MODE | | | | | | | | |
| | *2 STORE | | | | | | | | |
| | *OPERATION | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+R(DF) PLUS 2, | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| *NEXT, J/STORE2 | | | | | | | | | |
| ***** | | | | | | | | | |
| ----- | | | | | | | | | |
| DESTINATION MODE | | | | | | | | | |
| *3 STORE | | | | | | | | | |
| *OPERATION | | | | | | | | | |
| ----- | | | | | | | | | |
| *P2, D+R(DF) PLUS 2, D(C)+D(C), | | | | | | | | | |
| *P3, R(DF)+D (A ADDR), | | | | | | | | | |
| *P3, U, DATI NOINT, | | | | | | | | | |
| *NEXT, J/FSDM3INT | | | | | | | | | |
| ***** | | | | | | | | | |
| .CASE 2022 | 4 OF BSTOREINT | | | | | | | | |
| | STDM3INT:2013 | F/STOREINT | <-- | 2551 | 2010 | 651 | | | |
| | ***** | | | | | | | | |
| | ----- | | | | | | | | |
| | DESTINATION MODE | | | | | | | | |
| | *3 STORE | | | | | | | | |
| | *OPERATION | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+R(DF) PLUS 2, D(C)+D(C), | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| *P3, U, DATI NOINT, | | | | | | | | | |
| *NEXT, J/FSDM3INT | | | | | | | | | |
| ***** | | | | | | | | | |
| .CASE 2023 | 5 OF BSTOREINT | | | | | | | | |
| | STDM4INT:2014 | F/STOREINT | <-- | 2551 | 2010 | 651 | | | |
| | ***** | | | | | | | | |
| | ----- | | | | | | | | |
| | DESTINATION MODE | | | | | | | | |
| | *4 STORE | | | | | | | | |
| | *OPERATION | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+R(DF) MINUS 2, | | | | | | | | |
| | * SR+R(DF) MINUS 2, | | | | | | | | |
| *P3, R(DF)+D (A ADDR), | | | | | | | | | |
| *NEXT, J/STORE | | | | | | | | | |
| ***** | | | | | | | | | |

2012
 1001 11 11 10 10 000 000 0100 0
 00000 000110 11000 101110110

2013
 1001 11 11 10 10 000 111 0100 0
 10001 000110 11000 101110110

2014
 1101 11 11 10 10 000 000 0110 0
 00000 000110 11000 001111011

2173 2036 660

K06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 656

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUSB BUSA EXTENSION RIF COUT CLOCKS |
|------------|------------------------------|---------------------------------------|-----------------------|--|
| | | | | UPF UPF UPF UPF |
| .CASE 2024 | 6 OF BSTOREINT | | | |
| | STDM5INT:2015 | F/STOREINT | <-- 2551 2010 651 | 2015 000000001000 |
| | ***** | | | |
| | ----- DESTINATION MODE ----- | | | |
| | *5 STORE | | | |
| | *OPERATION | | | |
| | *-----* | | | |
| | *P2, | D+R(DF) MINUS 2,D(C)+D(C), | | |
| | *P3, | SR+R(DF) MINUS 2, | | |
| | *NEXT, | R(DF)+D (A ADDR), | | |
| | J/FSDM5INT | --> 2560 2029 657 | | |
| ***** | | | | |
| .CASE 2025 | 7 OF BSTOREINT | | | |
| | STDM6INT:2016 | F/STOREINT | <-- 2551 2010 651 | 2016 000000001011 |
| | ***** | | | |
| | ----- DESTINATION MODE ----- | | | |
| | *6 STORE | | | |
| | *OPERATION | | | |
| | *-----* | | | |
| | *P1, | BA+PC,CURRENT MODE, | | |
| | *P2, | D+PC PLUS 2,D(C)+D(C), | | |
| | *P3, | PC+D (A ADDR), | | |
| *NEXT, | U,DATI NOINT, | | | |
| | J/FSDM6INT | --> 2561 2030 658 | | |
| ***** | | | | |
| .CASE 2026 | 8 OF BSTOREINT | | | |
| | STDM7INT:2017 | F/STOREINT | <-- 2551 2010 651 | 2017 000000001011 |
| | ***** | | | |
| | ----- DESTINATION MODE ----- | | | |
| | *7 STORE | | | |
| | *OPERATION | | | |
| | *-----* | | | |
| | *P1, | BA+PC,CURRENT MODE, | | |
| | *P2, | D+PC PLUS 2,D(C)+D(C), | | |
| | *P3, | PC+D (A ADDR), | | |
| *NEXT, | U,DATI NOINT, | | | |
| | J/FSDM7INT | --> 2561 2030 658 | | |
| ***** | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|---|---|---|------|------------|------------|-------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| 2027 | FSDM3INT:2554 | F/FDM3INT <-- F/STDM3INT <-- F/FSDMSINT <-- | 2053 2014 652 2013 2022 655 2560 2029 657 | 2554 | 0000 | 11 10 | 00 00 | 000 000 | 0000 | 0 |
| | ***** ----- MD GETS ADDRESS *OF *OPERAND ----- *P3, MD+DATA, *NEXT, J/FSDM3INT2 ***** | | | | | | | 00000000 | 1000 | |
| 2028 | FSDM3INT2:2555 | F/FSDM3INT <-- VV | | 2555 | 1010 | 11 10 | 00 00 | 000 111 | 0110 | 0 |
| | ***** * ADDRESS TURNAROUND TARGETS *-- ----- *P2, D+MD, D(C)+D(C), SR+MD, *NEXT, BUTR(D(C)), * J/FETCH * J/FETCH <--> 01 2171 2033 659 * J/STORE <--> 11 2173 2036 660 ***** | | | | | | | 00000000 | 1000 | |
| 2029 | FSDMSINT:2560 | F/FDMSINT <-- F/STDM5INT <-- F/FSDM7INT <-- | 2055 2016 653 2015 2024 656 2337 2032 658 | 2560 | 0000 | 00 00 | 00 00 | 000 000 | 0001 | 0 |
| | ***** *0 - FETCH 1 - STORE *----- *----- FETCH ADDRESS OF *OPERAND *----- *P1, BA+SR, CURRENT MODE, *P3, U, DATI NOINT, *NEXT, J/FSDM3INT <--> 2554 2027 657 ***** | | | | | | | 00000000 | 1011 | |
| | | | | | 10001 | 000000 | 11000 | 101101100 | | |

M06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 658

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|-----------|---------------------------------------|--|--------------------------|------------------------------|------------------------------|--------------------------|----------|------------------------|--------|
| | | | | | | | | | |
| 2030 | FSDM6INT:2561 | F/EDM6INT F/FDM7INT F/STDM6INT F/STDM7INT | <-- <-- <-- <-- | 2056 2057 2016 2017 | 2017 2018 2025 2026 | 653 654 656 656 | | | |
| | ***** | | | | | | | | |
| | ----- | | | | | | | | |
| | * MD GETS INDEX | | | | | | | | |
| | *CHECK FOR MODE 6 OR 7 TARGETS | | | | | | | | |
| | *- *----- | | | | | | | | |
| | *P3, MD+DATA | | | | | | | | |
| | *NEXT, BUTR(DM) | | | | | | | | |
| | * J/FSDM6INT2 | | | | | | | | |
| | * J/FSDM6INT2 | | --> | 1110 2336 | 2031 | 658 | | | |
| | * J/FSDM7INT | | --> | 1111 2337 | 2032 | 658 | | | |
| | ***** | | | | | | | | |
| CASE 2031 | 1 OF BFSDM6INT | F/FSDM6INT | <-- VV | | | | | | |
| | FSDM6INT2:2336 | | | | | | | | |
| | ***** | | | | | | | | |
| | *0 - FSDM6INT2 1 - FSDM7INT ADD INDEX | | | | | | | | |
| | *TARGETS - 0 - | | | | | | | | |
| | *FETCH | | | | | | | | |
| | *----- | | | | | | | | |
| | *P2, D+R(DF) PLUS MD, D(C)+D(C), | | | | | | | | |
| | * SR+R(DF) PLUS MD, | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | |
| | * J/FETCH | | --> | 01 2171 | 2033 | 659 | | | |
| | * J/STORE | | --> | 11 2173 | 2036 | 660 | | | |
| | ***** | | | | | | | | |
| CASE 2032 | 2 OF BFSDM6INT | F/FSDM6INT | <-- | | | | | | |
| | FSDM7INT:2337 | | | | | | | | |
| | ***** | | | | | | | | |
| | *1 - STORE | | | | | | | | |
| | *----- | | | | | | | | |
| | * ADD INDEX TO FIND | | | | | | | | |
| | *ADDRESS OF | | | | | | | | |
| | *OPERAND | | | | | | | | |
| | *----- | | | | | | | | |
| | *P2, D+R(DF) PLUS MD, D(C)+D(C), | | | | | | | | |
| | * SR+R(DF) PLUS MD, | | | | | | | | |
| | *NEXT, J/FSDM5INT | | --> | 2560 2029 | 657 | | | | |
| | ***** | | | | | | | | |

2561 0000 11 10 00 00 000 000 0000 0
00000 100000 00101 011011110

2336 1001 11 10 10 10 000 111 0110 0
00000 000000 10011 001111001

2337 1001 11 10 10 10 000 111 0110 0
00000 000000 11000 101110000

N06

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 659

| BOX NO. .CASE | TAG: ADDRESS 1 OF BFSDM3INT2 | SOURCE/DESTINATION OF ST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------------|---|---|--------------------------|----------------------|----------------------|-------------------|-------------|---|
| 2033 | FETCH:2171 | F/FDM4INT F/FSDM3INT2 F/FSDM6INT2 | <-- <-- <-- | 2054 2555 2336 | 2015 2028 2031 | 653 657 658 | | |
| | ***** *----- *----- INITIATE DATI FOR * *OPERAND * *FETCH * *----- *P1, BA+SR, CURRENT MODE, * *P3, U, DATI NOINT, * *NEXT, * * J/FETCH2 * --> VV ***** | | | 2171 | | | | 000000001011 0000 00 00 00 00 000 000 0001 0 10001 000000 11000 101110100 |
| 2034 | FETCH2:2564 | F/FDM1INT F/FDM2INT F/FETCH | <-- <-- <-- VV | 2051 2052 | 2012 2013 | 652 652 | | |
| | ***** * MD GETS * *DATA * *----- *P3, MD+DATA, * *NEXT, * * J/FETCH3 * --> VV ***** | | | 2564 | | | | 000000001000 0000 11 10 00 00 000 000 0000 0 00000 100000 11000 101110101 |
| 2035 | FETCH3:2565 | F/FETCH2 | <-- VV | | | | | |
| | ***** * SR GETS DATA FOR ASH * *INSTRUCTION * *----- *P2, D+MD, SR+MD, * *P3, R(DST)+D (A ADDR), * *NEXT, * * BUT(RETURN) * --> VV ***** | | | 2565 | | | | 000000001000 1010 11 10 00 01 110 000 0110 0 00000 010110 11111 000000000 |

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------------|---------------------------|--|--------------------------|----------------------|----------------------|-------------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 2036 | STORE:2173 | F/FDM4INT F/FSDM3INT2 F/FSDM6INT2 | <-- <-- <-- | 2054 2555 2336 | 2015 2028 2031 | 653 657 658 | | | | |
| | | ***** | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/STORE2 | | --> | | | | | | | |
| | ***** | | | | | | | | | |
| 2037 | STORE2:2566 | F/STDM2INT F/STORE | <-- <-- VV | 2012 | 2021 | 655 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+R(T3) (A), | | | | | | | | | |
| | *P3, U, DATO, | | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/STORE3 | | --> | | | | | | | |
| | ***** | | | | | | | | | |
| 2038 | STORE3:2570 | F/STDM1INT F/STORE2 | <-- <-- VV | 2011 | 2020 | 654 | | | | |
| | ***** | | | | | | | | | |
| | * NULL TO PERMIT DATA | | | | | | | | | |
| | *OUT | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * BUT (RETURN) | | --> | | | | | | | |
| | ***** | | | | | | | | | |

```

2173      000000001011
0000 00 00 20 00 000 000 0001 0
00000 000000 11000 101110110

2566      000001001000
1111 00 00 10 01 011 000 0100 0
10010 000000 11000 101111000

2570      000000001000
0000 00 00 00 00 000 000 0000 0
00000 000000 11111 000000000

```

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SF | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---|---------------------|-------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .TOC = PREFIXES FOR FETCH STORE FLOAT SUBROUTINE ##FLPT## | | | | | | | | |
| | F/MULFZW | <-- | 344 1404 457 | | | | | |
| | F/MULDZW | <-- | 345 1405 457 | | | | | |
| | F/MULXW | <-- | 346 1406 458 | | | | | |
| | F/MODW | <-- | 347 1479 481 | | | | | |
| | F/ADDZW | <-- | 350 1565 508 | | | | | |
| | F/ADDNZW | <-- | 351 1566 509 | | | | | |
| | F/SUBZW | <-- | 355 1567 509 | | | | | |
| | F/SUBNZW | <-- | 356 1568 509 | | | | | |
| | F/CPW | <-- | 357 1656 539 | | | | | |
| | F/DIVFW3 | <-- | 547 1686 549 | | | | | |
| ***** | | | | | | | | |
| * | SUBROUTINE FETCHFLT | | * | | | | | |
| | RETURN/MULMODW | * --> | -1 -1 -1 | | | | 2 1 1 | |
| | RETURN/MULMODW | * --> | 2152 1408 458 | | | | | |
| | RETURN/MULMODW | * --> | -1 -1 -1 | | | | 2 1 1 | |
| | RETURN/MULMODW | * --> | 2152 1408 458 | | | | | |
| | RETURN/ADDW01 | * --> | 4232 1570 510 | | | | | |
| | RETURN/ADDW01 | * --> | 4232 1570 510 | | | | | |
| | RETURN/SUBW01 | * --> | 4230 1569 510 | | | | | |
| | RETURN/SUBW01 | * --> | 4230 1569 510 | | | | | |
| | RETURN/CPW2 | * --> | 4334 1657 539 | | | | | |
| | RETURN/DIVFW4 | * --> | 2422 1687 549 | | | | | |
| ***** | | | | | | | | |

D07

2039 FETCHFLT:4614

```
*****  
* ENTRY POINT FOR FETCHING OPERANDS USED *  
* ONLY BY WARM FLOATING POINT LOAD *  
* CONDITION *  
* REGISTER *  
*-----*  
*P2, D+D, *  
*P3, R(T2A)+D (A ADDR), *  
*NEXT, *  
* J/FETCHFLT2 * -->  
*****
```

4614 000000001000
0011 00 00 00 01 110 000 0100 0
00000 010010 11000 110101001

4651 2060 671

E07

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 662

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|----------------------|------------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | COOT |
| | | F/TSTNZW | <-- | 2655 | 1380 | 450 | | | | | | |
| | | F/ABSNZW | <-- | 2656 | 1387 | 452 | | | | | | |
| | | F/NEGNZW | <-- | 2657 | 1401 | 456 | | | | | | |
| | | F/LOADSIXW | <-- | 353 | 1648 | 536 | | | | | | |
| | | F/LOADNZW | <-- | 354 | 1650 | 537 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE FFLTDEFER | | * | | | | | | | | | |
| | | RETURN/TSTNZW2 | * --> | 2122 | 1381 | 451 | | | | | | |
| | | RETURN/ABSNZW2 | * --> | 2126 | 1388 | 452 | | | | | | |
| | | RETURN/NEGNZW2 | * --> | 2150 | 1402 | 456 | | | | | | |
| | | RETURN/LOADSIXW2 | * --> | 4324 | 1649 | 536 | | | | | | |
| | | RETURN/LOADSIXW2 | * --> | 4324 | 1649 | 536 | | | | | | |
| ***** | | | | | | | | | | | | |

F07

2040 FFLTDEFER:4616

| | | | | | |
|------|-------|--------|-------|-----------|--------------|
| 4616 | | | | | 000000001000 |
| | 1010 | 11 11 | 00 01 | 110 000 | 0100 0 |
| | 00000 | 010010 | 11000 | 110101001 | |

```

*****
*-----*
*----- ENTRY POINT *
*USED BY CLEAR,TEST,ABSOLUTE, NEGATE AND *
*LOAD FOR DEFERRAL OF NEGATIVE ZERO WHEN *
*FETCHED FROM MEMORY LOAD CONDITION *
*REGISTER *
*-----*
*P2,          D+2, *
*P3,          R(T2A)+D (A ADDR), *
*NEXT, *
*                J/FETCHFLT2 * -->
*****

```

4651 2060 671

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|---------|--------------------|------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|--|
| | | F/LDCP | <-- | 277 1291 418 | | | | | |
| | | F/FETCHFLT2 | <-- | 4651 2060 671 | | | | | |
| | | F/IA90 | <-- | 3014 624 235 | | | | | |
| | | F/UNDEFINED | <-- | -1 -1 -1 | 2 1 1 | | | | |
| | | F/LDCPW1 | <-- | 377 1889 610 | | | | | |
| ***** | | | | | | | | | |
| * | SUBROUTINE LDCFETH | | * | | | | | | |
| | | RETURN/UNDEFINED | * --> | -1 -1 -1 | 2 1 1 | | | | |
| | | RETURN/IA16 | * --> | 3000 618 233 | | | | | |
| | | RETURN/LDCTNZ | * --> | 276 1276 414 | | | | | |
| | | RETURN/RTIO3 | * --> | 4045 317 138 | | | | | |
| | | RETURN/LDCPW2 | * --> | 2466 1890 610 | | | | | |
| ***** | | | | | | | | | |

H07

2041 LDCFETCH:4620

```

*****
*-----*
*          ENTRY POINT          *
*USED BY LDCPW TO FETCH OPERANDS LOAD *
*CONDITION REGISTER D(C)=0 TRAP OF NEG *
*ZERO IS DEFERRED                *
*UNTIL                            *
*-----*
*P2,          D+P,D(C)+ALUDD,      *
*P3,          R(T2A)+D (A ADDR),  *
*NEXT,                            *
*          J/MODEALTER            *
*****

```

-->

4635 2052 668

```

4620          000000001000
1010 11 11 00 01 110 010 0100 0
00000 010010 11000 110011101

```

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF | |
|---------|-------------------|------------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|--|
| | | F/STCPNZ2 | <-- | 4156 1271 412 | | | | | |
| | | F/IA68 | <-- | 3127 636 239 | | | | | |
| | | F/UNDEFINED | <-- | -1 -1 -1 | 0 1 1 | | | | |
| | | F/STCPW29 | <-- | 4157 1832 593 | | | | | |
| | | F/STCPW31 | <-- | 4476 1834 593 | | | | | |
| ***** | | | | | | | | | |
| * | SUBROUTINE STCFLT | | * | | | | | | |
| | | RETURN/UNDEFINED | * --> | -1 -1 -1 | 0 1 1 | | | | |
| | | RETURN/UNDEFINED | * --> | -1 -1 -1 | 0 1 1 | | | | |
| | | RETURN/RTIO9 | * --> | 4065 323 140 | | | | | |
| | | RETURN/STCPW30 | * --> | -1 -1 -1 | 0 1 1 | | | | |
| | | RETURN/BRA05 | * --> | 3 283 126 | | | | | |
| ***** | | | | | | | | | |

J07

2042 STCFLT:4621

```
*****  
*CONDITION CODES ARE CLOCKED *  
*-----*  
*----- ENTRY POINT *  
*USED BY STCPW TO STORE CONVERTED DATA *  
*INTO MEMORY PREPARE TO LOAD CODE IN FLAG *  
*REGISTER *  
*-----*  
*P3, MD+1200 (BC), *  
*NEXT, *  
* J/STINTLG3 *  
*****
```

-->

4634 2050 667

```
4621 0000 10 00 10 10 000 000 0000 0  
00010 100000 11000 110011100
```

K07

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 665

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-----------------------|----------------|--------------------|------|------|-----------------------|------|---------|---------|----------|-----------|-----|--------|
| | | | OFST | ADDR | BOX | | | | | | PAGE | RIF | |
| | | F/LDCT5 | <-- | 1253 | 1280 | 415 | | | | | | | |
| | | F/LDCTW16 | <-- | 4443 | 1873 | 605 | | | | | | | |
| ***** | | | | | | | | | | | | | |
| * | SUBROUTINE FETCHINTLG | | * | | | | | | | | | | |
| | | RETURN/LDCT6 | * --> | 425 | 1281 | 415 | | | | | | | |
| | | RETURN/LDCTW17 | * --> | -1 | -1 | -1 | 2 | 1 | 1 | | | | |
| ***** | | | | | | | | | | | | | |

```

2043  FETCHINTLG:4624
*****
*TO ALTER EFFECT OF BUTR(FD) TO BUTR(NOT
*FD)
*-----
*                ENTRY POINT
*USED BY LDCLF/D TO FETCH TWO INTEGER
*WORD FROM MEMORY TO BE CONVERTED TO
*FLOATING DEFER NEG ZERO TRAP SINCE NOT
*APPLICABLE IN INTEGER FETCH TEST FOR DMO
*TARGETS
*-
*-----
*P2,          D+2,D(C)+ALU00,
*P3,          R(T2A)+D (A ADDR),
*NEXT,        BUTR2(DMO),
*             J/FINTLG2
*****

```

```

4624
1010 11 11 00 01 000000001000
00000 010010 01001 110 010 0100 0

```

```

.CASE 1 OF BFETCHINTLG
2044  FINTLG2:4663          F/FETCHINTLG      <-- VV
*****
*0 - FINTLG2 1 - FINTLG3  SET UP FLAG BIT
*FOR TWO WORD
*FETCH
*-----
*P3,          MD+3002 (BC),
*NEXT,
*             J/STINTLG3
*****

```

```

4663
0000 10 01 10 00 000 010 0000 0
00010 100000 11000 110011100

```

4634 2050 667

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSB UBF | EXTENSION | | CLOCK |
|---------|--|--|--------------------------|------|------------|------------|-------------|-----------|----------|----------------------|
| | | | | | | | | RIF | COUT | |
| 2045 | FINTLG3:4667 | F/FETCHINTLG | <-- | 4624 | 2043 | 665 | 4667 | 00000000 | 1000 | |
| | *ALSO FOR WARM BRANCH ON BUTR(HOTWARM) | | | | | | | 1111 | 00 11 | 10 10 011 000 0100 0 |
| | *DNO DO GENERAL REGISTER | | | | | | | 00000 | 001010 | 11000 110010101 |
| | *P2, D+R(DF) (A) | | | | | | | | | |
| | *P3, FDST3+D (B ADDR), | | | | | | | | | |
| | *NEXT, J/FINTLG4 | | --> | VV | | | | | | |
| 2046 | FINTLG4:4625 | F/FINTLG3 | <-- | VV | | | | 4625 | 00000000 | 1000 |
| | *FETCH | | | | | | | | | |
| | *P2, D+0 | | | | | | | | | |
| | *P3, FDST2+D (A ADDR), | | | | | | | | | |
| | *NEXT, J/FINTLG5 | | --> | VV | | | | | | |
| 2047 | FINTLG5:4630 | F/FINTLG4 | <-- | VV | | | | 4630 | 00000000 | 1000 |
| | *R(GRINC) IS FOR POSSIBLE | | | | | | | | | |
| | *ABORT | | | | | | | | | |
| | *P2, D+0 | | | | | | | | | |
| | *P3, R(GRINC)+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUT(RETURN) | | --> | VV | | | | | | |

N07

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 667

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-----------------------|----------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|--------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | |
| | | F/STST3 | <-- | 1614 | 1359 | 443 | | | | | | |
| | | F/STCTW40 | <-- | 4037 | 1796 | 582 | | | | | | |
| | | F/STCTW45 | <-- | 4047 | 1801 | 584 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE STOREINTLG | | * | | | | | | | | | |
| | | RETURN/BRA05 | * --> | 3 | 283 | 126 | | | | | | |
| | | RETURN/BRA05 | * --> | 3 | 283 | 126 | | | | | | |
| | | RETURN/STCTW46 | * --> | 4442 | 1802 | 584 | | | | | | |
| ***** | | | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|---------------|---------|---------|----------|---|
| 2051 | 2 OF BSTOREINTLG STINTLG4:4707 | F/STOREINTLG | <-- | 4632 2048 667 | | | | |
| | ***** * DMO OPERATION SIGNAL *HFPP *-----* | | | 4707 | | | | 000000001000 1111 00 00 10 01 011 000 0100 0 11100 001110 11111 00000000 |
| | *P2, D+FDST3, *P3, R(DF)+D (B ADDR),FLPG0, *NEXT, * BUT(RETURN) | | --> VV | | | | | |
| 2052 | MODEALTER:4635 | F/LDCFETCH | <-- | 4620 2041 663 | | | | |
| | ***** *-----* * COMMON *ROUTINE USED TO ALTER BUTR(FD) USED IN *FETCH STORE FLOAT SUBROUTINE ALTERATION *IS VIA FLAG REGISTER ALIGN NUMBER FOR *FLAG *REGISTER *-----* | | | 4635 | | | | 000000001000 1111 00 00 01 01 000 111 0110 0 00101 000000 11000 110100000 |
| | *P2, D+D SWAP,D(C)+D(C),SR+D SWAP, *NEXT, * J/MODEALTER2 | | --> VV | | | | | |
| 2053 | MODEALTER2:4640 | F/STINTLG3 F/MODEALTER | <-- <-- VV | 4634 2050 667 | | | | |
| | ***** * READ FLAG *REGISTER *-----* | | | 4640 | | | | 000000001000 0000 10 00 11 01 000 000 0000 0 11001 100000 11000 110100001 |
| | *SELECT, FLAGS(READ) *P3, EMITCON+DATA, *NEXT, * J/MODEALTR2B | | --> | 4641 2054 669 | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---------------------------------|--|--------------------------|------------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 2054 | MODEALTER2B:4641 | F/MODEALTER2 | <-- | 4640 2053 668 | 4641 | | | 00000000 | 1000 | |
| | *P2, D+EMITCON D(C)+D(C), | | | | 1010 | 10 00 | 00 00 | 110 111 | 0100 | 0 |
| | *P3, R(T1)+D (A ADDR), | | | | 01001 | 010110 | 11000 | 110100 | 100 | |
| | *NEXT, | | | | | | | | | |
| | * J/MODEALTER2C | | --> | VV | | | | | | |
| 2055 | MODEALTER2C:4644 | F/MODEALTER2B | <-- | VV | 4644 | | | 00000000 | 1000 | |
| | * MASK OUT GARBAGE LO | | | | 1011 | 10 00 | 11 00 | 110 111 | 0100 | 0 |
| | *BYTE | | | | 00111 | 010110 | 11000 | 110100 | 101 | |
| | *P2, D+R(T1) AND HIBYTEMASK, | | | | | | | | | |
| | * D(C)+D(C) | | | | | | | | | |
| | *P3, R(T1)+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MODEALTER3 | | --> | VV | | | | | | |
| 2056 | MODEALTER3:4645 | F/MODEALTER2C | <-- | VV | 4645 | | | 00000000 | 1000 | |
| | * INSERT NEW CONTROL | | | | 1110 | 01 10 | 00 00 | 110 111 | 0100 | 0 |
| | *BITS | | | | 00000 | 000000 | 11000 | 110101 | 000 | |
| | *P2, D+SR OR R(T1),D(C)+D(C), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/MODEALTER4 | | --> | VV | | | | | | |
| 2057 | MODEALTER4:4650 | F/MODEALTER3 | <-- | VV | 4650 | | | 00000000 | 1000 | |
| | * CHECK TO ENTER FETCH OR STORE | | | | 0000 | 00 00 | 00 01 | 000 001 | 0000 | 0 |
| | *OPERATIONS | | | | 11011 | 000000 | 10011 | 10100000 | 1 | |
| | *SELECT, FLAGS(WRITE), | | | | | | | | | |
| | *P3, FLAGS+D | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | |
| | * J/MODEALTER5 | | --> | 01 4501 2058 670 | | | | | | |
| | * J/MODEALTER6 | | --> | 11 4503 2059 670 | | | | | | |

E08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 670

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|--|
| | | | | | | | | RIF | COUT | CLOCKS | |
| .CASE 2058 | 1 OF BMODEALTER4 | | | | | | | | | | |
| | MODEALTERS:4501 | F/MODEALTER4 | <-- | 4650 | 2057 | 669 | | | | | |
| | ***** | | | | | | | | | | |
| | *TARGETS - 0 - MODEALTERS 1 - MODELATER6 * | | | | | | | | | | |
| | *SELECT, EMIT, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/FETCHFLT2 | | --> | 4651 | 2060 | 671 | | | | | |
| ***** | | | | | | | | | | | |
| .CASE 2059 | 2 OF BMODEALTER4 | | | | | | | | | | |
| | MODELATER6:4503 | F/MODEALTER4 | <-- | 4650 | 2057 | 669 | | | | | |
| | ***** | | | | | | | | | | |
| | *SELECT, EMIT, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/STOREFLT | | --> | 4654 | 2061 | 674 | | | | | |
| ***** | | | | | | | | | | | |

```

4501                                000000001000
0000 00 00 00 01 000 000 0000 0
11001 000000 11000 110101001

4503                                000000001000
0000 00 00 00 01 000 000 0000 0
11001 000000 11000 110101100
    
```

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
|---------|-------------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|

```

: .TOC " SUBROUTINE FETCH STORE FLOAT  ##FLPT##"
: : FETCHSTOREFLOAT SUBROUTINE

```

```

: THIS SUBROUTINE FETCHES OR STORES A FLOATING POINT NUMBER:-
: 32 BITS IF SINGLE 64 BITS IF DOUBLE.

```

```

: ENTRY INTO THIS SUBROUTINE IS PREFIXED BY FETCHFLT, STOREFLT,
: FETCHINTLONG, OR STOREINTLONG TO SET APPROPRIATE CONDITIONS
: USED BY THIS SUBROUTINE THEREFORE THE USER SHOULD LOOK AT
: THESE ENTRY POINTS .

```

PARAMETERS-

ON ENTRY:

```

R(T2A)<01> = 0 FOR FETCH TO ENTER TRAPS IF NZERO
IS OBTAINED FROM MEMORY
1 WILL DEFER TRAP EXECUTION -
REUTRN TO CALLER IS PERFORMED
USED BY TST,NEG,ABS,LDG/D,LDCPW
D(C) = 0 TO INDICATE A DATI OPERATION FOLLOWING
ADDRESS CALCULATION
1 TO INDICATE A DATO OPERATION FOLLOWING
ADDRESS CALCULATION

```

ON EXIT:

```

R(WDADR) = R(T1A) CONTAINS ADDRESS OF FIRST
OPERAND FETCHED FROM MEMORY
FDST3,FDST2,FDST1,FDST0 LEFT INTACT
USING STORE SEQUENCE
DATA LOADED INTO THESE REGISTER ON LOAD
R(T2A)<15> = CONDITION REGISTER MODIFIED -
0 FOR NOT IMMEDIATE ADDRESSING
1 FOR IMMEDIATE (USED BY NEG AND ABS -DMO)
R(T2A)<00> - 0 INDICATES THAT NO NEG ZERO WAS FETCHED
WHEN RETURN FROM DEFER TRAP ENTRY
1 INDICATES THAT A NEG ZERO WAS FETCHED
BUT TRAP OPERATION HAS BEEN DEFERRED
AND RETURN TO CALLER IS PERFORMED

```

```

: THIS SUBROUTINE IS COMPLEX AND THUS REQUIRES CAREFUL READING OF THE
: FLOWS AND MICROCODE TO UNDERSTAND IT.

```

```

: ITS MAIN FUNCTION IS TO FETCH OR STORE 32 OR 64 BITS AND TO
: UPDATE THE GENERAL REGISTERS ACCORDING TO THE ADDRESS MODE. IT ALSO
: DOES THE FOLLOWING:-

```

- TESTS FOR A MINUS-ZERO FETCH FROM MEMORY (SO THAT THE FIUV TRAP CAN OCCUR).
- TESTS FOR IMMEDIATE (REGISTER 7 AND MODES 1, 2, OR 4). IF IMMEDIATE THEN ONLY 16 BITS ARE FETCHED OR STORED.

```

: THE CODE HAS BEEN WRITTEN SO THAT THE FETCHES AND STORES ARE
: INITIATED AS SOON AS POSSIBLE. THUS THE UPDATING OF THE
: GENERAL REGISTERS TAKES CYCLES AT THE END - THE CORRECT
: PLACE SINCE WE FAVOR HOT OVER WARM. HOT CAN BE PROCESSING

```

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| :: | THE FETCHED DATA WHILE THE BM IS UPDATING. | | | | | | |
| :: | GENERAL REGISTER UPDATING:- WE REQUIRE THE FOLLOWING: | | | | | | |
| :: | DM 0 1 2 3 4 5 6 7 | | | | | | |
| :: | 4 2 -4 -2 0 0 | | | | | | |
| :: | 8 2 -8 -2 0 0 | | | | | | |
| :: | IMM 0 0 2 2 -2 -2 0 0 | | | | | | |
| :: | TRANSFORMATION LEAVES R(GRINC) AT ZERO FOR THE MODES 0, 6 AND 7 | | | | | | |
| :: | RETURN: - FETCH RETURNS BY A BUT(RETURN) IF NOT NZERO DATA OR R(T2A)<01> = 1 AND NZERO DATA ELSE WILL GO TO TRAPS AND EITHER RETURN OR TRAP STORE RETURNS BY BUT(RETURN) | | | | | | |
| :: | REGISTER MAP OF TEMPORARIES R(WDADR2) = R(T1B) R(WDADR) = R(T1A) R(GRINC) = R(T2B) R(T1A) USED FOR ADDR INCREMENTS R(T2A) = USED AS CONDITION REGISTER | | | | | | |
| :: | THIS SUBROUTINE IS USED BOTH BY HOT AND WARM FLOATING POINT TO PERFORM OPERAND FETCHES AND STORES TO MEMORY | | | | | | |
| :: | SPECIAL CONSIDERATION IS GIVEN TO DESTINATION MODES 1 OR 2 OR 4 AND DESTINATION REGISTER 7 (PC). IN THESE CASES, ONLY A ONE WORD FETCH OR STORE OPERATION IS PERFORMED AND THE INCREMENTING OR DECREMENTING OF REGISTER 7 REFLECTS THIS ONE WORD OPERATION REGADLESS OF THE OPERAND MODE (FD OF FPS). | | | | | | |
| :: | WHEN USED BY HOT FLOATING POINT, A SYNCHRONIZATION OPERATION IS PERFORMED WITH THE HOT FPP VIA BUTR(SERVICE#D(C)#FPPACK). SYNCHRONIZATION IS ACCOMPLISHED BY BASE MACHINES ISSUANCE OF A MICROCODE GENERATED SIGNAL LABELLED AS "FLPGO". IN RESPONSE TO THIS SIGNAL, HOT FPP WILL ISSUE "FPPACK" PERMITTING BASE MACHINE TO BREAK OUT OF IT'S WAIT LOOP INDICATING THAT HOT FPP HAS ARRIVED HAS AT IT'S SYNC POINT. IF HOT FPP HAS ARRIVED AT IT'S SYNC POINT AHEAD OF BASE MACHINE, HOT FPP WILL SIT IN IT'S OWN WAIT LOOP MONITORING THE ISSUANCE OF "FLPGO" BY BASE MACHINE. FOLLOWING THE ISSUANCE OF "FLPGO" AND THE RESPONSE "FPPACK", BOTH HOT FPP AND BASE MACHINE WILL BE SYNCHRONIZED EITHER TO PASS DATA FROM HOT FPP TO BASE MACHINE OR TO FETCH OPERANDS FROM MEMORY TO THE HOT FPP UNIT UNDER BASE MACHINE'S CONTROL. | | | | | | |
| :: | IF A SERVICE CONDITION BECOMES PRESENT DURING THE MONITORING OF "FPPACK" BY THE BASE MACHINE OR IF BOTH CONDITIONS EXIST SIMULTANEOUSLY, THE SERVICE REQUEST WILL BE HONORED FIRST. AN ABORT OF THE PRESENT INSTRUCTION WILL BE PERFORMED ONLY ON OPERAND FETCHES. ON OPERAND STORES, THE INSTRUCTION WILL NOT BE ABORTED ON THE | | | | | | |

H08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 673

BOX NO. TAG:ADDRESS
 ::SIMULTANEOUS OCCURANCE OF "FPPACK" AND SERVICE BUT WILL CONTINUE
 ::TO COMPLETION.

SOURCE/DESTINATION OFST ADDR BOX PAGE MICROFICHE COORD CARD ADDR ALU BUSB BUSA EXTENSION RIF COUT CLOCKS
 UPF

| | | | | | | | | | | | |
|------|----------------|-----|------|------|-----|--|--|--|--|--|--|
| | F/MULXNZ | <-- | 246 | 1245 | 404 | | | | | | |
| | F/ADDNZ | <-- | 251 | 1247 | 405 | | | | | | |
| | F/LOADNZS | <-- | 254 | 1251 | 406 | | | | | | |
| | F/SUBNZ | <-- | 256 | 1253 | 407 | | | | | | |
| | F/MOD | <-- | 247 | 1260 | 409 | | | | | | |
| | F/CMP | <-- | 257 | 1261 | 409 | | | | | | |
| | F/DIVNZ | <-- | 263 | 1284 | 416 | | | | | | |
| | F/FETCHFLT | <-- | 4614 | 2039 | 661 | | | | | | |
| | F/FFLTDEFER | <-- | 4616 | 2040 | 662 | | | | | | |
| 2060 | FETCHFLT2:4651 | <-- | 4501 | 2058 | 670 | | | | | | |

4651 000000001011
 1001 10 10 10 10 110 000 0111 0
 00001 011010 00101 001110000

```

*****
* PREPARATION STATE AND ENTRY TO PERFORM *
*FETCH OPERATION D(C)=0 FOR FETCH *
*INDICATOR TARGETS - 00 - *
*07 *
*-----*
*P1, BA+R(DF), CURRENT MODE, *
*P2, D+R(DF) PLUS 0(D), *
* SR+R(DF) PLUS 0(D), D(C)+CIN, *
*P3, R(WDADR)+D (B ADDR), *
*NEXT, BUT(DST REG 7#DM), *
* J/FSDMOFLT *
* *
* J/FSDMOFLT * -->
* J/FSDM1FLT * -->
* J/FSDM2FLT * -->
* J/FSDM3FLT * -->
* J/FSDM4FLT * -->
* J/FSDM5FLT * -->
* J/FSDM6FLT * -->
* J/FSDM7FLT * -->
* J/FS2MOFLT * -->
* J/FS2M1FLT * -->
* J/FS2M2FLT * -->
* J/FS2M3FLT * -->
* J/FS2M4FLT * -->
* J/FS2M5FLT * -->
* J/FS2M6FLT * -->
* J/FS2M7FLT * -->
*****
  
```

| | | | |
|------|------|------|-----|
| 0000 | 4160 | 2062 | 675 |
| 0001 | 4161 | 2075 | 679 |
| 0010 | 4162 | 2076 | 680 |
| 0011 | 4163 | 2077 | 680 |
| 0100 | 4164 | 2080 | 681 |
| 0101 | 4165 | 2084 | 683 |
| 0110 | 4166 | 2088 | 684 |
| 0111 | 4167 | 2091 | 685 |
| 1000 | 4170 | 2151 | 708 |
| 1001 | 4171 | 2152 | 708 |
| 1010 | 4172 | 2153 | 709 |
| 1011 | 4173 | 2154 | 709 |
| 1100 | 4174 | 2155 | 710 |
| 1101 | 4175 | 2158 | 711 |
| 1110 | 4176 | 2159 | 711 |
| 1111 | 4177 | 2160 | 711 |

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-------------------------|--------------|--|--------------------------|-----------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| | | F/STFD | <-- 260 1262 409 | | | | | | | |
| | | F/UNDEFINED | <-- -1 -1 -1 | 0 1 1 | | | | | | |
| | | F/CLRNZWS | <-- 2120 1379 450 | | | | | | | |
| | | F/STSW | <-- 3670 1682 547 | | | | | | | |
| ***** | | | | | | | | | | |
| | * SUBROUTINE STOREFLT * | | | | | | | | | |
| IT* --> | 246 1245 404 | RETURN/4'D0† | | | | | | | | |
| | | RETURN/IA60H | * --> 3112 631 237 | | | | | | | |
| | | RETURN/BRA05 | * --> 3 283 126 | | | | | | | |
| | | RETURN/BRA05 | * --> 3 283 126 | | | | | | | |
| ***** | | | | | | | | | | |

2061 STOREFLT:4654

4654

000000001011
1111 00 10 10 10 110 000 0111 0
00000 011010 00101 001110000

```

*****
*FSDMOFLT - FSDM7FLT 10 - 17 FS2DMOFLT - *
*FS2DM7FLT *
*-----*
*----- ENTRY POINT *
*AND PREPARATION STATE FOR STORE *
*OPERATION D(C) = 1 FOR STORE INDICATOR *
*TARGETS *
*- *
*-----*
*P1, BA+R(DF) CURRENT MODE, *
*P2, D+R(DF) (A) D(C)+CIN, *
* SR+R(DF) (A) *
*P3, R(WDADR)+D (B ADDR), *
*NEXT, BUT(DST REG 7#DM), *
* J/FSDMOFLT *
* *
* J/FSDMOFLT * --> 0000 4160 2062 675
* J/FSDM1FLT * --> 0001 4161 2075 679
* J/FSDM2FLT * --> 0010 4162 2076 680
* J/FSDM3FLT * --> 0011 4163 2077 680
* J/FSDM4FLT * --> 0100 4164 2080 681
* J/FSDM5FLT * --> 0101 4165 2084 683
* J/FSDM6FLT * --> 0110 4166 2088 684
* J/FSDM7FLT * --> 0111 4167 2091 685
* J/FS2DMOFLT * --> 1000 4170 2151 708
* J/FS2DM1FLT * --> 1001 4171 2152 708
* J/FS2DM2FLT * --> 1010 4172 2153 709
* J/FS2DM3FLT * --> 1011 4173 2154 709
* J/FS2DM4FLT * --> 1100 4174 2155 710
* J/FS2DM5FLT * --> 1101 4175 2158 711
* J/FS2DM6FLT * --> 1110 4176 2159 711
* J/FS2DM7FLT * --> 1111 4177 2160 711
*****

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K08

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 675

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS | |
|---------|---|---------------------------------------|-----------------------|--------------|--------------|------------|----------|------------------------|--------|----------------------------|
| .CASE | 1 OF BFETCHFLT2 | | | | | | | | | |
| 2062 | FSDMOFLT:4160 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | | | |
| | ***** | | | | | | | | | |
| | *00 - 07 FSDMOFLT - FSDM7FLT 10 - 17 * | | | | | | | | 4160 | 000000001000 |
| | *FS2DMOFLT - FS2DM7FLT DESTINATION MODE * | | | | | | | | 0011 | 00 00 00 01 110 111 0110 0 |
| | *0 OPERATION ONLY USED BY WARM FLOATING * | | | | | | | | 00000 | 010100 10100 110000110 |
| | *POINT STORE CONSTANT IN GENERAL REGISTER * | | | | | | | | | |
| | *INCREMENT TARGETS * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P2, | D+D, D(C)+D(C), SR+D, | | | | | | | | |
| | *P3, | R(GRINC)+D (A ADDR), | | | | | | | | |
| | *NEXT, | BUTR(HOTWARM), | | | | | | | | |
| | * | J/FSDMOFLT2 | | | | | | | | |
| | * | J/FSDMOFLT2 | --> | 10 4606 | 2063 | 675 | | | | |
| | * | J/FSDMOFLT5 | --> | 11 4607 | 2066 | 676 | | | | |
| | ***** | | | | | | | | | |
| .CASE | 1 OF BFSDMOFLT | | | | | | | | | |
| 2063 | FSDMOFLT2:4606 | F/FSDMOFLT F/FS2DMOFLT | <-- <-- | 4160 4170 | 2062 2151 | 675 708 | | | | |
| | ***** | | | | | | | | | |
| | *WARM - FSDMOFLT2 HOT - FSDMOFLT5 TEST * | | | | | | | | 4606 | 000000001000 |
| | *ILLEGAL * | | | | | | | | 1111 | 00 00 10 01 111 111 0100 0 |
| | *ACCUMULATOR * | | | | | | | | 00000 | 000000 10001 011100110 |
| | *-----* | | | | | | | | | |
| | *P2, | D+PC (A), D(C)+D(C), | | | | | | | | |
| | *NEXT, | BUTR(NOT DST REG 6-7), | | | | | | | | |
| | * | J/FSDMOFLT4 | | | | | | | | |
| | * | J/FSDMOFLT4 | --> | 10 4346 | 2065 | 676 | | | | |
| | * | J/FSDMOFLT3 | --> | 11 4347 | 2064 | 676 | | | | |
| | ***** | | | | | | | | | |

L08

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 676

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | | |
|---------------|---|--|--------------------------|--------------|--------------|------------|-------------|-----------|----------|--------|-----------|--------|
| | | | | | | | | RIF | COUT | | | |
| .CASE 2064 | 2 OF BFSMOFLT2 FSDMOFLT3:4347 | F/FSDMOFLT2 FSDMOFLT3:4347 | <-- | 4606 | 2063 | 675 | | | | | | |
| | ***** | | | | | | | 4347 | 00000000 | 1000 | | |
| | *TARGETS - 0 - FSDMOFLT4 1 - FSDMOFLT3 | | | | | | | 0000 | 00 10 | 00 00 | 111 000 | 0000 0 |
| | *STORE PC FOR EXCEPTION OCCURRANCE BRANCH | | | | | | | 00000 | 011100 | 10011 | 011101001 | |
| | *ON FETCH OR | | | | | | | | | | | |
| | *STORE | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | *P3, FPA+D (B ADDR), | | | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | | | |
| | * J/FDMOFLT | | | | | | | | | | | |
| | | J/FDMOFLT | --> | 01 | 4351 | 2067 | 677 | | | | | |
| | | J/STDMOFLT | --> | 11 | 4353 | 2071 | 678 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 2065 | 1 OF BFSMOFLT2 FSDMOFLT4:4346 | F/FSDMOFLT2 FSDMOFLT4:4346 | <-- | 4606 | 2063 | 675 | | | | | | |
| | ***** | | | | | | | 4346 | 00000000 | 1000 | | |
| | *TARGETS- 0 - FDMOFLT 1 - STDMOFLT STORE | | | | | | | 0000 | 00 00 | 00 00 | 111 000 | 0000 0 |
| | *PC FOR EXCEPTION OCCURRANCE GO TO OPCODE | | | | | | | 00000 | 010100 | 11100 | 011001011 | |
| | *ERROR | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | *P3, FPA+D (A ADDR), | | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | | | |
| | * J/ILLEGAL1 | | --> | 313 | 1321 | 432 | | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE 2066 | 2 OF BFSMOFLT FSDMOFLT5:4607 | F/FSDMOFLT F/FS2MOFLT | <-- <-- | 4160 4170 | 2062 2151 | 675 708 | | | | | | |
| | ***** | | | | | | | 4607 | 01000000 | 1000 | | |
| | * GO TO PAGE 0 | | | | | | | 1111 | 00 00 | 10 01 | 111 000 | 0100 0 |
| | *AND | | | | | | | 00000 | 000000 | 11100 | 001110101 | |
| | ----- | | | | | | | | | | | |
| | *SELECT, FPSCC(FPP),FPSCC+DATA, | | | | | | | | | | | |
| | *P2, D+PC (A), | | | | | | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | | | | | | | | | |
| | * J/HOTDMOSYNC | | --> | 165 | 1292 | 418 | | | | | | |
| | ***** | | | | | | | | | | | |

M08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 677

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------------|---|--|--------------------------|--------------------------------------|------------|------------|-------------|-----------|---|-------|
| | | | | | | | | RIF | COUT | |
| .CASE 2067 | 1 OF BFSMOFLT3 FDMOFLT:4351 | F/FDSMOFLT3 ----- *DO NOT DMO SYNC OPERATION FETCH *OPERATION TARGETS - F - 0 - *FDMOFLT4 *-----* | <-- | 4347 2064 676 | 4351 | | | | 100000001000 | |
| | *P2, D+FAC3(DF), *P3, FDST3+D (B' ADDR), *NEXT, BUTR(FD) * J/FDMOFLT4 *-----* | | | | | | | | 1111 00 11 10 10 011 000 0100 0 00000 001010 10111 101110010 | |
| | * J/FDMOFLT4 * J/FDMOFLT2 *-----* | | | 10 4562 2070 678 11 4563 2068 677 | | | | | | |
| .CASE 2068 | 2 OF BFSMOFLT FDMOFLT2:4563 | F/FDSMOFLT F/FDSMOFLT3 ----- *D - 1 - FDMOFLT2 *-----* | <-- <-- | 4351 2067 677 4655 2069 677 | 4563 | | | | 100000001000 | |
| | *P2, D+FAC1(DF), *P3, FDST1+D (B' ADDR), *NEXT, J/FDMOFLT3 *-----* | | | | | | | | 1111 00 11 11 10 011 000 0100 0 00000 011010 11000 110101101 | |
| 2069 | FDMOFLT3:4655 | F/FDSMOFLT2 ----- *P2, D+FAC0(DF), *P3, FDST0+D (A' ADDR), *NEXT, J/FDMOFLT4 *-----* | <-- VV <-- VV --> | 4655 | | | | | 100000001000 | |
| | | | | | | | | | 1010 01 00 00 01 011 000 0100 0 00000 010100 11000 101110010 | |
| | | | | 4562 2070 678 | | | | | | |

N08

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 678

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------------------|--|--------------------------|--------------|--------------|------------|-------------|-----------|--------|--------|
| | | | | | | | | RIF | COOT | |
| .CASE | 1 OF BFDMOFLT | | | | | | | | | |
| 2070 | FDMOFLT4:4562 | E/FDMOFLT F/FDMOFLT3 | <-- <-- | 4351 4655 | 2067 2069 | 677 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+FAC2(DF), | | | | | | | | | |
| | *P3, FDST2+D (A ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * BUT(RETURN) | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 4562 | | | | | | | | 10000000 | 1000 | |
| | | | | | | | | 011 000 | 0100 | 0 |
| | | | | | | | | 00000 | 000100 | 11111 |
| | | | | | | | | 00000000 | | |
| .CASE | 2 OF BFSDMOFLT3 | | | | | | | | | |
| 2071 | STDMOFLT:4353 | F/FSDMOFLT3 | <-- | 4347 | 2064 | 676 | | | | |
| | ***** | | | | | | | | | |
| | ----- STORE | | | | | | | | | |
| | *OPERATION TARGETS - F - 0 - | | | | | | | | | |
| | *STDMOFLT4 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+FDST3, | | | | | | | | | |
| | *P3, FAC3(DF)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUTR(DF), | | | | | | | | | |
| | * J/STDMOFLT4 | | --> | 10 4112 | 2074 | 679 | | | | |
| | * J/STDMOFLT2 | | --> | 11 4113 | 2072 | 678 | | | | |
| | ***** | | | | | | | | | |
| 4353 | | | | | | | | 10000000 | 1000 | |
| | | | | | | | | 011 000 | 0100 | 0 |
| | | | | | | | | 00000 | 001010 | 10111 |
| | | | | | | | | 001001010 | | |
| .CASE | 2 OF BSTDMOFLT | | | | | | | | | |
| 2072 | STDMOFLT2:4113 | F/STDMOFLT F/STDMOFLT3 | <-- <-- | 4353 4660 | 2071 2073 | 678 679 | | | | |
| | ***** | | | | | | | | | |
| | *D - 1 - STDMOFLT2 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+FDST1, | | | | | | | | | |
| | *P3, FAC1(DF)+D (B ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/STDMOFLT3 | | --> | 4660 | 2073 | 679 | | | | |
| | ***** | | | | | | | | | |
| 4113 | | | | | | | | 10000000 | 1000 | |
| | | | | | | | | 011 000 | 0100 | 0 |
| | | | | | | | | 00000 | 011010 | 11000 |
| | | | | | | | | 110110000 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUS A | EXTENSION | | CLOCK |
|---------|---|--------------------|------------|------|-------|--------|-------|-----------|--------|-------|
| | | | | | | | | OFST | ADDR | |
| 2773 | STDMOFLT3:4660 | F/STDMOFLT2 | <-- | 4113 | 2072 | 678 | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+FDST0 | | | 4660 | 1010 | 01 11 | 00 10 | 011 000 | 0100 0 | |
| | *P3, FAC0(DF)+D (A ADDR), | | | | 00000 | 010100 | 11000 | 001001010 | | |
| | *NEXT, | | | | | | | | | |
| | * J/STDMOFLT4 | | --> VV | | | | | | | |
| ***** | | | | | | | | | | |
| .CASE | 1 OF BSTDMOFLT | F/STDMOFLT | <-- | 4353 | 2071 | 678 | | | | |
| 2074 | STDMOFLT4:4112 | F/STDMOFLT3 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *P2, D+FDST2 | | | 4112 | 1010 | 00 11 | 00 10 | 011 000 | 0100 0 | |
| | *P3, FAC2(DF)+D (A ADDR), | | | | 00000 | 000100 | 11111 | 000000000 | | |
| | *NEXT, | | | | | | | | | |
| | * BUT(RETURN) | | --> VV | | | | | | | |
| ***** | | | | | | | | | | |
| .CASE | 2 OF BFETCHFLT2 | F/FETCHFLT2 | <-- | 4651 | 2060 | 671 | | | | |
| 2075 | FSDM1FLT:4161 | F/STOREFLT | <-- | 4654 | 2061 | 674 | | | | |
| | ***** | | | | | | | | | |
| | ----- DESTINATION ----- | | | | | | | | | |
| | *MODE 1 OPERATIONS STORE VALUE IN GENERAL | | | | | | | | | |
| | *REGISTER | | | | | | | | | |
| | *INCREMENT | | | | | | | | | |
| | *----- | | | | | | | | | |
| | * FLPG0 | | | | | | | | | |
| | *P2, D+D.D(C)+D(C), | | | | | | | | | |
| | *P3, R(GRINC)+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUTR(SERVICE#D(C)#FPPACK), | | | | | | | | | |
| | * J/FFLTSYNC | | | | | | | | | |
| | * J/FFLTSYNC | | --> | 0001 | 4201 | 2096 | 687 | | | |
| | * J/FFLT1 | | --> | 0011 | 4203 | 2097 | 688 | | | |
| | * J/STSYNC | | --> | 0101 | 4205 | 2115 | 694 | | | |
| | * J/STFLT2 | | --> | 0111 | 4207 | 2116 | 694 | | | |
| | * J/FPPABORT1 | | --> | 1001 | 4211 | 2176 | 717 | | | |
| | * J/FPPABORT2 | | --> | 1011 | 4213 | 2177 | 718 | | | |
| | * J/FPPABORT3 | | --> | 1101 | 4215 | 2178 | 718 | | | |
| | * J/STFLT2A | | --> | 1111 | 4217 | 2117 | 695 | | | |
| ***** | | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX | PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF UBF | EXTENSION COUT UPF | CLOCKS | |
|---------|---|----------------------------------|------------|-----------------------|--------------|------------|--------------|--------------------|--------|----------------------------|
| 2076 | FSDM2FLT:4162 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | | | |
| | ***** | | | | | | | | | |
| | *TARGETS - 000 - FFLTSYNC 001 - FFLT 010 * | | | | | | | | 4162 | 000000001000 |
| | *- STSYNC 011 - STFLT 100 - FPPABORT1 101 * | | | | | | | | 1010 | 10 00 00 01 110 111 0100 0 |
| | *- FPPABORT2 110 - FPPABORT3 111 - STFLT2 * | | | | | | | | 11100 | 010100 00111 01000001 |
| | *----- DESTINATION * | | | | | | | | | |
| | *MODE 2 OPERATIONS NOTE - ***** * | | | | | | | | | |
| | *CNST4 ADDRESS PICKED TO MESH WITH BC * | | | | | | | | | |
| | *CODE FOR FLPGO ***** TARGETS * | | | | | | | | | |
| | *----- * | | | | | | | | | |
| | *P2, | D+CNST4 D(C)+D(C), | | | | | | | | |
| | *P3, | R(GRINC)+D (A ADDR), FLPGO, | | | | | | | | |
| | *NEXT, | BUTR(SERVICE#D(C)#FPPACK), | | | | | | | | |
| | * | J/FFLTSYNC | * --> | 0001 | 4201 | 2096 | 687 | | | |
| | * | J/FFLT1 | * --> | 0011 | 4203 | 2097 | 688 | | | |
| | * | J/STSYNC | * --> | 0101 | 4205 | 2115 | 694 | | | |
| | * | J/STFLT2 | * --> | 0111 | 4207 | 2116 | 694 | | | |
| | * | J/FPPABORT1 | * --> | 1001 | 4211 | 2176 | 717 | | | |
| | * | J/FPPABORT2 | * --> | 1011 | 4213 | 2177 | 718 | | | |
| | * | J/FPPABORT3 | * --> | 1101 | 4215 | 2178 | 718 | | | |
| | * | J/STFLT2A | * --> | 1111 | 4217 | 2117 | 695 | | | |
| | ***** | | | | | | | | | |
| 2077 | FSDM3FLT:4163 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | | | |
| | ***** | | | | | | | | | |
| | *SAME AS ABOVE * | | | | | | | | 4163 | 000000001000 |
| | *----- DESTINATION * | | | | | | | | 1010 | 11 11 00 01 110 111 0100 0 |
| | *MODE 3 OPERATIONS STORE CONSTANT FOR * | | | | | | | | 10001 | 010100 11000 110110001 |
| | *GENERAL * | | | | | | | | | |
| | *REGISTER * | | | | | | | | | |
| | *P2, | D+2 D(C)+D(C), | | | | | | | | |
| | *P3, | R(GRINC)+D (A ADDR), | | | | | | | | |
| | *P3, | U,DATI NOINT, | | | | | | | | |
| | *NEXT, | J/FSDM3FLT2 | * --> | 4661 | 2078 | 681 | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------|-----------------------------------|--|--------------------------|---|------------|-------------|---------------------------------|---------------------------------|--------|--|
| | | | | | | | RIF | COUT | CLOCKS | |
| 2078 | FSDM3FLT2:4661 | F/FSDM3FLT F/FSDM5FLT4 F/FS2DM3FLT | <-- <-- <-- | 4163 2077 680 4670 2087 683 4173 2154 709 | 4661 | | | 000000001000 | | |
| | *INCREMENT GO FETCH ADDRESS | | | | | | 0000 11 10 00 00 000 000 0000 0 | | | |
| | *P3, MD+DATA, | | | | | | 00000 100000 11000 110110010 | | | |
| | *NEXT, J/FSDM3FLT3 | | --> VV | | | | | | | |
| 2079 | FSDM3FLT3:4662 | F/FSDM3FLT2 | <-- VV | | | | 4662 | 000000001000 | | |
| | * TARGETS | | | | | | | 1010 11 10 00 00 110 111 0110 0 | | |
| | *- | | | | | | | 11100 010010 00111 010000001 | | |
| | *P2, D+MD D(C)+D(C) SR+MD | | | | | | | | | |
| | *P3, R(WDADR)+D (A ADDR) FLPGO, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE#D(C)#FPPACK), | | | | | | | | | |
| | * J/FFLTSYNC | | --> | 0001 4201 2096 687 | | | | | | |
| | * J/FFLT1 | | --> | 0011 4203 2097 688 | | | | | | |
| | * J/STSYNC | | --> | 0101 4205 2115 694 | | | | | | |
| | * J/STFLT2 | | --> | 0111 4207 2116 694 | | | | | | |
| | * J/FPPABORT1 | | --> | 1001 4211 2176 717 | | | | | | |
| | * J/FPPABORT2 | | --> | 1011 4213 2177 718 | | | | | | |
| | * J/FPPABORT3 | | --> | 1101 4215 2178 718 | | | | | | |
| | * J/STFLT2A | | --> | 1111 4217 2117 695 | | | | | | |
| .CASE | 5 OF BFETCHFLT2 | | | | | | | | | |
| 2080 | FSDM4FLT:4164 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 2060 671 4654 2061 674 | 4164 | | | 000000001000 | | |
| | *SAME AS DMD | | | | | | | 1111 10 11 11 11 111 100 0000 0 | | |
| | *----- DESTINATION 4 | | | | | | | 00010 100000 11000 110110100 | | |
| | *OPERATIONS SELECT EMIT MUST BE | | | | | | | | | |
| | *DEFAULT | | | | | | | | | |
| | *P3, MD+-4 (BC), | | | | | | | | | |
| | *NEXT, J/FSDM4FLT2 | | --> | 4664 2081 682 | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|-----------------------|---|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-----------|--------|----------------------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 2081 | FSDM4FLT2:4664 | F/FSDM4FLT | <-- | 4164 | 2080 | 681 | 4664 | | | 000000001000 |
| | * STORE CONSTANT FOR GENERAL REGISTER | | | | | | | 1010 | 11 10 | 00 01 110 111 0100 0 |
| | * INCREMENT | | | | | | | 00000 | 010100 | 10111 010100110 |
| | *P2, D+MD, D(C)+D(C) | | | | | | | | | |
| | *P3, R(GRINC)+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | | | |
| | J/FSDM4FLT3 | | --> | 10 | 4246 | 2082 | 682 | | | |
| | J/FSDM4FLT4 | | --> | 11 | 4247 | 2083 | 682 | | | |
| .CASE 1 OF BFSDM4FLT2 | | | | | | | | | | |
| 2082 | FSDM4FLT3:4246 | F/FSDM4FLT2 F/FSDM4FLT4 | <-- <-- | 4664 4247 | 2081 2083 | 682 682 | 4246 | | | 000000001000 |
| | *TARGETS - 0 - F - FSDM4FLT3 1 - D - | | | | | | | 1001 | 11 10 | 10 10 110 111 0110 0 |
| | *FSDM4FLT4 SPECIAL BSEL MATCH ON MD AND | | | | | | | 11100 | 011010 | 00111 010000001 |
| | *IMMEDO TARGETS - SAME AS | | | | | | | | | |
| | *DMD | | | | | | | | | |
| | *P2, D+R(DF) PLUS MD, D(C)+D(C), | | | | | | | | | |
| | * SR+R(DF) PLUS MD, | | | | | | | | | |
| | *P3, R(WDADR)+D (B ADDR), FLPGO, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE#D(C)#FPPACK), | | | | | | | | | |
| | J/FFLTSYNC | | --> | 0001 | 4201 | 2096 | 687 | | | |
| | J/FFLT1 | | --> | 0011 | 4203 | 2097 | 688 | | | |
| | J/STSYNC | | --> | 0101 | 4205 | 2115 | 694 | | | |
| | J/STFLT2 | | --> | 0111 | 4207 | 2116 | 694 | | | |
| | J/FPPABORT1 | | --> | 1001 | 4211 | 2176 | 717 | | | |
| | J/FPPABORT2 | | --> | 1011 | 4213 | 2177 | 718 | | | |
| | J/FPPABORT3 | | --> | 1101 | 4215 | 2178 | 718 | | | |
| | J/STFLT2A | | --> | 1111 | 4217 | 2117 | 695 | | | |
| .CASE 2 OF BFSDM4FLT2 | | | | | | | | | | |
| 2083 | FSDM4FLT4:4247 | F/FSDM4FLT2 F/FSDM4FLT4 | <-- <-- | 4664 4247 | 2081 2083 | 682 682 | 4247 | | | 000000001000 |
| | *P3, MD+-8 (BC), | | | | | | | 1111 | 10 11 | 11 11 111 000 0000 0 |
| | *NEXT, J/FSDM4FLT3 | | --> | 4246 | 2082 | 682 | | 00010 | 100000 | 11000 010100110 |

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------------|---|--|--------------------------|--------------------------------|------------|------------|-------------|--|
| 2084 | FSDMSFLT:4165 6 OF BFETCHFLT2 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 2060 671 4654 2061 674 | | | | |
| | ***** ----- *----- DESTINATION * *MODE 5 OPERATIONS DEFAULT UCON MUST BE * *EMIT * *----- *P3, MD+-2 (BC), * *NEXT, * * J/FSDMSFLT2 * --> VV ***** | | | | 4165 | | | 00000001000 1111 10 11 11 11 111 110 0000 0 00010 100000 11000 110110101 |
| 2085 | FSDMSFLT2:4665 | F/FSDMSFLT F/FS2DMSFLT | <-- <-- | 4165 2084 683 4175 2158 711 | | | | |
| | ***** *P2, D+MD D(C)+D(C) * *P3, R(GRINC)+D (A ADDR), * *NEXT, * * J/FSDMSFLT3 * --> VV ***** | | | | 4665 | | | 00000001000 1010 11 10 00 01 110 111 0100 0 00000 010100 11000 110110110 |
| 2086 | FSDMSFLT3:4666 | F/FSDMSFLT2 | <-- VV | | | | | |
| | ***** *P2, D+R(DF) MINUS 2(D), D(C)+D(C), * * SR+R(DF) MINUS 2(D), * *P3, R(WDADR)+D (B ADDR), * *NEXT, * * J/FSDMSFLT4 * --> VV ***** | | | | 4666 | | | 00000001000 1101 10 10 10 10 110 111 0110 0 00011 011010 11000 110111000 |
| 2087 | FSDMSFLT4:4670 | F/FSDMSFLT3 | <-- VV | | | | | |
| | ***** * LOAD ADDRESS OF ADDRESS AND FETCH GO TO * *DESTINATION MODE * *3 * *----- *P1, BA+SR, CURRENT MODE, * *P3, U,DATI NOINT, * *NEXT, * * J/FSDM3FLT2 * --> VV ***** | | | | 4670 | | | 00000001011 0000 00 00 00 00 000 000 0001 0 10001 000000 11000 110110001 |
| | | | | 4661 2078 681 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--------------------------------------|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-------------------------------|
| 2088 | FSDM6FLT:4166 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | |
| | ***** | | | | | | | |
| | *OPERATION FLOWS TO COMPLETE FETCH * | | | | | | | |
| | *----- DESTINATION * | | | | | | | |
| | *MODE 6 OPERATIONS GO FETCH THE * | | | | | | | |
| | *INDEX * | | | | | | | |
| | *----- * | | | | | | | |
| | *P1, | BA+PC,CURRENT MODE, | | | | | | |
| | *P2, | D+PC PLUS 2,D(C)+D(C), | | | | | | |
| | *P3, | PC+D (A ADDR), | | | | | | |
| | *P3, | U,DATI NOINT, | | | | | | |
| | *NEXT, | | | | | | | |
| | * | J/FSDM6FLT2 | --> | VV | | | | |
| | ***** | | | | | | | |
| | | F/FSDM6FLT | <-- | 4166 | 2088 | 684 | | |
| | | F/FSDM7FLT | <-- | 4167 | 2091 | 685 | | |
| | | F/FS2DM6FLT | <-- | 4176 | 2159 | 711 | | |
| | | F/FS2DM7FLT | <-- | 4177 | 2160 | 711 | | |
| 2089 | FSDM6FLT2:4671 | | | | | | | |
| | ***** | | | | | | | |
| | * BRANCH ON EVEN OR ODD * | | | | | | | |
| | *MODES * | | | | | | | |
| | *----- * | | | | | | | |
| | *P2, | D+D,D(C)+D(C), | | | | | | |
| | *P3, | MD+DATA,R(GRIINC)+D (A ADDR), | | | | | | |
| | *NEXT, | BUTR(DM), | | | | | | |
| | * | J/FSDM6FLT3 | | | | | | |
| | * | J/FSDM6FLT3 | --> | 1110 | 4336 | 2090 | 685 | |
| | * | J/FSDM7FLT2 | --> | 1111 | 4337 | 2092 | 686 | |
| | ***** | | | | | | | |

4166 000000001011
 1001 11 11 10 01 111 111 0101 0
 1001 000110 11000 110111001

4671 000000001000
 0011 11 10 00 01 110 111 0100 0
 00000 110100 00101 011011110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|--------------------------------|---------|----------|---------------------------------|
| .CASE | 1 OF BFSDM6FLT2 | | | | | | |
| 2090 | FSDM6FLT3:4336 | F/LOADSIX2 F/FSDM6FLT2 | <-- <-- | 4154 1250 406 4671 2089 684 | | | |
| | ***** | | | | | | |
| | *TARGETS - EVEN - FSDM6FLT3 ODD - | | | | | | 4336 000000001000 |
| | *FSDM7FLT2 ADD INDEX SPECIAL BSEL MATCH | | | | | | 1001 11 10 10 10 110 111 0110 0 |
| | *ON IMMEDO AND MD TARGETS | | | | | | 11100 011010 00111 011110001 |
| | *- *-----* | | | | | | |
| | *P2, D+R(DF) PLUS MD, D(C)+D(C), | | | | | | |
| | * SR+R(DF) PLUS MD | | | | | | |
| | *P3, R(WDADR)+D (B ADDR), FLPGO, | | | | | | |
| | *NEXT, BUTR(SERVICE#D(C)#FPPACK), | | | | | | |
| | * J/FFLTSYNC2 | | | | | | |
| | | J/FFLTSYNC2 | * --> | 0001 4361 2144 704 | | | |
| | | J/FDM67FLT | * --> | 0011 4363 2146 706 | | | |
| | | J/STSYNC2 | * --> | 0101 4365 2145 705 | | | |
| | | J/STDM67FLT | * --> | 0111 4367 2149 707 | | | |
| | | J/FPPABORT4 | * --> | 1001 4371 2179 718 | | | |
| | | J/FPPABORT5 | * --> | 1011 4373 2180 719 | | | |
| | | J/FPPABORT6 | * --> | 1101 4375 2181 719 | | | |
| | | J/STDM67FLT2 | * --> | 1111 4377 2150 707 | | | |
| | ***** | | | | | | |
| .CASE | 8 OF BFETCHFLT2 | | | | | | |
| 2091 | FSDM7FLT:4167 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 2060 671 4654 2061 674 | | | |
| | ***** | | | | | | |
| | *000 - FFLTSYNC2 001 - FDM67FLT 010 - | | | | | | 4167 000000001011 |
| | *STSYNC2 011 - STDM67FLT 100 - FPPABORT4 | | | | | | 1001 11 11 10 01 111 111 0101 0 |
| | *101 - FPPABORT5 110 - FPPABORT6 111 - | | | | | | 10001 000110 11000 110111001 |
| | *STDM67FLT2 | | | | | | |
| | *-----* | | | | | | |
| | *-----* | DESTINATION | | | | | |
| | *MODE 7 | | | | | | |
| | *OPERATIONS | | | | | | |
| | *-----* | | | | | | |
| | *P1, BA+PC, CURRENT MODE, | | | | | | |
| | *P2, D+PC PLUS 2, D(C)+D(C), | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/FSDM6FLT2 | | * --> | 4671 2089 684 | | | |
| | ***** | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|----------------------------------|---------------------------------------|-----------------------|--------------------------------|---------|---------|----------|------------------------|--------|
| 2092 | FSDM7FLT2:4337 | F/LOADSIX2 F/FSDM6FLT2 | <-- <-- | 4154 1250 406 4671 2089 684 | | | | | |
| | * ADD | | | 4337 | 1001 | 11 10 | 10 10 | 000 111 | 0110 0 |
| | * INDEX | | | | 00000 | 000000 | 11000 | 110111100 | |
| | *P2, D+R(DF) PLUS MD, D(C)+D(C), | | | | | | | | |
| | * SR+R(DF) PLUS MD, | | | | | | | | |
| | *NEXT, J/FSDM7FLT3 | | --> VV | | | | | | |
| 2093 | FSDM7FLT3:4674 | F/FSDM7FLT2 | <-- VV | | | | | | |
| | * FETCH | | | 4674 | 0000 | 00 00 | 00 00 | 000 000 | 0001 0 |
| | * ADDRESS | | | | 10001 | 000000 | 11000 | 110111101 | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | | | |
| | *NEXT, J/FSDM7FLT4 | | --> VV | | | | | | |
| 2094 | FSDM7FLT4:4675 | F/FSDM7FLT3 | <-- VV | | | | | | |
| | *P3, MD+DATA, | | | 4675 | 0000 | 11 10 | 00 00 | 000 000 | 0000 0 |
| | *NEXT, J/FSDM7FLT5 | | --> | 4700 2095 687 | 00000 | 100000 | 11000 | 111000000 | |

K09

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| BOX NO. .CASE | TAG: ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|------------------|--------------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|
| | | | | | | | | | RIF | COUT |
| 2097 | FFLT1:4203 | F/FSDM1FLT | <-- | 4161 | 2075 | 679 | | | | |
| | | F/FSDM2FLT | <-- | 4162 | 2076 | 680 | | | | |
| | | F/FSDM3FLT3 | <-- | 4662 | 2079 | 681 | | | | |
| | | F/FSDM4FLT3 | <-- | 4246 | 2082 | 682 | | | | |
| | | F/FFLTSYNC | <-- | 4201 | 2096 | 687 | | | | |
| | | F/STSYNC | <-- | 4205 | 2115 | 694 | | | | |
| | | ***** | | | | | | | | |
| | | ----- LOAD ADDRESS ----- | | | | | | | | |
| | | *FOR FIRST OPERAND* | | | | | | | | |
| | | *P1, BA+SR, CURRENT MODE,* | | | | | | | | |
| | | *P2, SR+SR PLUS 2,* | | | | | | | | |
| | | *P3, U, DATI NOINT,* | | | | | | | | |
| | | *NEXT, J/FFLT2 | | | --> | VV | | | | |
| | | ***** | | | | | | | | |
| 2098 | FFLT2:4701 | F/FFLT1 | <-- | VV | | | | | | |
| | | ***** | | | | | | | | |
| | | * FETCH FIRST OPERAND TARGETS - WARM - | | | | | | | | |
| | | *FFLT3 | | | | | | | | |
| | | *P2, D+PC (A),* | | | | | | | | |
| | | *P3, MD+DATA,* | | | | | | | | |
| | | *NEXT, BUTR(HOTWARM),* | | | | | | | | |
| | | * J/FFLT3 | | | --> | 10 4066 | 2099 | 688 | | |
| | | * J/FFLT7 | | | --> | 11 4067 | 2103 | 690 | | |
| | | ***** | | | | | | | | |
| .CASE | 1 OF BFFLT2 | | | | | | | | | |
| 2099 | FFLT3:4066 | F/FFLT2 | <-- | 4701 | 2098 | 688 | | | | |
| | | F/FDM67FLT3 | <-- | 4653 | 2148 | 706 | | | | |
| | | ***** | | | | | | | | |
| | | *HOT - FFLT7 STORE PC FOR EXCEPTIONS* | | | | | | | | |
| | | *FETCH 2ND WORD* | | | | | | | | |
| | | *P1, BA+SR, CURRENT MODE,* | | | | | | | | |
| | | *P3, FPA+D (B ADDR),* | | | | | | | | |
| | | *P3, U, DATI NOINT,* | | | | | | | | |
| | | *NEXT, J/FFLT4 | | | --> | 4702 | 2100 | 689 | | |
| | | ***** | | | | | | | | |

```

4203      000000001011
      1001 11 11 00 00 000 000 0011 0
      10001 000000 11000 111000001
    
```

```

4701      000000001000
      1111 11 10 10 01 111 000 0100 0
      00000 100000 10100 000110110
    
```

```

4066      000000001011
      0000 00 10 00 00 111 000 0001 0
      10001 011100 11000 111000010
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|--|--------------------------|--------------------|------------|-------------|---|
| 2100 | FFLT4:4702 ***** * STORE FIRST WORD GET 2ND WORD TARGETS * *- *-----* *P2, D+MD, *P3, FDST3+D (A ADDR), MD+DATA, *NEXT, BUTR(FD), * J/FFLT5 * J/FFLT6 ***** | <-- 4066 2099 688 | | 4702 | | | 000000001000 1010 11 10 00 01 011 000 0100 0 00000 100010 10111 101101010 |
| | | --> 10 4552 2101 689 | | | | | |
| | | --> 11 4553 2102 689 | | | | | |
| .CASE 2101 | 1 OF BFFLT4 FFLT5:4552 ***** * STORE 2ND *WORD *-----* *P2, D+MD, *P3, FDST2+D (A ADDR), *NEXT, J/TSTNZERO * J/TSTNZERO ***** | <-- VV | | 4552 | | | 000000001000 1010 11 10 00 01 011 000 0100 0 00000 000100 11000 011001111 |
| | | --> 4317 2187 721 | | | | | |
| .CASE 2102 | 2 OF BFFLT4 FFLT6:4553 ***** *P2, SR+SR PLUS 2, *NEXT, J/FFLT10 * J/FFLT10 ***** | <-- | | 4553 | | | 000000001000 1001 11 11 00 00 000 000 0010 0 00000 000000 11000 111000100 |
| | | --> 4704 2106 691 | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|--------------------------------------|---------|----------|---|
| .CASE | 2 OF BFFLT2 | | | | | | |
| 2103 | FFLT7:4067 | F/FFLT2 F/FDM67FLT3 | <-- <-- | 4701 2098 688 4653 2148 706 | | | |
| | ***** * FETCH 2ND WORD FOR HOT SAVE PC FOR * EXCEPTIONS TARGETS - F - 0 - * FFLT8 *-----* | | | | | | 4067 0000 00 10 00 00 111 000 0001 0 10001 011100 10111 001000010 |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, *P1, BA+SR, CURRENT MODE, *P3, FPA+D (B ADDR), *P3, U, DATI NOINT, *NEXT, BUTR(FD), * J/FFLT8 * J/FFLT9 | | | 10 4102 2104 690 11 4103 2105 690 | | | |
| .CASE | 1 OF BFFLT7 | | | | | | |
| 2104 | FFLT8:4102 | F/FFLT7 F/FFLTIMM3 | <-- <-- | 4067 2103 690 4273 2164 713 | | | |
| | ***** * 0 - 1 - FFLT9 UPDATE GENERAL REGISTER * TARGETS *-----* | | | | | | 4102 1001 01 11 10 10 110 000 0100 0 00000 000110 10000 111010010 |
| | *P2, D+R(DP) PLUS R(GRINC), *P3, R(DP)+D (A ADDR), *NEXT, BUTR(SERVICE), * J/FETO1F * J/SERO2F | | | 10 4722 1316 427 11 4723 1317 428 | | | |
| .CASE | 2 OF BFFLT7 | | | | | | |
| 2105 | FFLT9:4103 | F/FFLT7 F/FFLTIMM3 | <-- <-- | 4067 2103 690 4273 2164 713 | | | |
| | ***** * 0 - FETO1F 1 - SERO2F DO DOUBLE FETCH * FOR * HOT *-----* | | | | | | 4103 1001 11 11 00 00 000 000 0010 0 00000 000000 11000 111000100 |
| | *P2, SR+SR PLUS 2, *NEXT, J/FFLT10 | | | 4704 2106 691 | | | |

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS | |
|---------|---------------------------------|--|--------------------------|--------------|--------------|------------|-------------|-----------|----------|----------------|--|
| | | | | | | | | RIF | COOT | | |
| 2106 | FFLT10:4704 | F/FFLT6 F/FFLT9 | <-- <-- | 4553 4103 | 2102 2105 | 689 690 | | | | | |
| | ***** | | | | | | | 4704 | 00000000 | 1011 | |
| | * LOAD ADDRESS FOR 3RD | | | | | | 1001 | 11 11 | 00 00 | 000 000 0011 0 | |
| | *WORD | | | | | | 10001 | 000000 | 11000 | 111000101 | |
| | -----* | | | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | | | |
| | *P2, SR+SR PLUS 2, | | | | | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/FFLT11 | | --> VV | | | | | | | | |
| 2107 | FFLT11:4705 | F/FFLT10 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 4705 | 00000000 | 1000 | |
| | * TARGETS - WARM - | | | | | | 1010 | 11 10 | 00 01 | 011 000 0100 0 | |
| | *FFLT12 | | | | | | 00000 | 100100 | 10100 | 010100010 | |
| | -----* | | | | | | | | | | |
| | *P2, D+MD, | | | | | | | | | | |
| | *P3, FDST2+D (A ADDR), MD+DATA, | | | | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | | | | |
| | * J/FFLT12 | | --> | 10 4242 | 2108 | 691 | | | | | |
| | * J/FFLT16 | | --> | 11 4243 | 2112 | 693 | | | | | |
| | ***** | | | | | | | | | | |
| .CASE | 1 OF BFFLT11 | | | | | | | | | | |
| 2108 | FFLT12:4242 | F/FFLT11 | <-- VV | | | | | | | | |
| | ***** | | | | | | | 4242 | 00000000 | 1011 | |
| | *HOT - FFLT16 FETCH 4TH | | | | | | 1010 | 01 11 | 00 00 | 110 000 0011 0 | |
| | *WORD | | | | | | 10001 | 000000 | 11000 | 111000110 | |
| | -----* | | | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | | | |
| | *P2, SR+R(GRINC), | | | | | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/FFLT13 | | --> | 4706 | 2109 | 692 | | | | | |
| | ***** | | | | | | | | | | |

C10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|------------|---|--|--------------------------|--------------|--------------|------------|-------------|-----------|---|
| | | | | | | | | RIF | COUT CLOCKS |
| .CASE 2112 | 2 OF BFFLT11 FFLT16:4243 | F/FFLT11 | <-- | 4705 | 2107 | 691 | | | |
| | ***** * FOR HOT FP GO FETCH 4TH WORD TEST * INDIRECT MODE TARGETS *- *-----* | | | | | | | 4243 | 000000001011 |
| | | | | | | | | | 0000 00 00 00 00 000 000 0001 0 10001 000000 00101 010111110 |
| | *P1, BA+SR, CURRENT MODE, *P3, U, DAT1 NOINT, *NEXT, BUTR(DM), * J/FFLT17 * J/FFLT18 ***** | | | | | | | | |
| | | | --> | 1110 | 4276 | 2113 | 693 | | |
| | | | --> | 1111 | 4277 | 2114 | 693 | | |
| .CASE 2113 | 1 OF BFFLT16 FFLT17:4276 | F/FFLT16 F/STOREHOT9 | <-- <-- | 4243 4734 | 2112 2143 | 693 703 | | | |
| | ***** * EVEN - FFLT17 ODD - FFLT18 UPDATE * GENERAL REGISTER *-----* | | | | | | | 4276 | 000000001000 |
| | | | | | | | | | 1001 01 11 10 10 110 000 0100 0 00000 000110 11000 010111111 |
| | *P2, D+R(DF) PLUS R(GRINC), *P3, R(DF)+D (A ADDR), *NEXT, J/FFLT18 ***** | | --> VV | | | | | | |
| .CASE 2114 | 2 OF BFFLT16 FFLT18:4277 | F/FFLT16 F/STOREHOT9 | <-- <-- | 4243 4734 | 2112 2143 | 693 703 | | | |
| | ***** * UPDATE GENERAL REGISTER TARGETS *- *-----* | | | | | | | 4277 | 000000001000 |
| | | | | | | | | | 1001 01 11 10 10 110 000 0100 0 00000 000110 10000 111010010 |
| | *P2, D+R(DF) PLUS R(GRINC), *P3, R(DF)+D (A ADDR), *NEXT, BUTR(SERVICE), * J/FETO1F * J/FETO1F * J/SERO2F ***** | | --> | 10 | 4722 | 1316 | 427 | | |
| | | | --> | 11 | 4723 | 1317 | 428 | | |

| BOX NO. .CASE | TAG: ADDRESS 3 OF BFSDM1FLT | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|------------------|--------------------------------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| | | F/FSDM1FLT | <-- | 4161 | 2075 | 679 | | | | |
| | | F/FSDM2FLT | <-- | 4162 | 2076 | 680 | | | | |
| | | F/FSDM3FLT3 | <-- | 4662 | 2079 | 681 | | | | |
| | | F/FSDM4FLT3 | <-- | 4246 | 2082 | 682 | | | | |
| | | F/FFLTSYNC | <-- | 4201 | 2096 | 687 | | | | |
| 2115 | STSYNC:4205 | F/STSYNC | <-- | 4205 | 2115 | 694 | | | | |
| | ***** | | | | | | | | | |
| | *0 - FETO1F 1 - SERO1F | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *----- STORE OPERATION | | | | | | | | | |
| | *SYNCHRONIZATION POINT FOR DM'S | | | | | | | | | |
| | *1-5 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | | FLPGO | | | | | | | | |
| | *SELECT, | FPSCC(FPP) FPSCC+DATA | | | | | | | | |
| | *NEXT, | BUTR(SERVICE#D(C)#FPPACK), | | | | | | | | |
| | | J/FFLTSYNC | * --> | 0001 | 4201 | 2096 | 687 | | | |
| | | J/FFLT1 | * --> | 0011 | 4203 | 2097 | 688 | | | |
| | | J/STSYNC | * --> | 0101 | 4205 | 2115 | 694 | | | |
| | | J/STFLT2 | * --> | 0111 | 4207 | 2116 | 694 | | | |
| | | J/FPPABORT1 | * --> | 1001 | 4211 | 2176 | 717 | | | |
| | | J/FPPABORT2 | * --> | 1011 | 4213 | 2177 | 718 | | | |
| | | J/FPPABORT3 | * --> | 1101 | 4215 | 2178 | 718 | | | |
| | | J/STFLT2A | * --> | 1111 | 4217 | 2117 | 695 | | | |
| | ***** | | | | | | | | | |
| .CASE | 4 OF BFSDM1FLT | | | | | | | | | |
| | | F/FSDM1FLT | <-- | 4161 | 2075 | 679 | | | | |
| | | F/FSDM2FLT | <-- | 4162 | 2076 | 680 | | | | |
| | | F/FSDM3FLT3 | <-- | 4662 | 2079 | 681 | | | | |
| | | F/FSDM4FLT3 | <-- | 4246 | 2082 | 682 | | | | |
| | | F/FFLTSYNC | <-- | 4201 | 2096 | 687 | | | | |
| 2116 | STFLT2:4207 | F/STSYNC | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *----- D(C)=0 SET FOR | | | | | | | | | |
| | *INDICATOR OF NOT IMMED MODE FOR HOT | | | | | | | | | |
| | *STOREHOT FLOWS TARGETS - WARM - | | | | | | | | | |
| | *STFLT3 | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P1, | BA+SR | | | | | | | | |
| | *P2, | D+0, D(C)+ALU00, CURRENT MODE, | | | | | | | | |
| | *NEXT, | BUTR(HOTWARM), | | | | | | | | |
| | | J/STFLT3 | * --> | 10 | 4012 | 2118 | 695 | | | |
| | | J/STOREHOT | * --> | 11 | 4013 | 2130 | 699 | | | |
| | ***** | | | | | | | | | |

4205 010000001000
 0000 00 00 00 00 000 000 0000 0
 11100 000000 00111 010000001

4207 000000001011
 0011 00 00 00 00 000 010 0101 0
 00000 000000 10100 000001010

E10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 695

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE | 8 OF BFSM1FLT | | | | | | | |
| | | F/FSDM1FLT | <-- | 4161 | 2075 | 679 | | |
| | | F/FSDM2FLT | <-- | 4162 | 2076 | 680 | | |
| | | F/FSDM3FLT3 | <-- | 4662 | 2079 | 681 | | |
| | | F/FSDM4FLT3 | <-- | 4246 | 2082 | 682 | | |
| | | F/FFLTSYNC | <-- | 4201 | 2096 | 687 | | |
| | | F/STSYNC | <-- | 4205 | 2115 | 694 | | |
| 2117 | STFLT2A:4217 | | | | | | | |
| | ***** | | | | | | | |
| | *HOT - STOREHOT SET D(C)=0 AS INDICATOR * | | | | | | | |
| | *OF NOT IMMED MODE FOR STOREHOT FLOWS * | | | | | | | |
| | *TARGETS - WARM - * | | | | | | | |
| | *STFLT3 * | | | | | | | |
| | *-----* | | | | | | | |
| | *P1, | BA+SR, CURRENT MODE, | * | | | | | |
| | *P2, | D+0, D(C)+ALU00, | * | | | | | |
| | *NEXT, | BUTR(HOTWARM), | * | | | | | |
| | * | J/STFLT3 | * | | | | | |
| | * | J/STOREHOT | * --> | 10 | 4012 | 2118 | 695 | |
| | * | | * --> | 11 | 4013 | 2130 | 699 | |
| | ***** | | | | | | | |
| .CASE | 1 OF BSTFLT2 | | | | | | | |
| | | F/STFLT2 | <-- | 4207 | 2116 | 694 | | |
| | | F/STFLT2A | <-- | 4217 | 2117 | 695 | | |
| | | F/STDM67FLT | <-- | 4367 | 2149 | 707 | | |
| | | F/STDM67FLT2 | <-- | 4377 | 2150 | 707 | | |
| 2118 | STFLT3:4012 | | | | | | | |
| | ***** | | | | | | | |
| | *HOT - STOREHOT * | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, | D+FDST3, | * | | | | | |
| | *P3, | U, DATO, | * | | | | | |
| | *ENABLE, | KJ, | * | | | | | |
| | *NEXT, | | * | | | | | |
| | * | J/STFLT4 | * --> | 4711 | 2119 | 696 | | |
| | ***** | | | | | | | |

```

4217          000000001011
      0011  00 00  00 00  000 010  0101  0
      0000  000000  10100  000001010
  
```

```

4012          000001001000
      1111  00 00  10 01  011 000  0100  0
      10010 000000  11000  111001001
  
```

F10

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 696

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------|------------------------------------|--|--------------------------|--------------------------------|--------------|------------|-------------|--------------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 2119 | STFLT4:4711 | F/STFLT3 F/STOREHOT2 | <-- <-- | 4012 2118 695 4656 2131 699 | | | | | | |
| | ***** | | | 4711 | | | | 000000001000 | | |
| | * TARGETS - WARM - | | | | 1001 11 11 | 00 00 | 000 000 | 0010 0 | | |
| | *STFLT5 | | | | 00000 000000 | 10100 | 101111010 | | | |
| | ----- | | | | | | | | | |
| | *P2, SR+SR PLUS 2, | | | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | | | |
| | * J/STFLT5 | | --> | 10 4572 2120 696 | | | | | | |
| | * J/STOREHOT3 | | --> | 11 4573 2137 701 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 2120 | 1 OF BSTFLT4 STFLT5:4572 | F/STFLT4 | <-- VV | | | | | | | |
| | ***** | | | 4572 | | | | 000001001011 | | |
| | *HOT - STOREHOT3 TARGETS - F - 0 - | | | | 1010 00 11 | 00 00 | 011 000 | 0101 0 | | |
| | *STFLT6 | | | | 10010 000000 | 10111 | 010011110 | | | |
| | ----- | | | | | | | | | |
| | *P1, BA+SR CURRENT MODE, | | | | | | | | | |
| | *P2, D+FDST2, | | | | | | | | | |
| | *P3, U,DATO, | | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | | | |
| | * J/STFLT6 | | --> | 10 4236 2121 696 | | | | | | |
| | * J/STFLT7 | | --> | 11 4237 2122 697 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 2121 | 1 OF BSTFLT5 STFLT6:4236 | F/STFLT5 F/STIMM3 | <-- <-- | 4572 2120 696 4672 2172 716 | | | | | | |
| | ***** | | | 4236 | | | | 000000001000 | | |
| | *D - 1 - STFLT7 NULL ;NO OP DUE TO | | | | 0000 00 00 | 00 00 | 000 000 | 0000 0 | | |
| | *STORE | | | | 00000 000000 | 11000 | 010101111 | | | |
| | ----- | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/STFLT14 | | --> | 4257 2129 698 | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | |
|---------|---------------------------------------|--------------------|------------|------|--------|------|------|-----------------|----------------------------|
| .CASE | 2 OF BSTFLT2 | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS | |
| 2130 | STOREHOT:4013 | F/STFLT2 | <-- | 4207 | 2116 | 694 | | | |
| | | F/STFLT2A | <-- | 4217 | 2117 | 695 | | | |
| | | F/STDM67FLT | <-- | 4367 | 2149 | 707 | | | |
| | | F/STDM67FLT2 | <-- | 4377 | 2150 | 707 | | | |
| | ***** | | | | | | | 4013 | 010000001000 |
| | *-----* | | | | | | | 0000 | 11 10 00 00 001 000 0000 0 |
| | *-----* | | | | | | | 11001 | 100000 00111 110101110 |
| | *-----* | | | | | | | | |
| | *SELECT, FPSCC(FPP),FPSCC+DATA,* | | | | | | | | |
| | *SELECT, FPP(READ),* | | | | | | | | |
| | *P3, MD+DATA,* | | | | | | | | |
| | *NEXT, BUTR(HOT EXCEPTION),* | | | | | | | | |
| | * J/STOREHOT2 * | | | | | | | | |
| | | J/STOREHOT2 | --> | 1110 | 4656 | 2131 | 699 | | |
| | | J/STOREHOT2B | --> | 1111 | 4657 | 2132 | 700 | | |
| | ***** | | | | | | | | |
| .CASE | 1 OF BSTOREHOT | | | | | | | | |
| 2131 | STOREHOT2:4656 | F/STOREHOT | <-- | 4013 | 2130 | 699 | | | |
| | | F/STOREHOT2E | <-- | 4725 | 2135 | 701 | | | |
| | ***** | | | | | | | 4656 | 000001001000 |
| | *OPERATION - ACTIVE ONLY IF STCP* | | | | | | | 1010 | 11 10 00 00 000 000 0100 0 |
| | *INSTRUCTION OVERFLOWS TARGETS - 0 -* | | | | | | | 10010 | 100000 11000 111001001 |
| | *STOREHOT2 1 - STOREHOT2B FETCH 2ND* | | | | | | | | |
| | *WORD* | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, D+MD,* | | | | | | | | |
| | *P3, MD+DATA,* | | | | | | | | |
| | *P3, U, DATO,* | | | | | | | | |
| | *ENABLE, KJ,* | | | | | | | | |
| | *NEXT,* | | | | | | | | |
| | | J/STFLT4 | --> | 4711 | 2119 | 696 | | | |
| | ***** | | | | | | | | |

J10

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSB | BUSB | EXTENSION | CLOCK |
|---------|--------------------------------------|----------------------------|------------|--------------|--------------|------------|------|------|---------------------------------|-------|
| | | | | | | | | | | |
| 2132 | STOREHOT2B:4657 | F/STOREHOT F/STOREHOT2E | <-- <-- | 4013 4725 | 2130 2135 | 699 701 | | | | |
| | *D(C)=0 | | | | | | | | 000000001000 | |
| | *P2, D+FPSHIFEC PLUS 0,D(C)+CIN, | | | | | | | | 1001 11 01 11 00 011 000 0100 0 | |
| | *NEXT, FLPG0, | | | | | | | | 11100 000000 11000 111010001 | |
| | * J/STOREHOT2C | | --> | VV | | | | | | |
| 2133 | STOREHOT2C:4721 | F/STOREHOT2B F/STIMM6 | <-- <-- | 4657 4677 | 2132 2175 | 700 717 | | | | |
| | *DO BYTE BYTE | | | | | | | | 000000001000 | |
| | *SWAP | | | | | | | | 1111 00 00 01 01 000 111 0100 0 | |
| | *P2, D+D SWAP,D(C)+D(C), | | | | | | | | 00101 000000 11000 111010100 | |
| | *NEXT, J/STOREHOT2D | | --> | VV | | | | | | |
| 2134 | STOREHOT2D:4724 | F/STOREHOT2C | <-- | VV | | | | | | |
| | *FETCH SAVED PC FOR FPA JUMP BACK TO | | | | | | | | 000000001000 | |
| | *IMMED OR NOT IMMED STOREHOT | | | | | | | | 1111 00 00 10 01 011 111 0100 0 | |
| | *FLOWS | | | | | | | | 00000 000000 10011 111010101 | |
| | *P2, D+R(T3) (A),D(C)+D(C), | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | |
| | * J/STOREHOT2E | | --> | 01 4725 | 2135 | 701 | | | | |
| | * J/STOREHOT2F | | --> | 11 4727 | 2136 | 701 | | | | |

K10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 701

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE 2135 | 1 OF BSTOREHOT2D | | | | | | | | | |
| | STOREHOT2E:4725 | F/STOREHOT2D | <-- | 4724 | 2134 | 700 | | | | |
| | ***** | | | | | | | | | |
| | *TARGETS - 0 - STOREHOT2E 1 - STOREHOT2F * | | | | | | | | | |
| | *FETCH FIRST WORD FROM * | | | | | | | | | |
| | *HOT * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P3, FPA+D (A ADDR),MD+DATA, * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/STOREHOT2 * --> | | | | | | | | | |
| .CASE 2136 | 2 OF BSTOREHOT2D | | | | | | | | | |
| | STOREHOT2F:4727 | F/STOREHOT2D | <-- | 4724 | 2134 | 700 | | | | |
| | ***** | | | | | | | | | |
| | * FETCH FIRST WORD FROM HOT RETURN TO * | | | | | | | | | |
| | *IMMED * | | | | | | | | | |
| | *FLOWS * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P3, FPA+D (A ADDR),MD+DATA, * | | | | | | | | | |
| | *NEXT, * | | | | | | | | | |
| | * J/STIMMS * --> | | | | | | | | | |
| .CASE 2137 | 2 OF BSTFLT4 | | | | | | | | | |
| | STOREHOT3:4573 | F/STFLT4 | <-- | 4711 | 2119 | 696 | | | | |
| | ***** | | | | | | | | | |
| | * FETCH 3RD WORD TARGETS - F - * | | | | | | | | | |
| | *STOREHOT4 * | | | | | | | | | |
| | *-----* | | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, * | | | | | | | | | |
| | *P2, D+MD, * | | | | | | | | | |
| | *P3, MD+DATA, * | | | | | | | | | |
| | *P3, U, DATO, * | | | | | | | | | |
| *ENABLE, KJ, * | | | | | | | | | | |
| *NEXT, BUTR(FD), * | | | | | | | | | | |
| * J/STOREHOT4 * --> | | | | | | | | | | |
| * J/STOREHOT5 * --> | | | | | | | | | | |
| ***** | | | | | | | | | | |

```

4725
0000 11 10 00 00 111 000 0000 0
00000 110100 11000 110101110

4727
0000 11 10 00 00 111 000 0000 0
00000 110100 11000 110111110

4573
1010 11 10 00 00 000 000 0101 0
10010 100000 10111 110010010
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|--|-------------------------|------------|--------------|--------------|------------|----------|--------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | RIF COUT | CLOCKS |
| 2138 | STOREHOT4:4622 | F/STOREHOT3 F/STIMMS | <-- <-- | 4573 4676 | 2137 2174 | 701 717 | | |
| | *D - STOREHOT5 NULL TO PERMIT DATA TO SETTLE | | | 4622 | 0000 | 00 00 | 00 00 | 000000001000 |
| | *NEXT, J/FFLT18 | | --> | 4277 | 2114 | 693 | | |
| 2139 | STOREHOT5:4623 | F/STOREHOT3 F/STIMMS | <-- <-- | 4573 4676 | 2137 2174 | 701 717 | | |
| | * CALCULATE 3RD WORD ADDRESS | | | 4623 | 1001 | 11 11 | 00 00 | 000000001000 |
| | *P2, SR+SR PLUS 2, | | | | 0000 | 000000 | 11000 | 111010110 |
| | *NEXT, J/STOREHOT6 | | --> VV | | | | | |
| 2140 | STOREHOT6:4726 | F/STOREHOT5 | <-- VV | | | | | |
| | * FETCH 4TH WORD | | | 4726 | 1010 | 11 10 | 00 00 | 00001001011 |
| | *P1, BA+SR, CURRENT MODE, | | | | 10010 | 100000 | 11000 | 111011000 |
| | *P2, D+MD, | | | | | | | |
| | *P3, MD+DATA, | | | | | | | |
| | *P3, U, DATO, | | | | | | | |
| | *ENABLE, KJ, | | | | | | | |
| | *NEXT, J/STOREHOT7 | | --> | 4730 | 2141 | 703 | | |

M10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 703

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------|--|--|--------------------------|------|------------|------------|-------------|------------------|---------|-----------|
| | | | | | | | | RIF | COUT | |
| 2141 | STOREHOT7:4730 ***** * CALCULATE 4TH WORD *ADDRESS *-----* | F/STOREHOT6 ***** | <-- | 4726 | 2140 | 702 | 4730 | 00000000 | 1000 | |
| | *P2, SR+SR PLUS 2, *NEXT, * J/STOREHOT8 ***** | | --> VV | | | | | 1001 11 11 00 00 | 000 000 | 0010 0 |
| 2142 | STOREHOT8:4731 ***** *P1, BA+SR, CURRENT MODE, *P2, D+MD, *P3 U, DATO, *ENABLE, KJ, *NEXT, * J/STOREHOT9 ***** | F/STOREHOT7 ***** | <-- VV | 4731 | | | | 00000100 | 1011 | |
| | | | | | | | | 1010 11 10 00 00 | 000 000 | 0101 0 |
| | | | | | | | | 10010 000000 | 11000 | 111011100 |
| 2143 | STOREHOT9:4734 ***** * NULL TO PERMIT DATA TO SETTLE CHECK *FOR ODD OR EVEN *DM *-----* | F/STOREHOT8 ***** | <-- VV | 4734 | | | | 00000000 | 1000 | |
| | *NEXT, BUTR(DM), * J/FFLT17 * J/FFLT18 ***** | | --> | 1110 | 4276 | 2113 | 693 | 0000 00 00 00 00 | 000 000 | 0000 0 |
| | | | --> | 1111 | 4277 | 2114 | 693 | 00000 000000 | 00101 | 010111110 |

N10

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 704

| BOX NO. .CASE | TAG: ADDRESS 1 OF BFSDM6FLT3 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|------------------|--|--|--------------------------|-------|------------|------------|-------------|--------------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| | | F/FSDM6FLT3 <-- | 4336 2090 685 | | | | | | |
| | | F/FSDM7FLT5 <-- | 4700 2095 687 | | | | | | |
| | | F/FFLTSYNC2 <-- | 4361 2144 704 | | | | | | |
| 2144 | FFLTSYNC2:4361 | F/STSYNC2 <-- | 4365 2145 705 | | | | | | |
| | ***** | | | 4361 | | | | 010000001000 | |
| | ----- | | | 0000 | 00 00 | 00 00 | 000 000 | 0000 0 | |
| | * SYNC POINT FOR * | | | 11100 | 000000 | 00111 | 011110001 | | |
| | * FETCH ROUTINE AND DESTINATION MODES 6 OR * | | | | | | | | |
| | * 7 TARGETS * | | | | | | | | |
| | *-----* | | | | | | | | |
| | * SELECT, FLPG0, | | | | | | | | |
| | * NEXT, FPSCC(FPP), FPSCC+DATA, | | | | | | | | |
| | * BUTR(SERVICE#D(C)#FPPACK), | | | | | | | | |
| | * J/FFLTSYNC2 | | | | | | | | |
| | | J/FFLTSYNC2 * --> | 0001 4361 2144 704 | | | | | | |
| | | J/FDM67FLT * --> | 0011 4363 2146 706 | | | | | | |
| | | J/STSYNC2 * --> | 0101 4365 2145 705 | | | | | | |
| | | J/STDM67FLT * --> | 0111 4367 2149 707 | | | | | | |
| | | J/FPPABORT4 * --> | 1001 4371 2179 718 | | | | | | |
| | | J/FPPABORT5 * --> | 1011 4373 2180 719 | | | | | | |
| | | J/FPPABORT6 * --> | 1101 4375 2181 719 | | | | | | |
| | | J/STDM67FLT2 * --> | 1111 4377 2150 707 | | | | | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|--------------------|------------|------|--------|------|------|-----------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| | | F/FSDM6FLT3 | <-- | 4336 | 2090 | 685 | | |
| | | F/FSDM7FLT5 | <-- | 4700 | 2095 | 687 | | |
| | | F/FFLTSYNC2 | <-- | 4361 | 2144 | 704 | | |
| 2145 | STSYNC2:4365 | F/STSYNC2 | <-- | 4365 | 2145 | 705 | | |
| | ***** | | | | | | | |
| | *000 - FFLTSYNC2 001 - FDM67FLT 010 - | | | | | | | |
| | *STSYNC2 011 - STDM67FLT 100 - FPPABORT4 | | | | | | | |
| | *101 - FPPABORT5 110 - FPPABORT6 111 - | | | | | | | |
| | *STDM67FLT2 | | | | | | | |
| | ----- | | | | | | | |
| | *----- SYNC POINT FOR | | | | | | | |
| | *STORE ROUTINE AND DESTINATION MODES 6 OR | | | | | | | |
| | *7 TARGETS | | | | | | | |
| | *----- | | | | | | | |
| | * FLPG0, | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, | | | | | | | |
| | *NEXT, BUTR(SERVICE#D(C)#FPPACK), | | | | | | | |
| | * J/FFLTSYNC2 | | | | | | | |
| | | J/FFLTSYNC2 | * --> | 0001 | 4361 | 2144 | 704 | |
| | | J/FDM67FLT | * --> | 0011 | 4363 | 2146 | 706 | |
| | | J/STSYNC2 | * --> | 0101 | 4365 | 2145 | 705 | |
| | | J/STDM67FLT | * --> | 0111 | 4367 | 2149 | 707 | |
| | | J/FPPABORT4 | * --> | 1001 | 4371 | 2179 | 718 | |
| | | J/FPPABORT5 | * --> | 1011 | 4373 | 2180 | 719 | |
| | | J/FPPABORT6 | * --> | 1101 | 4375 | 2181 | 719 | |
| | | J/STDM67FLT2 | * --> | 1111 | 4377 | 2150 | 707 | |
| | ***** | | | | | | | |

4365 010000001000
0000 00 00 00 00 000.000 0000 0
11100 000000 00111 011110001

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|---|--|--------------------------|------------------------------|------------------------------|--------------------------|----------|-------------------|------|--------|
| .CASE | 2 OF BFSDM6FLT3 | | | | | | | | | |
| 2146 | FDM67FLT:4363 | F/FSDM6FLT3 F/FSDM7FLT5 F/FFLTSYNC2 F/STSYNC2 | <-- <-- <-- <-- | 4336 4700 4361 4365 | 2090 2095 2144 2145 | 685 687 704 705 | | | | |
| | ***** *SAME AS ABOVE ***** | | | | | | | | | |
| | ----- ENTRY POINT ----- *FOR FETCH OPERATION FO DM 6 AND 7 FETCH *FIRST OPERAND TARGETS - WARM - *FDM67FLT2 ***** | | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, * SR+SR PLUS 2, *P3, J, DATA POINT, *NEXT, BUTR(HOTWARM), * J/FDM67FLT2 ***** | | | | | | | | | |
| | | J/FDM67FLT2 J/FDM67FLT3 | * --> * --> | 10 4652 11 4653 | 2147 2148 | 706 706 | | | | |
| .CASE | 1 OF BFDM67FLT | | | | | | | | | |
| 2147 | FDM67FLT2:4652 | F/FDM67FLT | <-- VV | | | | | | | |
| | ***** *HOT - FDM67FLT3 ***** | | | | | | | | | |
| | *P3, MD+DATA, *NEXT, J/FDM67FLT3 ***** | | | | | | | | | |
| | | | * --> VV | | | | | | | |
| .CASE | 2 OF BFDM67FLT | | | | | | | | | |
| 2148 | FDM67FLT3:4653 | F/FDM67FLT | <-- | 4363 | 2146 | 706 | | | | |
| | ***** * FOR OCCURRANCE OF EXCEPTION TARGETS - *WARM - *FFLT3 ***** | | | | | | | | | |
| | *P2, D+PC MINUS 2, *NEXT, BUTR(HOTWARM), * J/FFLT3 ***** | | | | | | | | | |
| | | J/FFLT3 J/FFLT7 | * --> * --> | 10 4066 11 4067 | 2099 2103 | 688 690 | | | | |

4363
1001 11 11 00 00 000 000 0011 0
10001 000000 10100 110101010

4652
0000 11 10 00 00 000 000 0000 0
00000 100000 11000 110101011

4653
1101 11 11 10 01 111 000 0100 0
00000 000000 10100 000110110

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|-----------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|--------------------------------------|
| .CASE | 4 OF BFSDM6FLT3 | | | | | | | |
| 2149 | STD67FLT:4367 | F/FSDM6FLT3 <-- | 4336 2090 685 | | | | | |
| | | F/FSDM7FLT5 <-- | 4700 2095 687 | | | | | |
| | | F/FFLTSYNC2 <-- | 4361 2144 704 | | | | | |
| | | F/STSYNC2 <-- | 4365 2145 705 | | | | | |
| | ***** | | | | | | | |
| | *HOT - FFLT7 | | | | | | | 4367 0000 00 00 00 00 000 000 0001 0 |
| | ----- | | | | | | | 00000 000000 10100 000001010 |
| | *----- TARGETS - 0 - | | | | | | | |
| | *STFLT3 | | | | | | | |
| | ----- | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | |
| | * J/STFLT3 | * --> | 10 4012 2118 695 | | | | | |
| | * J/STOREHOT | * --> | 11 4013 2130 699 | | | | | |
| | ***** | | | | | | | |
| .CASE | 8 OF BFSDM6FLT3 | | | | | | | |
| 2150 | STD67FLT2:4377 | F/FSDM6FLT3 <-- | 4336 2090 685 | | | | | |
| | | F/FSDM7FLT5 <-- | 4700 2095 687 | | | | | |
| | | F/FFLTSYNC2 <-- | 4361 2144 704 | | | | | |
| | | F/STSYNC2 <-- | 4365 2145 705 | | | | | |
| | ***** | | | | | | | |
| | *1 - STOREHOT TARGETS - 0 - | | | | | | | 4377 0000 00 00 00 00 000 000 0001 0 |
| | *STFLT3 | | | | | | | 00000 000000 10100 000001010 |
| | ----- | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | |
| | * J/STFLT3 | * --> | 10 4012 2118 695 | | | | | |
| | * J/STOREHOT | * --> | 11 4013 2130 699 | | | | | |
| | ***** | | | | | | | |

E11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 708

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|------------------------------------|---------------------------------------|-----------------------|--------------|--------------|------------|----------|---------------------------------|
| .CASE | 9 OF BFETCHFLT2 | | | | | | | |
| 2151 | FS2DMOFLT:4170 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | |
| | ***** | | | | | | | 4170 000000001000 |
| | *1 - STOREHOT | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | -----* | | | | | | | 00000 000000 10100 110000110 |
| | *-----* | | | | | | | |
| | *ILLEGAL | | | | | | | |
| | *OPCODE TARGETS - 0 - WARM - | | | | | | | |
| | *FSDMOFLT2 | | | | | | | |
| | -----* | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | |
| | * J/FSDMOFLT2 | | | | | | | |
| | * J/FSDMOFLT5 | | | | | | | |
| | ***** | | | | | | | |
| .CASE | 10 OF BFETCHFLT2 | | | | | | | |
| 2152 | FS2DM1FLT:4171 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | |
| | ***** | | | | | | | 4171 000000001000 |
| | *1 - HOT - FSDMOFLT5 | | | | | | | 0011 00 00 00 01 110 111 0100 0 |
| | -----* | | | | | | | 00000 010100 00111 100110001 |
| | *-----* | | | | | | | |
| | *DM1 AND REG | | | | | | | |
| | *7 (PC) DO ONLY ONE WORD OPERATICN | | | | | | | |
| | *TARGETS | | | | | | | |
| | *- | | | | | | | |
| | -----* | | | | | | | |
| | *P2, D+D, D(C)+D(C), | | | | | | | |
| | *P3, R(GRINC)+D (A ADDR), | | | | | | | |
| | *NEXT, BUTR(SERVICE#D(C)#FPPACK), | | | | | | | |
| | * J/FFLTSYNC3 | | | | | | | |
| | * J/FFLTIMM | | | | | | | |
| | * J/STSYNC3 | | | | | | | |
| | * J/STIMM1 | | | | | | | |
| | * J/FPPABORT7 | | | | | | | |
| | * J/FPPABORT8 | | | | | | | |
| | * J/FPPABORT9 | | | | | | | |
| | * J/STIMM2 | | | | | | | |
| | ***** | | | | | | | |

G11

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 710

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|--|---------------------------------------|-----------------------|--------------|--------------|------------|----------|------------------------|--------|
| 2155 | FS2DM4FLT:4174 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | | |
| | ***** | | | | | | | | |
| | *FLOWS | | | | | | | | |
| | *-----* | | | | | | | | |
| | *----- DM4 AND | | | | | | | | |
| | *DESTINATION REGISTER 7 DO ONLY ONE WORD | | | | | | | | |
| | *OPERATION DEFAULT UCON MUST BE ON | | | | | | | | |
| | *EMIT | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P3, | MD+-2 (BC), | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * | J/FS2DM4FLT2 | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 2156 | FS2DM4FLT2:4735 | F/FS2DM4FLT | <-- | VV | | | | | |
| | ***** | | | | | | | | |
| | *P2, | D+R(DF) PLUS MD, D(C)+D(C), | | | | | | | |
| | * | SR+R(DF) PLUS MD, | | | | | | | |
| | *P3, | R(WDADR)+D (B ADDR), | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * | J/FS2DM4FLT3 | --> | VV | | | | | |
| | ***** | | | | | | | | |
| 2157 | FS2DM4FLT3:4736 | F/FS2DM4FLT2 | <-- | VV | | | | | |
| | ***** | | | | | | | | |
| | * TARGETS | | | | | | | | |
| | *- | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, | D+MD, D(C)+D(C) | | | | | | | |
| | *P3, | R(GRINC)+D (A ADDR) | | | | | | | |
| | *NEXT, | BUTR(SERVICE#D(C)#FPPACK), | | | | | | | |
| | * | J/FFLTSYNC3 | | | | | | | |
| | * | J/FFLTSYNC3 | --> | 0001 | 4461 | 2161 | 712 | | |
| | * | J/FFLTTIMM | --> | 0011 | 4463 | 2162 | 712 | | |
| | * | J/STSYNC3 | --> | 0101 | 4465 | 2169 | 715 | | |
| | * | J/STIMM1 | --> | 0111 | 4467 | 2170 | 715 | | |
| | * | J/FPPABORT7 | --> | 1001 | 4471 | 2182 | 719 | | |
| | * | J/FPPABORT8 | --> | 1011 | 4473 | 2183 | 720 | | |
| | * | J/FPPABORT9 | --> | 1101 | 4475 | 2184 | 720 | | |
| | * | J/STIMM2 | --> | 1111 | 4477 | 2171 | 716 | | |
| | ***** | | | | | | | | |

```

4174      000000001000
      1111 10 11 11 11 111 110 0000 0
      00010 100000 11000 111011101

4735      000000001000
      1001 11 10 10 10 110 111 0110 0
      00000 011010 11000 111011110

4736      000000001000
      1010 11 10 00 01 110 111 0100 0
      00000 010100 00111 100110001
    
```

H11

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 711

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------------------|--|--------------------------|--------------|--------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| .CASE | 14 OF BFETCHFLT2 | | | | | | | | | |
| 2158 | FS2DMSFLT:4175 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | | | |
| | ***** | | | | | | | | | |
| | *P3, MD+-2 (BC), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/FSDMSFLT2 | | --> | 4665 | 2085 | 683 | | | | |
| | ***** | | | | | | | | | |
| .CASE | 15 OF BFETCHFLT2 | | | | | | | | | |
| 2159 | FS2DM6FLT:4176 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | | | |
| | ***** | | | | | | | | | |
| | *INDEX | | | | | | | | | |
| | *P1, BA+PC, CURRENT MODE, | | | | | | | | | |
| | *P2, D+PC PLUS 2, D(C)+D(C), | | | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/FSDM6FLT2 | | --> | 4671 | 2089 | 684 | | | | |
| | ***** | | | | | | | | | |
| .CASE | 16 OF BFETCHFLT2 | | | | | | | | | |
| 2160 | FS2DM7FLT:4177 | F/FETCHFLT2 F/STOREFLT | <-- <-- | 4651 4654 | 2060 2061 | 671 674 | | | | |
| | ***** | | | | | | | | | |
| | *P1, BA+PC, CURRENT MODE, | | | | | | | | | |
| | *P2, D+PC PLUS 2, D(C)+D(C), | | | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/FSDM6FLT2 | | --> | 4671 | 2089 | 684 | | | | |
| | ***** | | | | | | | | | |

```

4175
1111 10 11 11 11 111 110 0000 0
00010 100000 11000 110110101

4176
000000001011
1001 11 11 10 01 111 111 0101 0
10001 000110 11000 110111001

4177
000000001011
1001 11 11 10 01 111 111 0101 0
10001 000110 11000 110111001
    
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|-----------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|------------------------|--------|
| .CASE | 1 OF BFS2DM1FLT | | | | | | | | |
| 2161 | F/FS2DM1FLT | <-- | 4171 | 2152 | 708 | | | | |
| | F/FS2DM2FLT | <-- | 4172 | 2153 | 709 | | | | |
| | F/FS2DM4FLT3 | <-- | 4736 | 2157 | 710 | | | | |
| | F/FFLTSYNC3 | <-- | 4461 | 2161 | 712 | | | | |
| | F/STSYNC3 | <-- | 4465 | 2169 | 715 | | | | |
| | ***** | | | | | | | | |
| | *SAME AS FS2DM1FLT | | | | | | | | |
| | ----- | | | | | | | | |
| | ----- | | | | | | | | |
| | ----- | | | | | | | | |
| | ----- | | | | | | | | |
| | DM'S 1,2,4 | | | | | | | | |
| | *AND PC FETCH SYNCRONIZATION | | | | | | | | |
| | *POINT | | | | | | | | |
| | ----- | | | | | | | | |
| | *FLPGO, | | | | | | | | |
| | *SELECT, FPSCC(FPP) FPSCC+DATA, | | | | | | | | |
| | *NEXT, BUTR(SERVICE#D(C)#FPPACK), | | | | | | | | |
| | J/FFLTSYNC3 | | | | | | | | |
| | J/FFLTSYNC3 | --> | 0001 | 4461 | 2161 | 712 | | | |
| | J/FFLTI | --> | 0011 | 4463 | 2162 | 712 | | | |
| | J/STSYNC3 | --> | 0101 | 4465 | 2169 | 715 | | | |
| | J/STIMM1 | --> | 0111 | 4467 | 2170 | 715 | | | |
| | J/FPPABORT7 | --> | 1001 | 4471 | 2182 | 719 | | | |
| | J/FPPABORT8 | --> | 1011 | 4473 | 2183 | 720 | | | |
| | J/FPPABORT9 | --> | 1101 | 4475 | 2184 | 720 | | | |
| | J/STIMM2 | --> | 1111 | 4477 | 2171 | 716 | | | |
| | ***** | | | | | | | | |
| .CASE | 2 OF BFS2DM1FLT | | | | | | | | |
| | F/FS2DM1FLT | <-- | 4171 | 2152 | 708 | | | | |
| | F/FS2DM2FLT | <-- | 4172 | 2153 | 709 | | | | |
| | F/FS2DM4FLT3 | <-- | 4736 | 2157 | 710 | | | | |
| | F/FFLTSYNC3 | <-- | 4461 | 2161 | 712 | | | | |
| | F/STSYNC3 | <-- | 4465 | 2169 | 715 | | | | |
| 2162 | FFLTI | | | | | | | | |
| | ***** | | | | | | | | |
| | ----- | | | | | | | | |
| | IMMEDIATE MODE | | | | | | | | |
| | *FETCH ROUTINE TARGETS - WARM - | | | | | | | | |
| | *FFLTI | | | | | | | | |
| | ----- | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | |
| | *P2, D+PC (B), | | | | | | | | |
| | *P3, U, DATI NOINT, | | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | | |
| | J/FFLTI | | | | | | | | |
| | J/FFLTI | --> | 10 | 4272 | 2163 | 713 | | | |
| | J/FFLTI | --> | 11 | 4273 | 2164 | 713 | | | |
| | ***** | | | | | | | | |

4461 010000001000
0000 00 00 00 00 000 000 0000 0
11100 000000 00111 100110001

4463 000000001011
1010 00 11 00 00 111 000 0101 0
10001 000000 10100 01011010

J11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|---------------|---|--|--------------------------|---------|------------|------------|-------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| .CASE 2163 | 1 OF BFFLTIMM | | | | | | | | | |
| | FFLTIMM2:4272 | F/FFLTIMM | <-- | 4463 | 2162 | 712 | | | | |
| | ***** | | | | | | | | | |
| | *HOT - FFLTIMM3 SAVE PC FOR * *EXCEPTIONS * *-----* | | | | | | | | | |
| | *P3, FPA+D (A ADDR), MD+DATA, | | | | | | | | | |
| | *NEXT, J/FFLTIMM4 | | --> | 4737 | 2165 | 713 | | | | |
| ***** | | | | | | | | | | |
| .CASE 2164 | 2 OF BFFLTIMM | | | | | | | | | |
| | FFLTIMM3:4273 | F/FFLTIMM | <-- | 4463 | 2162 | 712 | | | | |
| | ***** | | | | | | | | | |
| | * SAVE PC FOR * *EXCEPTIONS * *-----* | | | | | | | | | |
| | *SELECT, FPSCC(FPP), FPSCC+DATA, | | | | | | | | | |
| | *P3, FPA+D (A ADDR), | | | | | | | | | |
| | *NEXT, J/FFLT8 | | --> | 4102 | 2104 | 690 | | | | |
| ***** | | | | | | | | | | |
| 2165 | FFLTIMM4:4737 | F/FFLTIMM2 | <-- | 4272 | 2163 | 713 | | | | |
| | ***** | | | | | | | | | |
| | * TARGETS - F - 0 - * *FFLTIMM5 * *-----* | | | | | | | | | |
| | | *P2, D+0, | | | | | | | | |
| | *P3, FDST2+D (A ADDR), | | | | | | | | | |
| | *NEXT, BUTR(FD), | | | | | | | | | |
| | * J/FFLTIMM5 | | --> | 10 4302 | 2166 | 714 | | | | |
| | * J/FFLTIMM6 | | --> | 11 4303 | 2167 | 714 | | | | |
| ***** | | | | | | | | | | |

4272
0000 11 10 00 00 111 000 0000 0
00000 110100 11000 111011111

4273
0000 00 00 00 00 111 000 0000 0
00000 010100 11000 001000010

4737
0011 00 00 00 01 011 000 0100 0
00000 000100 10111 011000010

K11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|-------------------------------------|--|--------------------------|--------------|--------------|------------|-------------|-----------|--------------------|
| | | | | | | | | RIF | COUT CLOCKS UPF |
| .CASE | 1 OF BFFLTIMM4 | | | | | | | | |
| 2166 | FFLTIMM5:4302 | F/FFLTIMM4 F/FFLTIMM6 | <-- | 4737 4303 | 2165 2167 | 713 714 | | | |
| | ***** | | | | | | | | |
| | *D - 1 - FFLTIMM6 | | * | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+MD | | * | | | | | | |
| | *P3, FDST3+D (A ADDR), | | * | | | | | | |
| | *NEXT, | | * | | | | | | |
| | * J/FFLTIMM7 | | * --> | 4740 | 2168 | 714 | | | |
| | ***** | | | | | | | | |
| .CASE | 2 OF BFFLTIMM4 | | | | | | | | |
| 2167 | FFLTIMM6:4303 | F/FFLTIMM4 F/FFLTIMM6 | <-- | 4737 4303 | 2165 2167 | 713 714 | | | |
| | ***** | | | | | | | | |
| | *P2, D+D | | * | | | | | | |
| | *P3, FDST10+D (A ADDR), | | * | | | | | | |
| | *NEXT, | | * | | | | | | |
| | * J/FFLTIMM5 | | * --> | 4302 | 2166 | 714 | | | |
| | ***** | | | | | | | | |
| 2168 | FFLTIMM7:4740 | F/FFLTIMM5 | <-- | 4302 | 2166 | 714 | | | |
| | ***** | | | | | | | | |
| | * SET FLAG IN CONDITION TO INDICATE | | * | | | | | | |
| | *IMMEDIATE MODE | | * | | | | | | |
| | *ADDRESSING | | * | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+R(T2A) OR CNST100000, | | * | | | | | | |
| | *P3, R(T2A)+D (A ADDR), | | * | | | | | | |
| | *NEXT, | | * | | | | | | |
| | * J/TSTNZERO | | * --> | 4317 | 2187 | 721 | | | |
| | ***** | | | | | | | | |

```

4302      000000001000
1010     11 10 00 01 011 000 0100 0
00000    000010 11000 111100000

4303      000000001000
0011     00 00 00 01 011 000 0100 0
00000    010110 11000 011000010

4740      000000001000
1110     10 00 11 01 110 000 0100 0
00101    010010 11000 011001111
    
```

See...

L11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 715

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|---------------------------------|--------------------|--------|------|------|------|------------------|---------|---------|----------|-----------|------|
| | | | | | | | | | | | RIF | COUT |
| .CASE | 3 OF BFS2DM1FLT | | | | | | | | | | | |
| 2169 | STSYNC3:4465 | F/FS2DM1FLT | <-- | 4171 | 2152 | 708 | | | | | | |
| | | F/FS2DM2FLT | <-- | 4172 | 2153 | 709 | | | | | | |
| | | F/FS2DM4FLT3 | <-- | 4736 | 2157 | 710 | | | | | | |
| | | F/FFLTSYNC3 | <-- | 4461 | 2161 | 712 | | | | | | |
| | | F/STSYNC3 | <-- | 4465 | 2169 | 715 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *THIS FLAG IS CHECKED BY CTAN * | | | | | | | | | | | |
| | *INSTRUCTIONS * | | | | | | | | | | | |
| | *----- STORE SYNC * | | | | | | | | | | | |
| | *POINT FOR IMMEDIATE * | | | | | | | | | | | |
| | *DATA * | | | | | | | | | | | |
| | *----- * | | | | | | | | | | | |
| | *SELECT, FLPGO | | | | | | | | | | | |
| | *NEXT, FPSCC(FPP) FPSCC+DATA | | | | | | | | | | | |
| | * J/FFLTSYNC3 | | | | | | | | | | | |
| | | J/FFLTSYNC3 | * --> | 0001 | 4461 | 2161 | 712 | | | | | |
| | | J/FFLTIMM | * --> | 0011 | 4463 | 2162 | 712 | | | | | |
| | | J/STSYNC3 | * --> | 0101 | 4465 | 2169 | 715 | | | | | |
| | | J/STIMM1 | * --> | 0111 | 4467 | 2170 | 715 | | | | | |
| | | J/FPPABORT7 | * --> | 1001 | 4471 | 2182 | 719 | | | | | |
| | | J/FPPABORT8 | * --> | 1011 | 4473 | 2183 | 720 | | | | | |
| | | J/FPPABORT9 | * --> | 1101 | 4475 | 2184 | 720 | | | | | |
| | | J/STIMM2 | * --> | 1111 | 4477 | 2171 | 716 | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE | 4 OF BFS2DM1FLT | | | | | | | | | | | |
| 2170 | STIMM1:4467 | F/FS2DM1FLT | <-- | 4171 | 2152 | 708 | | | | | | |
| | | F/FS2DM2FLT | <-- | 4172 | 2153 | 709 | | | | | | |
| | | F/FS2DM4FLT3 | <-- | 4736 | 2157 | 710 | | | | | | |
| | | F/FFLTSYNC3 | <-- | 4461 | 2161 | 712 | | | | | | |
| | | F/STSYNC3 | <-- VV | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | *----- TARGETS - 0 - * | | | | | | | | | | | |
| | *STIMM3 * | | | | | | | | | | | |
| | *----- * | | | | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | | | | | |
| | * J/STIMM3 | | | | | | | | | | | |
| | | J/STIMM3 | * --> | 10 | 4672 | 2172 | 716 | | | | | |
| | | J/STIMM4 | * --> | 11 | 4673 | 2173 | 716 | | | | | |
| | ***** | | | | | | | | | | | |

```

4465          01000000:000
0000 00 00 00 00 000 000 0000 0
11100 000000 00111 100110001

```

```

4467          00000000:0101
0000 00 00 00 00 000 000 0001 0
00000 000000 10100 110111010

```

M11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 716

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|---------|---|--|---------------------------------|--------------------------------------|--------------------------------------|---------------------------------|----------|------------------------|--------|
| .CASE | 8 OF BFS2DM1FLT | | | | | | | | |
| 2171 | STIMM2:4477 | F/FS2DM1FLT F/FS2DM2FLT F/FS2DM4FLT3 F/FFLTSYNC3 F/STSYNC3 | <-- <-- <-- <-- <-- | 4171 4172 4736 4461 4465 | 2152 2153 2157 2161 2169 | 708 709 710 712 715 | | | |
| | ***** | | | | | | | | |
| | *1 - STIMM4 TARGETS - 0 - | | | | | | | | |
| | *STIMM3 | | | | | | | | |
| | ----- | | | | | | | | |
| | *P1, BA+SR, CURRENT MODE, | | | | | | | | |
| | *NEXT, BUTR(HOTWARM), | | | | | | | | |
| | * J/STIMM3 | | | | | | | | |
| | * J/STIMM4 | | | | | | | | |
| | ***** | | | | | | | | |
| .CASE | 1 OF BSTIMM1 | | | | | | | | |
| 2172 | STIMM3:4672 | F/STIMM1 F/STIMM2 | <-- <-- VV | 4467 | 2170 | 715 | | | |
| | ***** | | | | | | | | |
| | *1 - STIMM4 | | | | | | | | |
| | ----- | | | | | | | | |
| | *P2, D+FDST3, | | | | | | | | |
| | *P3, U,DATO, | | | | | | | | |
| | *ENABLE, KJ, | | | | | | | | |
| | *NEXT, J/STFLT6 | | | | | | | | |
| | ***** | | | | | | | | |
| .CASE | 2 OF BSTIMM1 | | | | | | | | |
| 2173 | STIMM4:4673 | F/STIMM1 F/STIMM2 | <-- <-- | 4467 4477 | 2170 2171 | 715 716 | | | |
| | ***** | | | | | | | | |
| | * FETCH ONE WORD FROM HOT FPP TARGETS - 0 | | | | | | | | |
| | *- | | | | | | | | |
| | *STIMM5 | | | | | | | | |
| | ----- | | | | | | | | |
| | *SELECT, FPSCC(FPP),FPSCC+DATA, | | | | | | | | |
| | *SELECT, FPP(READ), | | | | | | | | |
| | *P3, MD+DATA, | | | | | | | | |
| | *NEXT, BUTR(HOT EXCEPTION), | | | | | | | | |
| | * J/STIMM5 | | | | | | | | |
| | * J/STIMM6 | | | | | | | | |
| | ***** | | | | | | | | |

```

4477          000000001011
0000 00 00 00 00 000 000 0001 0
00000 000000 10100 110111010
    
```

```

4672          000001001000
1111 00 00 10 01 011 000 0100 0
10010 000000 11000 010011110
    
```

```

4673          010000001000
0000 11 10 00 00 001 000 0000 0
11001 100000 00111 110111110
    
```

N11

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 717

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---|--|--|--|--|--|-------------|-----------|-----|--------|
| | | | | | | | | RIF | COU | |
| .CASE | 1 OF BSTIMM4 | | | | | | | | | |
| 2174 | STIMM5:4676 | F/STOREHOT2F F/STIMM4 | <-- <-- | 4727 4673 | 2136 2173 | 701 716 | | | | |
| | ***** *1 - STIMM6 ***** | | | | | | | | | |
| | *P2, D+MD *P3, U, DATO, *ENABLE, KJ, *NEXT, * J/STOREHOT4 | | | 4622 | 2138 | 702 | | | | |
| | ***** | | | | | | | | | |
| .CASE | 2 OF BSTIMM4 | | | | | | | | | |
| 2175 | STIMM6:4677 | F/STOREHOT2F F/STIMM4 | <-- <-- | 4727 4673 | 2136 2173 | 701 716 | | | | |
| | ***** * GET FPS HI *D(C)=1 ***** | | | | | | | | | |
| | *P2, D+FPSHIFEC, D(C)+CIN, FLPGO, *NEXT, * J/STOREHOT2C | | | 4721 | 2133 | 700 | | | | |
| | ***** | | | | | | | | | |
| .CASE | 5 OF BFSM1FLT | | | | | | | | | |
| 2176 | FPPABORT1:4211 | F/FSDM1FLT F/FSDM2FLT F/FSDM3FLT3 F/FSDM4FLT3 F/FFLTSYNC F/STSYNC | <-- <-- <-- <-- <-- <-- | 4161 4162 4662 4246 4201 4205 | 2075 2076 2079 2082 2096 2115 | 679 680 681 682 687 694 | | | | |
| | ***** *----- SEND ABORT *PATTERN *----- *SELECT, FPP(ABORT), *NEXT, * J/FPPABORT10 ***** | | | 4741 | 2185 | 720 | | | | |

```

4676
1010 11 10 00 00 000 000 0100 0
10010 000000 11000 110010010
    
```

```

4677
1111 00 00 11 00 011 000 0100 0
11100 000000 11000 111010001
    
```

```

4211
0000 00 00 00 00 001 001 0000 0
11001 000000 11000 111100001
    
```

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|----------------------|-------------|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | | RIF | COUT | |
| .CASE | 6 OF BFSDM1FLT | | | | | | | | | | |
| | | F/FSDM1FLT | <-- | 4161 | 2075 | 679 | | | | | |
| | | F/FSDM2FLT | <-- | 4162 | 2076 | 680 | | | | | |
| | | F/FSDM3FLT3 | <-- | 4662 | 2079 | 681 | | | | | |
| | | F/FSDM4FLT3 | <-- | 4246 | 2082 | 682 | | | | | |
| | | F/FFLTSYNC | <-- | 4201 | 2096 | 687 | | | | | |
| 2177 | FPPABORT2:4213 | F/STSYNC | <-- | 4205 | 2115 | 694 | | | | | |
| | ***** | | | | | | | | | | |
| | *SELECT, FPP(ABORT), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/FPPABORT10 | | --> | 4741 | 2185 | 720 | | | | | |
| | ***** | | | | | | | | | | |
| .CASE | 7 OF BFSDM1FLT | | | | | | | | | | |
| | | F/FSDM1FLT | <-- | 4161 | 2075 | 679 | | | | | |
| | | F/FSDM2FLT | <-- | 4162 | 2076 | 680 | | | | | |
| | | F/FSDM3FLT3 | <-- | 4662 | 2079 | 681 | | | | | |
| | | F/FSDM4FLT3 | <-- | 4246 | 2082 | 682 | | | | | |
| | | F/FFLTSYNC | <-- | 4201 | 2096 | 687 | | | | | |
| 2178 | FPPABORT3:4215 | F/STSYNC | <-- | 4205 | 2115 | 694 | | | | | |
| | ***** | | | | | | | | | | |
| | *SELECT, FPP(ABORT), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/FPPABORT10 | | --> | 4741 | 2185 | 720 | | | | | |
| | ***** | | | | | | | | | | |
| .CASE | 5 OF BFSDM6FLT3 | | | | | | | | | | |
| | | F/FSDM6FLT3 | <-- | 4336 | 2090 | 685 | | | | | |
| | | F/FSDM7FLT5 | <-- | 4700 | 2095 | 687 | | | | | |
| | | F/FFLTSYNC2 | <-- | 4361 | 2144 | 704 | | | | | |
| | | F/STSYNC2 | <-- | 4365 | 2145 | 705 | | | | | |
| 2179 | FPPABORT4:4371 | | | | | | | | | | |
| | ***** | | | | | | | | | | |
| | *SELECT, FPP(ABORT), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/FPPABORT11 | | --> | 4742 | 2186 | 721 | | | | | |
| | ***** | | | | | | | | | | |

4213
0000 00 00 00 00 001 001 0000 0
11001 000000 11000 111100001

4215
0000 00 00 00 00 001 001 0000 0
11001 000000 11000 111100001

4371
0000 00 00 00 00 001 001 0000 0
11001 000000 11000 111100010

| BOX NO. | TAC: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|------------------------|---------------------------------------|-----------------------|--------------|---------|----------|--------------------------------------|
| .CASE | 6 OF BFSDM6FLT3 | | | | | | |
| 2180 | FPPABORT5:4373 | F/FSDM6FLT3 <-- | 4336 2090 685 | | | | |
| | | F/FSDM7FLT5 <-- | 4700 2095 687 | | | | |
| | | F/FFLTSYNC2 <-- | 4361 2144 704 | | | | |
| | | F/STSYNC2 <-- | 4365 2145 705 | | | | |
| | ***** | | | | | | |
| | *SELECT, FPP(ABORT), * | | | | | | 4373 0000 00 00 00 00 001 001 0000 0 |
| | *NEXT, * | | | | | | 11001 000000 11000 111100010 |
| | * J/FPPABORT11 * --> | | 4742 2186 721 | | | | |
| | ***** | | | | | | |
| .CASE | 7 OF BFSDM6FLT3 | | | | | | |
| 2181 | FPPABORT6:4375 | F/FSDM6FLT3 <-- | 4336 2090 685 | | | | |
| | | F/FSDM7FLT5 <-- | 4700 2095 687 | | | | |
| | | F/FFLTSYNC2 <-- | 4361 2144 704 | | | | |
| | | F/STSYNC2 <-- | 4365 2145 705 | | | | |
| | ***** | | | | | | |
| | *SELECT, FPP(ABORT), * | | | | | | 4375 0000 00 00 00 00 001 001 0000 0 |
| | *NEXT, * | | | | | | 11001 000000 11000 111100010 |
| | * J/FPPABORT11 * --> | | 4742 2186 721 | | | | |
| | ***** | | | | | | |
| .CASE | 5 OF BFS2DM1FLT | | | | | | |
| 2182 | FPPABORT7:4471 | F/FS2DM1FLT <-- | 4171 2152 708 | | | | |
| | | F/FS2DM2FLT <-- | 4172 2153 709 | | | | |
| | | F/FS2DM4FLT3 <-- | 4736 2157 710 | | | | |
| | | F/FFLTSYNC3 <-- | 4461 2161 712 | | | | |
| | | F/STSYNC3 <-- | 4465 2169 715 | | | | |
| | ***** | | | | | | |
| | *SELECT, FPP(ABORT), * | | | | | | 4471 0000 00 00 00 00 001 001 0000 0 |
| | *NEXT, * | | | | | | 11001 000000 11000 111100001 |
| | * J/FPPABORT10 * --> | | 4741 2185 720 | | | | |
| | ***** | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------|---|----------------------------------|------|-----------------------|------|---------|---------|----------|-----------|------|--------|--|
| | | | | | | | | | RIF | COUT | CLOCKS | |
| .CASE | 6 OF BFS2DM1FLT | | | | | | | | | | | |
| 2183 | FPPABORT8:4473 | F/FS2DM1FLT | <-- | 4171 | 2152 | 708 | | | | | | |
| | | F/FS2DM2FLT | <-- | 4172 | 2153 | 709 | | | | | | |
| | | F/FS2DM4FLT3 | <-- | 4736 | 2157 | 710 | | | | | | |
| | | F/FFLTSYNC3 | <-- | 4461 | 2161 | 712 | | | | | | |
| | | F/STSYNC3 | <-- | 4465 | 2169 | 715 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *SELECT, FPP(ABORT), | | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | | |
| | * J/FPPABORT10 | | --> | 4741 | 2185 | 720 | | | | | | |
| | ***** | | | | | | | | | | | |
| .CASE | 7 OF BFS2DM1FLT | | | | | | | | | | | |
| 2184 | FPPABORT9:4475 | F/FS2DM1FLT | <-- | 4171 | 2152 | 708 | | | | | | |
| | | F/FS2DM2FLT | <-- | 4172 | 2153 | 709 | | | | | | |
| | | F/FS2DM4FLT3 | <-- | 4736 | 2157 | 710 | | | | | | |
| | | F/FFLTSYNC3 | <-- | 4461 | 2161 | 712 | | | | | | |
| | | F/STSYNC3 | <-- | 4465 | 2169 | 715 | | | | | | |
| | ***** | | | | | | | | | | | |
| | *SELECT, FPP(ABORT), | | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | | |
| | * J/FPPABORT10 | | --> | VV | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | | F/SETCLASS6 | <-- | 335 | 1242 | 403 | | | | | | |
| | | F/HTDMOSYNC5 | <-- | 457 | 1296 | 420 | | | | | | |
| | | F/HOTSYNC3 | <-- | 4575 | 1299 | 422 | | | | | | |
| | | F/HOTSYNC4 | <-- | 4577 | 1300 | 422 | | | | | | |
| | | F/FPPABORT1 | <-- | 4211 | 2176 | 717 | | | | | | |
| | | F/FPPABORT2 | <-- | 4213 | 2177 | 718 | | | | | | |
| | | F/FPPABORT3 | <-- | 4215 | 2178 | 718 | | | | | | |
| | | F/FPPABORT7 | <-- | 4471 | 2182 | 719 | | | | | | |
| | | F/FPPABORT8 | <-- | 4473 | 2183 | 720 | | | | | | |
| | | F/FPPABORT9 | <-- | VV | | | | | | | | |
| 2185 | FPPABORT10:4741 | | | | | | | | | | | |
| | ***** | | | | | | | | | | | |
| | * BACK THE PC UP TO BE REEXECUTED CLEAR | | | | | | | | | | | |
| | *SHORT TERM | | | | | | | | | | | |
| | *FLAGS | | | | | | | | | | | |
| | ----- | | | | | | | | | | | |
| | *P2, D+PC MINUS 2, | | | | | | | | | | | |
| | *P3, PC+D (A ADDR), | | | | | | | | | | | |
| | *NEXT, BUT(CLEAR FLAGS), | | | | | | | | | | | |
| | * J/RESTART11 | | --> | 4764 | 2255 | 745 | | | | | | |
| | ***** | | | | | | | | | | | |

4473
 0000 00 00 00 00 001 001 0000 0
 11001 000000 11000 111100001

4475
 0000 00 00 00 00 001 001 0000 0
 11001 000000 11000 111100001

4741
 1101 11 11 10 01 111 000 0100 0
 00000 000110 11010 111110100

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|------------|--------------------------------------|---------------------------------------|-----------------------|---------------|--------------|---------|-----------|------------------------|--------|
| .CASE 2189 | 1 OF BTSTNZERO2 NOTNZERO1:4250 | F/TSTNZERO2 | <-- | 4743 2188 721 | 4250 | | | 000000001000 | |
| | *TRAP TARGETS- 00 - NOTNZERO1 01 - | | | | 1001 01 11 | 10 10 | 110 000 | 0100 0 | |
| | *NOTNZERO2 10 - NOTNZERO3 11 - NZERO | | | | 00000 000110 | 11111 | 000000000 | | |
| | *UPDATE GENERAL | | | | | | | | |
| | *REGISTER | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, D+R(DF) PLUS R(GRINC), | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * BUT(RETURN) | | --> VV | | | | | | |
| .CASE 2190 | 2 OF BTSTNZERO2 NOTNZERO2:4251 | F/TSTNZERO2 | <-- | 4743 2188 721 | 4251 | | | 000000001000 | |
| | * UPDATE GENERAL | | | | 1001 01 11 | 10 10 | 110 000 | 0100 0 | |
| | *REGISTER | | | | 00000 000110 | 11111 | 000000000 | | |
| | *-----* | | | | | | | | |
| | *P2, D+R(DF) PLUS R(GRINC), | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * BUT(RETURN) | | --> VV | | | | | | |
| .CASE 2191 | 3 OF BTSTNZERO2 NOTNZERO3:4252 | F/TSTNZERO2 | <-- | 4743 2188 721 | 4252 | | | 000000001000 | |
| | * UPDATE GENERAL | | | | 1001 01 11 | 10 10 | 110 000 | 0100 0 | |
| | *REGISTER | | | | 00000 000110 | 11111 | 000000000 | | |
| | *-----* | | | | | | | | |
| | *P2, D+R(DF) PLUS R(GRINC), | | | | | | | | |
| | *P3, R(DF)+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * BUT(RETURN) | | --> VV | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE 2192 | 4 OF BTSTNZERO2 NZERO:4253 | F/TSTNZERO2 | <-- | 4743 | 2188 | 721 | | |
| | ***** * NEG ZERO HAS OCCURRED TEST FOR DEFERRAL * * OF NZERO * * TRAP * *-----* *P2, D+R(DF) PLUS R(GRINC), * *P3, R(DF)+D (A ADDR), * *NEXT, BUT(CASE), * * J/NZERO2 * * J/NZERO3 * | | | 1101 | 4355 | 2193 | 723 | |
| | | | | 1111 | 4357 | 2194 | 723 | |
| .CASE 2193 | 1 OF BNZERO NZERO2:4355 | F/LOADNZWS F/NZERO | <-- VV | 4332 | 1655 | 538 | | |
| | ***** * TARGETS - SR<01> 0 - NZERO2 1 - NZERO3 * * PERFORM TRAP OPERATION ON NEGATIVE ZERO * * SELECT * * EMIT * *-----* *P2, D+FPSHIFEC, * *NEXT, BUT(CLEAR FLAGS), * * J/NZERO4 * | | | 4744 | 2195 | 724 | | |
| .CASE 2194 | 2 OF BNZERO NZERO3:4357 | F/LOADNZWS F/NZERO | <-- | 4332 | 1655 | 538 | | |
| | ***** * NEG ZERO TRAP IS DEFERRED RETURN TO * * CALLER * *-----* *P2, D+R(T2A) OR 1, SR+R(T2A) OR 1, * *P3, R(T2A)+D (A ADDR), * *NEXT, BUT(RETURN) * ***** | | | 4253 | 2192 | 723 | | |

4253 000000001000
1001 01 11 10 10 110 000 0100 0
00000 000110 00000 011101101

4355 000000001000
1111 00 00 11 00 011 000 0100 0
00000 000000 11010 111100100

4357 000000001000
1110 11 00 11 01 110 000 0110 0
00000 010010 11111 000000000

H12

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 724

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|-----------------------------|---------------------------------------|-----------------------|--------------------------------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| 2195 | NZER04:4744 | F/TSTNZW7 F/NZER02 | <-- <-- | 4637 1386 452 4355 2193 723 | | | | | | |
| | ***** | | | | | | | | | |
| | * GET FID IN | | | | | | | | | |
| | *D(C) | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+D LEFT 1,D(C)+ALU15, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/NZEROTRAP | | --> | 4546 1985 642 | | | | | | |
| | ***** | | | | | | | | | |

4744
1111 00 00 01 00 000 100 0100 0
00000 000000 11000 101100110

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS |
|--|---------------------|---------------------------------------|-----------------------|------|---------|---------|----------|------------------------|--------|
| ***** | | | | | | | | | |
| .TOC " SUBROUTINE DATA PREPARATION ##FLPT##" | | | | | | | | | |
| | F/MULMODW13 | <-- | 2116 | 1420 | 462 | | | | |
| | F/ADDW04 | <-- | 4235 | 1573 | 511 | | | | |
| | F/DIVFDW10 | <-- | 3671 | 1693 | 551 | | | | |
| ***** | | | | | | | | | |
| * | SUBROUTINE DATAPREP | * | | | | | | | |
| | RETURN/MULMODW14 | * --> | 2156 | 1421 | 463 | | | | |
| | RETURN/ADDW05 | * --> | -1 | -1 | -1 | 0 | 1 | 1 | |
| | RETURN/DIVFDW11 | * --> | 3672 | 1694 | 551 | | | | |
| ***** | | | | | | | | | |

```

2196 DATAPREP:2571
*****
* WARM FLOATING POINT DATA PREPARATION *
* SUBROUTINE. SUBROUTINE EXTRACTS *
* EXPONENT FROM FAC(SF) AND FAC(DF) ; AND *
* STORES THEM IN R(ES) AND R(ED) *
* RESPECTIVELY ; NOTE THAT EXPONENTS ARE *
* PLACED RIGHT JUSTIFIED IN R(ES) AND *
* R(ED)!!!!!!!!!!!! ; ; TEMPORARIES USED *
* ARE: ; R(ES),R(ED) ; SUBROUTINE ALSO *
* CLEANS OUT EXPONENT AND SIGN FROM *
* FAC3(SF) ; CONDITION REGISTER CR1 IS SET *
* FOR THE SOURCE *
* AND *
*-----*
*P2, D+WHAMI OR CNSTB, *
*P3, WHAMI+D (A ADDR), *
*NEXT, *
* J/DPREP2 --> VV
*****
2197 DPREP2:2572 F/DATAPREP <-- VV
*****
*P2, D+R(GRINC), *
*P3, R(GRINC-SAV)+D (B ADDR), *
*NEXT, *
* J/DPREP2B --> VV
*****
2198 DPREP2B:2574 F/DPREP2 <-- VV
*****
*P2, D+FAC3(SF), *
*P3, FAC3(SAV)+D (B ADDR), *
*NEXT, *
* J/DPREP3 -->
*****

```

```

2571
1110 10 00 11 00 00000001000
01110 010010 11000 101111010 0100 0

```

```

2572
1010 01 11 00 00 00000001000
00000 001010 11000 101111100 0100 0

```

```

2574
1111 00 10 10 11 10000001000
00000 001010 11000 101111101 0100 0

```

2575 2199 726

K12

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 726

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|------------------------------------|--|--------------------------|---------------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 2199 | DPREP3:2575 | F/DPREP28 | <-- | 2574 2198 725 | 2575 | | | 10000000 | 1000 | |
| | *P2, D+FAC2(SF), | | | | 1010 | 00 01 | 00 01 | 100 000 | 0100 | 0 |
| | *P3, FAC2(SAV)+D (A ADDR), | | | | 00000 | 000010 | 11000 | 110000000 | | |
| | *NEXT, | | | | | | | | | |
| | * J/DPREP4 | | --> | VV | | | | | | |
| 2200 | DPREP4:2600 | F/DPREP3 | <-- | VV | 2600 | | | 10000000 | 1000 | |
| | *P2, D+FAC1(SF), | | | | 1111 | 00 10 | 11 11 | 111 000 | 0100 | 0 |
| | *P3, FAC1(SAV)+D (B ADDR), | | | | 00000 | 001010 | 11000 | 110000001 | | |
| | *NEXT, | | | | | | | | | |
| | * J/DPREP5 | | --> | VV | | | | | | |
| 2201 | DPREP5:2601 | F/DPREP4 | <-- | VV | 2601 | | | 10000000 | 1000 | |
| | *P2, D+FAC0(SF), | | | | 1010 | 01 01 | 00 01 | 111 000 | 0100 | 0 |
| | *P3, FAC0(SAV)+D (A ADDR), | | | | 00000 | 000010 | 11000 | 110000010 | | |
| | *NEXT, | | | | | | | | | |
| | * J/DPREP6 | | --> | VV | | | | | | |
| 2202 | DPREP6:2602 | F/DPREP5 | <-- | VV | 2602 | | | 00000000 | 1000 | |
| | * D(C) = | | | | 1011 | 10 00 | 10 01 | 011 000 | 0100 | 0 |
| | *0 | | | | 01111 | 000000 | 11000 | 110000100 | | |
| | *-----* | | | | | | | | | |
| | *P2, D+FDST3 AND EXPMASK,D(C)+CIN, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/DPREP7 | | --> | 2604 2203 727 | | | | | | |

M12

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 728

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|------|--------------------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 2207 | DPREP11:2611 ***** * ISOLATE SIGN *DATA *-----* *P2, D+SR AND SIGNBIT, *P3, CR2+D (B ADDR), *NEXT, * J/DPREP12 ***** | <-- | 2610 2206 727 | 2611 | | | | 00000000 | 1000 | |
| | | | | | 1011 10 11 00 00 | | 101 000 | 0100 | 0 | |
| | | | | | 00101 001010 11000 | | 110001010 | | | |
| 2208 | DPREP12:2612 ***** * REMOVE SIGN AND EXPONENT *DATA *-----* *P2, D+FDST3 * NOT HIBYTE MASK, *P3, FDST3+D (A ADDR), *NEXT, * J/DPREP13 ***** | <-- VV | | 2612 | | | | 00000000 | 1000 | |
| | | | | | 0111 10 00 10 01 011 000 | | 0100 | 0 | | |
| | | | | | 00111 000010 11000 | | 110001100 | | | |
| 2209 | DPREP13:2614 ***** * D(C)=0 *-----* *P2, D+FAC3(SF) AND EXPMASK, *P3, D(C)+CIN, *NEXT, * J/DPREP14 ***** | <-- VV | | 2614 | | | | 10000000 | 1000 | |
| | | | | | 1011 10 00 10 11 000 000 | | 0100 | 0 | | |
| | | | | | 01111 000000 11000 | | 110001101 | | | |
| 2210 | DPREP14:2615 ***** * RIGHT JUSTIFY *EXPONENT *-----* *P2, D+D RIGHT 7, *P3, R(ES)+D (B ADDR), *NEXT, * J/DPREP15 ***** | <-- VV | | 2615 | | | | 00000000 | 1000 | |
| | | | | | 1111 00 10 01 00 110 000 | | 0100 | 0 | | |
| | | | | | 00110 011110 11000 | | 110001110 | | | |
| | | | 2616 2211 729 | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE AND DESTINATION | EXONENTS | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------|-------------------|------------------------|----------|------|------|-----|------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| | | F/MULMODW | <-- | 2152 | 1408 | 458 | | | | | | | | | |
| | | F/ADDW01 | <-- | 4232 | 1570 | 510 | | | | | | | | | |
| | | F/DIVFDW4 | <-- | 2422 | 1687 | 549 | | | | | | | | | |
| ***** | | | | | | | | | | | | | | | |
| * | SUBROUTINE EXPTST | | * | | | | | | | | | | | | |
| | | RETURN/MULMODW2 | * --> | 2154 | 1409 | 459 | | | | | | | | | |
| | | RETURN/ADDW02 | * --> | -1 | -1 | -1 | | 2 | 1 | 1 | | | | | |
| | | RETURN/DIVFDW5 | * --> | 2424 | 1688 | 549 | | | | | | | | | |
| ***** | | | | | | | | | | | | | | | |

```

2213 EXPTST:2621
*****
* :SUBROUTINE EXPONENT TEST ;LEAVES DATA *
*IN FAC(SF) AND FDST INTACT ;SETS SR TO *
*THE FOLLOWING IF OPERANDS ARE ZERO ; ; *
*SR : 00 BOTH OPERANDS ARE NOT ZERO ; *
*01 SF EXP IS ZERO ; 10 DF EXP IS ZERO ; *
*11 BOTH OPERANDS ARE *
*ZERO *
-----*
*P2,      D+FAC3(SF) AND EXPMASK, *
*      SR+FAC3(SF) AND EXPMASK, *
*NEXT, *
*      J/EXPTST2 * --> VV
*****
2214 EXPTST2:2622      F/EXPTST <-- VV
*****
*P2,      D+SR MINUS 1,D(C)+ALU15, *
*NEXT, *
*      J/EXPTST3 * --> VV
*****
2215 EXPTST3:2624      F/EXPTST2 <-- VV
*****
*P2,      D+FDST3 AND EXPMASK,D(C)+D(C), *
*NEXT, *
*      J/EXPTST4 * -->
*****

```

```

2621      100000001000
1011 10 00 10 11 000 000 0110 0
01111 000000 11000 110010010

```

```

2622      000000001000
1101 11 00 00 00 000 100 0100 0
00000 000000 11000 110010100

```

```

2624      000000001000
1011 10 00 10 01 011 111 0100 0
01111 000000 11000 110010101

```

2625 2216 731

E13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 732

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---|----------------------|------------------|--------------------|------|------|--------------------------|-------------|------------|------------|-------------|-----------|-----|------|
| | | | OFST | ADDR | BOX | | | | | | PAGE | RIF | COUT |
| .TOC " FLIP OF FD IN FPS REGISTER ##FLPT##" | | | | | | | | | | | | | |
| | | F/MULMODW18 | <-- | 2722 | 1425 | 464 | | | | | | | |
| | | F/MOD1CLSS18 | <-- | 2332 | 1514 | 492 | | | | | | | |
| | | F/NROUND19 | <-- | 2222 | 1925 | 622 | | | | | | | |
| | | F/NROUND53 | <-- | 2552 | 1958 | 632 | | | | | | | |
| | | F/RESTART16 | <-- | 2452 | 2260 | 746 | | | | | | | |
| ***** | | | | | | | | | | | | | |
| * | SUBROUTINE FD-TOGGLE | | * | | | | | | | | | | |
| | | RETURN/MULMODW19 | * --> | -1 | -1 | -1 | 2 | 1 | 1 | | | | |
| | | RETURN/NROUND21 | * --> | -1 | -1 | -1 | 2 | 1 | 1 | | | | |
| | | RETURN/NROUND21 | * --> | 2506 | 1927 | 622 | | | | | | | |
| | | RETURN/NROUND55 | * --> | 2535 | 1960 | 633 | | | | | | | |
| | | RETURN/RESTART17 | * --> | -1 | -1 | -1 | 2 | 1 | 1 | | | | |
| ***** | | | | | | | | | | | | | |

F13

```

2219 FD-TOGGLE:1623
*****
*USED ONLY BY THE MOD INSTRUCTION TO
*OPERATE IN DOUBLE PRECISION ROUTINE
*FLIP FTHE FD BIT OF
*FPS
*-----*
*SELECT,   FPS(READ),
*P3,      EMITCON+DATA,
*NEXT,
*
*                J/FDTGL2
*****
2220 FDTGL2:1624                F/FD-TOGGLE
*****
*P2,      SR+CNST200,
*NEXT,
*
*                J/FDTGL3
*****
2221 FDTGL3:1625                F/FDTGL2
*****
* SAVE D(C) CONTAINS ROUNDING
*BIT
*-----*
*P2,      D+SR XOR EMITCON,D(C)+D(C),
*NEXT,
*
*                J/FDTGL4
*****

```

```

1623
0000 10 00 11 01 000 000 0000 0
11001 100000 11000 110010100

```

```

1624
1010 10 00 00 00 000 000 0010 0
00100 000000 11000 110010101

```

```

1625
0110 10 00 00 00 000 111 0100 0
01001 000000 11000 110010110

```

1626 2222 733

G13

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 733

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|----------------------|--------------------|---------------|-------|--------|-------|----------|-----------------|
| | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | | UPF |
| 2222 | FDTGL4:1626 | | 1625 2221 732 | | | | | |
| | F/FDTGL3 | <-- | | 1626 | | | | 000000001000 |
| | *SELECT, FPS(WRITE), | * | | 0000 | 00 00 | 00 01 | 100 000 | 0000 0 |
| | *P3, FPS+D, | * | | 11011 | 000000 | 11111 | 00000000 | |
| | *NEXT, | * | | | | | | |
| | * BUT(RETURN) | * --> VV | | | | | | |
| | ***** | | | | | | | |

H13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 734

| BOX NO. | TAG: ADDRESS | LEFT SHIFT | SOURCE FIELD | ##FLPT## | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|----------------------|------------|-------------------|----------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .TOC | SUBROUTINE | | | | | | | | | |
| | | | F/MOD5W | <-- | 2274 1484 483 | | | | | |
| | | | F/MOD3CLSS29 | <-- | 2375 1549 503 | | | | | |
| | | | F/MOD3CLSS30 | <-- | 2400 1550 503 | | | | | |
| | | | F/MOD3CLSS31 | <-- | 2401 1551 503 | | | | | |
| | | | F/NROUNDEND3 | <-- | 4554 1622 527 | | | | | |
| | | | F/NROUNDEND4 | <-- | 4555 1623 528 | | | | | |
| | | | F/NROUND29 | <-- | 2111 1934 624 | | | | | |
| ***** | | | | | | | | | | |
| * | SUBROUTINE LEFTSHFSF | | | * | | | | | | |
| | | | RETURN/MOD6W | * --> | 2127 1485 483 | | | | | |
| | | | RETURN/MOD3CLSS30 | * --> | 2400 1550 503 | | | | | |
| | | | RETURN/MOD3CLSS31 | * --> | 2401 1551 503 | | | | | |
| | | | RETURN/NROUND | * --> | -1 -1 -1 | 0 1 1 | | | | |
| | | | RETURN/NROUND | * --> | 2362 1906 615 | | | | | |
| | | | RETURN/NROUND32 | * --> | 2216 1937 625 | | | | | |
| | | | RETURN/NROUND26 | * --> | -1 -1 -1 | 0 1 1 | | | | |
| ***** | | | | | | | | | | |

```

2223 LEFTSHFSF:2626
*****
* SUBROUTINE PERFORMS LEFT SHIFT OF
* FAC(SF) : SINGLE SHIFT IS PERFORMED EACH
* TIME ROUTINE ; IS ENTERED ; LOW BIT IS
* ALWAYS PULLED IN FROM GUARD REGISTER.
* COMBINATION OF D, SR AND GUARD PERFORMS
* SINGLE LEFT ; SHIFT TARGETS - SINGLE -
* LFSHFSF2
*-----*
* P2,          SR+FAC2(SF),
* NEXT,        BUTR(FD),
*              J/LFSHFSF2
*              J/LFSHFSF2
*              J/LFSHFSF3
*****

```

```

2626
1010 00 01 00 00 10000001000
00000 000000 10111 011010010 0010 0

```

```

--> 10 2322 2224 734
--> 11 2323 2226 735

```

```

CASE 1 OF BLEFTSHFSF
2224 LFSHFSF2:2322 F/LEFTSHFSF <-- VV
*****
* DOUBLE - LFSHFSF3 TARGETS - 0 -
* LFSHFSF2B
*-----*
* P2,          D+FAC3(SF), D(C)+ALU15,
*              RES+RESLEFTGD,
* NEXT,        BUTR(BG),
*              J/LFSHFSF2B
*              J/LFSHFSF2B
*              J/LFSHFSF9
*****

```

```

2322
1111 10 00 10 11 10000001000
01010 010001 01100 110000011 0100 0

```

```

--> 011 2603 2225 735
--> 111 2607 2233 737

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|---------------|---------|---------|----------|---|
| .CASE 2225 | 1 OF BLFSHFSF2 LFSHFSF2B:2603 | F/LFSHFSF2 | <-- | 2322 2224 734 | | | | |
| | ***** *1 - LFSHFSF9 INSTRUCTION *ABORT *-----* *P2, D+FAC3(SAV), *P3, FAC3(SF)+D (B ADDR), *NEXT, * J/RESTART2 | | | | | | | 2603 1111 00 01 10 00 100 000 0100 0 00000 001010 11000 110011100 |
| | ***** | | | | | | | |
| .CASE 2226 | 2 OF BLEFTSHFSF LFSHFSF3:2323 | F/LEFTSHFSF | <-- | 2626 2223 734 | | | | |
| | ***** *GO RESTORE ORIGINAL STATE *-----* *P2, SR+FAC0(SF), *NEXT, * J/LFSHFSF4 | | | | | | | 2323 1010 01 01 00 00 000 000 0010 0 00000 000000 11000 110011000 |
| | ***** | | | | | | | |
| 2227 | LFSHFSF4:2630 | F/LFSHFSF3 | <-- VV | | | | | |
| | ***** *P2, D+FAC1(SF), D(C)+ALU15, * RES+RESLEFTGD, *NEXT, * J/LFSHFSF5 | | | | | | | 2630 1111 10 00 11 11 000 100 0100 0 01010 010001 11000 110011001 |
| | ***** | | | | | | | |
| 2228 | LFSHFSF5:2631 | F/LFSHFSF4 | <-- VV | | | | | |
| | ***** *P2, D+D LEFT 1, D(C)+D(C), SHIFT SR, *P3, FAC1(SF)+D (B ADDR), *NEXT, * J/LFSHFSF6 | | | | | | | 2631 1111 00 01 01 00 000 111 0110 0 00000 011010 11000 110011010 |
| | ***** | | | | | | | |
| | | | | 2632 2229 736 | | | | |

K13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 736

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|---|--|--------------------------|-------------------|------------|------------|-------------|------------|----------|--------|
| | | | | | | | | RIF UPF | COUT | |
| 2229 | LFSHFSF6:2632 | F/LFSHFSF5 | <-- | 2631 2228 735 | 2632 | | | | 10000000 | 1000 |
| | *P2, D+SR, D(C)+D(C), | | | | 1111 | 00 01 | 00 00 | 000 111 | 0100 | 0 |
| | *P3, FAC0(SF)+D (B ADDR), | | | | 00000 | 011100 | 11010 | 110001011 | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | | | |
| | * J/LFSHFSF7 | | --> VV | | | | | | | |
| CASE 2230 | 3 OF BLFSHFSF2 | F/LFSHFSF2 | <-- | 2322 2224 734 | 2613 | | | | 10000000 | 1000 |
| | LFSHFSF7:2613 | | | | 1010 | 00 01 | 00 00 | 000 000 | 0010 | 0 |
| | * TARGETS - 0 - | | | | 00000 | 000000 | 01100 | 100110011 | | |
| | *LFSHFSF8B | | | | | | | | | |
| | *P2, SR+FAC2(SF), | | | | | | | | | |
| | *NEXT, BUTP(BG), | | | | | | | | | |
| | * J/LFSHFSF8B | | --> | 011 2463 2232 736 | | | | | | |
| | * J/LFSHFSF8 | | --> | 111 2467 2231 736 | | | | | | |
| CASE 2231 | 2 OF BLFSHFSF7 | F/LFSHFSF7 | <-- VV | | 2467 | | | | 10000000 | 1000 |
| | LFSHFSF8:2467 | | | | 1111 | 10 00 | 10 11 | 000 111 | 0100 | 0 |
| | *1 - LFSHFSF8 | | | | 01011 | 010001 | 11000 | 11000C111 | | |
| | *P2, D+FAC3(SF), D(C)+D(C), | | | | | | | | | |
| | * RES+RESLEFTD(C), | | | | | | | | | |
| | *NEXT, J/LFSHFSF9 | | --> | 2607 2233 737 | | | | | | |
| CASE 2232 | 1 OF BLFSHFSF7 | F/LFSHFSF7 | <-- | 2613 2230 736 | 2463 | | | | 10000000 | 1000 |
| | LFSHFSF8B:2463 | | | | 1111 | 00 01 | 10 00 | 100 000 | 0100 | 0 |
| | * ABORT INSTRUCTION GO RESTORE ORIGINAL | | | | 00000 | 001010 | 11000 | 110011100 | | |
| | *STATE | | | | | | | | | |
| | *P2, D+FAC3(SAV), | | | | | | | | | |
| | *P3, FAC3(SF)+D (B ADDR), | | | | | | | | | |
| | *NEXT, J/RESTART2 | | --> | 2634 2245 742 | | | | | | |

M13

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 738

| BOX NO. | TAG: ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|--------------|--|--------------------|------|------|------------------|--------------|---------|----------|-----------|-----|------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | COUT |
| .TOC | " | SUBROUTINE PERFORMS WORD MOVE FROM FDST TO FAC(SF) | **FLPT** | | | | | | | | | |
| | | F/ADDSFEZ | <-- | 4415 | 1580 | 513 | | | | | | |
| | | F/BIGEXDFGSF | <-- | 4227 | 1592 | 517 | | | | | | |
| | | F/LOADNZW2 | <-- | 4076 | 1651 | 537 | | | | | | |
| | | F/LDCPW6 | <-- | 2545 | 1894 | 611 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | | SUBROUTINE MOVFDSTSF | * | | | | | | | | | |
| | | RETURN/LOADZW4 | * --> | 3222 | 1645 | 535 | | | | | | |
| | | RETURN/NROUND46 | * --> | 2311 | 1951 | 630 | | | | | | |
| | | RETURN/LOADZW4 | * --> | 3222 | 1645 | 535 | | | | | | |
| | | RETURN/LDCPW8 | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | |
| ***** | | | | | | | | | | | | |

N13

2235 MOVFDSTSF:4745

```
*****
* SUBROUTINE PERFORMS WORD TRANSFER *
* OPERATION MOVING FDST3+FDSTO TO *
* FAC3(SF)-FACO(SF) TARGETS - F - *
* MOVFDSTSF4 *
*-----*
```

```
*P2,      D+FDST3, *
*P3,      FAC3(SF)+D (B ADDR), *
*NEXT,    BUTR(FD), *
*          J/MVFDSTSF4 *
*          J/MVFDSTSF2 *
*****
```

```
--> 10 4422 2238 739
--> 11 4423 2236 738
```

.CASE 2 OF BMOVFDSTSF

```
F/MVFDSTSF <-- 4745 2235 738
F/MVFDSTSF3 <-- 4746 2237 738
```

2236 MVFDSTSF2:4423

```
*****
* D - MOVFDSTSF2 *
*-----*
```

```
*P2,      D+FDST1, *
*P3,      FAC1(SF)+D (B ADDR), *
*NEXT,    J/MVFDSTSF3 *
*          J/MVFDSTSF3 *
*****
```

--> VV

2237 MVFDSTSF3:4746

```
F/MVFDSTSF2 <-- VV
```

```
*P2,      D+FDSTO, *
*P3,      FACO(SF)+D (A ADDR), *
*NEXT,    J/MVFDSTSF4 *
*          J/MVFDSTSF4 *
*****
```

```
--> 4422 2238 739
```

4745

```
1111 00 01 10 01 011 000 0100 0
00000 001010 10111 100010010
```

4423

```
1111 00 01 11 01 011 000 0100 0
00000 011010 11000 111100110
```

4746

```
1010 01 11 00 11 011 000 0100 0
00000 010100 11000 100010010
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|---------------------------|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-----------|-------------|
| | | | | | | | | RIF UPF | COUT CLOCKS |
| .CASE | 1 OF BMOVFDSTSF | | | | | | | | |
| 2238 | MVFDSTSF4:4422 | F/MOVFDSTSF F/MVFDSTSF3 | <-- <-- | 4745 4746 | 2235 2237 | 738 738 | | | |
| | ***** | | | | | | | | |
| | *P2, D+FDST2 | | | | | | | | |
| | *P3, FAC2(SF)+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * BUT(RETURN) | | | | | | | | |
| | ***** | | | | | | | | |
| | | | --> | VV | | | | | |

4422 100000001000
1010 00 11 00 11 011 000 0100 0
00000 000100 11111 00000000

| BOX NO. | TAG: ADDRESS | OPERANDS TO | FDST | ##FLPT## | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|----------------------|---------------|-------------|----------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|------|
| | | | | | OFST | ADDR | BOX | | | | | PAGE | RIF | COUT |
| .TOC | SUBROUTINE MOVE | SOURCE | OPERANDS TO | FDST | | | | | | | | | | |
| | | F/ST1W | | | <-- | 360 | 1680 | 546 | | | | | | |
| | | F/ST2W | | | <-- | 361 | 1681 | 547 | | | | | | |
| | | F/STCTW | | | <-- | 367 | 1757 | 571 | | | | | | |
| | | F/STCPW3 | | | <-- | 143 | 1805 | 585 | | | | | | |
| | | F/STCPNZW | | | <-- | 371 | 1806 | 585 | | | | | | |
| ***** | | | | | | | | | | | | | | |
| * | SUBROUTINE MOVSFFDST | | | | * | | | | | | | | | |
| | | RETURN/STSW | | | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | |
| | | RETURN/STSW | | | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | |
| | | RETURN/STCTW2 | | | * --> | 4362 | 1758 | 571 | | | | | | |
| | | RETURN/STCPW4 | | | * --> | 4444 | 1807 | 585 | | | | | | |
| | | RETURN/STCPW4 | | | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | |
| ***** | | | | | | | | | | | | | | |

```

2239 MOVSFFDST:4747
*****
* SUBROUTINE PERFORMS WORD TRANSFER OF *
* FAC3(SF)-FAC0(SF) TO *
* FDST3-FDST0 *
*-----*
*P2,          D+FAC3(SF), *
*P3,          FDST3+D (B' ADDR), *
*NEXT, *
*          J/MVSFFDST2 *
*****
2240 MVSFFDST2:4760          F/MVSFFDST
*****
* TARGETS - 0 - *
* MVSFFDST5 *
*-----*
*P2,          D+FAC2(SF), *
*P3,          FDST2+D (A' ADDR), *
*NEXT,        BUTR(FD), *
*          J/MVSFFDST5 *
*          J/MVSFFDST5 *
*          J/MVSFFDST3 *
*****

```

```

4747
1111 00 11 10 11 011 000 0100 0
00000 001010 11000 111110000

```

```

4760
1010 00 01 00 01 011 000 0100 0
00000 000100 10111 000111010

```

```

--> 10 4072 2243 741
--> 11 4073 2241 741

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | CLOCK COUNT |
|-----------|-------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------|-------------|
| CASE 2241 | MVSFFDST3:4073 | F/MVSFFDST2 | <-- | 4760 | 2240 | 740 | | | |
| | *1 - MVSFFDST3 | | | 4073 | | | | 100000001000 | |
| | *P2, D+FA1(SF), | | | | 1111 | 00 11 | 11 11 | 011 000 | 0100 0 |
| | *P3, FDST1+D (B ADDR), | | | | 00000 | 011010 | 11000 | 111110001 | |
| | *NEXT, J/MVSFFDST4 | | --> VV | | | | | | |
| 2242 | MVSFFDST4:4761 | F/MVSFFDST3 | <-- VV | 4761 | | | | 100000001000 | |
| | *P2, D+FA1(SF), | | | | 1010 | 01 01 | 00 01 | 011 000 | 0100 0 |
| | *P3, FDST0+D (A ADDR), | | | | 00000 | 010100 | 11111 | 000000000 | |
| | *NEXT, BUT(RETURN) | | --> VV | | | | | | |
| CASE 2243 | MVSFFDST5:4072 | F/MVSFFDST2 | <-- | 4760 | 2240 | 740 | | | |
| | *P2, D+0 | | | 4072 | | | | 000000001000 | |
| | *P3, FDST10+D (A ADDR), | | | | 0011 | 00 00 | 00 01 | 011 000 | 0100 0 |
| | *NEXT, BUT(RETURN) | | --> VV | | 00000 | 010110 | 11111 | 000000000 | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--|---------------|--|--------------------------|-----------------|------------|-------------|-----------|----------------------------|--------|
| | | | | | | | RIF | COUT | |
| .TOC " INSTRUCTION ABORT ROUTINE RESTORES " | | | | | | | | | |
| .TOC " ORIGINAL STATE OF MACHINE " | | | | | | | | | |
| ; RESTART ROUTINE USED BY THE FOLLOWING INSTRUCTIONS - | | | | | | | | | |
| ; MULF/D | | | | | | | | | |
| ; DIVF/D | | | | | | | | | |
| ; MODF/D | | | | | | | | | |
| ; ADDF/D | | | | | | | | | |
| ; SUBF/D | | | | | | | | | |
| ; LDCTW | | | | | | | | | |
| ; ROUTINE PERMITS INSTRUCTION RESTART AND RESTORES ALL REGISTERS | | | | | | | | | |
| ; TO ORIGINAL VALUES THAT EXISTED BEFORE EXECUTION | | | | | | | | | |
| ; ALL VALUES ARE TAKEN FROM A SIDE SCRATCH PAD WHICH WERE LOADED | | | | | | | | | |
| ; DURING DATAPREP SUBROUTINE BY ALL ARITHMETIC INSTRUCTIONS AND | | | | | | | | | |
| ; DONE SPECIFICALLY FOR LDCTW | | | | | | | | | |
| 2244 | RESTART:2633 | F/QUOLEFT12 | <-- | 2454 | 1739 | 565 | | | |
| | ***** | | | | | | | | |
| | *P2, | D+FAC3(SAV) | * | | | | 2633 | 100000001000 | |
| | *P3, | FAC3(SF)+D (B ADDR), | * | | | | 1111 | 00 01 10 00 100 000 0100 0 | |
| | *NEXT, | | * | | | | 00000 | 001010 11000 110011100 | |
| | * | J/RESTART2 | * --> VV | | | | | | |
| | ***** | | | | | | | | |
| | | F/MFRACF12 | <-- | 2623 | 1463 | 476 | | | |
| | | F/LFSHFSF2B | <-- | 2603 | 2225 | 735 | | | |
| | | F/LFSHFSF8B | <-- | 2463 | 2232 | 736 | | | |
| | | F/RESTART | <-- | 2633 | 2244 | 742 | | | |
| | | F/RTSHFDST2C | <-- | 2063 | 2288 | 754 | | | |
| | | F/RTSHFDST7B | <-- | 2433 | 2294 | 756 | | | |
| | | F/RSHFDSTSN7 | <-- | 2503 | 2305 | 760 | | | |
| | | F/RTSHFSF2C | <-- | 2243 | 2309 | 762 | | | |
| | | F/RTSHFSF7B | <-- | 2413 | 2315 | 764 | | | |
| 2245 | RESTART2:2634 | | | | | | | | |
| | ***** | | | | | | | | |
| | *P2, | D+FAC2(SAV) | * | | | | 2634 | 100000001000 | |
| | *P3, | FAC2(SF)+D (B ADDR), | * | | | | 1111 | 00 01 10 01 100 000 0100 0 | |
| | *NEXT, | BUTR(RESET RES), | * | | | | 00000 | 001100 11010 110011101 | |
| | * | J/RESTART3 | * --> | 2635 | 2246 | 743 | | | |
| | ***** | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|-----------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 2246 | RESTART3:2635 | F/RESTART2 | <-- | 2634 | 2245 | 742 | | | | |
| | ***** | | | | | | | | | |
| | * GET CONDITION REGISTER D(C) GETS MOD | | | 2635 | | | | 00000000 | 1000 | |
| | * FLAG | | | | 1111 | 00 00 | 10 01 | 101 010 | 0110 | 0 |
| | -----* | | | | | | | | | |
| | *P2, D+CR2, D(C)+ALU00, SR+CR2, | | | | 00000 | 000000 | 11000 | 110100 | 100 | |
| | *NEXT, J/RESTART4 | | --> VV | | | | | | | |
| 2247 | RESTART4:2644 | F/RESTART3 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * TEST FOR MOD INSTRUCTION TARGETS | | | 2644 | | | | 10000000 | 1000 | |
| | *- | | | | 1111 | 00 01 | 10 00 | 111 111 | 0100 | 0 |
| | -----* | | | | | | | | | |
| | *P2, D+FAC1(SAV), D(C)+D(C), | | | | 00000 | 011010 | 10011 | 100101 | 000 | |
| | *P3, FAC1(SF)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUT(D(C)#BA00), | | | | | | | | | |
| | * J/RESTART5 | | --> | 00 | 2450 | 2248 | 743 | | | |
| | * J/RESTART5B | | --> | 01 | 2451 | 2249 | 744 | | | |
| | * J/RESTART16 | | --> | 10 | 2452 | 2260 | 746 | | | |
| | * J/RESTART17 | | --> | 11 | 2453 | 2261 | 747 | | | |
| | ***** | | | | | | | | | |
| CASE 2248 | 1 OF BRESTART4 | F/RESTART4 | <-- VV | | | | | | | |
| | RESTARTS:2450 | | | 2450 | | | | 10000000 | 1000 | |
| | *00 - RESTARTS 01 - RSTART5B 10 - | | | | 1111 | 00 01 | 10 01 | 111 000 | 0100 | 0 |
| | *RESTART16 11 - RESTART17 | | | | 00000 | 011100 | 11000 | 110110 | 1111 | |
| | -----* | | | | | | | | | |
| | *P2, D+FAC0(SAV), | | | | | | | | | |
| | *P3, FAC0(SF)+D (B ADDR), | | | | | | | | | |
| | *NEXT, J/RESTART6 | | --> | 2667 | 2250 | 744 | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|---|---------------------------------------|--------------------------------|------|--------------------|----------------|----------------|--------------|------|
| | | | | | | | | RIF | COUT |
| 2253 | RESTART9:2650 ***** * D(C)= 1 FOR RETURN FROM *REGINIT01 ***** *P2, D+SR MINUS 2(D),D(C)+CIN, *P3, PC+D (B ADDR) *NEXT, BUT(CLEAR FLAGS), * J/RESTART10 ***** | <-- | 2645 2252 744 | 2650 | | | | 000000001000 | |
| | | | | | 1101 10 11 00 00 | 001110 11010 | 111 000 0100 0 | | |
| | | | | | 00011 | | 110101001 | | |
| 2254 | RESTART10:2651 ***** * REGINIT REQUIRES EMIT SELECTED ALSO *EMIT MUST REMAIN *SELECTED ***** *NEXT, BUT(GO TO) PAGE+3, * RETURN+RESTART11, * J/REGINIT01 ***** | <-- VV | | 2651 | | | | 000000001000 | |
| | | | | | 0100 00 11 11 10 | 100 011 0000 0 | | | |
| | | | | | 00000 000000 11100 | 101011111 | | | |
| | | --> | 3537 896 301 | | | | | | |
| 2255 | RESTART11:4764 ***** *P2, MD+TMASK (BC), *NEXT, J/RESTART12 ***** | <-- <-- | 4741 2185 720 4742 2186 721 | 4764 | | | | 000000001000 | |
| | | | | | 0000 10 00 01 00 | 000 000 0000 0 | | | |
| | | | | | 00010 100000 11000 | 111110101 | | | |
| 2256 | RESTART12:4765 ***** *P2, SR+MD, *NEXT, J/RESTART13 ***** | <-- VV | | 4765 | | | | 000000001000 | |
| | | | | | 1010 11 10 00 00 | 000 000 0010 0 | | | |
| | | | | | 00000 000000 11000 | 111110110 | | | |
| | | --> | 4766 2257 746 | | | | | | |

J14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 746

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCK |
|---------|---------------------------------------|--------------------|------------|-------|--------|-------|-----------|-----------|--------------|-------|
| | | | | | | | | OFST | ADDR | |
| 2257 | RESTART13:4766 | F/RESTART12 | <-- | 4765 | 2256 | 745 | | | | |
| | ***** | | | 4766 | | | | | 000000001000 | |
| | *SELECT, FLAGS(READ) | | | 0000 | 10 00 | 11 01 | 000 000 | 0000 0 | | |
| | *P3, EMITCON+DATA, | | | 11001 | 100000 | 11000 | 111110111 | | | |
| | *NEXT, | | | | | | | | | |
| | * J/RESTART14 | --> VV | | | | | | | | |
| 2258 | RESTART14:4767 | F/RESTART13 | <-- VV | | | | | | | |
| | ***** | | | 4767 | | | | | 000000001000 | |
| | *P2, D+SR OR EMITCON, | | | 1110 | 10 00 | 00 00 | 000 000 | 0100 0 | | |
| | *NEXT, BUT(GO TO),PAGE+0, | | | 01001 | 000000 | 11100 | 110100001 | | | |
| | * J/RESTART15 | --> VV | | | | | | | | |
| 2259 | RESTART15:0641 | F/RESTART14 | <-- VV | | | | | | | |
| | ***** | | | 641 | | | | | 000000001000 | |
| | * CLEAR OUT COUNTER FOR SERVICE FLOWS | | | 0000 | 00 00 | 00 01 | 000 001 | 0000 0 | | |
| | ** | | | 11011 | 000000 | 10000 | 111000011 | | | |
| | ----- | | | | | | | | | |
| | *SELECT, FLAGS(WRITE), | | | | | | | | | |
| | *P3, FLAGS+D, | | | | | | | | | |
| | *NEXT, BUTR(SERVICE), | | | | | | | | | |
| | * J/SER02 | | | | | | | | | |
| | * J/FET03 | --> | 00 700 | 3 | 11 | | | | | |
| | * J/SER01 | --> | 01 701 | 385 | 160 | | | | | |
| | * J/FET01 | --> | 10 702 | 1 | 2 | | | | | |
| | * J/SER02 | --> | 11 703 | 387 | 162 | | | | | |
| | ***** | | | | | | | | | |
| .CASE | 3 OF BRESTART4 | | | | | | | | | |
| 2260 | RESTART16:2452 | F/RESTART4 | <-- | 2644 | 2247 | 743 | | | | |
| | ***** | | | 2452 | | | | | 000000001000 | |
| | ***** INSTRUCTION ABORTED | | | 0010 | 00 10 | 01 01 | 011 001 | 0000 0 | | |
| | *WAS MODF - RESTORE F BIT IN | | | 00000 | 000000 | 11100 | 110010011 | | | |
| | *FPS<07> | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *NEXT, CALL FD-TOGGLE | | | | | | | | | |
| | * RETURN+RESTART17 | | | | | | | | | |
| | ***** | --> | 1623 | 2219 | 732 | | | | | |
| | ***** | | | | | | | | | |
| | | | | VV | | | | | | |
| | | | -1 | -1 | -1 | 0 | 1 | 1 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU | BUSB | BUSA | EXTENSION | | CLOCKS |
|---------|-----------------------------|---------------------------------------|-----------------------|---------------|-------|--------|-------|-----------|--------------|--------|
| | | | | | BUS | SP | UBF | RIF | COUT | |
| 2264 | RESTART17D:2652 | F/RESTART17C | <-- | 2036 2263 747 | 2652 | | | | 100000001000 | |
| | * RESTORE | | | | 1111 | 00 01 | 10 01 | 011 000 | 0100 0 | |
| | *FAC(SF+1) | | | | 00000 | 001010 | 10010 | 110101011 | | |
| | *-----* | | | | | | | | | |
| | *P2, D+FDST3, | | | | | | | | | |
| | *P3, FAC3(SF+1)+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUT(ROR1) | | | | | | | | | |
| | * J/RESTART17E | | --> | VV | | | | | | |
| 2265 | RESTART17E:2653 | F/RESTART17D | <-- VV | | 2653 | | | | 100000001000 | |
| | *P2, D+FDST2, | | | | 1010 | 00 11 | 00 11 | 011 000 | 0100 0 | |
| | *P3, FAC2(SF+1)+D (A ADDR), | | | | 00000 | 000100 | 10010 | 110110000 | | |
| | *NEXT, BUT(ROR1) | | | | | | | | | |
| | * J/RESTART17F | | --> | VV | | | | | | |
| 2266 | RESTART17F:2660 | F/RESTART17E | <-- VV | | 2660 | | | | 100000001000 | |
| | *P2, D+FDST1, | | | | 1111 | 00 01 | 11 01 | 011 000 | 0100 0 | |
| | *P3, FAC1(SF+1)+D (B ADDR), | | | | 00000 | 011010 | 10010 | 110110001 | | |
| | *NEXT, BUT(ROR1) | | | | | | | | | |
| | * J/RESTART17G | | --> | VV | | | | | | |
| 2267 | RESTART17G:2661 | F/RESTART17F | <-- VV | | 2661 | | | | 100000001000 | |
| | *P2, D+FDST0, | | | | 1010 | 01 11 | 00 11 | 011 000 | 0100 0 | |
| | *P3, FAC0(SF+1)+D (A ADDR), | | | | 00000 | 010100 | 11000 | 110100101 | | |
| | *NEXT, BUT(ROR1) | | | | | | | | | |
| | * J/RESTART8 | | --> | 2645 2252 744 | | | | | | |

M14

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 749

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------|--|--|--------------------------|------------|--------------|------------|-------------|-----------|--------|--------------|----------------|
| | | | | | | | | RIF | COUT | CLOCKS | |
| .TOC | SUBROUTINE RESTORE CSP ##FLPT## | | | | | | | | | | |
| 2268 | RESTORECSP:2662 | F/HFORKNVALD F/WFORKNVALD | <-- <-- | 477 476 | 1236 1319 | 401 431 | | | | | |
| | ***** * SUBROUTINE USED BY HOT AND WARM * FLOATING POINT TO RESTORE CSP CONSTANTS * AND CLEAR THE FLAG BIT INDICATING CSP * INVALID *-----* *P3, CSP(0)+EXPMASK, *NEXT, * J/RESTCSP2 | | | | | | | | | | |
| | | | | | | | 2662 | | | 000000001000 | |
| | | | | | | | | 0111 | 10 11 | 11 10 | 000 000 0000 0 |
| | | | | | | | | 01111 | 100000 | 11000 | 110110011 |
| 2269 | RESTCSP2:2663 | F/RESTORECSP | <-- VV | | | | | | | | |
| | ***** *P3, CSP(1)+CNST8, *NEXT, * J/RESTCSP3 | | | | | | | | | | |
| | | | | | | | 2663 | | | 000000001000 | |
| | | | | | | | | 0000 | 10 00 | 00 00 | 001 000 0000 0 |
| | | | | | | | | 01110 | 100000 | 11000 | 110110100 |
| 2270 | RESTCSP3:2664 | F/RESTCSP2 | <-- VV | | | | | | | | |
| | ***** *P3, CSP(2)+RESRIGHT, *NEXT, * J/RESTCSP4 | | | | | | | | | | |
| | | | | | | | 2664 | | | 000000001000 | |
| | | | | | | | | 0010 | 10 00 | 00 00 | 000 000 0000 0 |
| | | | | | | | | 01101 | 100000 | 11000 | 110110101 |
| 2271 | RESTCSP4:2665 | F/RESTCSP3 | <-- VV | | | | | | | | |
| | ***** *P3, CSP(3)+CNST4, *NEXT, * J/RESTCSP5 | | | | | | | | | | |
| | | | | | | | 2665 | | | 000000001000 | |
| | | | | | | | | 0000 | 10 00 | 00 00 | 000 100 0000 0 |
| | | | | | | | | 01100 | 100000 | 11000 | 110110110 |
| | | | | 2666 | 2272 | 750 | | | | | |

N14

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|------|---------------|-----------------|----------------|----------------------|----------|-----------|
| | | | | | | | | RIF | COUT | |
| 2272 | RESTCSP5:2666 ***** *P3, CSP(4)+RESLEFTD(C), * *NEXT, J/RESTCSP6 * ***** | <-- | 2665 2271 749 | 2666 | 0101 01011 | 10 00 100000 | 00 00 11000 | 000 000 110111000 | 00000000 | 1000 0 |
| 2273 | RESTCSP6:2670 ***** *P3, CSP(5)+RESLEFTGD, * *NEXT, J/RESTCSP7 * ***** | <-- VV | | 2670 | 0101 01010 | 10 10 100000 | 00 00 11000 | 000 000 110111010 | 00000000 | 1000 0 |
| 2274 | RESTCSP7:2672 ***** *P3, CSP(7)+RESRIGHTGD, * *NEXT, J/RESTCSP8 * ***** | <-- VV | | 2672 | 0010 01000 | 10 10 100000 | 00 00 11000 | 000 000 110111100 | 00000000 | 1000 0 |
| 2275 | RESTCSP8:2674 ***** *P3, CSP(10)+HIBYTEMASK, * *NEXT, J/RESTCSP9 * ***** | <-- VV | | 2674 | 1111 00111 | 10 11 100000 | 11 00 11000 | 000 000 110111101 | 00000000 | 1000 0 |
| 2276 | RESTCSP9:2675 ***** *P3, CSP(11)+SEXPMASK, * *NEXT, J/RESTCSP10 * ***** | <-- VV | 2676 2277 751 | 2675 | 1111 00110 | 10 11 100000 | 11 10 11000 | 000 000 110111110 | 00000000 | 1000 0 |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA RIF COUT CLOCKS | EXTENSION UBF UPF |
|---------|---|---------------------------------------|-----------------------|--------------|---------|----------------------|-------------------|
| .TOC | SUBROUTINE RIGHT SHIFT FDSI REGISTERS *#FLPT#* F/MFRAC17 <-- | 2231 1450 472 | | | | | |
| * | SUBROUTINE RTSHFDST RETURN/MFRAC10 * --> | 2220 1443 470 | | | | | |

2285 RTSHFDST:2706

```

*****
* SUBROUTINE PERFORMS RIGHT SHIFT OF
* FDST ; ONE SHIFT IS PERFORMED EACH TIME
* THIS ROUTINE ; IS ENTERED ; OPTION EXISTS
* FOR CALLER TO PUSH LOW BIT INTO GUARD
* OR NOT ; CHOICE IS DETERMINED BY CALLER
* PUTTING PROPER RESIDUAL CONTROL PATTERN
* IN MD REGISTER D(C) GETS 0 TARGETS -
* SINGLE -
* RTSHFDST2
-----
*P2,      D+FDST2,D(C)+CIN,SR+FDST2,
*NEXT,    BUTR(FD)
*         J/RTSHFDST2
*         J/RTSHFDST2  --> 10 2526 2286 753
*         J/RTSHFDST3  --> 11 2527 2289 754
*****

```

```

2706      000000001000
1010 00 11 00 00 011 000 0110 0
00000 000000 10111 101010110

```

CASE 2286

```

1 OF BRTSHFDST
RTSHFDST2:2526      F/RTSHFDST  <-- VV
*****
* DOUBLE - RTSHFDST3 TARGETS - 0 -
* RTSHFDST2C
-----
*P2,      D+FDST3,D(C)+D(C),RES+MD,
*NEXT,    BUTR(BG)
*         J/RTSHFDST2C
*         J/RTSHFDST2C  --> 011 2063 2288 754
*         J/RTSHFDST2B  --> 111 2067 2287 754
*****

```

```

2526      000000001000
1111 11 10 10 01 011 111 0100 0
00000 010001 01100 000110011

```

F15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 754

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|------------|--|---------------------------------------|-----------------------|--------------------------------|---------|---------|----------|-----------|------|--------|---|
| | | | | | | | | RIF | COUT | CLOCKS | |
| .CASE 2287 | RTSHFDST2B:2067 | F/RTSHFDST2 F/RSHFDSTSN2 | <-- <-- | 2526 2286 753 2106 2300 758 | | | | | | | |
| | *1 - RTSHFDST2B | | | | | | | 2067 | | | 000000001000 |
| | | | | | | | | | | | 1111 00 11 01 10 011 111 0110 0 00000 001010 11010 111001000 |
| | *P2, D+D RIGHT 1,D(C)+D(C), | | | | | | | | | | |
| | * SHIFT SR, | | | | | | | | | | |
| | *P3, FDST3+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | | | | |
| | * J/RTSHFDST6 | | --> | 2710 2292 755 | | | | | | | |
| .CASE 2288 | RTSHFDST2C:2063 | F/RTSHFDST2 F/RSHFDSTSN2 | <-- <-- | 2526 2286 753 2106 2300 758 | | | | | | | |
| | * EXTERNAL SERVICE REQUEST IS PRESENT GO | | | | | | | 2063 | | | 100000001000 |
| | * TO RESTART | | | | | | | | | | 1111 00 01 10 00 100 000 0100 0 00000 001010 11000 110011100 |
| | * ROUTINE | | | | | | | | | | |
| | *P2, D+FAC3(SAV) | | | | | | | | | | |
| | *P3, FAC3(SF)+D (B ADDR), | | | | | | | | | | |
| | *NEXT, J/RESTART2 | | --> | 2634 2245 742 | | | | | | | |
| .CASE 2289 | RTSHFDST3:2527 | F/RTSHFDST | <-- | 2706 2285 753 | | | | | | | |
| | * BRANCH ON SR<00> 0 - | | | | | | | 2527 | | | 000000001000 |
| | * RTSHFDST4 | | | | | | | | | | 1111 10 00 10 01 011 111 0100 0 01101 010001 00000 101101110 |
| | *P2, D+FDST3,D(C)+D(C), | | | | | | | | | | |
| | * RES+RESRIGHT, | | | | | | | | | | |
| | *NEXT, BUT(CASE) | | | | | | | | | | |
| | * J/RTSHFDST4 | | --> | 1110 2556 2290 755 | | | | | | | |
| | * J/RTSHFDST5 | | --> | 1111 2557 2291 755 | | | | | | | |

G15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 755

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------|---------------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|-------|----------------|
| | | | | | | | | RIF UPF | COUT | CLOCKS |
| .CASE 2290 | 1 OF BRTSHFDST3 RTSHFDST4:2556 | F/RTSHFDST3 | <-- | 2527 | 2289 | 754 | 2556 | | | 000000001000 |
| | *1 - RTSHFDST5 CHECK EXTERNAL SERVICE | | | | | | 1111 | 00 11 | 01 10 | 011 111 0110 0 |
| | *REQUEST TARGETS - 0 - | | | | | | 00000 | 001010 | 01100 | 100011011 |
| | *RTSHFDST7B | | | | | | | | | |
| | *P2, D+D RIGHT 1,D(C)+D(C), | | | | | | | | | |
| | * SHIFT SR, | | | | | | | | | |
| | *P3, FDST3+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUTR(BG) | | | | | | | | | |
| | * J/RTSHFDST7B | | | | | | | | | |
| | | J/RTSHFDST7B | --> | 011 | 2433 | 2294 | 756 | | | |
| | | J/RTSHFDST7 | --> | 111 | 2437 | 2293 | 756 | | | |
| .CASE 2291 | 2 OF BRTSHFDST3 RTSHFDST5:2557 | F/RTSHFDST3 | <-- | 2527 | 2289 | 754 | 2557 | | | 000000001000 |
| | *1 - RTSHFDST7 D(C) GETS 1 CHECK | | | | | | 1111 | 00 11 | 01 10 | 011 000 0110 0 |
| | *EXTERNAL SERVICE TARGETS | | | | | | 00000 | 001010 | 01100 | 100011011 |
| | *- | | | | | | | | | |
| | *P2, D+D RIGHT 1 D(C)+CIN,SHIFT SR, | | | | | | | | | |
| | *P3, FDST3+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUTR(BG) | | | | | | | | | |
| | * J/RTSHFDST7B | | | | | | | | | |
| | | J/RTSHFDST7B | --> | 011 | 2433 | 2294 | 756 | | | |
| | | J/RTSHFDST7 | --> | 111 | 2437 | 2293 | 756 | | | |
| 2292 | RTSHFDST6:2710 | F/RTSHFDST2B | <-- | 2067 | 2287 | 754 | 2710 | | | 000000001000 |
| | *0 - RTSHFDST7B 1 - RTHSFDST7 | | | | | | 1111 | 00 11 | 00 00 | 011 111 0100 0 |
| | | | | | | | 00000 | 001100 | 11111 | 000000000 |
| | *P2, D+SR,D(C)+D(C) | | | | | | | | | |
| | *P3, FDST2+D (B ADDR), | | | | | | | | | |
| | *NEXT, BUT(RETURN) | | --> | VV | | | | | | |

H15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 756

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|--|--|-----------------------|---|---------|----------|--------------------|---|
| .CASE | 2 OF BRTSHFDST4 | | | | | | | |
| 2293 | RTSHFDST7:2437 | F/RTSHFDST4 F/RTSHFDST5 F/RSHFDSTSN5 | <-- <-- <-- | 2556 2290 755 2557 2291 755 2737 2303 759 | | | | |
| | ***** * DOUBLE PRECISION *ENTRY *-----* *P2, D+SR,D(C)+D(C), *P3, FDST2+D (B ADDR), *NEXT, BUTR(RESET RES), * J/RTSHFDST8 ***** | | | | | | 2437 | 000000001000 1111 00 11 00 00 011 111 0100 0 00000 001100 11010 111001001 |
| | | | | 2711 2295 756 | | | | |
| .CASE | 1 OF BRTSHFDST4 | | | | | | | |
| 2294 | RTSHFDST7B:2433 | F/RTSHFDST4 F/RTSHFDST5 F/RSHFDSTSN5 | <-- <-- <-- | 2556 2290 755 2557 2291 755 2737 2303 759 | | | | |
| | ***** *P2, D+FAC3(SAV), *P3, FAC3(SF)+D (B ADDR), *NEXT, * J/RESTART2 ***** | | | | | | 2433 | 100000001000 1111 00 01 10 00 100 000 0100 0 00000 001010 11000 110011100 |
| | | | | 2634 2245 742 | | | | |
| 2295 | RTSHFDST8:2711 | F/RTSHFDST7 F/RSHFDSTSN6 | <-- <-- | 2437 2293 756 2507 2304 759 | | | | |
| | ***** *P2, SR+FDST0, *NEXT, * J/RTSHFDST9 ***** | | | | | | 2711 | 000000001000 1010 01 11 00 00 011 000 0010 0 00000 000000 11000 111001010 |
| | | | | | | | | |
| 2296 | RTSHFDST9:2712 | F/RTSHFDST8 | <-- VV | | | | | |
| | ***** *P2, D+FDST1,D(C)+D(C),RES+MD, *NEXT, * J/RTSHFDST10 ***** | | | | | | 2712 | 000000001000 1111 11 10 11 01 011 111 0100 0 00000 010001 11000 111001011 |
| | | | | 2713 2297 757 | | | | |

J15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 758

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|---------------------|--------------------|-------|-----|-----------------------|--------------|---------|----------|-----------|-----|
| | | OFST | ADDR | BOX | | | | | PAGE | RIF |
| | | F/ADDSHFDFD1 | <-- | | 4130 | 1608 | 523 | | | |
| * | SUBROUTINE RSHFDSTN | | * | | | | | | | |
| | | RETURN/ADDSHFDFD | * --> | | 4413 | 1607 | 522 | | | |

K15

```

2299 RSHFDSTSN:2715
*****
* SUBROUTINE PERFORMS RIGHT SHIFT OF FDST *
* REGISTER SIGN EXTEND FOR ADDF/D AND *
* SUBF/D DIFFERENCE OPERATIONS TARGETS *
*-
-----
*P2,      D+FDST2,SR+FDST2,
*NEXT,    BUTR(FD),
*          J/RSHFDSTSN2
*          J/RSHFDSTSN2  --> 10 2106 2300 758
*          J/RSHFDSTSN3  --> 11 2107 2301 758
*****
.CASE 1 OF BRSHFDSTSN
2300 RSHFDSTSN2:2106      F/RSHFDSTSN  <-- VV
*****
*0 - RSHFDSTSN2 1 - RSHFDSTSN3 TARGETS -
* 0 -
*RTSHFDST2C
-----
*P2,      D+FDST3,D(C)+ALU15,
*          RES+RESRIGHTGD,
*NEXT,    BUTR(BG),
*          J/RTSHFDST2C
*          J/RTSHFDST2C  --> 011 2063 2288 754
*          J/RTSHFDST2B  --> 111 2067 2287 754
*****
.CASE 2 OF BRSHFDSTSN
2301 RSHFDSTSN3:2107      F/RSHFDSTSN  <--      2715 2299 758
*****
*1 - RTSHFDST2B BRANCH ON
*SR<00>
-----
*P2,      D+FDST3,D(C)+ALU15,
*          RES+RESRIGHT,
*NEXT,    BUT(CASE),
*          J/RSHFDSTSN4
*          J/RSHFDSTSN4  --> 1110 2736 2302 759
*          J/RSHFDSTSN5  --> 1111 2737 2303 759
*****

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2715      000000001000
1010 00 11 00 00 011 000 0110 0
00000 000000 10111 001000110

```

```

2106      000000001000
1111 10 00 10 01 011 100 0100 0
01000 010001 01100 000110011

```

```

2107      000000001000
1111 10 00 10 01 011 100 0100 0
01101 010001 00000 111011110

```

L15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 759

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|----------------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|------|--------|--|
| | | | | | | | | RIF UPF | COUT | CLOCKS | |
| .CASE 2302 | 1 OF BRSHFDSTSN3 | | | | | | | | | | |
| | RSHFDSTSN4:2736 | F/RSHFDSTSN3 | <-- | 2107 | 2301 | 758 | | | | | |
| | ***** | | | | | | | | | | |
| | *TARGETS - 0 - RSHFDSTSN4 1 - RSHFDSTSN5 | | | | | | | | | | |
| | *TARGETS - 0 - | | | | | | | | | | |
| | *RSHFDSTSN7 | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+D RIGHT 1,SHIFT SR, | | | | | | | | | | |
| | *P3, FDST3+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUTR(BG), | | | | | | | | | | |
| * J/RSHFDSTSN7 | | | | | | | | | | | |
| | J/RSHFDSTSN7 | | --> | 011 | 2503 | 2305 | 760 | | | | |
| | J/RSHFDSTSN6 | | --> | 111 | 2507 | 2304 | 759 | | | | |
| ***** | | | | | | | | | | | |
| .CASE 2303 | 2 OF BRSHFDSTSN3 | | | | | | | | | | |
| | RSHFDSTSN5:2737 | F/RSHFDSTSN3 | <-- | 2107 | 2301 | 758 | | | | | |
| | ***** | | | | | | | | | | |
| | *1 - RSHFDSTSN6 D(C) = 1 TARGETS - 0 - | | | | | | | | | | |
| | *RTSHFDST7B | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+D RIGHT 1,D(C)+CIN,SHIFT SR, | | | | | | | | | | |
| | *P3, FDST3+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUTR(BG), | | | | | | | | | | |
| | * J/RTSHFDST7B | | | | | | | | | | |
| | J/RTSHFDST7 | | --> | 011 | 2433 | 2294 | 756 | | | | |
| | J/RTSHFDST7 | | --> | 111 | 2437 | 2293 | 756 | | | | |
| ***** | | | | | | | | | | | |
| .CASE 2304 | 2 OF BRSHFDSTSN4 | | | | | | | | | | |
| | RSHFDSTSN6:2507 | F/RSHFDSTSN4 | <-- | 2736 | 2302 | 759 | | | | | |
| | ***** | | | | | | | | | | |
| | *1 - RTSHFDST7 | | | | | | | | | | |
| | *D(C)=0 | | | | | | | | | | |
| | ----- | | | | | | | | | | |
| | *P2, D+SR PLUS 0(D),D(C)+CIN, | | | | | | | | | | |
| | *P3, FDST2+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | | | | |
| | * J/RTSHFDST8 | | | | | | | | | | |
| | J/RTSHFDST8 | | --> | 2711 | 2295 | 756 | | | | | |

```

2736      000000001000
1111 00 11 01 10 011 000 0110 0
00000 001010 01100 101000011

2737      000000001000
1111 00 11 01 10 011 000 0110 0
00000 001010 01100 100011011

2507      000000001000
1001 10 11 00 00 011 000 0100 0
00001 001100 11010 111001001
    
```

M15

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 760

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|--|---------------------------------------|-----------------------|--------------------|---------|----------------|---------------------------|
| .CASE 2305 | 1 OF BRSHFDSTSN4 RSHFDSTSN7:2503 | F/RSHFDSTSN4 <-- | 2736 2302 759 | 2503 | | | 100000001000 |
| | * EXTERNAL SERVICE REQUEST IS PRESENT GO | | | 1111 00 01 10 00 | | 100 000 0100 0 | |
| | *TO | | | 00000 001010 11000 | | 110011100 | |
| | *RESTART | | | | | | |
| | ----- | | | | | | |
| | *P2, D+FAC3(SAV), | | | | | | |
| | *P3, FAC3(SF)+D (B ADDR), | | | | | | |
| | *NEXT, | | | | | | |
| | * J/RESTART2 | --> | 2634 2245 742 | | | | |
| | ***** | | | | | | |

N15

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 761

| BOX NO. | TAG:ADDRESS | SOURCE FIELD | ##FLTP## | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|---------|--------------------------|-----------------|----------|--------------------|------|-----|--------------------------|--------------------|------------|-------------|-----------|-----|------|
| | | | | OFST | ADDR | BOX | | | | | PAGE | RIF | COUT |
| .TOC | " SUBROUTINE RIGHT SHIFT | F/MFRAC11 | <-- | 2224 | 1444 | 470 | | | | | | | |
| | | F/NROUND27 | <-- | 2203 | 1932 | 624 | | | | | | | |
| ***** | | | | | | | | | | | | | |
| * | SUBROUTINE RTSHFSF | RETURN/MFRAC17 | * --> | 2231 | 1450 | 472 | | | | | | | |
| | | RETURN/NROUND13 | * --> | 2141 | 1919 | 620 | | | | | | | |
| ***** | | | | | | | | | | | | | |

2306 RTSHFSF:2720

 * :SUBROUTINE PERFORMS RIGHT SHIFT OF *
 *FAC(SF) :IN SINGLE AND DOUBLE PRECISION *
 *SINGLE SHIFT IS PERFORMED EACH TIME *
 *SUBROUTINE IS ENTERED AND LOW END BIT *
 *IS ALWAYS PUSHED INTO THE GUARD *
 *REGISTER D(C) GETS 0 TARGETS - SINGLE - *
 *RTSHFSF2 *

2720
 1010 00 01 00 00 10000001000
 00000 000000 10111 101011010

 *P2, D+FAC2(SF),D(C)+CIN, *
 * SR+FAC2(SF), *
 *NEXT, BUTR(FD), *
 * J/RTSHFSF2 *
 * J/RTSHFSF2 * --> 10 2532 2307 761
 * J/RTSHFSF3 * --> 11 2533 2310 762

CASE 1 OF BRTSHFSF
 2307 RTSHFSF2:2532 F/RTSHFSF <-- VV

2532
 1111 10 00 10 11 000 111 0100 0
 01000 010001 01100 010100011

*DOUBLE - RTSHFSF3 BRANCH ON BUS REQUEST *
 *TARGETS *
 * - *

 *P2, D+FAC3(SF),D(C)+D(C), *
 * RES+RESRIGHTGD, *
 *NEXT, BUTR(BG) *
 * J/RTSHFSF2C *
 * J/RTSHFSF2C * --> 011 2243 2309 762
 * J/RTSHFSF2B * --> 111 2247 2308 762

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|------------------------------|---------------------------------------|-----------------------|--------------|--------------|------------|----------|---------------------------------|
| .CASE | 2 OF BRTSHFSF2 | | | | | | | |
| 2308 | RTSHFSF2B:2247 | F/RTSHFSF2 F/RTSHFSFSN2 | <-- <-- | 2532 2166 | 2307 2321 | 761 766 | | |
| | ***** | | | | | | | |
| | *0 - RTSHFSF2C 1 - RTSHFSF2B | | | | | | | 2247 100000001000 |
| | -----* | | | | | | | 1111 00 01 01 10 000 111 0110 0 |
| | *P2, D+D RIGHT 1,D(C)+D(C), | | | | | | | 00000 001010 11010 111010001 |
| | * SHIFT SR, | | | | | | | |
| | *P3, FAC3(SF)+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | |
| | * J/RTSHFSF6 | | --> | 2721 | 2313 | 763 | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BRTSHFSF2 | | | | | | | |
| 2309 | RTSHFSF2C:2243 | F/RTSHFSF2 F/RTSHFSFSN2 | <-- <-- | 2532 2166 | 2307 2321 | 761 766 | | |
| | ***** | | | | | | | |
| | *P2, D+FAC3(SAV) | | | | | | | 2243 100000001000 |
| | *P3, FAC3(SF)+D (B ADDR), | | | | | | | 1111 00 01 10 00 100 000 0100 0 |
| | *NEXT, | | | | | | | 00000 001010 11000 110011100 |
| | * J/RESTART2 | | --> | 2634 | 2245 | 742 | | |
| | ***** | | | | | | | |
| .CASE | 2 OF BRTSHFSF | | | | | | | |
| 2310 | RTSHFSF3:2533 | F/RTSHFSF | <-- | 2720 | 2306 | 761 | | |
| | ***** | | | | | | | |
| | * BRANCH ON SR<00> TARGETS | | | | | | | 2533 100000001000 |
| | *-----* | | | | | | | 1111 10 00 10 11 000 111 0100 0 |
| | *P2, D+FAC3(SF), D(C)+D(C), | | | | | | | 01101 010001 00000 101011110 |
| | * RES+RESRIGHT, | | | | | | | |
| | *NEXT, BUT(CASE), | | | | | | | |
| | * J/RTSHFSF4 | | --> | 1110 | 2536 | 2311 | 763 | |
| | * J/RTSHFSF5 | | --> | 1111 | 2537 | 2312 | 763 | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUF CLOCKS UPF |
|---------|--|---------------------------------------|-----------------------|--------------|--------------|------------|----------|-------------------------------|
| .CASE | 1 OF BRTSHFSF3 | | | | | | | |
| 2311 | RTSHFSF4:2536 | F/RTSHFSF3 F/RTSHFSFSN3 | <-- <-- | 2533 2167 | 2310 2322 | 762 767 | | |
| | ***** | | | | | | | 2536 |
| | *0 - RTSHFSF4 1 - RTSHFSF5 TARGETS - 0 - | | | | | | | 100000001000 |
| | *RTSHFSF7B | | | | | | | 100000001000 |
| | ----- | | | | | | | 0000 001010 01100 100001011 |
| | *P2, D+D RIGHT 1 PLUS 0, D(C)+CIN, | | | | | | | |
| | * SHIFT SR, | | | | | | | |
| | *P3, FAC3(SF)+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(BG) | | | | | | | |
| | * J/RTSHFSF7B | | | | | | | |
| | * J/RTSHFSF7B | | --> | 011 2413 | 2315 | 764 | | |
| | * J/RTSHFSF7 | | --> | 111 2417 | 2314 | 764 | | |
| | ***** | | | | | | | |
| .CASE | 2 OF BRTSHFSF3 | | | | | | | |
| 2312 | RTSHFSF5:2537 | F/RTSHFSF3 F/RTSHFSFSN3 | <-- <-- | 2533 2167 | 2310 2322 | 762 767 | | |
| | ***** | | | | | | | 2537 |
| | *1 - RTSHFSF7 D(C)=1 TARGETS - 0 - | | | | | | | 100000001000 |
| | *RTSHFSF7B | | | | | | | 100000001000 |
| | ----- | | | | | | | 0000 001010 01100 100001011 |
| | *P2, D+D RIGHT 1, D(C)+CIN, SHIFT SR, | | | | | | | |
| | *P3, FAC3(SF)+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(BG) | | | | | | | |
| | * J/RTSHFSF7B | | | | | | | |
| | * J/RTSHFSF7B | | --> | 011 2413 | 2315 | 764 | | |
| | * J/RTSHFSF7 | | --> | 111 2417 | 2314 | 764 | | |
| | ***** | | | | | | | |
| 2313 | RTSHFSF6:2721 | F/RTSHFSF2B | <-- | 2247 | 2308 | 762 | | |
| | ***** | | | | | | | 2721 |
| | *1 - RTSHFSF7 | | | | | | | 100000001000 |
| | ----- | | | | | | | 0000 001100 11111 000000000 |
| | *P2, D+SR, D(C)+D(C) | | | | | | | |
| | *P3, FAC2(SF)+D (B ADDR), | | | | | | | |
| | *NEXT, BUT(RETURN) | | --> | VV | | | | |
| | ***** | | | | | | | |

E16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 764

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------|--------------|------------|----------|---|
| .CASE | 2 OF BRTSHFSF4 | | | | | | | |
| 2314 | RTSHFSF7:2417 | F/RTSHFSF4 F/RTSHFSF5 | <-- <-- | 2536 2537 | 2311 2312 | 763 763 | | |
| | ***** * DOUBLE PRECISION ENTRY *POINT *-----* *P2, D+SR, D(C)+D(C), *P3, FAC2(SF)+D (B ADDR), *NEXT, BUTR(RESET RES), * J/RTSHFSF8 ***** | | | | | | | 2417 1111 00 01 00 00 000 111 0100 0 00000 001100 11010 101110111 |
| | | | | 2567 | 2316 | 764 | | |
| .CASE | 1 OF BRTSHFSF4 | | | | | | | |
| 2315 | RTSHFSF7B:2413 | F/RTSHFSF4 F/RTSHFSF5 | <-- <-- | 2536 2537 | 2311 2312 | 763 763 | | |
| | ***** *P2, D+FAC3(SAV) *P3, FAC3(SF)+D (B ADDR), *NEXT, * J/RESTART2 ***** | | | | | | | 2413 1111 00 01 10 00 100 000 0100 0 00000 001010 11000 110011100 |
| | | | | 2634 | 2245 | 742 | | |
| .CASE | 3 OF BDFRACADD | | | | | | | |
| 2316 | RTSHFSF8:2567 | F/DFRACADD F/DFRACADD3 | <-- <-- | 2324 2432 | 1724 1726 | 560 561 | | |
| | ***** *P2, SR+FAC0(SF), *NEXT, * J/RTSHFSF9 ***** | | | | | | | 2567 1010 01 01 00 00 000 000 0010 0 00000 000000 11000 111010100 |
| | | | | | | | | |
| 2317 | RTSHFSF9:2724 | F/RTSHFSF8 | <-- VV | | | | | |
| | ***** *P2, D+FAC1(SF), D(C)+D(C), * RES+RESRIGHTGD, *NEXT, * J/RTSHFSF10 ***** | | | | | | | 2724 1111 10 00 11 11 000 111 0100 0 01000 010001 11000 111010101 |
| | | | | 2725 | 2318 | 765 | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-----------------------------|--|--------------------------|--------------------------------|------------|------------|-------------|-----------|--------------|--------|
| | | | | | | | | RIF | COUT | |
| 2318 | RTSHFSF10:2725 | F/RTSHFSF9 | <-- | 2724 2317 764 | 2725 | | | | 100000001000 | |
| | *P2, D+D RIGHT 1,D(C)+D(C), | | * | | 1111 | 00 01 | 01 10 | 000 111 | 0110 0 | |
| | * SHIFT SR, | | * | | 00000 | 011010 | 11010 | 101111011 | | |
| | *P3, FAC1(SF)+D (B ADDR), | | * | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | * | | | | | | | |
| | * J/RTSHFSF11 | | * --> VV | | | | | | | |
| ***** | | | | | | | | | | |
| .CASE | 4 OF BDFRACADD | | | | | | | | | |
| 2319 | RTSHFSF11:2573 | F/DFRACADD F/DFRACADD3 | <-- <-- | 2324 1724 560 2432 1726 561 | 2573 | | | | 100000001000 | |
| | *P2, D+SR, | | * | | 1111 | 00 01 | 00 00 | 000 000 | 0100 0 | |
| | *P3, FAC0(SF)+D (B ADDR), | | * | | 00000 | 011100 | 11111 | 000000000 | | |
| | *NEXT, BUT(RETURN) | | * --> VV | | | | | | | |
| | * J/RTSHFSF11 | | * | | | | | | | |
| ***** | | | | | | | | | | |

G16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | OFST | ADDR | BOX | PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|---------|----------------------|--------------------|-------|------|------|------|-----------------------|--------------|---------|----------|-----------|------|--------|--|
| | | | | | | | | | | | RIF | COUT | CLOCKS | |
| | | F/ADDSHFSFD1 | <-- | 4060 | 1601 | 520 | | | | | | | | |
| | | F/NROUNDEND2 | <-- | 4537 | 1621 | 527 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |
| * | SUBROUTINE RTSHFSFSN | | * | | | | | | | | | | | |
| | | RETURN/ADDSHFSFD | * --> | 4307 | 1600 | 520 | | | | | | | | |
| | | RETURN/NROUNDEND6 | * --> | 4557 | 1625 | 528 | | | | | | | | |
| ***** | | | | | | | | | | | | | | |

H16

2320 RTSHFSFSN:2726

 * ROUTINE PERFORMS RIGHT SHIFT SIGN *
 *EXTEND OF FAC(SF) FOR DIFFERENCE *
 *OPERATION IN ADD OF SUBTRACT FLOWS *
 *INTERRUPT DUE TO SERVICE IS PROVIDED FOR *
 *TARGETS - 0 - *
 *RTSHFSFSN2 *

2726 1010 00 01 00 00 10000001000
 00000 000000 10111 001110110 0110 0

*P2, D+FAC2(SF),SR+FAC2(SF), *
 *NEXT, BUTR(FD) *
 * J/RTSHFSFSN2 *
 * J/RTSHFSFSN2 * --> 10 2166 2321 766
 * J/RTSHFSFSN3 * --> 11 2167 2322 767

.CASE 1 OF BRTSHFSFSN
 2321 RTSHFSFSN2:2166 F/RTSHFSFSN <-- VV

2166 1111 10 00 10 11 10000001000
 01000 010001 01100 010100011 0100 0

*1 - RTSHFSFSN3 TARGETS - 0 - *
 *RTSHFSF2C *

 *P2, D+FAC3(SF),D(C)+ALU15, *
 * RES+RESRIGHTGD, *
 *NEXT, BUTR(BG) *
 * J/RTSHFSF2C *
 * J/RTSHFSF2C * --> 011 2243 2309 762
 * J/RTSHFSF2B * --> 111 2247 2308 762

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------------|---|--|--------------------------|------|------------|------------|-------------|-----------|-----|--------|
| | | | | | | | | RIF | COU | |
| .CASE 2322 | 2 OF BRTSHFSFSN RTSHFSFSN3:2167 | F/RTSHFSFSN | <-- | 2726 | 2320 | 766 | | | | |
| | ***** | | | | | | | | | |
| | *1 - RTSHFSF2B BRANCH ON SR<00> TARGETS | | | | | | | | | |
| | *- -----* | | | | | | | | | |
| | *P2, D+FAC3(SF),D(C)+ALU15, | | | | | | | | | |
| | * RES+RESRIGHT, | | | | | | | | | |
| | *NEXT, BUT(CASE) | | | | | | | | | |
| | * J/RTSHFSF4 | | | | | | | | | |
| | | J/RTSHFSF4 | --> | 1110 | 2536 | 2311 | 763 | | | |
| | | J/RTSHFSF5 | --> | 1111 | 2537 | 2312 | 763 | | | |
| | ***** | | | | | | | | | |

2167 10000001000
 1111 10 00 10 11 000 100 0100 0
 01101 010001 00000 101011110

J16

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

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| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---|--------------------|-------|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .TOC " SUBROUTINE TO SET FLOATING CONDITION CODES ##FLPT##" | | | | | | | | |
| | F/LOADZW4 | <-- | 3222 1645 535 | | | | | |
| | F/STCPW10 | <-- | 4135 1813 587 | | | | | |
| | F/STCPW15 | <-- | 4147 1818 589 | | | | | |
| | F/LDEXP19 | <-- | 3733 1854 599 | | | | | |
| | F/LDCPW17 | <-- | 4550 1905 614 | | | | | |
| | F/FINISH | <-- | 2542 1962 633 | | | | | |
| ***** | | | | | | | | |
| * | SUBROUTINE SETFZFN | * | | | | | | |
| | RETURN/BRA05 | * --> | 3 283 126 | | | | | |
| | RETURN/STCPW31 | * --> | 4476 1834 593 | | | | | |
| | RETURN/STCPW31 | * --> | 4476 1834 593 | | | | | |
| | RETURN/FINISH4 | * --> | 3740 1965 634 | | | | | |
| | RETURN/BRA05 | * --> | -1 -1 -1 | | 0 1 1 | | | |
| | RETURN/FINISH2 | * --> | 3734 1963 633 | | | | | |
| ***** | | | | | | | | |

2323 SETFZFN:2727

```

*****
*0 - RTSHFSF4 1 - RTSHFSF5 :SUBROUTINE *
*USED TO SET THE Z AND N BITS OF ;FPS *
*REGISTER :MULTIPLE ENTRY POINTS: ; *
*EARLIEST IS SETFZFN WHICH SETS FPS<3:0> *
*AS : FC+0 ; FV+0 ; FZ+1 IF AC=0 *
*ELSE FZ+0 ; FN+1 IF AC<0 ELSE FN+0 *
*:LAST ENTRY IS DTOFCC2 WHICH WRITES TO *
*FPS<3:0> ;WHATEVER IS IN D *
* ; *
*-----*
*P2, D+AC3(SF) AND SEXPMASK, *
*NEXT, *
* J/SETFZFN2 *
*****

```

--> 2730 2324 769

2727

```

1011 10 00 10 11 000 000 0100 0
00110 000000 11000 111011000

```

L16

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 769

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA U3F | EXTENSION | | CLOCKS |
|---------|----------------------------|-------|--------------------|------|-----|-----------------------|--------------|---------|----------|-----------|---------|--------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF UPF | |
| | F/TSTZW | <-- | 3455 | 1367 | 446 | | | | | | | |
| | F/IA114E | <-- | 3251 | 689 | 251 | | | | | | | |
| | F/IOT01 | <-- | 64 | 348 | 148 | | | | | | | |
| | F/ASRB05 | <-- | 522 | 180 | 92 | | | | | | | |
| | F/ASRB07 | <-- | 112 | 182 | 93 | | | | | | | |
| | F/CMPB03 | <-- | 732 | 102 | 64 | | | | | | | |
| | F/UNDEFINED | <-- | -1 | -1 | -1 | 0 | 1 | 1 | | | | |
| | F/DST25 | <-- | 642 | 72 | 50 | | | | | | | |
| | F/DST03 | <-- | 513 | 41 | 36 | | | | | | | |
| | F/SRC33 | <-- | 663 | 25 | 26 | | | | | | | |
| | F/UNDEFINED | <-- | -1 | -1 | -1 | 0 | 1 | 1 | | | | |
| | F/STEXP4 | <-- | 620 | 1755 | 570 | | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE SETFZFN2 | * | | | | | | | | | | |
| | RETURN/A,RFDAE,RF,RF1* --> | | 2703 | 2151 | 708 | | | | | | | |
| | RETURN/UNDEFINED | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | | |
| | RETURN/IA115 | * --> | 3411 | 692 | 252 | | | | | | | |
| | RETURN/UNDEFINED | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | | |
| | RETURN/BIT03 | * --> | 723 | 96 | 62 | | | | | | | |
| | RETURN/MOV36 | * --> | 605 | 197 | 98 | | | | | | | |
| | RETURN/DST19 | * --> | 526 | 57 | 44 | | | | | | | |
| | RETURN/CLRB01 | * --> | 570 | 135 | 76 | | | | | | | |
| | RETURN/BIC02 | * --> | 624 | 87 | 58 | | | | | | | |
| | RETURN/DST05 | * --> | 515 | 43 | 37 | | | | | | | |
| | RETURN/SRC15 | * --> | 4022 | 17 | 21 | | | | | | | |
| | RETURN/STEXP5 | * --> | 1622 | 1756 | 570 | | | | | | | |
| ***** | | | | | | | | | | | | |

M16

```
2324 SETFZFN2:2730
*****
*SELECT,      EMIT,      *
*NEXT,       BUT(D(14-00) IS 0 # D15), *
*           J/FCCHEX0    *
*           J/FCCHEX0    * --> 00 2030 2325 769
*           J/FCCHEX1    * --> 01 2031 2326 770
*           J/FCCHEX2    * --> 10 2032 2327 770
*           J/FCCHEX3    * --> 11 2033 2328 770
*****
CASE 1 OF BSETFZFN2
2325 FCCHEX0:2030      F/SETFZFN2      <-- VV
*****
*P3,        D+0,      *
*NEXT,      *
*           J/DTOFCC2  * --> 2732 2330 771
*****
```

```
2730
0000 00 00 00 01 000 000 0000 0
11001 000000 01101 000011000
```

```
2030
0011 00 00 00 00 000 000 0100 0
00000 000000 11000 111011010
```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|-------------------------------|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------------------|
| .CASE 2326 | 2 OF BSETFZFN2 FCHEX1:2031 | F/SETFZFN2 | <-- | 2730 | 2324 | 769 | | |
| | ***** | | | 2031 | | | | 000000001000 |
| | *P3, D+CNST8, | | * | | 1010 | 10 00 | 00 00 | 000 000 0100 0 |
| | *NEXT, | | * | | 01110 | 000000 | 11000 | 111011010 |
| | * J/DTOFCC2 | | * --> | 2732 | 2330 | 771 | | |
| | ***** | | | | | | | |
| .CASE 2327 | 3 OF BSETFZFN2 FCHEX2:2032 | F/SETFZFN2 | <-- | 2730 | 2324 | 769 | | |
| | ***** | | | 2032 | | | | 000000001000 |
| | *P3, D+CNST4, | | * | | 1010 | 10 00 | 00 00 | 000 000 0100 0 |
| | *NEXT, | | * | | 01100 | 000000 | 11000 | 111011010 |
| | * J/DTOFCC2 | | * --> | 2732 | 2330 | 771 | | |
| | ***** | | | | | | | |
| .CASE 2328 | 4 OF BSETFZFN2 FCHEX3:2033 | F/SETFZFN2 | <-- | 2730 | 2324 | 769 | | |
| | ***** | | | 2033 | | | | 000000001000 |
| | *P3, MD+14 (BC), | | * | | 0000 | 10 00 | 00 00 | 001 100 0000 0 |
| | *NEXT, | | * | | 00010 | 100000 | 11000 | 111011001 |
| | * J/DTOFCC1 | | * --> VV | | | | | |
| | ***** | | | | | | | |
| 2329 | DTOFCC1:2731 | F/FCHEX3 | <-- VV | | | | | |
| | ***** | | | 2731 | | | | 000000001000 |
| | *P2, D+MD, | | * | | 1010 | 11 10 | 00 00 | 000 000 0100 0 |
| | *NEXT, | | * | | 00000 | 000000 | 11000 | 111011010 |
| | * J/DTOFCC2 | | * --> | 2732 | 2330 | 771 | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|---|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| .CASE 2333 | MULDIV:1367 F/EISO2 | <-- | 1627 2332 771 | 1367 | | | 000000001000 |
| | *1 - ASH001 FOR EIS MULTIPLY GET | | | 1111 | 00 00 | 11 01 | 110 100 0100 0 |
| | *MULTIPICAND SIGN IN D(C) BREAK OUT MUL | | | 00000 | 000000 | 00100 | 110000111 |
| | *AND DIV. TARGETS - 0 - | | | | | | |
| | *MULT | | | | | | |
| | *P2, D+R(T2A) D(C)+ALU15, | | | | | | |
| | *NEXT, BUTR(IR(09)), | | | | | | |
| | * J/MULT | --> | 0111 1607 2374 785 | | | | |
| | * J/DIV01 | --> | 1111 1617 2334 772 | | | | |

.TOC " INTEGER DIVISION "

;; INTEGER DIVISION ROUTINE

;; NON-RESTORING DIVIDE ALGORITHM IS USED

;; HI WORD OF DIVIDEND IS IN R(SF)

;; LO WORD OF DIVIDEND IS IN R(SF+1)

;; DIVISOR IS PLACED IN R(T2) BY SUBROUTINE FETCHINT

;; TO ALL READERS -

;; BUT(ROR1) USED IN ALL EIS CODE AND IN MODF/D OF FLOATING

;; POINT IS AN ACTIVE BUT USED SOLELY TO OR THE LO BIT

;; OF THE SOURCE FIELD SCRATCH PAD ADDRESS WITH 1 AND DOES

;; NOT PERFORM ANY BRANCHING WHATSOEVER.

;; FOR REASONS OF TIMING, IT MUST BE INVOKED ONE MICROCYCLE

;; AHEAD OF THE CYCLE IN WHICH R(SF+1) IS USED.

| | | | | | | | |
|------------|---|--------|---------------|-------|--------|-------|----------------|
| .CASE 2334 | DIV01:1617 F/MULDIV | <-- VV | | 1617 | | | 000000001000 |
| | *1 - DIV01 PUT ZERO IN R(T1) FOR USE IN | | | 0011 | 00 00 | 00 00 | 110 000 0100 0 |
| | *COMPLEMENTING | | | 00000 | 010110 | 11000 | 110011000 |
| | *P2, D+0, | | | | | | |
| | *P3, R(T1)+D (A ADDR), | | | | | | |
| | *NEXT, J/DIV01B | --> | 1630 2335 773 | | | | |

E01

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|--|--|--------------------------|------|------------|------------|-------------|-----------|------|--------|
| | | | | | | | | RIF | COUT | |
| 2335 | DIV01B: 1630 | F/DIV01 | <-- | 1617 | 2334 | 772 | | | | |
| | ***** | | | | | | | | | |
| | * GENERATE SIGN BIT (FOR USE TO TEST | | | | | | | | | |
| | *OVERFLOW) STORE IT IN | | | | | | | | | |
| | *PSW(C) | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+R(T2A) XOR R(SF),D(C)+ALU15, | | | | | | | | | |
| | *DEFER, SET CC | | | | | | | | | |
| | *NEXT, BUT(ROR1), | | | | | | | | | |
| | * J/DIV02 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 2336 | DIV02: 1631 | F/DIV01B | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * SR GETS DIVIDEND LO R(T1B) GETS | | | | | | | | | |
| | *DIVIDEND | | | | | | | | | |
| | *LO | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+R(SF+1) (A),D(C)+D(C), | | | | | | | | | |
| | * SR+R(SF+1) (A) | | | | | | | | | |
| | *P3, R(T1B)+D (B ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/DIV03 | | --> VV | | | | | | | |
| | ***** | | | | | | | | | |
| 2337 | DIV03: 1632 | F/DIV02 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | * SET UP FOR DIVISOR | | | | | | | | | |
| | *TEST | | | | | | | | | |
| | ----- | | | | | | | | | |
| | *P2, D+R(T2B),D(C)+D(C), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/DIV04 | | --> | 1633 | 2338 | 774 | | | | |
| | ***** | | | | | | | | | |

```

1630      000000001000
          0110 00 01 11 01 110 100 0100 1
          00000 000000 10010 110011001

1631      000000001000
          1111 00 10 10 11 110 111 0110 0
          00000 011100 11000 110011010

1632      000000001000
          1010 01 11 00 00 110 111 0100 0
          00000 000000 11000 110011011
    
```

F01

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | | |
|-----------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-----------|----------|----------------|--|
| | | | | | | | | RIF | COUT | CLOCKS | |
| 2338 | DIV04:1633 | F/DIV03 | <-- | 1632 | 2337 | 773 | | | | | |
| | ***** | | | | | | | 1633 | 00000000 | 1000 | |
| | * TARGETS | | | | | | 0000 | 00 00 | 00 00 | 000 000 0000 0 | |
| | *- ----- * | | | | | | 00000 | 000000 | 01101 | 10110000 | |
| | *NEXT, BUT(D(14-00) IS 0 # D15), | | | | | | | | | | |
| | * J/DIV05 | | --> | 00 | 1540 | 2339 | 774 | | | | |
| | * J/DIV06 | | --> | 01 | 1541 | 2340 | 774 | | | | |
| | * J/DIV07 | | --> | 10 | 1542 | 2341 | 775 | | | | |
| | * J/DIV08 | | --> | 11 | 1543 | 2342 | 775 | | | | |
| | ***** | | | | | | | | | | |
| CASE 2339 | 1 OF BDIV04 | F/DIV04 | <-- VV | | | | | | | | |
| | DIV05:1540 | | | 1540 | | | | 00000000 | 1000 | | |
| | ***** | | | | | | | | | | |
| | *00 - DIV05 01 - DIV06 10 - DIV07 11 - | | | | | | 1111 | 00 11 | 10 11 | 110 111 0100 0 | |
| | *DIV08 POSITIVE DIVISOR EXISTS BRANCH ON | | | | | | 00000 | 011010 | 10011 | 101110001 | |
| | *QUOTIENT SIGN TARGETS | | | | | | | | | | |
| | *- ----- * | | | | | | | | | | |
| | *P2, D+R(SF) (A), D(C)+D(C), | | | | | | | | | | |
| | *P3, R(T2A)+D (B ADDR), | | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | | |
| | * J/DIV11 | | --> | 01 | 1561 | 2345 | 776 | | | | |
| | * J/DIV12 | | --> | 11 | 1563 | 2346 | 776 | | | | |
| | ***** | | | | | | | | | | |
| CASE 2340 | 2 OF BDIV04 | F/DIV04 | <-- | 1633 | 2338 | 774 | | | | | |
| | DIV06:1541 | | | 1541 | | | | 00000000 | 1000 | | |
| | ***** | | | | | | | | | | |
| | *0 - DIV11 1 - DIV12 NEG DIVISOR EXISTS | | | | | | 1101 | 01 11 | 11 00 | 110 111 0100 0 | |
| | *2'S COMPLEMENT THE | | | | | | 00000 | 011100 | 11000 | 101100011 | |
| | *DIVISOR | | | | | | | | | | |
| | *- ----- * | | | | | | | | | | |
| | *P2, D+R(T1A) MINUS R(T2B), | | | | | | | | | | |
| | * D(C)+D(C), | | | | | | | | | | |
| | *P3, R(T2B)+D (B ADDR), | | | | | | | | | | |
| | *NEXT, J/DIV08 | | --> | 1543 | 2342 | 775 | | | | | |
| | ***** | | | | | | | | | | |

G01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 775

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|--|---------------------------------------|-----------------------|---------------|---------|---------|----------|---------------------------|
| .CASE 2341 | 3 OF BDIV04 | | | | | | | |
| | DIV07:1542 | F/DIV04 | <-- | 1633 2338 774 | | | | |
| | ***** | | | | | | | |
| | * D GETS OCTAL 3 FOR PSM(CC) DIVISION BY * | | | | | | | |
| | * ZERO BEING ATTEMPTED SET V AND C IN * | | | | | | | |
| | * PSM * | | | | | | | |
| | ----- | | | | | | | |
| | * P2, D+R(T1A) PLUS 2 PLUS 1, * | | | | | | | |
| | * NEXT, BUT(GO TO), PAGE+0, * | | | | | | | |
| | * J/DIV39 * | | | | | | | |
| | | --> | 647 2373 785 | | | | | |
| ***** | | | | | | | | |
| .CASE 2342 | 4 OF BDIV04 | | | | | | | |
| | DIV08:1543 | F/DIV04 | <-- | 1633 2338 774 | | | | |
| | ***** | | | | | | | |
| | * FETCH DIVIDEND HI TARGETS - 0 - * | | | | | | | |
| | * DIV09 * | | | | | | | |
| | ----- | | | | | | | |
| | * P2, D+R(SF) (A), D(C)+D(C), * | | | | | | | |
| | * P3, R(T2A)+D (B ADDR), * | | | | | | | |
| | * NEXT, BUTR(D(C)), * | | | | | | | |
| | * J/DIV09 * | | | | | | | |
| | | --> | 01 1545 2343 775 | | | | | |
| | | --> | 11 1547 2344 776 | | | | | |
| ***** | | | | | | | | |
| .CASE 2343 | 1 OF BDIV08 | | | | | | | |
| | DIV09:1545 | F/DIV08 | <-- VV | | | | | |
| | ***** | | | | | | | |
| | * 1 - DIV10 2'S COMPLEMENT DIVIDEND * | | | | | | | |
| | * L0 * | | | | | | | |
| | ----- | | | | | | | |
| | * P2, D+R(T1A) MINUS R(T1B), * | | | | | | | |
| | * SR+R(T1A) MINUS R(T1B), * | | | | | | | |
| | * D(C)+COUT15, * | | | | | | | |
| | * NEXT, * | | | | | | | |
| | | --> | 1634 2347 777 | | | | | |
| ***** | | | | | | | | |

```

1542      000000001000
        1100 11 11 11 00 110 000 0100 0
        00000 000000 11100 110100111

1543      000000001000
        1111 00 11 10 11 110 111 0100 0
        00000 011010 10011 101100101

1545      000000001000
        1101 01 10 11 00 110 110 0110 0
        00000 000000 11000 110011100
    
```

H01

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 776

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | |
|------------|-----------------------------|---------------------------------------|-----------------------|--------------------------------|---------|---------|----------|-----------|------|--------|
| | | | | | | | | RIF | COUT | CLOCKS |
| .CASE 2344 | DIV10:1547 | F/DIV08 | <-- | 1543 2342 775 | | | | | | |
| | * CHECK | | | | | | | | | |
| | * OVERFLOW | | | | | | | | | |
| | *P2, D+R(SF) MINUS R(T2B), | | | | | | | | | |
| | * D(C)+COUT15, | | | | | | | | | |
| | * NEXT, | | | | | | | | | |
| | * J/DIV14 | | --> | 1635 2348 777 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 2345 | DIV11:1561 | F/DIV05 F/DIV13 | <-- <-- | 1540 2339 774 1634 2347 777 | | | | | | |
| | * OVERFLOW | | | | | | | | | |
| | * TEST | | | | | | | | | |
| | *P2, D+R(SF) MINUS R(T2B), | | | | | | | | | |
| | * D(C)+COUT15, | | | | | | | | | |
| | * NEXT, | | | | | | | | | |
| | * J/DIV14 | | --> | 1635 2348 777 | | | | | | |
| | ***** | | | | | | | | | |
| .CASE 2346 | DIV12:1563 | F/DIV05 F/DIV13 | <-- <-- | 1540 2339 774 1634 2347 777 | | | | | | |
| | *P2, D+R(T1A) MINUS R(T1B), | | | | | | | | | |
| | * SR+R(T1A) MINUS R(T1B), | | | | | | | | | |
| | * D(C)+COUT15, | | | | | | | | | |
| | * NEXT, | | | | | | | | | |
| | * J/DIV13 | | --> | 1634 2347 777 | | | | | | |
| | ***** | | | | | | | | | |

I01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 777

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|--------------|--|--|--------------------------|--------------------------------|------------|------------|-------------|---------------------------------|--------------|--------|
| | | | | | | | | RIF UPF | COU T | |
| 2347 | DIV13:1634 | F/DIV09 F/DIV12 | <-- <-- | 1545 2343 775 1563 2346 776 | | | | | | |
| | ***** | | | | | | | 1634 | 000000001000 | |
| | * 2'S COMPLEMENT DIVD | | | | | | | 0101 00 01 11 00 110 000 0100 0 | | |
| | *HI | | | | | | | 00000 001110 11000 101110001 | | |
| | ----- | | | | | | | | | |
| | *P2, | | | | | | | | | |
| | * D+R(T1A) PLUS NOT R(SF | | | | | | | | | |
| | *) PLUS D(C), | | | | | | | | | |
| | *P3, R(SF)+D (B ADDR), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/DIV11 | | --> | 1561 2345 776 | | | | | | |
| | ***** | | | | | | | | | |
| 2348 | DIV14:1635 | F/DIV10 F/DIV11 | <-- <-- | 1547 2344 776 1561 2345 776 | | | | | | |
| | ***** | | | | | | | 1635 | 000000001000 | |
| | * CHECK OVERFLOW TARGETS | | | | | | | 0101 10 00 00 11 110 001 0000 0 | | |
| | *- | | | | | | | 00010 100000 10011 101110101 | | |
| | ----- | | | | | | | | | |
| | *P3, MD+50361 (BC), | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | |
| | * J/DIV15 | | --> | 01 1565 2349 777 | | | | | | |
| | * J/DIV16 | | --> | 11 1567 2350 778 | | | | | | |
| | ***** | | | | | | | | | |
| CASE 2349 | 1 OF BDIV14 DIV15:1565 | F/DIV14 | <-- VV | | | | | | | |
| | ***** | | | | | | | 1565 | 000000001000 | |
| | *0 - DIV15 1 - DIV16 DATA OK - NO | | | | | | | 1111 11 10 10 11 000 000 0100 0 | | |
| | *OVERFLOW | | | | | | | 00000 010101 11000 110100000 | | |
| | ----- | | | | | | | | | |
| | *P2, D+R(SF) (A), RES+MD, COUNTER+MD, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/DIV17 | | --> | 1640 2351 778 | | | | | | |
| | ***** | | | | | | | | | |

J01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 778

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK | |
|--|--|--|--------------------------|--------------|--------------|------------|-------------|-----------|------|-------|--|
| | | | | | | | | RIF | COUT | | |
| .CASE 2350 | 2 OF BDIV14 | | | | | | | | | | |
| | DIV16:1567 | F/DIV14 | <-- | 1635 | 2348 | 777 | | | | | |
| | ***** | | | | | | | | | | |
| | * OVERFLOW OCCURRED RESTORE OPERAND GO | | | | | | | | | | |
| | *SET V | | | | | | | | | | |
| | *BIT | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P2, D+R(T2A), | | | | | | | | | | |
| | *P3, R(SF)+D (B ADDR), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | | J/DIV38 | --> | 1656 | 2372 | 785 | | | | | |
| 2351 | DIV17:1640 | F/DIV15 | <-- | 1565 | 2349 | 777 | | | | | |
| | ***** | | | | | | | | | | |
| | * DO FIRST | | | | | | | | | | |
| | *SUBTRACT | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P3, D+D LEFT 1 MINUS R(T2B), | | | | | | | | | | |
| | * D(C)+COUT15,CLOCKSR (P3), | | | | | | | | | | |
| | *NEXT, | | | | | | | | | | |
| | * J/DIV18 | | | | | | | | | | |
| | *-----* --> VV | | | | | | | | | | |
| .CASE 2352 | 1 OF BDIV18 | | | | | | | | | | |
| | DIV18:1570 | F/DIV17 F/DIV18 | <-- <-- | 1640 1570 | 2351 2352 | 778 778 | | | | | |
| | ***** | | | | | | | | | | |
| | * DIVISION INNER LOOP LOOP EXECUTED 15 | | | | | | | | | | |
| | *TIMES WITH REMAINDER LEFT IN D REGISTER | | | | | | | | | | |
| | *AND QUOTIENT GENERATED IN SR UPON | | | | | | | | | | |
| | *COMPLETION GO | | | | | | | | | | |
| | *TO | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P3, D+D LEFT 1 DIV R(T2B), | | | | | | | | | | |
| * D(C)+COUT15,CLOCKSR (P3), | | | | | | | | | | | |
| *NEXT, BUT(COUNT IS -1), | | | | | | | | | | | |
| * J/DIV18 | | | | | | | | | | | |
| | | J/DIV18 | --> | 0 | 1570 | 2352 | 778 | | | | |
| | | J/DIV19 | --> | 1 | 1571 | 2353 | 779 | | | | |
| ***** | | | | | | | | | | | |

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1567
1111 00 01 11 01 110 000 0100 0
00000 001110 11000 110101110

```

```

1640
1101 01 11 01 00 110 110 1110 0
00000 000000 11000 101111000

```

```

1570
1000 01 11 01 00 110 110 1110 0
00000 000000 10101 101111000

```

K01

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 779

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK |
|--------------------------------------|--|--|--------------------------|--------------|--------------|------------|-------------|-----------|------|-------|
| | | | | | | | | RIF | COUT | |
| 2353 | DIV19:1571 | F/DIV17 F/DIV18 | <-- <-- | 1640 1570 | 2351 2352 | 778 778 | | | | |
| | ***** | | | | | | | | | |
| | *DIV19 REALIGN | | | | | | | | | |
| | *QUOTIENT | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P2, SHIFT SR, | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| | * J/DIV20 | | | | | | | | | |
| | ***** | | | | | | | | | |
| | *D(C) GETS QUOTIENT SIGN FOR OVERFLOW | | | | | | | | | |
| *TEST BRANCH ON LAST QUOTIENT | | | | | | | | | | |
| *BIT | | | | | | | | | | |
| -----* | | | | | | | | | | |
| *P3, D+D (P3),D(C)+PS(C), | | | | | | | | | | |
| *NEXT, BUTR(D(C)), | | | | | | | | | | |
| * J/DIV21 | | | | | | | | | | |
| * J/DIV22 | | | | | | | | | | |
| ***** | | | | | | | | | | |
| 2354 | DIV20:1641 | F/DIV19 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *D(C) GETS QUOTIENT SIGN FOR OVERFLOW | | | | | | | | | |
| | *TEST BRANCH ON LAST QUOTIENT | | | | | | | | | |
| | *BIT | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P3, D+D (P3),D(C)+PS(C), | | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | | |
| | * J/DIV21 | | | | | | | | | |
| | * J/DIV22 | | | | | | | | | |
| ***** | | | | | | | | | | |
| 2355 | DIV21:1521 | F/DIV20 | <-- VV | | | | | | | |
| | ***** | | | | | | | | | |
| | *GENERATED TARGETS - 0 - DIV21 1 - DIV22 | | | | | | | | | |
| | *RESTORE REMAINDER LAST DIVISION STEP | | | | | | | | | |
| | *DIDN'T | | | | | | | | | |
| | *GO | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P3, D+D PLUS R(T2B) (P3), | | | | | | | | | |
| | * D(C)+D(C), | | | | | | | | | |
| | *NEXT, | | | | | | | | | |
| * J/DIV22 | | | | | | | | | | |
| ***** | | | | | | | | | | |

```

1571      0000 00 00 00 00 00000001000
          00000 000000 11000 110100001
    
```

```

1641      1111 00 00 01 01 000 001 1100 0
          00000 000000 10011 101010001
    
```

```

1521      1001 01 11 01 01 110 111 1100 0
          00000 000000 11000 101010011
    
```

```

-->      1523 2356 780
    
```

L01

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | CLOCK COUNT |
|------------|---|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------|-------------|
| .CASE 2356 | DIV22:1523 | F/DIV20 | <-- | 1641 | 2354 | 779 | | | |
| | * TEMPORARY STORE OF *REMAINDER | | | 1523 | | | | 000000001000 | |
| | | | | | 0000 | 00 00 | 00 01 | 110 000 | 0000 0 |
| | | | | | 00000 | 010100 | 11010 | 110100100 | |
| | *P3, R(T2B)+D (A ADDR), | | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | | |
| | * J/DIV23 | | --> VV | | | | | | |
| 2357 | DIV23:1644 | F/DIV22 | <-- VV | | | | | | |
| | * GET QUOTIENT SET COND CODES BRANCH ON *QUOTIENT SIGN 0 - *DIV24 | | | 1644 | | | | 000000001000 | |
| | | | | | 1111 | 00 01 | 00 00 | 000 111 | 0100 1 |
| | | | | | 00000 | 001110 | 10011 | 101010101 | |
| | *P2, D+SR, D(C)+D(C), | | | | | | | | |
| | *P3, R(SF)+D (B ADDR), | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | |
| | * J/DIV24 | | --> | 01 | 1525 | 2358 | 780 | | |
| | * J/DIV25 | | --> | 11 | 1527 | 2359 | 781 | | |
| .CASE 2358 | DIV24:1525 | F/DIV23 | <-- VV | | | | | | |
| | *1 - DIV25 POSITIVE QUOTIENT BRANCH ON *GENERATED QUOTIENT *SIGN | | | 1525 | | | | 000000001000 | |
| | | | | | 1111 | 00 00 | 11 01 | 110 100 | 1100 0 |
| | | | | | 00000 | 000000 | 01101 | 101111010 | |
| | *P3, D+R(T2A) (P3), D(C)+ALU15, | | | | | | | | |
| | *NEXT, BUTR(D15), | | | | | | | | |
| | * J/DIV32 | | --> | 10 | 1572 | 2366 | 783 | | |
| | * J/DIV37 | | --> | 11 | 1573 | 2371 | 784 | | |

MO1

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 781

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | EXTENSION | | | | | |
|---------|------------------------------------|---------------------------------------|-----------------------|------------------|-----------|---------|----------|--------------|-----------|--------|
| | | | | | ALU BUS | BUSB SP | BUSA UBF | RIF COUT UPF | | |
| 2359 | DIV25:1527 | F/DIV23 | <-- | 1644 2357 780 | 1527 | 0000 | 00 01 | 00 00 | 000 000 | 0100 0 |
| | *TARGETS - 0 - DIV32 1 - DIV37 2'S | | | | | 00000 | 001110 | 11000 | 110100101 | |
| | *COMPLEMENT RESULTANT | | | | | | | | | |
| | *QUOTIENT | | | | | | | | | |
| | *P2, D+NOT SR, | | | | | | | | | |
| | *P3, R(SF)+D (B ADDR), | | | | | | | | | |
| | *NEXT, J/DIV26 | | --> VV | | | | | | | |
| 2360 | DIV26:1645 | F/DIV25 | <-- VV | | 1645 | 1001 | 11 00 | 10 11 | 000 000 | 0100 1 |
| | *FINISH 27S COMPLEMENT | | | | | 00000 | 000110 | 11010 | 110101000 | |
| | *D(C)=0 | | | | | | | | | |
| | *P2, D+R(SF) PLUS 1, D(C)+CIN, | | | | | | | | | |
| | *P3, R(SF)+D (A ADDR), | | | | | | | | | |
| | *DEFER, SET CC, | | | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | --> VV | | | | | | | |
| | * J/DIV27 | | | | | | | | | |
| 2361 | DIV27:1650 | F/DIV26 | <-- VV | | 1650 | 1111 | 00 00 | 11 01 | 110 100 | 1100 0 |
| | *FETCH ORIGINAL DIVIDEND | | | | | 00000 | 000000 | 01101 | 101011000 | |
| | *HI | | | | | | | | | |
| | *P3, D+R(T2A) (P3) D(C)+ALU15, | | | | | | | | | |
| | *NEXT, BUT(D(14-00) IS 0 # D15), | | | | | | | | | |
| | * J/DIV28 | | --> | 00 1530 2362 782 | | | | | | |
| | * J/DIV29 | | --> | 01 1531 2363 782 | | | | | | |
| | * J/DIV30 | | --> | 10 1532 2364 782 | | | | | | |
| | * J/DIV31 | | --> | 11 1533 2365 783 | | | | | | |

NO1

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 782

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF UPF | COUT | CLOCKS |
|---------------|--|---------------------------------------|-----------------------|------|---------|---------|----------|-------------------|------|--------|
| .CASE 2362 | 1 OF BDIV27 DIV28:1530 | F/DIV27 | <-- | 1650 | 2361 | 781 | | | | |
| | ***** | | | | | | | | | |
| | * OVERFLOW OCCURRED RESTORE R(SF) SET V * *BIT IN * *CC'S * *-----* | | | | | | | | | |
| | *P2, D+R(T2A) * *P3, R(SF)+D (B ADDR), * *NEXT, * * J/DIV16 * --> | | | | | | | | | |
| .CASE 2363 | 2 OF BDIV27 DIV29:1531 | F/DIV27 | <-- | 1650 | 2361 | 781 | | | | |
| | ***** | | | | | | | | | |
| | * NEGATE THE * *REMAINDER * *-----* | | | | | | | | | |
| | *P2, D+R(T1A) MINUS R(T2B), * * D(C)+D(C), * *NEXT, * * J/DIV33 * --> | | | | | | | | | |
| .CASE 2364 | 3 OF BDIV27 DIV30:1532 | F/DIV27 | <-- | 1650 | 2361 | 781 | | | | |
| | ***** | | | | | | | | | |
| | * NEGATE THE * *REMAINDER * *-----* | | | | | | | | | |
| | *P2, D+R(T1A) MINUS R(T2B), * * D(C)+D(C), * *NEXT, * * J/DIV33 * --> | | | | | | | | | |

1530
1111 00 01 11 01 110 000 0100 0
00000 001110 11000 101110111

1531
1101 01 11 11 00 110 111 0100 0
00000 000000 11000 110101010

1532
1101 01 11 11 00 110 111 0100 0
00000 000000 11000 110101010

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|------------|--|---------------------------------------|-----------------------|---------------|---------|---------|----------|---------------------------------|
| .CASE 2368 | DIV34:1535 | F/DIV33 | <-- | 1652 2367 783 | | | | |
| | *1 - DIV35 DIVIDEND ORIGINALLY | | | | | | | 1535 000000001000 |
| | *POSITIVE | | | | | | | 1010 01 11 00 00 110 000 0100 0 |
| | *-----* | | | | | | | 00000 000000 10010 110101100 |
| | *P2, D+R(T2B) | | | | | | | |
| | *NEXT, BUT(ROR1), | | --> | 1654 2370 784 | | | | |
| | * J/DIV36 | | | | | | | |
| .CASE 2369 | DIV35:1537 | F/DIV33 | <-- | 1652 2367 783 | | | | |
| | *NEXT, BUT(ROR1), | | --> VV | | | | | 1537 000000001000 |
| | * J/DIV36 | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | *-----* | | | | | | | 00000 000000 10010 110101100 |
| 2370 | DIV36:1654 | F/DIV34 F/DIV35 | <-- <-- VV | 1535 2368 784 | | | | |
| | *P3, R(SF+1)+D (A ADDR), | | | | | | | 1654 000000001000 |
| | *NEXT, BUT(GO TO),PAGE+0, | | --> | 3 283 126 | | | | 0000 00 00 00 11 000 000 0000 0 |
| | * J/BRA05 | | | | | | | 00000 000110 11100 000000011 |
| .CASE 2371 | DIV37:1573 | F/DIV24 | <-- | 1525 2358 780 | | | | |
| | * OVERFLOW OCCURRED RESTORE R(SF) GO SET | | | | | | | 1573 000000001000 |
| | *OVERFLOW | | | | | | | 1111 00 01 11 01 110 000 0100 0 |
| | *BIT | | | | | | | 00000 001110 11000 110101110 |
| | *-----* | | | | | | | |
| | *P2, D+R(T2A) | | | | | | | |
| | *P3, R(SF)+D (B ADDR), | | | | | | | |
| | *NEXT, J/DIV38 | | --> | 1656 2372 785 | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUF UPF | CLOCKS |
|---------|---|---------------------------------------|-----------------------|--------------|--------------|------------|----------|---------------------------------|--------|
| 2372 | DIV38:1656 | F/DIV16 F/DIV37 | <-- <-- | 1567 1573 | 2350 2371 | 778 784 | | | |
| | *P2, D+2 | | | | | | | 000000001000 | |
| | *NEXT, BUT(GO TO), PAGE+D, | | | | | | | 1010 11 11 00 00 000 000 0100 0 | |
| | * J/DIV39 | | --> VV | | | | | 00000 000000 11100 110100111 | |
| 2373 | DIV39:0647 | F/DIV07 F/DIV38 | <-- <-- VV | 1542 | 2341 | 775 | | | |
| | *SELECT, PS(CC), | | | | | | | 000000001000 | |
| | *P3, PS(CC)+D, | | | | | | | 1000 00 00 10 01 000 000 0000 0 | |
| | *NEXT, BUTR(SERVICE), | | | | | | | 11011 000000 10000 111000010 | |
| | * J/FET01 | | | | | | | | |
| | * J/FET03 | | --> | 00 700 | 3 | 11 | | | |
| | * J/SER01 | | --> | 01 701 | 385 | 160 | | | |
| | * J/FET01 | | --> | 10 702 | 1 | 2 | | | |
| | * J/SER02 | | --> | 11 703 | 387 | 162 | | | |
| .TOC " | INTEGER MULTIPLICATION " | | | | | | | | |
| .CASE | 1 OF BMULDIV | | | | | | | | |
| 2374 | MULT:1607 | F/MULDIV | <-- | 1367 | 2333 | 772 | | | |
| | *INTEGER MULTIPLICATION ALGORITHM USED IS * | | | | | | | 000000001000 | |
| | *ADD SHIFT WITH CORRECTION FACTORS * | | | | | | | 1111 00 00 10 11 000 111 0110 0 | |
| | *DEPENDENT ON SIGNS OF MULTIPLIER AND * | | | | | | | 00000 000000 10011 000111001 | |
| | *MULTPLICAND ENTER WITH MULTIPLICAND * | | | | | | | | |
| | *SIGN IN D(C) D GETS MIER D(C) = MAND * | | | | | | | | |
| | *SIGN BRANCH ON MIER SIGN TARGETS * | | | | | | | | |
| | *-----* | | | | | | | | |
| | *P2, D+R(SF) (A), D(C)+D(C), | | | | | | | | |
| | * SR+R(SF) (A), | | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | | |
| | * J/MULT2 | | | | | | | | |
| | * J/MULT2 | | --> | 01 1071 | 2375 | 786 | | | |
| | * J/MULT7 | | --> | 11 1073 | 2380 | 787 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT UPF | CLOCKS | |
|------------|--|---------------------------------------|--|------|---------|---------|----------|------------------------|-----------------------|--------|
| .CASE 2375 | MULT2:1071 F/MULT ***** *0 - MULT2 1 - MULT7 MD GETS CONSTANT *FOR RES AND COUNTER TARGETS * *-----* *P3, MD+20361 (BC), *NEXT, BUTR(D15), * J/MULT3 * J/MULT3 * J/MULT5 ***** | <-- | 1607 2374 785 | 1071 | 0010 | 10 00 | 00 11 | 110 001 | 00000001000 0000 0 | 0000 0 |
| .CASE 2376 | MULT3:1122 F/MULT2 ***** *0 - MULT3 1 - MULT5 GENERATE *PRODUCT *-----* *NEXT, CALL MLOOP2, * RETURN+MULT4 ***** | <-- VV | 10 1122 2376 786 11 1123 2378 787 | 1122 | 0001 | 00 11 | 01 10 | 110 001 | 00000001000 0000 0 | 0000 0 |
| 2377 | MULT4:1666 ***** * REALIGN PRODUCT STORE HI *WORD *-----* *P2, D+D RIGHT 1 SHIFT SR, *P3, R(SF)+D (B ADDR), *NEXT, J/MULT14 ***** | --> | ***** 1714 2395 794 ***** VV 1666 2377 786 | 1666 | 1111 | 00 01 | 01 10 | 000 000 | 00000001000 0000 0 | 0110 0 |

F02

PROGRAM FLOWS

11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 787

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---|---------------------------|---------------------------------------|-----------------------|-------|---------|---------|-----------|--------------------|--------|
| .CASE 2378 | MULT5:1123 | F/MULT2 | <-- | 1071 | 2375 | 786 | | | |
| | ***** | | | 1123 | | | | 000000001000 | |
| | * GENERATE | | * | 0001 | 00 11 | 01 10 | 111 001 | 0000 0 | |
| | * PRODUCT | | * | 00000 | 000000 | 11100 | 111001100 | | |
| | ***** | | | | | | | | |
| * NEXT, | CALL MLOOP2, | | * | | | | | | |
| | RETURN+MULT6 | | * | | | | | | |
| ***** | | | --> | 1714 | 2395 | 794 | | | |
| ***** | | | | | | | | | |
| | | VV | | 1667 | 2379 | 787 | | | |
| 2379 | MULT6:1667 | | | | | | | | |
| ***** | | | | 1667 | | | | 000000001000 | |
| * REALIGN PRODUCT AND PERFORM CORRECTION | | * | | 1101 | 01 11 | 01 10 | 110 000 | 1110 0 | |
| * OPERATION | | * | | 00000 | 000000 | 11000 | 111000101 | | |
| ***** | | | | | | | | | |
| * P3, | D+D RT 1 MINUS R(T2), | | * | | | | | | |
| | CLOCKSR (P3), | | * | | | | | | |
| * NEXT, | | | * | | | | | | |
| | J/MULT13 | | --> | 1705 | 2386 | 789 | | | |
| ***** | | | | | | | | | |
| .CASE 2380 | MULT7:1073 | F/MULT | <-- | 1607 | 2374 | 785 | | | |
| ***** | | | | 1073 | | | | 000000001000 | |
| * GENERATE CORRECTION FACTOR FOR NEGATIVE | | * | | 1001 | 01 11 | 10 11 | 110 000 | 1100 0 | |
| * OPERANDS | | * | | 00000 | 000000 | 01101 | 000010010 | | |
| ***** | | | | | | | | | |
| * P3, | D+(P3) R(SF) PLUS R(T2B), | | * | | | | | | |
| * NEXT, | BUTR(D15), | | * | | | | | | |
| | J/MULT8 | | * | | | | | | |
| | | J/MULT8 | --> | 10 | 1022 | 2381 | 788 | | |
| | | J/MULT10 | --> | 11 | 1023 | 2383 | 788 | | |
| ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT | CLOCKS |
|---------|---|---------------------------------------|--|------|------------------|-------------|----------------|--------------------|------------------|
| 2381 | MULT8:1022 F/MULT7 ***** *TARGETS - 0 - MULT8 1 - MULT10 ENTRY OF * *NEG MAND POS * *MIER * -----* *NEXT, CALL MULTLOOP, * * RETURN+MULT9 * ***** --> | <-- | 1073 2380 787 | 1022 | 0001 00 11 10 00 | 0000 000000 | 1100 111001010 | 00000001000 | 0000 0000 0000 0 |
| 2382 | MULT9:1700 ***** * REALIGN PRODUCT AND PERFORM CORRECTION * *OPERATION * -----* *P3, D+D RT 1 MINUS R(SF), * * CLOCKS R (P3), * *NEXT, * * J/MULT13 * --> | | 1712 2393 792 ***** VV -1 -1 -1 0 1 1 | 1700 | 1101 00 01 01 10 | 0000 000000 | 1100 111000101 | 0000 000 1110 0 | |
| 2383 | MULT10:1023 F/MULT7 ***** * STORE CORRECTION FACTOR FOR * *NEGATIVE * -----* *P3, R(T1)+D (A ADDR), * *NEXT, * * J/MULT11 * --> VV ***** | <-- | 1073 2380 787 | 1023 | 0000 00 00 00 00 | 0000 000000 | 1100 111000010 | 0000 000 0000 0 | |
| 2384 | MULT11:1702 F/MULT10 ***** *OPERANDS * -----* *NEXT, CALL MULTLOOP, * * RETURN+MULT12 * ***** --> | <-- VV | 1712 2393 792 ***** VV 1704 2385 789 | 1702 | 0001 00 11 10 00 | 0000 000000 | 1100 111001010 | 100 001 0000 0 | |

H02

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | EXTENSION | | |
|---------|--|--|--------------------------|------|------------|------------|-------------|------------|---------------|
| | | | | | | | BUSA UBF | RIF UPF | COUT CLOCK |
| 2385 | MULT12:1704 | | | 1704 | | | | | 00000001000 |
| | * REALIGN PRODUCT AND PERFORM CORRECTION OPERATION | | | | 1101 | 01 10 | 01 10 | 110 000 | 1110 0 |
| | | | | | 00000 | 070000 | 11000 | 111000101 | |
| | *P3, D+D RT 1 MINUS R(T1), | | | | | | | | |
| | * CLOCKSR (P3), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/MULT13 | | --> VV | | | | | | |
| 2386 | MULT13:1705 | | | 1705 | | | | | 00000001000 |
| | * STORE HI | | <-- | | 0000 | 00 00 | 00 11 | 000 000 | 0000 0 |
| | *PRODUCT | | <-- VV | | 00000 | 000110 | 11000 | 111000110 | |
| | *P3, R(SF)+D (A ADDR), | | | | | | | | |
| | *NEXT, | | | | | | | | |
| | * J/MULT14 | | --> VV | | | | | | |
| 2387 | MULT14:1706 | | | 1706 | | | | | 00000001000 |
| | * TEMPORARY SAVE OF HI | | <-- | | 0000 | 00 00 | 00 00 | 110 000 | 0000 0 |
| | *PRODUCT | | <-- VV | | 00000 | 010110 | 10010 | 111000111 | |
| | *P3, R(T1)+D (A ADDR), | | | | | | | | |
| | *NEXT, BUT(ROR1), | | | | | | | | |
| | * J/MULT15 | | --> VV | | | | | | |
| 2388 | MULT15:1707 | | | 1707 | | | | | 00000001000 |
| | * STORE LO | | <-- | | 1111 | 00 01 | 00 00 | 000 100 | 0100 0 |
| | *WORD | | <-- VV | | 00000 | 001110 | 11010 | 111001000 | |
| | *P2, D+SR D(C)+ALU15, | | | | | | | | |
| | *P3, R(SF+1)+D (B ADDR), | | | | | | | | |
| | *NEXT, BUTR(RESET RES), | | | | | | | | |
| | * J/MULT16 | | --> | 1710 | 2389 | 790 | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|---------|--|--|--------------------------|------|------------|------------|-------------|---------------------------------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| 2389 | MULT16:1710 ***** * CHECK HI WORD FOR FOR SIGN * *EXTENSION * *-----* | F/MULT15 1707 2388 789 | <-- | 1710 | | | | 000000001000 | |
| | *P2, D+R(T1) PLUS 0 PLUS D(C), * *NEXT, * * J/MULT17 * --> VV ***** | | | | | | | 0100 11 01 11 00 110 000 0100 0 | |
| 2390 | MULT17:1711 ***** *OF LO WORD D(C)=1 SET CONDITION CODES * *ASSUMING HI WORD CONTAINS ALL * *INFO * *-----* | F/MULT16 01 1125 2391 790 11 1127 2392 791 | <-- VV | 1711 | | | | 000000001000 | |
| | *P2, D+D,D(C)+CIN, * *DEFER, SET CC, * *NEXT, BUTR(D(14-00) IS 0), * * J/MULT18 * --> * J/MULT19 * --> | | | | | | | 1111 00 00 01 01 000 000 0100 1 | |
| .CASE | 1 OF BMULT17 | | | | | | | 00000 000000 01101 001010101 | |
| 2391 | MULT18:1125 ***** *TARGETS - 0 - MULT18 1 - MULT19 HI WORD * *IS NOT A SIGN EXTENSION OF LO * *WORD * *-----* | F/MULT17 F/MULT19 1711 2390 790 1127 2392 791 | <-- | 1125 | | | | 000000001000 | |
| | *NEXT, BUT(GO TO),PAGE+0, * * J/BRA05 * --> | | | | | | | 0000 00 00 00 00 000 000 0000 0 | |
| | ***** | | | | | | | 00000 000000 11100 00000011 | |

J02

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCK | |
|---------|---|--|--------------------------|--------------|--------------|------------|-------------|-----------|-------|-------------|-----------------|
| | | | | | | | | RIF | COUT | | |
| .CASE | 2 OF BMULT17 | | | | | | | | | | |
| 2392 | MULT19:1127 | E/MULT17 F/MULT19 | <== | 1711 1127 | 2390 2392 | 790 791 | | | | | |
| | ***** | | | | | | | | 1127 | 00000001000 | |
| | *CONDITIONS CODES ARE SET APPROPRIATELY * | | | | | | | | 1001 | 11 01 00 00 | 000 000 0100 1 |
| | *GO FETCH NEXT INSTRUCTION SET CONDITION * | | | | | | | | 00000 | 000000 | 11000 001010101 |
| | *CODES FROM THE LO WORD D(C)=0 HI WORD IS * | | | | | | | | | | |
| | *A SIGN * | | | | | | | | | | |
| | *EXTENSION * | | | | | | | | | | |
| | *-----* | | | | | | | | | | |
| | *P2, | D+SR PLUS 0,D(C)+CIN, | * | | | | | | | | |
| | *DEFER, | SET CC, | * | | | | | | | | |
| | *NEXT, | | * | | | | | | | | |
| | * | J/MULT18 | * --> | 1125 | 2391 | 790 | | | | | |
| | ***** | | | | | | | | | | |

K02

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377

PAGE 792

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|---------------------|-----------------|--------------------|------|------|--------------------------|--------------------|------------|-------------|-----------|-----|--------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | |
| | | F/MFRACF2 | <-- | 2234 | 1452 | 473 | | | | | | |
| | | F/MULT8 | <-- | 1022 | 2381 | 788 | | | | | | |
| | | F/MULT11 | <-- | 1702 | 2384 | 788 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE MULTLOOP | | * | | | | | | | | | |
| | | RETURN/MFRACF2B | * --> | 1615 | 1453 | 473 | | | | | | |
| | | RETURN/MULT9 | * --> | -1 | -1 | -1 | 2 | 1 | 1 | | | |
| | | RETURN/MULT12 | * --> | 1704 | 2385 | 789 | | | | | | |
| ***** | | | | | | | | | | | | |

L02

```

2393 MULTLOOP:1712
*****
*OF THE LO WORD :SUBROUTINE :GENERATES *
*32 BIT PRODUCT FROM TWO 16 BIT WORDS ; *
*IN SR AND R(T2) :PREREQUISITES- :MAND *
*MUST ALREADY BE IN R(T2) :OR R(TEMP5) *
*:MIER MUST ALREADY BE IN SR ; :AT *
*CONCLUSION OF PROGRAM HI PRODUCT IN D *
*:LOW PRODUCT IS IN SR :RESIDUAL CONTROL *
*IS NOT RESET!!!!!! CONSTANT FOR *
*RESIDUAL CONTROL AND COUNTER RIGHT SHIFT *
*AND 16 *
*COUNT *
*-----*
*P3, MD+20361 (BC), *
*NEXT, *
* J/MLOOP2 * -->
*****

```

```

1712 000000001000
0010 10 00 00 11 110 001 0000 0
0010 100000 11000 111001100

```

1714 2395 794

M02

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 793

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|----------------------|-----------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|--------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | |
| | | F/MFRACF5 | <-- | 1621 | 1456 | 474 | | | | | | |
| | | F/MFRACF12B | <-- | 2627 | 1464 | 476 | | | | | | |
| | | F/MFRACF20 | <-- | 2260 | 1472 | 478 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE MULTLOOP3 | | * | | | | | | | | | |
| | | RETURN/MFRACF6 | * --> | -1 | -1 | -1 | 0 | 1 | 1 | | | |
| | | RETURN/MFRACF13 | * --> | 2246 | 1465 | 476 | | | | | | |
| | | RETURN/MFRACF21 | * --> | 2262 | 1473 | 478 | | | | | | |
| ***** | | | | | | | | | | | | |

N02

2394 MULTLOOP3:1713

```
*****  
* SECONDARY ENTRY POINT USED BY MULF *  
*D(C)=0 TARGETS *  
*-- *  
*----- *  
*P2      D+D PLUS D,D(C)+CIN, *  
*NEXT,   BUTR(SR00), *  
*        J/MLOOP3 *  
*        J/MLOOP3 * --> 1110 1636 2396 794  
*        J/MLOOP4 * --> 1111 1637 2397 795  
*****
```

1713

```
000000001000  
1001 11 01 01 01 000 000 0100 0  
00000 000000 00000 110011110
```

| BOX NO. | TAG:ADDRESS | | SOURCE/DESTINATION | | | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | | CLOCKS |
|---------|-------------------|--------------|--------------------|------|------|-----------------------|--------------|---------|----------|-----------|-----|--------|
| | | | OFST | ADDR | BOX | | | | | PAGE | RIF | |
| | | F/MULT3 | <-- | 1122 | 2376 | 786 | | | | | | |
| | | F/MULT5 | <-- | 1123 | 2378 | 787 | | | | | | |
| ***** | | | | | | | | | | | | |
| * | SUBROUTINE MLOOP2 | | * | | | | | | | | | |
| | | RETURN/MULT4 | * --> | 1666 | 2377 | 786 | | | | | | |
| | | RETURN/MULT6 | * --> | 1667 | 2379 | 787 | | | | | | |
| ***** | | | | | | | | | | | | |

```

2395 MLOOP2:1714
*****
#D - MLOOP3 1 - MLOOP4 D(C)=0 BRANCH ON *
#LOW SR BIT ZERO *
#MLOOP3 *
-----*
#P2, D+D,D(C)+ALU00,RES+MD, *
# COUNTER+MD, *
#NEXT, BUT(SR00), *
# J/MLOOP3 *
# J/MLOOP4 *
*****

```

.CASE 1 OF BMULTLOOP3

```

2396 MLOOP3:1636
*****
#ONE MLOOP4 WHERE MIER<00> = 0 BRANCH ON *
#SR01 BIT00V ZERO *
#MLOOP5 *
-----*
#P2, D+D PLUS 0 (P3),D(C)+COUT15, *
# CLOCKS SR (P3), *
#NEXT, BUTR(SR01 * (COUNT IS -1)), *
# J/MLOOP5 *
# J/MLOOP6 *
# J/MLOOP7 *
# J/MLOOP8 *
*****

```

```

--> 1110 1636 2396 794
--> 1111 1637 2397 795
<-- F/MULTLOOP3 1713 2394 793
<-- VV

```

```

--> 010 1642 2398 795
--> 011 1643 2399 796
--> 110 1646 2400 796
--> 111 1647 2401 797

```

```

1714 000000001000
0011 11 10 00 00 000 010 0100 0
00000 010101 00000 110011110

```

```

1636 000000001000
1001 11 01 01 01 000 110 1110 0
00000 000000 01011 110100010

```

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|------------------------------------|---|--------------------------|------------------------------|------------------------------|--------------------------|------|-----------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 2397 | MLOOP4: 1637 | F/MULTLOOP3 F/MLOOP2 | <-- <-- | 1713 1714 | 2394 2395 | 793 794 | | |
| | ***** | | | | | | | |
| | *ONE MLOOP7 PERFORM FIRST MULT * | | | | | | | |
| | *OPERATION WHERE MIER<00> = 1 00 * | | | | | | | |
| | *MLOOPS * | | | | | | | |
| | *-----* | | | | | | | |
| | *P3, | D+D PLUS R(T2),D(C)+COUT15, | * | | | | | |
| | * | CLOCKSR (P3) | * | | | | | |
| | *NEXT, | BUTR(SR01 # (COUNT IS -1)), | * | | | | | |
| | * | J/MLOOPS5 | * --> | 010 1642 | 2398 | 795 | | |
| | * | J/MLOOP6 | * --> | 011 1643 | 2399 | 796 | | |
| | * | J/MLOOP7 | * --> | 110 1646 | 2400 | 796 | | |
| | * | J/MLOOP8 | * --> | 111 1647 | 2401 | 797 | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BML00P3 | F/MLOCP3 F/MLOOP4 F/MLOOPS5 F/MLOOP7 | <-- <-- <-- <-- | 1636 1637 1642 1646 | 2396 2397 2398 2400 | 794 795 795 796 | | |
| 2398 | MLOOP5: 1642 | | | | | | | |
| | ***** | | | | | | | |
| | *01 MLOOP6 10 MLOOP7 11 MLOOP8 * | | | | | | | |
| | *MULTIPLICATION INNER LOOP SHIFT * | | | | | | | |
| | *OPERATION * | | | | | | | |
| | *-----* | | | | | | | |
| | *P3, | D+D RIGHT 1 PLUS ZERO, | * | | | | | |
| | * | D(C)+COUT15,CLOCKSR (P3), | * | | | | | |
| | *NEXT, | BUT(SR01 # (COUNT IS -1)), | * | | | | | |
| | * | J/MLOOPS5 | * --> | 010 1642 | 2398 | 795 | | |
| | * | J/MLOOP6 | * --> | 011 1643 | 2399 | 796 | | |
| | * | J/MLOOP7 | * --> | 110 1646 | 2400 | 796 | | |
| | * | J/MLOOP8 | * --> | 111 1647 | 2401 | 797 | | |
| | ***** | | | | | | | |

1637
 1001 01 11 01 01 110 110 1110 0
 00000 000000 01011 110100010

1642
 1001 11 01 01 10 000 110 1110 0
 00000 000000 01011 110100010

E03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 796

| BOX NO. .CASE | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|------------------|--|--|--------------------------|--------------------|------------|------------|-------------|-----------|-------------|
| | | | | | | | | RIF | COUT CLOCKS |
| 2399 | MLOOP6: 1643 | F/MLOOP3 | <-- | 1636 | 2396 | 794 | | | |
| | | F/MLOOP4 | <-- | 1637 | 2397 | 795 | | | |
| | | F/MLOOP5 | <-- | 1642 | 2398 | 795 | | | |
| | | F/MLOOP7 | <-- | 1646 | 2400 | 796 | | | |
| | ***** | | | | | | | | |
| | * INNER LOOP OPERATION WHERE SHIFT | | | | | | | | |
| | * D(C)=0 IS PERFORMED DUE TO MIER BIT = | | | | | | | | |
| | * 0 | | | | | | | | |
| | -----* | | | | | | | | |
| | * P3, D+D RIGHT 1 PLUS ZERO, | | | | | | | | |
| | * D(C)+CIN, CLOCKS R (P3), | | | | | | | | |
| | * NEXT, | | | | | | | | |
| | * BUT (RETURN) | | | | | | | | --> VV |
| | ***** | | | | | | | | |
| 2400 | MLOOP7: 1646 | F/MLOOP3 | <-- | 1636 | 2396 | 794 | | | |
| | | F/MLOOP4 | <-- | 1637 | 2397 | 795 | | | |
| | | F/MLOOP5 | <-- | 1642 | 2398 | 795 | | | |
| | | F/MLOOP7 | <-- | 1646 | 2400 | 796 | | | |
| | ***** | | | | | | | | |
| | * POINT IS ENTERED WHEN COUNT OF 15 IS | | | | | | | | |
| | * SATISFIED RETURN TO CALLER FOR | | | | | | | | |
| | * CORRECTION FACTOR AND LAST SHIFT | | | | | | | | |
| | * OPERATION RES IS NOT RESET INNER LOOP | | | | | | | | |
| | * OPERATION ADD SHIFT COUNT NOT | | | | | | | | |
| | * SATISFIED | | | | | | | | |
| | -----* | | | | | | | | |
| | * P3, D+D RIGHT 1 PLUS R(T2), | | | | | | | | |
| | * D(C)+COUT15, CLOCKS R (P3), | | | | | | | | |
| | * NEXT, | | | | | | | | |
| | * BUT (SRO1 # {COUNT IS -1}), | | | | | | | | |
| | * J/MLOOP5 | | | | | | | | |
| | * J/MLOOP5 | | --> | 010 | 1642 | 2398 | 795 | | |
| | * J/MLOOP6 | | --> | 011 | 1643 | 2399 | 796 | | |
| | * J/MLOOP7 | | --> | 110 | 1646 | 2400 | 796 | | |
| | * J/MLOOP8 | | --> | 111 | 1647 | 2401 | 797 | | |
| | ***** | | | | | | | | |

```

1643
1001 11 01 01 10 000 000 1110 0
00000 000000 11111 00000000

```

```

1646
1001 01 11 01 10 110 110 1110 0
00000 000000 01011 110100010

```

F03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 797

| BOX NO. .CASE | TAG: ADDRESS 4 OF EML00P3 | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION | |
|------------------|--|--|--------------------------|-----------------|------------|-------------|-----------|---------------------------------|
| | | | | | | | RIF | COUT CLOCKS |
| | | F/MLOOP3 | <-- | 1636 | 2396 | 794 | | |
| | | F/MLOOP4 | <-- | 1637 | 2397 | 795 | | |
| | | F/MLOOP5 | <-- | 1642 | 2398 | 795 | | |
| | | F/MLOOP7 | <-- | 1646 | 2400 | 796 | | |
| 2401 | MLOOP8: 1647 | | | | | | 1647 | 000000001000 |
| | ***** | | | | | | | |
| | * INNER LOOP ADD SHIFT 15 COUNT IS | | | | | | | 1001 01 11 01 10 110 110 1110 0 |
| | *SATISFIED RETURN TO | | | | | | | 00000 000000 11111 00000000 |
| | *CALLER | | | | | | | |
| | ----- | | | | | | | |
| | *P3, D+D RIGHT 1 PLUS R(T2), | | | | | | | |
| | * D(C)+COUT15,CLOCKSR (P3), | | | | | | | |
| | *NEXT, | | | | | | | |
| | * BUT(RETURN) | | --> | VV | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|--------------|---------|----------|-------------------------------|
| | ASH 072RSS, ASHC 073RSS | | | | | | |
| | ASH RIGHT SHIFT | | | | | | |
| | D(C)----->DDDDDDDDDDDDDDDD----->SRSRSRSRSRSRSR----->C | | | | | | |
| | D(C)+ALU15 D=R(SF) D00 SR=0 SROO | | | | | | |
| | D=RESULTANT | | | | | | |
| | ASHC RIGHT SHIFT | | | | | | |
| | D(C)----->DDDDDDDDDDDDDDDD----->SRSRSRSRSRSRSR----->C | | | | | | |
| | D(C)+ALU15 D=R(SF) D00 SR=R(SF OR 1) SROO | | | | | | |
| | R (EVEN)-----D=RESULTANT-----SR=RESULTANT | | | | | | |
| | R (ODD)-----SR=RESULTANT | | | | | | |

| | | | | | | | |
|--|---|--|--|--|--|--|--|
| | ASH LEFT SHIFT | | | | | | |
| | FV(SET CC)+NOT UASELO1 AND [(D15 XOR BSIGN) OR PS(V)] | | | | | | |
| | C<-----DDDDDDDDDDDDDDDD<-----SRSRSRSRSRSRSR<-----0 | | | | | | |
| | D(C)+ALU15 D=R(SF) SR15 SR=0 GD=0 | | | | | | |
| | D=RESULTANT | | | | | | |
| | ASHC LEFT SHIFT | | | | | | |
| | FV(SET CC)+NOT UASELO1 AND [(D15 XOR BSIGN) OR PS(V)] | | | | | | |
| | C<-----DDDDDDDDDDDDDDDD<-----SRSRSRSRSRSRSR<-----0 | | | | | | |
| | D(C)+ALU15 D=R(SF) SR15 SR=R(SF OR 1) GD=0 | | | | | | |
| | R (EVEN)-----D=RESULTANT-----SR=RESULTANT | | | | | | |
| | R (ODD)-----SR=RESULTANT | | | | | | |

```

CASE 2 OF BEIS02
2402 ASH001:1377 F/EIS02 <-- 1627 2332 771
*****
*FOR CORRECTION FACTOR AND LAST SHIFT *
*OPERATION RES IS NOT RESET LO PROD IN SR *
*RESIDUAL CONTROL IS NOT RESET!!!! BOTH *
*ASH AND ASHC ENTER AT ASH001 WITH MD = *
*77 RESET V BIT IF SET SET D(C)=0 *
*STORE 0 IN SPA, *
*R(T1A) *
*-----*
*P2, D+0(D),D(C)+ALU15, *
*P3, R(T1A)+D (B ADDR), *
*NEXT, *
* J/ASH002 * --> 1715 2403 799
*****

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1377 000000001000
1010 10 10 00 00 110 100 0100 0
00001 011010 11000 111001101

```

H03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 799

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|---|---------------------------------------|-----------------------|------|---------|---------|----------|---------------------------|
| 2403 | ASH002:1715 | F/ASH001 | 1377 2402 798 | 1715 | | | | 000000001000 |
| | * CLEAN COUNT IN D, 6 BITS SR GETS DATA * | | | | 1011 | 10 11 | 00 10 | 110 000 0110 1 |
| | *FROM FETCINT 6 BIT COUNT IN R(T2) ASSERT * | | | | 00010 | 011110 | 11000 | 111001110 |
| | *ASELO1 = 1 TO CLEAR V BIT IN * | | | | | | | |
| | *PSW * | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, D+SR AND MD(D), * | | | | | | | |
| | * SR+SR AND MD(D), * | | | | | | | |
| | *P3, R(T2)+D (B ADDR),ASELO1/1, * | | | | | | | |
| | *DEFER, SET CC, * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | * J/ASH003 | --> | VV | | | | | |
| 2404 | ASH003:1716 | F/ASH002 | | 1716 | | | | 000000001000 |
| | * ADD TO SR FOR D(C), COUNT SIGN MUST BE * | | | | 0000 | 10 10 | 00 11 | 100 000 0000 0 |
| | *ASSERTED ACROSS 2 MICROSTATES TO CLEAR V * | | | | 00010 | 100000 | 01101 | 000001101 |
| | *BIT *** CHECK SHIFT VALUE = 0 TARGETS * | | | | | | | |
| | *- * | | | | | | | |
| | *-----* | | | | | | | |
| | *P3, MD+4340, * | | | | | | | |
| | *NEXT, BUTR(D(14-00) IS 0), * | | | | | | | |
| | * J/ASH004 | --> | 01 1015 2405 799 | | | | | |
| | * J/ASHZ00 | --> | 11 1017 2407 800 | | | | | |
| | *-----* | | | | | | | |
| .CASE 2405 | 1 OF BASH003 | | | | | | | |
| 2405 | ASH004:1015 | F/ASH003 | | 1015 | | | | 000000001000 |
| | *0 - ASH004 1 - ASHZ00 MINUS COUNT FOR * | | | | 1101 | 01 11 | 11 00 | 110 000 0100 0 |
| | *ASSUMED PLUS VALUE (-) COUNT FOR (+) * | | | | 00000 | 011100 | 11000 | 111001111 |
| | *VALUE IN * | | | | | | | |
| | *R(T2B) * | | | | | | | |
| | *-----* | | | | | | | |
| | *P2, D+R(T1A) MINUS R(T2B), * | | | | | | | |
| | *P3, R(T2B)+D (B ADDR), * | | | | | | | |
| | *NEXT, * | | | | | | | |
| | * J/ASH005 | --> | 1717 2406 800 | | | | | |
| | *-----* | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|------------|--|---------------------------------------|-----------------------|------|------------|-------------------|-------------------|-----------------------------|
| 2406 | ASH005:1717 ***** * SR=0000XX, MD=004340, D(C)=COUNT SIGN * * SAME POLARITY AS ORIGINAL SIGN * * GUARDEN=4000, 0 TO GD ON NEXT * * CLOCKS SR * -----* * P2, D+SR PLUS MD, D(C)+COUT07, * * RES+MD, * * NEXT, * * J/ASH006 * ***** | <-- | 1015 2405 799 | 1717 | 1001 00000 | 11 10 010001 | 00 00 11000 | 000 101 111010010 0100 0 |
| .CASE 2407 | 2 OF BASH003 ASHZ00:1017 ***** -----* * TEST FOR D=0, ASHC SET CARRY BIT TO 0 * * NEXT MICRO, SF=SF OR * * 1 * -----* * P2, D+R(SF) (B), D(C)+CIN, * * NEXT, BUT(ROR1), * * J/ASHZ01 * ***** | <-- | 1716 2404 799 | 1017 | 1010 00000 | 00 01 000000 | 00 00 10010 | 000 000 111010000 0100 0 |
| 2408 | ASHZ01:1720 ***** * R(SF)=R(SF OR 1), TEST FOR * * 0 * -----* * P2, SR+R(SF+1) (A), * * NEXT, * * J/ASHEX01 * ***** | <-- VV <-- VV --> | 1417 2427 808 | 1720 | 1111 00000 | 00 00 10 11 11000 | 000 000 100001111 | 0010 0 |

K03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 802

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|-----------|---|---------------------------------------|-----------------------|--------------------|---------|---------|----------|-------------------------------|
| 2412 | ASH011:1725 | F/ASH010 | <-- | 1724 2411 801 | 1725 | | | 000000001000 |
| | * ORIGINAL NEG COUNT (BYTE) | | | | 0000 | 01 11 | 00 00 | 110 000 0000 0 |
| | *BUT(IR(09-06)),,,,ASH OR ASHC TARGETS | | | | 00000 | 000101 | 00100 | 011100111 |
| | *(0) ASH013, | | | | | | | |
| | *ASH | | | | | | | |
| | ----- | | | | | | | |
| | *P2, COUNTER+R(T2B), | | | | | | | |
| | *NEXT, BUTR(IR(09)), | | | | | | | |
| | * J/ASH013 | | --> | 0111 1347 2414 802 | | | | |
| | * J/ASH014 | | --> | 1111 1357 2415 803 | | | | |
| | ***** | | | | | | | |
| CASE 2413 | 1 OF BASH006 | F/ASH006 | <-- | 1722 2409 801 | 1221 | | | 000000001000 |
| | ASH012:1221 | | | | 0101 | 10 10 | 00 00 | 000 000 0000 0 |
| | *(10) ASH014 ASHC,, (OCTAL) RESLEFTGD | | | | 00010 | 100000 | 00100 | 011100111 |
| | *BUT(IR(09-06)),,,,ASH OR ASHC TARGETS | | | | | | | |
| | *(0) ASH013, | | | | | | | |
| | *ASH | | | | | | | |
| | ----- | | | | | | | |
| | *P3, MD+54000, | | | | | | | |
| | *NEXT, BUTR(IR(09)), | | | | | | | |
| | * J/ASH013 | | --> | 0111 1347 2414 802 | | | | |
| | * J/ASH014 | | --> | 1111 1357 2415 803 | | | | |
| | ***** | | | | | | | |
| CASE 2414 | 1 OF BASH011 | F/ASH011 | <-- | 1725 2412 802 | 1347 | | | 000000001000 |
| | ASH013:1347 | F/ASH012 | <-- VV | | 0011 | 11 10 | 00 00 | 000 000 0010 0 |
| | *(10) ASH014 ASHC (OCTAL) ASH MODE, | | | | 00000 | 010001 | 10011 | 001000001 |
| | *ZEROS TO GUARD DIGIT RESLEFTGD OR | | | | | | | |
| | *RESRIGHT 0=POS=LEFT, 1=NEG=RIGHT TARGETS | | | | | | | |
| | *(0) ASH016, LEFT | | | | | | | |
| | *SHIFT | | | | | | | |
| | ----- | | | | | | | |
| | *P2, SR+0, RES+MD, | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | |
| | * J/ASH016 | | --> | 01 1101 2417 803 | | | | |
| | * J/ASH017 | | --> | 11 1103 2418 804 | | | | |
| | ***** | | | | | | | |

L03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 803

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|----------------------|------------|--------------------------------|-----|------|------|---------------------------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | | BUS | SP | UBF | RIF COUT CLOCKS |
| | | | | | | | | UPF |
| 2415 | ASH014:1357 | F/ASH011 F/ASH012 | <-- <-- | 1725 2412 802 1221 2413 802 | | | | |
| | ***** | | | | | | | |
| | *(2) ASH017, RIGHT SHIFT ASHC MODE, SET | | | | | | | 000000001000 |
| | *SR FROM R(SF OR | | | | | | | 0000 00 00 00 00 000 000 0000 0 |
| | *1) | | | | | | | 00000 000000 10010 111010110 |
| | ----- | | | | | | | |
| | *NEXT, BUT(ROR1), | | | | | | | |
| | * J/ASH015 | | --> | VV | | | | |
| 2416 | ASH015:1726 | F/ASH014 | <-- | VV | | | | |
| | ***** | | | | | | | |
| | * SET SR FROM R(SF OR 1), 0 TO GD | | | | | | | 000000001000 |
| | *RESLEFTGD OR RESRIGHT 0=POS=LEFT, | | | | | | | 1111 11 10 10 11 000 000 0010 0 |
| | *1=NEG=RIGHT TARGETS (0) ASH016, LEFT | | | | | | | 00000 010001 10011 001000001 |
| | *SHIFT | | | | | | | |
| | ----- | | | | | | | |
| | *P2, SR+R(SF+1) (A), RES+MD, | | | | | | | |
| | *NEXT, BUTR(D(C)), | | | | | | | |
| | * J/ASH016 | | --> | 01 1101 2417 803 | | | | |
| | * J/ASH017 | | --> | 11 1103 2418 804 | | | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BASH013 | F/ASH013 F/ASH015 | <-- <-- | VV | | | | |
| 2417 | ASH016:1101 | | | 1347 2414 802 | | | | |
| | ***** | | | | | | | |
| | *(2) ASH017, RIGHT SHIFT SR IS LOADED, | | | | | | | 000000001000 |
| | *NOW LOAD D D(C) SET TO POLARITY OF R(SF) | | | | | | | 1111 00 10 10 11 110 100 0100 0 |
| | *START, R(T1B) SIGN=D SIGN ELIMINATE ONE | | | | | | | 00000 011100 10101 101001000 |
| | *COUNT TARGETS (0) ASHLOO, COUNT > | | | | | | | |
| | *ONE | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+R(SF) (A), D(C)+ALU15, | | | | | | | |
| | *P3, R(T1B)+D (B ADDR), | | | | | | | |
| | *NEXT, BUT(COUNT IS -1), | | | | | | | |
| | * J/ASHLOO | | --> | 0 1510 2423 806 | | | | |
| | * J/ASHLO1 | | --> | 1 1511 2424 807 | | | | |
| | ***** | | | | | | | |

M03

PROGRAM FLOWS 11/60 MICROCODE ON 09-Mar-77 BY ADSYS 020377 PAGE 804

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|----------------------------------|-------------------|----------------------|----------------------|-------------------|------|---------------------------------|
| .CASE | | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | RIF | COUT CLOCKS |
| 2418 | ASH017:1103 | F/ASH013 F/ASH015 | <-- <-- | 1347 1726 | 2414 2416 | 802 803 | | |
| | ***** | | | | | | | |
| | * (1) ASHLO1, COUNT OF ONE SR IS LOADED, * | | | | | | | 1103 000000001000 |
| | * NOW LOAD D'D(C) SET TO POLARITY OF * | | | | | | | 1111 00 00 10 11 000 100 0100 0 |
| | * R(SF) * | | | | | | | 00000 000000 11000 101111100 |
| | *-----* | | | | | | | |
| | * P2, D+R(SF) (A), D(C)+ALU15, * | | | | | | | |
| | * NEXT, * | | | | | | | |
| | * J/ASHROO * | | | | | | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BASHROO | | | | | | | |
| 2419 | ASHROO:1574 | F/ASH017 F/ASHROO F/ASHRO2 | <-- <-- <-- | 1103 1574 1576 | 2418 2419 2421 | 804 804 805 | | |
| | ***** | | | | | | | |
| | *-----* | | | | | | | |
| | * ASH, ASHC RIGHT SHIFT, MAJOR LOOP D, SR * | | | | | | | 1574 000000001000 |
| | * RIGHT SHIFT 1 FORCE IN SIGN BITS AT D15 * | | | | | | | 1111 00 00 01 10 000 100 1110 0 |
| | * BUT(SRD1#SROO#COUNT IS -1) TARGETS (0) * | | | | | | | 00000 000000 01011 101111100 |
| | * ASHROO, CONTINUE * | | | | | | | |
| | * SHIFT * | | | | | | | |
| | *-----* | | | | | | | |
| | * P3, D+D RIGHT 1 (P3), CLOCKS R (P3), * | | | | | | | |
| | * D(C)+ALU15, * | | | | | | | |
| | * NEXT, BUTR(SROO#COUNT IS -1), * | | | | | | | |
| | * J/ASHROO * | | | | | | | |
| | * J/ASHRO1 * | | | | | | | |
| | * J/ASHRO2 * | | | | | | | |
| | * J/ASHRO3 * | | | | | | | |
| | ***** | | | | | | | |

N03

| BOX NO. | TAG:ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|---|----------------------------------|-------------------|----------------------|----------------------|-------------------|----------|-----------|
| .CASE | 2 OF BASHROO | OFST ADDR BOX PAGE | COORD CARD | BUS | SP | UBF | RIF COUT | CLOCKS |
| 2420 | ASHRO1:1575 | F/ASHO17 F/ASHROO F/ASHRO2 | <-- <-- <-- | 1103 1574 1576 | 2418 2419 2421 | 804 804 805 | | |
| | ***** | | | | | | | |
| | *(1) ASHRO1, ASHC, CARRY=0 (2) ASHRO2, * | | | | | | | |
| | *CONTINUE SHIFT (3) ASHRO3, ASHC * | | | | | | | |
| | *CARRY=1 FOR D(C)+PS(C) SET D(C)=0 FOR * | | | | | | | |
| | *CARRY SAVE D IN R(SF) * | | | | | | | |
| | *BUT(IR(09-06)),,,,ASH OR ASHC TARGETS * | | | | | | | |
| | *(0) ASHEXOO, * | | | | | | | |
| | *ASH * | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+D,D(C)+PS(C), * | | | | | | | |
| | *P3, R(SF)+D (B ADDR), * | | | | | | | |
| | *NEXT, BUTR(IR(09)), * | | | | | | | |
| | * J/ASHEXOO * | | | | | | | |
| | * J/ASHEXOO1 * | | | | | | | |
| | ***** | | | | | | | |
| .CASE | 3 OF BASHROO | | | | | | | |
| 2421 | ASHRO2:1576 | F/ASHO17 F/ASHROO F/ASHRO2 | <-- <-- <-- | 1103 1574 1576 | 2418 2419 2421 | 804 804 805 | | |
| | ***** | | | | | | | |
| | *(10) ASHEXOO1, ASHC, (OCTAL) D RIGHT * | | | | | | | |
| | *SHIFT 1 SR RIGHT SHIFT 1 FORCE IN SIGN * | | | | | | | |
| | *BITS AT D15 BUT(SRO1#SROO#COUNT IS -1) * | | | | | | | |
| | *TARGETS (0) ASHROO, CONTINUE * | | | | | | | |
| | *SHIFT * | | | | | | | |
| | ----- | | | | | | | |
| | *P3, D+D RIGHT 1 (P3),CLOCKSR (P3), * | | | | | | | |
| | * D(C)+ALU15, * | | | | | | | |
| | *NEXT, BUTR(SROO#COUNT IS -1), * | | | | | | | |
| | * J/ASHROO * | | | | | | | |
| | * J/ASHRO1 * | | | | | | | |
| | * J/ASHRO2 * | | | | | | | |
| | * J/ASHRO3 * | | | | | | | |
| | ***** | | | | | | | |

1575
 1111 00 01 01 01 000 001 0100 0
 00000 001110 00100 100000111

1576
 1111 00 00 01 10 000 100 1110 0
 00000 000000 01011 101111100

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION | MICROFICHE | ADDR | ALU | BUSB | BUSA | EXTENSION |
|---------|--|----------------------------------|-------------------|----------------------|----------------------|-------------------|------|---------------------------------|
| .CASE | 4 OF BASHROO | OFST ADDR BOX PAGE | COORD CARD | BUS | BUS SP | UBF | UPF | RIF COUT CLOCKS |
| 2422 | ASHRO3: 1577 | F/ASHO17 F/ASHROO F/ASHRO2 | <-- <-- <-- | 1103 1574 1576 | 2418 2419 2421 | 804 804 805 | | |
| | ***** | | | | | | | 1577 000000001000 |
| | *(1) ASHRO1, SHIFT OVER, ASHC, CARRY=0 | | | | | | | 1111 00 01 01 01 000 000 0100 0 |
| | *(2) ASHRO2, CONTINUE SHIFT (3) ASHRO3, | | | | | | | 00000 001110 00100 100000111 |
| | *SHIFT OVER, ASHC, CARRY=1 FOR | | | | | | | |
| | *D(C)+CIN SET D(C)=1 FOR CARRY SAVE D IN | | | | | | | |
| | *R(SF) BUT(IR(09-06)),,,,ASH OR ASHC | | | | | | | |
| | *TARGETS (0) ASHROO, | | | | | | | |
| | *ASH | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+D D(C)+CIN, | | | | | | | |
| | *P3, R(SF)+D (B ADDR), | | | | | | | |
| | *NEXT, BUTR(IR(09)), | | | | | | | |
| | * J/ASHROO | | | | | | | |
| | * J/ASHRO1 | | | | | | | |
| | ***** | | | | | | | |
| .CASE | 1 OF BASHO16 | | | | | | | |
| 2423 | ASHLOO: 1510 | F/ASHO16 F/ASHLOO | <-- <-- | 1101 1510 | 2417 2423 | 803 806 | | |
| | ***** | | | | | | | 1510 000000001000 |
| | *(10) ASHRO1, ASHC,,, (OCTAL) | | | | | | | 1111 01 10 01 00 110 100 0110 1 |
| | ===== | | | | | | | 00000 010100 10101 101001000 |
| | *LEFT SHIFT, ASH, ASHC D(C) FOR NEXT | | | | | | | |
| | *CARRY, SIGN OF SHIFTED D LEFT SHIFT SR | | | | | | | |
| | *R(T1B) TO BBUS, BEN/BSPHI | | | | | | | |
| | *BSEL/IMMEDO, RIF/2 BEN/BSPHI, | | | | | | | |
| | *BSEL/IMMEDO, RIF/2 V+NOT UASELO1 AND | | | | | | | |
| | *[(D15 XOR BSIGN) OR PS(V)] TARGETS (0) | | | | | | | |
| | *ASHLOO, CONTINUE | | | | | | | |
| | *SHIFT | | | | | | | |
| | ----- | | | | | | | |
| | *P2, D+D LEFT 1 D(C)+ALU15, | | | | | | | |
| | * SHIFT SR, R(T1B) | | | | | | | |
| | *P3, R(T1B)+D (A ADDR), | | | | | | | |
| | *DEFER, SET CC, | | | | | | | |
| | *NEXT, BUT(COUNT IS -1), | | | | | | | |
| | * J/ASHLOO | | | | | | | |
| | * J/ASHLOO | | | | | | | |
| | * J/ASHLO1 | | | | | | | |
| | ***** | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|--------------------------------|---------|----------|---------------------------------|
| .CASE | 2 OF BASH016 | | | | | | |
| 2424 | ASHL01:1511 | F/ASH016 F/ASHL00 | <-- <-- | 1101 2417 803 1510 2423 806 | | | |
| | ***** | | | | | | |
| | *(1) ASHL01, ONE LAST SHIFT LAST LEFT | | | | | | 1511 000000001000 |
| | *SHIFT SAVE CARRY LEFT SHIFT SR R(T1B) TO | | | | | | 1111 01 10 01 00 110 111 0110 1 |
| | *BBUS ENABLE SET | | | | | | 00000 000000 11000 111010111 |
| | *OVERFLOW | | | | | | |
| | ----- | | | | | | |
| | *P2, D+D LEFT 1,D(C)+D(C),SHIFT SR, | | | | | | |
| | * R(T1B), | | | | | | |
| | *DEFER, SET CC, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/ASHL02 | | --> VV | | | | |
| | ***** | | | | | | |
| 2425 | ASHL02:1727 | F/ASHL01 | <-- VV | | | | |
| | ***** | | | | | | |
| | * SAVE D IN R(SF) MAINTAIN ASELO1 ACROSS | | | | | | 1727 000000001000 |
| | *TWO | | | | | | 0000 00 01 00 00 000 000 0000 0 |
| | *STATES | | | | | | 00000 001110 11000 100001111 |
| | ----- | | | | | | |
| | *P3, R(SF)+D (B ADDR),ASELO1/D, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/ASHEX01 | | --> | 1417 2427 808 | | | |
| | ***** | | | | | | |
| .CASE | 1 OF BASHR01 | | | | | | |
| 2426 | ASHEX00:1407 | F/ASHR01 F/ASHR03 | <-- <-- | 1575 2420 805 1577 2422 806 | | | |
| | ***** | | | | | | |
| | ----- | | | | | | |
| | *ASH, SR15 CONTAINS CARRY ASH, GET | | | | | | 1407 000000001000 |
| | *CARRY | | | | | | 1111 00 00 00 00 000 100 0100 0 |
| | ----- | | | | | | 00000 000000 11000 100001111 |
| | *P2, D+SR,D(C)+ALU15, | | | | | | |
| | *NEXT, | | | | | | |
| | * J/ASHEX01 | | --> | 1417 2427 808 | | | |
| | ***** | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR | ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS |
|---------|--|---|---------------------------------|--------------------------------------|--------------------------------------|---------------------------------|----------|---|
| .CASE | 2 OF BASHR01 | | | | | | | |
| 2427 | ASHEX01:1417 | F/ASHR01 F/ASHR03 | <-- <-- | 1575 1577 | 2420 2422 | 805 806 | | |
| | ***** * SAVE MOST SIGNIF WORD IN R(T1) RETAIN * *D(C) SAVE FOR SIGN, CARRY * *BUT(IR(09-06)),,,,ASH OR ASHC TARGETS * *(0) ASHPREXIT, * *ASH * *-----* | | | | | | | 1417 1111 00 10 10 11 110 111 0100 0 00000 011110 00100 010110111 |
| | *P2, D+R(SF) (A),D(C)+D(C), * *P3, R(T1)+D (B ADDR), * *NEXT, BUTR(IR(09)), * * J/ASHPREXIT * * J/ASHPREXIT * --> * J/ASHEX02 * --> | | | 0111 1267 1111 1277 | 2434 2428 | 810 808 | | |
| .CASE | 2 OF BASHEX01 | | | | | | | |
| 2428 | ASHEX02:1277 | F/ASHEX01 F/ASHEX04 F/ASHEX05 F/ASHEX06 F/ASHEX07 | <-- <-- <-- <-- <-- | 1417 1150 1151 1152 1153 | 2427 2430 2431 2432 2433 | 808 809 809 810 810 | | |
| | ***** *(10) ASHEX02, ASHC, (OCTAL) ASHC, D * *STORED IN R(T1) PRESERVE D(C) CARRY NEXT * *MICRO SF=SF OR * *1 * *-----* | | | | | | | 1277 1111 00 00 00 00 000 111 0100 0 00000 000000 10010 111011000 |
| | *P2, D+SR, D(C)+D(C), * *NEXT, BUT(ROR1), * * J/ASHEX03 * --> | | | 1730 | 2429 | 809 | | |

| BOX NO. | TAG: ADDRESS | EXTENSION | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | RIF UPF | COUT | CLOCKS |
|-----------|---|-----------|---------------------------------------|-----------------------|--------------|---------|----------|---------|----------|--------|
| 2429 | ASHEX03:1730 | F/ASHEX02 | <-- | 1277 2428 808 | 1730 | 0000 | 00 00 | 00 11 | 0000 000 | 0000 0 |
| | ***** | | | | | | | | | |
| | * SR IN R(SF OR 1), OK IF R ODD CHECK IF * | | | | | | | | | |
| | *SR=0 TARGETS (0) ASHEX04, SR NOT * | | | | | | | | | |
| | *0 * | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P3, R(SF+1)+D (A ADDR), * | | | | | | | | | |
| | *NEXT, BUT(D(14-00) IS 0 & D15), * | | | | | | | | | |
| | * J/ASHEX04 * | | --> | 00 1150 2430 809 | | | | | | |
| | * J/ASHEX05 * | | --> | 01 1151 2431 809 | | | | | | |
| | * J/ASHEX06 * | | --> | 10 1152 2432 810 | | | | | | |
| | * J/ASHEX07 * | | --> | 11 1153 2433 810 | | | | | | |
| | ***** | | | | | | | | | |
| CASE 2430 | 1 OF BASHEX03 ASHEX04:1150 | F/ASHEX03 | <-- VV | | 1150 | 1110 | 11 00 | 11 00 | 110 111 | 0100 0 |
| | ***** | | | | | | | | | |
| | *(1) ASHEX05, SR NOT 0 (2) ASHEX06, SR=0, * | | | | | | | | | |
| | *TEST IF D=0 (3) ASHEX07, SR NOT 0 SR * | | | | | | | | | |
| | *NOT 0, PRESERVE SIGN OF D PRESERVE D(C) * | | | | | | | | | |
| | *CARRY ASH PRE * | | | | | | | | | |
| | *EXIT * | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P2, D+R(T1A) OR 1, D(C)+D(C), * | | | | | | | | | |
| | *P3, R(T1)+D (A ADDR), * | | --> | 1267 2434 810 | | | | | | |
| | * J/ASHPREXIT * | | | | | | | | | |
| | ***** | | | | | | | | | |
| CASE 2431 | 2 OF BASHEX03 ASHEX05:1151 | F/ASHEX03 | <-- | 1730 2429 809 | 1151 | 1110 | 11 00 | 11 00 | 110 111 | 0100 0 |
| | ***** | | | | | | | | | |
| | * SR NOT 0, PRESERVE SIGN OF D PRESERVE * | | | | | | | | | |
| | *D(C) CARRY ASH PRE * | | | | | | | | | |
| | *EXIT * | | | | | | | | | |
| | -----* | | | | | | | | | |
| | *P2, D+R(T1A) OR 1, D(C)+D(C), * | | | | | | | | | |
| | *P3, R(T1)+D (A ADDR), * | | --> | 1267 2434 810 | | | | | | |
| | * J/ASHPREXIT * | | | | | | | | | |
| | ***** | | | | | | | | | |

| BOX NO. | TAG: ADDRESS | SOURCE/DESTINATION OFST ADDR BOX PAGE | MICROFICHE COORD CARD | ADDR ALU BUS | BUSB SP | BUSA UBF | EXTENSION RIF COUT CLOCKS UPF |
|---------|---|---------------------------------------|-----------------------|--------------|---------|----------|---------------------------------|
| 2435 | ASHEXIT:1732 | | 1267 2434 610 | | | | |
| | F/ASHPREXIT | <-- | | | | | |
| | ***** | | | | | | |
| | * A AEN/ASPHI,ASEL/IMMEDO RIF/2, NOT | | | | | | 00000001000 |
| | *UASELO1 (ASEL/O) RETAIN ASELO1/O ACROSS | | | | | | 1111 00 00 11 00 110 000 0010 0 |
| | *2 MICROSTATES GO TO | | | | | | 00000 000000 11100 00000011 |
| | *FETO1 | | | | | | |
| | ----- | | | | | | |
| | *P2, SR+R(T1A),ASELO1/O, | | | | | | |
| | *NEXT, BUT(GO TO),PAGE+O, | | | | | | |
| | * J/BRAOS | --> | 3 283 126 | | | | |
| | ***** | | | | | | |
| | BRANCHING-BUT USED WITH TAG NOT IDENTIFIED AS .CASE | -- | BOX 487 | | | | |
| | BRANCHING-BUT USED WITH TAG NOT IDENTIFIED AS .CASE | -- | BOX 1297 | | | | |
| | ***** 2 ERRORS DETECTED ***** | | | | | | |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-------------|------|
| 1387 | ABSNZW | 2656 |
| 1388 | ABSNZW2 | 2126 |
| 1389 | ABSNZW3 | 2130 |
| 1368 | ABSZW | 3456 |
| 1369 | ABSZW2 | 3235 |
| 1370 | ABSZW3 | 3237 |
| 1371 | ABSZW4 | 3664 |
| 123 | ADC01 | 555 |
| 159 | ADC03 | 435 |
| 141 | ADC01 | 575 |
| 175 | ADC02 | 535 |
| 78 | ADD01 | 446 |
| 89 | ADD02 | 626 |
| 99 | ADD03 | 726 |
| 110 | ADD04 | 406 |
| 1611 | ADD001 | 4523 |
| 1612 | ADD002 | 4264 |
| 1613 | ADD003 | 4266 |
| 1614 | ADD004 | 4270 |
| 1581 | ADD0FEZ | 4416 |
| 1615 | ADD0F01 | 4522 |
| 1616 | ADD0F02 | 4271 |
| 1617 | ADD0F03 | 4274 |
| 1618 | ADD0F04 | 4327 |
| 1247 | ADD0NZ | 251 |
| 1566 | ADD0NZW | 351 |
| 1582 | ADD0SFDFEZ | 4417 |
| 1580 | ADD0SFEZ | 4415 |
| 1603 | ADD0SHDF | 4265 |
| 1607 | ADD0SHDFD | 4413 |
| 1608 | ADD0SHDFD1 | 4130 |
| 1604 | ADD0SHDFF | 4412 |
| 1605 | ADD0SHDFF1 | 4100 |
| 1606 | ADD0SHDFF2 | 4101 |
| 1596 | ADD0SHFSF | 4267 |
| 1600 | ADD0SHFSFD | 4307 |
| 1601 | ADD0SHFSFD1 | 4060 |
| 1597 | ADD0SHFSFF | 4306 |

H04

| | | |
|------|------------|------|
| 1598 | ADDSHFSFF1 | 4010 |
| 1599 | ADDSHFSFF2 | 4011 |
| 1570 | ADDW01 | 4232 |
| 1571 | ADDW02 | 4234 |
| 1572 | ADDW03 | 4414 |
| 1573 | ADDW04 | 4235 |
| 1574 | ADDW05 | 4240 |
| 1575 | ADDW06 | 4241 |
| 1576 | ADDW07 | 4244 |
| 1577 | ADDW08 | 4245 |
| 1588 | ADDW09 | 4053 |
| 1589 | ADDW10 | 4052 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1590 | ADDW11 | 4255 |
| 1594 | ADDW12 | 4512 |
| 1595 | ADDW12B | 4260 |
| 1609 | ADDW20 | 4131 |
| 1602 | ADDW20A | 4061 |
| 1610 | ADDW21 | 4262 |
| 1246 | ADDZ | 250 |
| 1565 | ADDZW | 350 |
| 1390 | ANWRTBAK | 2261 |
| 1399 | ANWRTBAK10 | 2123 |
| 1400 | ANWRTBAK11 | 2146 |
| 1391 | ANWRTBAK2 | 2263 |
| 1392 | ANWRTBAK3 | 2131 |
| 1393 | ANWRTBAK4 | 2121 |
| 1394 | ANWRTBAK5 | 2102 |
| 1395 | ANWRTBAK6 | 2103 |
| 1396 | ANWRTBAK7 | 2134 |
| 1397 | ANWRTBAK8 | 2135 |
| 1398 | ANWRTBAK9 | 2144 |
| 2402 | ASH001 | 1377 |
| 2403 | ASH002 | 1715 |
| 2404 | ASH003 | 1716 |
| 2405 | ASH004 | 1015 |
| 2406 | ASH005 | 1717 |
| 2409 | ASH006 | 1722 |
| 2410 | ASH007 | 1223 |
| 2411 | ASH010 | 1724 |
| 2412 | ASH011 | 1725 |
| 2413 | ASH012 | 1221 |
| 2414 | ASH013 | 1347 |
| 2415 | ASH014 | 1357 |
| 2416 | ASH015 | 1726 |
| 2417 | ASH016 | 1101 |
| 2418 | ASH017 | 1103 |
| 2426 | ASHEX00 | 1407 |
| 2427 | ASHEX01 | 1417 |
| 2428 | ASHEX02 | 1277 |
| 2429 | ASHEX03 | 1730 |
| 2430 | ASHEX04 | 1150 |
| 2431 | ASHEX05 | 1151 |
| 2432 | ASHEX06 | 1152 |
| 2433 | ASHEX07 | 1153 |
| 2423 | ASHL00 | 1510 |
| 2424 | ASHL01 | 1511 |
| 2425 | ASHL02 | 1727 |
| 2419 | ASHR00 | 1574 |
| 2420 | ASHR01 | 1575 |
| 2421 | ASHR02 | 1576 |
| 2422 | ASHR03 | 1577 |
| 2407 | ASHZ00 | 1017 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 2408 | ASHZ01 | 1720 |
| 134 | ASL01 | 543 |
| 168 | ASL03 | 423 |
| 152 | ASLB01 | 563 |
| 187 | ASLB02 | 523 |
| 130 | ASR01 | 542 |
| 131 | ASR02 | 75 |
| 132 | ASR03 | 16 |
| 133 | ASR04 | 17 |
| 164 | ASR05 | 422 |
| 165 | ASR06 | 420 |
| 166 | ASR07 | 116 |
| 167 | ASR08 | 117 |
| 148 | ASRB01 | 562 |
| 149 | ASRB02 | 104 |
| 150 | ASRB03 | 36 |
| 151 | ASRB04 | 37 |
| 180 | ASRB05 | 522 |
| 181 | ASRB06 | 115 |
| 182 | ASRB07 | 112 |
| 183 | ASRB08 | 120 |
| 184 | ASRB09 | 113 |
| 185 | ASRB10 | 121 |
| 186 | ASRB11 | 520 |
| 914 | BASINIT01 | 3557 |
| 915 | BASINIT02 | 3524 |
| 916 | BASINIT03 | 3525 |
| 76 | BIC01 | 444 |
| 87 | BIC02 | 624 |
| 97 | BIC03 | 724 |
| 108 | BIC04 | 404 |
| 82 | BIC801 | 454 |
| 93 | BIC802 | 634 |
| 104 | BIC803 | 734 |
| 115 | BIC804 | 414 |
| 1592 | BIGEXDFGSF | 4227 |
| 1591 | BIGEXPDIIF | 4513 |
| 1593 | BIGEXPEND | 4225 |
| 77 | BIS01 | 445 |
| 88 | BIS02 | 625 |
| 98 | BIS03 | 725 |
| 109 | BIS04 | 405 |
| 83 | BIS801 | 455 |
| 94 | BIS802 | 635 |
| 105 | BIS803 | 735 |
| 116 | BIS804 | 415 |
| 75 | BIT01 | 443 |
| 86 | BIT02 | 623 |
| 96 | BIT03 | 723 |
| 107 | BIT04 | 403 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|----------|------|
| 81 | BITB01 | 453 |
| 92 | BITB02 | 633 |
| 103 | BITB03 | 733 |
| 114 | BITB04 | 413 |
| 1110 | BOOT | 1143 |
| 452 | BOOT01 | 1112 |
| 453 | BOOT02 | 1114 |
| 454 | BOOT03 | 1115 |
| 455 | BOOT03A | 1116 |
| 456 | BOOT04 | 1653 |
| 457 | BOOT05 | 1120 |
| 349 | BPT01 | 63 |
| 279 | BRA01 | 757 |
| 280 | BRA02 | 2 |
| 282 | BRA03 | 7 |
| 281 | BRA04 | 6 |
| 283 | BRA05 | 3 |
| 284 | BRA06 | 210 |
| 253 | BYTE01 | 32 |
| 254 | BYTE02 | 33 |
| 912 | CAINIT01 | 3217 |
| 913 | CAINIT02 | 3211 |
| 831 | CAREAD01 | 3661 |
| 832 | CAREAD02 | 3415 |
| 829 | CAWRT01 | 3660 |
| 830 | CAWRT02 | 3414 |
| 910 | CCRINIT | 3157 |
| 2000 | CDIS | 4617 |
| 1326 | CFCC | 220 |
| 117 | CLR01 | 550 |
| 153 | CLR02 | 430 |
| 135 | CLRB01 | 570 |
| 169 | CLRB02 | 530 |
| 1366 | CLRDZW | 3227 |
| 1365 | CLRFZW | 3226 |
| 1375 | CLRNZW | 2654 |
| 1376 | CLRNZW2 | 2114 |
| 1377 | CLRNZW3 | 2115 |
| 1378 | CLRNZW4 | 545 |
| 1379 | CLRNZW5 | 2120 |
| 1364 | CLRZW | 3454 |
| 1261 | CMP | 257 |
| 74 | CMP01 | 442 |
| 84 | CMP02 | 622 |
| 85 | CMP03 | 35 |
| 95 | CMP04 | 722 |
| 106 | CMP05 | 402 |
| 80 | CMPB01 | 452 |
| 91 | CMPB02 | 632 |
| 102 | CMPB03 | 732 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 113 | CMPB04 | 412 |
| 1656 | CMPW | 357 |
| 1665 | CMPW10 | 4350 |
| 1666 | CMPW11 | 4352 |
| 1667 | CMPW12 | 4354 |
| 1668 | CMPW13 | 4356 |
| 1669 | CMPW14 | 4360 |
| 1657 | CMPW2 | 4334 |
| 1658 | CMPW3 | 4335 |
| 1659 | CMPW4 | 4340 |
| 1660 | CMPW5 | 4342 |
| 1661 | CMPW6 | 4344 |
| 1662 | CMPW7 | 4056 |
| 1663 | CMPW8 | 4057 |
| 1664 | CMPW9 | 4345 |
| 1678 | CMPWEQUAL | 2416 |
| 1679 | CMPWEQUAL2 | 2420 |
| 118 | COM01 | 551 |
| 154 | COM03 | 431 |
| 136 | COMB01 | 571 |
| 170 | COMB02 | 531 |
| 382 | CON99 | 1040 |
| 383 | CON99B | 1000 |
| 384 | CON99C | 1004 |
| 458 | CONDIAG01 | 3613 |
| 459 | CONDIAG02 | 3021 |
| 460 | CONDIAG03 | 3575 |
| 461 | CONDIAG04 | 3577 |
| 462 | CONDIAG05 | 3022 |
| 463 | CONDIAG06 | 3023 |
| 464 | CONDIAG07 | 3025 |
| 465 | CONDIAG08 | 3026 |
| 466 | CONDIAG09 | 3027 |
| 467 | CONDIAG10 | 3503 |
| 468 | CONDIAG11 | 3500 |
| 469 | CONDIAG12 | 3501 |
| 470 | CONDIAG13 | 3036 |
| 471 | CONDIAG14 | 3042 |
| 472 | CONDIAG15 | 4150 |
| 474 | CONDIAG16 | 3502 |
| 473 | CONDIAG16A | 3043 |
| 1975 | CONVTRAP | 4543 |
| 545 | CSPE01 | 1321 |
| 980 | CSR01 | 1664 |
| 981 | CSR04 | 1263 |
| 982 | CSR05 | 1264 |
| 986 | CSR06 | 1271 |
| 983 | CSR06A | 1265 |
| 984 | CSR06B | 1266 |
| 985 | CSR06C | 1270 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|----------|------|
| 987 | CSR06D | 1272 |
| 988 | CSR06E | 1273 |
| 990 | CSR07 | 1275 |
| 991 | CSR08 | 1003 |
| 992 | CSR09 | 1276 |
| 993 | CSR10 | 1300 |
| 989 | CSR12 | 1274 |
| 1255 | CTANNZ | 243 |
| 1256 | CTANNZ2 | 336 |
| 1257 | CTANNZ3 | 337 |
| 1258 | CTANNZ4 | 2110 |
| 1373 | CTANNZW | 343 |
| 1374 | CTANNZW2 | 2112 |
| 1254 | CTANZ | 242 |
| 1360 | CTANZW | 342 |
| 1361 | CTANZW2 | 122 |
| 1362 | CTANZW3 | 123 |
| 1363 | CTANZW3B | 3663 |
| 1976 | CTRAP2 | 4551 |
| 2196 | DATAPREP | 2571 |
| 120 | DEC01 | 553 |
| 156 | DEC03 | 433 |
| 138 | DEC001 | 573 |
| 172 | DEC002 | 533 |
| 1083 | DEP01 | 1131 |
| 1084 | DEP02 | 1430 |
| 1085 | DEP03 | 1052 |
| 1086 | DEP04 | 1432 |
| 1087 | DEP05 | 1434 |
| 1088 | DEP06 | 1053 |
| 1091 | DEP07 | 1437 |
| 1089 | DEP07A | 1435 |
| 1090 | DEP07B | 1436 |
| 1092 | DEP08 | 1440 |
| 1701 | DFRAC | 3675 |
| 1710 | DFRAC10 | 3233 |
| 1711 | DFRAC11 | 3706 |
| 1712 | DFRAC12 | 3707 |
| 1713 | DFRAC13 | 3710 |
| 1714 | DFRAC14 | 3712 |
| 1715 | DFRAC15 | 3714 |
| 1716 | DFRAC16 | 3432 |
| 1717 | DFRAC17 | 3433 |
| 1718 | DFRAC18 | 2427 |
| 1702 | DFRAC2 | 3676 |
| 1703 | DFRAC3 | 3700 |
| 1704 | DFRAC4 | 3701 |
| 1705 | DFRAC5 | 3702 |
| 1706 | DFRAC6 | 3703 |
| 1707 | DFRAC7 | 3704 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 1708 | DFRAC8 | 3705 |
| 1709 | DFRAC9 | 3232 |
| 1724 | DFRACADD | 2324 |
| 1725 | DFRACADD2 | 2563 |
| 1726 | DFRACADD3 | 2432 |
| 1727 | DFRACADD4 | 2562 |
| 1728 | DFRACADD5 | 2434 |
| 1719 | DFRACSUB | 2325 |
| 1720 | DFRACSUB2 | 2373 |
| 1721 | DFRACSUB3 | 2430 |
| 1722 | DFRACSUB4 | 2372 |
| 1723 | DFRACSUB5 | 2431 |
| 1104 | DIAG01 | 1141 |
| 1105 | DIAG02 | 1454 |
| 1106 | DIAG03 | 1456 |
| 1107 | DIAG04 | 1512 |
| 1108 | DIAG05 | 1513 |
| 1583 | DIFDFGSF | 4647 |
| 1579 | DIFP | 4333 |
| 1585 | DIFSFGDF | 4646 |
| 1054 | DIS01 | 1161 |
| 1056 | DIS02 | 1375 |
| 1057 | DIS03 | 1376 |
| 1055 | DIS04 | 1374 |
| 1058 | DIS06 | 1400 |
| 1989 | DISA8 | 4515 |
| 485 | DISP01 | 1134 |
| 486 | DISP02 | 1001 |
| 487 | DISP03 | 1211 |
| 488 | DISP04 | 1213 |
| 489 | DISP05 | 1136 |
| 2334 | DIV01 | 1617 |
| 2335 | DIV01B | 1630 |
| 2336 | DIV02 | 1631 |
| 2337 | DIV03 | 1632 |
| 2338 | DIV04 | 1633 |
| 2339 | DIV05 | 1540 |
| 2340 | DIV06 | 1541 |
| 2341 | DIV07 | 1542 |
| 2342 | DIV08 | 1543 |
| 2343 | DIV09 | 1545 |
| 2344 | DIV10 | 1547 |
| 2345 | DIV11 | 1561 |
| 2346 | DIV12 | 1563 |
| 2347 | DIV13 | 1634 |
| 2348 | DIV14 | 1635 |
| 2349 | DIV15 | 1565 |
| 2350 | DIV16 | 1567 |
| 2351 | DIV17 | 1640 |
| 2352 | DIV18 | 1570 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|----------|------|
| 2353 | DIV19 | 1571 |
| 2354 | DIV20 | 1641 |
| 2355 | DIV21 | 1521 |
| 2356 | DIV22 | 1523 |
| 2357 | DIV23 | 1644 |
| 2358 | DIV24 | 1525 |
| 2359 | DIV25 | 1527 |
| 2360 | DIV26 | 1645 |
| 2361 | DIV27 | 1650 |
| 2362 | DIV28 | 1530 |
| 2363 | DIV29 | 1531 |
| 2364 | DIV30 | 1532 |
| 2365 | DIV31 | 1533 |
| 2366 | DIV32 | 1572 |
| 2367 | DIV33 | 1652 |
| 2368 | DIV34 | 1535 |
| 2369 | DIV35 | 1537 |
| 2370 | DIV36 | 1654 |
| 2371 | DIV37 | 1573 |
| 2372 | DIV38 | 1656 |
| 2373 | DIV39 | 647 |
| 1693 | DIVFDW10 | 3671 |
| 1694 | DIVFDW11 | 3672 |
| 1695 | DIVFDW12 | 3673 |
| 1696 | DIVFDW13 | 3674 |
| 1697 | DIVFDW14 | 2326 |
| 1698 | DIVFDW15 | 2327 |
| 1699 | DIVFDW16 | 2425 |
| 1700 | DIVFDW17 | 2426 |
| 1685 | DIVFDW2 | 546 |
| 1686 | DIVFDW3 | 547 |
| 1687 | DIVFDW4 | 2422 |
| 1688 | DIVFDW5 | 2424 |
| 1689 | DIVFDW6 | 2354 |
| 1690 | DIVFDW7 | 2355 |
| 1691 | DIVFDW8 | 2356 |
| 1692 | DIVFDW9 | 2357 |
| 1284 | DIVNZ | 263 |
| 1684 | DIVNZW | 363 |
| 1283 | DIVZ | 262 |
| 1683 | DIVZW | 362 |
| 2206 | DPREP10 | 2610 |
| 2207 | DPREP11 | 2611 |
| 2208 | DPREP12 | 2612 |
| 2209 | DPREP13 | 2614 |
| 2210 | DPREP14 | 2615 |
| 2211 | DPREP15 | 2616 |
| 2212 | DPREP16 | 2620 |
| 2197 | DPREP2 | 2572 |
| 2198 | DPREP28 | 2574 |

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| | | |
|------|---------|------|
| 2199 | DPREP3 | 2575 |
| 2200 | DPREP4 | 2600 |
| 2201 | DPREP5 | 2601 |
| 2202 | DPREP6 | 2602 |
| 2203 | DPREP7 | 2604 |
| 2204 | DPREP8 | 2605 |
| 2205 | DPREP9 | 2606 |
| 1041 | DSR01 | 1163 |
| 1043 | DSR02 | 1361 |
| 1042 | DSR02A | 1360 |
| 1044 | DSR03 | 1352 |
| 39 | DST01 | 511 |
| 40 | DST02 | 512 |
| 41 | DST03 | 513 |
| 42 | DST04 | 514 |
| 43 | DST05 | 515 |
| 44 | DST06 | 516 |
| 45 | DST07 | 517 |
| 53 | DST08 | 11 |
| 54 | DST09 | 14 |
| 46 | DST11 | 741 |
| 47 | DST12 | 742 |
| 48 | DST13 | 743 |
| 49 | DST14 | 744 |
| 50 | DST15 | 745 |
| 51 | DST16 | 746 |
| 52 | DST17 | 747 |
| 57 | DST19 | 526 |
| 58 | DST20 | 527 |
| 55 | DST21 | 524 |
| 56 | DST22 | 525 |
| 71 | DST23 | 34 |
| 66 | DST24 | 31 |
| 72 | DST25 | 642 |
| 73 | DST26 | 643 |
| 67 | DST27 | 762 |
| 68 | DST28 | 763 |
| 59 | DST29 | 15 |
| 60 | DST30 | 20 |
| 61 | DST35 | 22 |
| 62 | DST36 | 24 |
| 63 | DST38 | 645 |
| 64 | DST39 | 25 |
| 65 | DST40 | 30 |
| 69 | DST41 | 400 |
| 70 | DST42 | 410 |
| 2329 | DTOFCC1 | 2731 |
| 2330 | DTOFCC2 | 2732 |
| 2331 | EIS01 | 42 |
| 2332 | EIS02 | 1627 |

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| | | |
|------|---------|------|
| 351 | EMT01 | 55 |
| 519 | EOE01 | 1433 |
| 520 | EOE02 | 1204 |
| 521 | EOE03 | 1206 |
| 1113 | E0S01 | 1462 |
| 1114 | E0S02 | 1463 |
| 1115 | E0S03 | 1464 |
| 1116 | E0S03A | 1465 |
| 1118 | E0S04 | 1472 |
| 1119 | E0S04A | 1471 |
| 1120 | E0S04B | 1611 |
| 1121 | E0S04C | 1613 |
| 1122 | E0S05 | 1473 |
| 1123 | E0S06 | 1474 |
| 1124 | E0S07 | 1006 |
| 1125 | E0S07A | 1007 |
| 1126 | E0S08 | 1475 |
| 1127 | E0S09 | 1500 |
| 1128 | E0S10 | 1502 |
| 1129 | E0S11 | 1504 |
| 1130 | E0S12 | 1062 |
| 1131 | E0S13 | 1063 |
| 1111 | E0S1A | 1460 |
| 1112 | E0S1B | 1461 |
| 1117 | E0S3B | 1470 |
| 558 | ETRP01 | 1244 |
| 559 | ETRP02 | 1245 |
| 560 | ETRP03 | 1246 |
| 561 | ETRP04 | 1247 |
| 562 | ETRP05 | 1250 |
| 563 | ETRP06 | 1252 |
| 1059 | EXM01 | 1137 |
| 1060 | EXM02 | 1401 |
| 1061 | EXM03 | 1042 |
| 1062 | EXM04 | 1402 |
| 1063 | EXM05 | 1403 |
| 1065 | EXM06 | 1043 |
| 1066 | EXM07 | 1405 |
| 1064 | EXM07A | 1404 |
| 1067 | EXM08 | 1406 |
| 1068 | EXM09 | 1410 |
| 1069 | EXM10 | 1411 |
| 2213 | EXPTST | 2621 |
| 2214 | EXPTST2 | 2622 |
| 2215 | EXPTST3 | 2624 |
| 2216 | EXPTST4 | 2625 |
| 2217 | EXPTST5 | 2541 |
| 2218 | EXPTST6 | 2543 |
| 1192 | FASTX1 | 41 |
| 2325 | FCCHEX0 | 2030 |

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| | | |
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| 2326 | FCCHX1 | 2031 |
| 2327 | FCCHX2 | 2032 |
| 2328 | FCCHX3 | 2033 |
| 2219 | FD-TOGGLE | 1623 |
| 2067 | FDMOFLT | 4351 |
| 2068 | FDMOFLT2 | 4563 |
| 2069 | FDMOFLT3 | 4655 |
| 2070 | FDMOFLT4 | 4562 |
| 2011 | FDMOINT | 2050 |
| 2012 | FDM1INT | 2051 |
| 2013 | FDM2INT | 2052 |
| 2014 | FDM3INT | 2053 |
| 2015 | FDM4INT | 2054 |
| 2016 | FDM5INT | 2055 |
| 2146 | FDM67FLT | 4363 |
| 2147 | FDM67FLT2 | 4652 |
| 2148 | FDM67FLT3 | 4653 |
| 2017 | FDM6INT | 2056 |
| 2018 | FDM7INT | 2057 |
| 1634 | FDST2SC | 4311 |
| 1636 | FDST2SCD1 | 4527 |
| 1637 | FDST2SCD2 | 4315 |
| 1638 | FDST2SCD3 | 4320 |
| 1635 | FDST2SCF1 | 4314 |
| 1639 | FDST2SCF2 | 4526 |
| 1640 | FDST2SCF3 | 4321 |
| 2220 | FDTGL2 | 1624 |
| 2221 | FDTGL3 | 1625 |
| 2222 | FDTGL4 | 1626 |
| 1 | FETO1 | 702 |
| 1316 | FETO1F | 4722 |
| 1315 | FETO1F2 | 4233 |
| 2 | FETO2 | 1 |
| 3 | FETO3 | 700 |
| 2033 | FETCH | 2171 |
| 2034 | FETCH2 | 2564 |
| 2035 | FETCH3 | 2565 |
| 2039 | FETCHFLT | 4614 |
| 2060 | FETCHFLT2 | 4651 |
| 2009 | FETCHINT | 2550 |
| 2043 | FETCHINTLG | 4624 |
| 2097 | FFLT1 | 4203 |
| 2106 | FFLT10 | 4704 |
| 2107 | FFLT11 | 4705 |
| 2108 | FFLT12 | 4242 |
| 2109 | FFLT13 | 4706 |
| 2110 | FFLT14 | 4710 |
| 2111 | FFLT15 | 4316 |
| 2112 | FFLT16 | 4243 |
| 2113 | FFLT17 | 4276 |

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|------|------------|------|
| 2114 | FFLT18 | 4277 |
| 2098 | FFLT2 | 4701 |
| 2099 | FFLT3 | 4066 |
| 2100 | FFLT4 | 4702 |
| 2101 | FFLT5 | 4552 |
| 2102 | FFLT6 | 4553 |
| 2103 | FFLT7 | 4067 |
| 2104 | FFLT8 | 4102 |
| 2105 | FFLT9 | 4103 |
| 2040 | FFLTDEFER | 4616 |
| 2162 | FFLTMM | 4463 |
| 2163 | FFLTMM2 | 4272 |
| 2164 | FFLTMM3 | 4273 |
| 2165 | FFLTMM4 | 4737 |
| 2166 | FFLTMM5 | 4302 |
| 2167 | FFLTMM6 | 4303 |
| 2168 | FFLTMM7 | 4740 |
| 2096 | FFLTSYNC | 4201 |
| 2144 | FFLTSYNC2 | 4361 |
| 2161 | FFLTSYNC3 | 4461 |
| 890 | FGI01 | 3117 |
| 891 | FGI02 | 3511 |
| 892 | FGI03 | 3513 |
| 893 | FGI04 | 3474 |
| 1962 | FINISH | 2542 |
| 1963 | FINISH2 | 3734 |
| 1964 | FINISH3 | 3735 |
| 1965 | FINISH4 | 3740 |
| 1966 | FINISH5 | 3551 |
| 1967 | FINISH6 | 3553 |
| 1968 | FINISH7 | 3555 |
| 2044 | FINTLG2 | 4663 |
| 2045 | FINTLG3 | 4667 |
| 2046 | FINTLG4 | 4625 |
| 2047 | FINTLG5 | 4630 |
| 1191 | FIS01 | 43 |
| 564 | FLG01 | 1254 |
| 565 | FLG02 | 1255 |
| 566 | FLG03 | 1256 |
| 567 | FLG04 | 1257 |
| 569 | FLGC01 | 1261 |
| 570 | FLGC02 | 1262 |
| 568 | FLGS01 | 1260 |
| 2006 | FLTPTRAP | 4025 |
| 2007 | FLTPTRAP2 | 4612 |
| 2176 | FPPABORT1 | 4211 |
| 2185 | FPPABORT10 | 4741 |
| 2186 | FPPABORT11 | 4742 |
| 2177 | FPPABORT2 | 4213 |
| 2178 | FPPABORT3 | 4215 |

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| | | |
|------|------------|------|
| 2179 | FPPABORT4 | 4371 |
| 2180 | FPPABORT5 | 4373 |
| 2181 | FPPABORT6 | 4375 |
| 2182 | FPPABORT7 | 4471 |
| 2183 | FPPABORT8 | 4473 |
| 2184 | FPPABORT9 | 4475 |
| 1331 | FPPMAINT1 | 224 |
| 1332 | FPPMAINT2 | 225 |
| 1334 | FPPMAINT3 | 227 |
| 2151 | FS2DMOFLT | 4170 |
| 2152 | FS2DM1FLT | 4171 |
| 2153 | FS2DM2FLT | 4172 |
| 2154 | FS2DM3FLT | 4173 |
| 2155 | FS2DM4FLT | 4174 |
| 2156 | FS2DM4FLT2 | 4735 |
| 2157 | FS2DM4FLT3 | 4736 |
| 2158 | FS2DM5FLT | 4175 |
| 2159 | FS2DM6FLT | 4176 |
| 2160 | FS2DM7FLT | 4177 |
| 2062 | FSDMOFLT | 4160 |
| 2063 | FSDMOFLT2 | 4606 |
| 2064 | FSDMOFLT3 | 4347 |
| 2065 | FSDMOFLT4 | 4346 |
| 2066 | FSDMOFLT5 | 4607 |
| 2075 | FSDM1FLT | 4161 |
| 2076 | FSDM2FLT | 4162 |
| 2077 | FSDM3FLT | 4163 |
| 2078 | FSDM3FLT2 | 4661 |
| 2079 | FSDM3FLT3 | 4662 |
| 2027 | FSDM3INT | 2554 |
| 2028 | FSDM3INT2 | 2555 |
| 2080 | FSDM4FLT | 4164 |
| 2081 | FSDM4FLT2 | 4664 |
| 2082 | FSDM4FLT3 | 4246 |
| 2083 | FSDM4FLT4 | 4247 |
| 2084 | FSDM5FLT | 4165 |
| 2085 | FSDM5FLT2 | 4665 |
| 2086 | FSDM5FLT3 | 4666 |
| 2087 | FSDM5FLT4 | 4670 |
| 2029 | FSDM5INT | 2560 |
| 2088 | FSDM6FLT | 4166 |
| 2089 | FSDM6FLT2 | 4671 |
| 2090 | FSDM6FLT3 | 4336 |
| 2030 | FSDM6INT | 2561 |
| 2031 | FSDM6INT2 | 2336 |
| 2091 | FSDM7FLT | 4167 |
| 2092 | FSDM7FLT2 | 4337 |
| 2093 | FSDM7FLT3 | 4674 |
| 2094 | FSDM7FLT4 | 4675 |
| 2095 | FSDM7FLT5 | 4700 |

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| | | |
|------|------------|------|
| 2032 | FSDM7INT | 2337 |
| 345 | HALT01 | 74 |
| 346 | HALT02 | 132 |
| 347 | HALT03 | 133 |
| 1235 | HFORK | 475 |
| 1236 | HFORKNVALD | 477 |
| 868 | HFPINIT | 3017 |
| 1301 | HFPSPVC | 1663 |
| 1302 | HFPSPVC2 | 1610 |
| 1303 | HFPSPVC3 | 4202 |
| 1304 | HFPSPVC4 | 4204 |
| 1305 | HFPSPVC5 | 4206 |
| 1306 | HFPSPVC6 | 4210 |
| 1307 | HFPSPVC7 | 4626 |
| 1308 | HFPSTRAP | 4627 |
| 1309 | HFPSTRAP2 | 4231 |
| 1310 | HFPSTRAP3 | 4212 |
| 1311 | HFPSTRAP4 | 4214 |
| 1312 | HFPSTRAP5 | 4216 |
| 1313 | HFPSTRAP6 | 4220 |
| 1314 | HFPSTRAP7 | 4222 |
| 1029 | HLT01 | 1032 |
| 1030 | HLT02 | 1344 |
| 1031 | HLT03 | 1345 |
| 1032 | HLT04 | 1346 |
| 1034 | HLT05 | 1351 |
| 1033 | HLT05A | 1350 |
| 1996 | HOTDIS | 4447 |
| 1292 | HOTDMOSYNC | 165 |
| 1297 | HOTSYNC | 4565 |
| 1298 | HOTSYNC2 | 4567 |
| 1299 | HOTSYNC3 | 4575 |
| 1300 | HOTSYNC4 | 4577 |
| 1293 | HTDMOSYNC2 | 167 |
| 1294 | HTDMOSYNC3 | 175 |
| 1295 | HTDMOSYNC4 | 177 |
| 1296 | HTDMOSYNC5 | 457 |
| 584 | IA01 | 1055 |
| 585 | IA05 | 2035 |
| 586 | IA06 | 2145 |

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| | | |
|-----|--------|------|
| 610 | IA07 | 3120 |
| 611 | IA08 | 3122 |
| 612 | IA09 | 3123 |
| 613 | IA10 | 3121 |
| 598 | IA100 | 3055 |
| 599 | IA101 | 3056 |
| 600 | IA102 | 3057 |
| 601 | IA103 | 3062 |
| 614 | IA11 | 3130 |
| 681 | IA110 | 3221 |
| 682 | IA111 | 3225 |
| 683 | IA112A | 3231 |
| 685 | IA113 | 3242 |
| 684 | IA113B | 3236 |
| 691 | IA114 | 3263 |
| 686 | IA114B | 3244 |
| 687 | IA114C | 3246 |
| 688 | IA114D | 3250 |
| 689 | IA114E | 3251 |
| 690 | IA114F | 3262 |
| 692 | IA115 | 3411 |
| 693 | IA115A | 3264 |
| 696 | IA115C | 3273 |
| 694 | IA115D | 3266 |
| 695 | IA115E | 3272 |
| 697 | IA116 | 3413 |
| 615 | IA12 | 3132 |
| 616 | IA13 | 3133 |
| 617 | IA14 | 3131 |
| 679 | IA15 | 3100 |
| 618 | IA16 | 3000 |
| 619 | IA17 | 3002 |
| 620 | IA18 | 3003 |
| 621 | IA19 | 3001 |
| 622 | IA20 | 3010 |
| 587 | IA207 | 2346 |
| 588 | IA207A | 2040 |
| 589 | IA207B | 2351 |
| 590 | IA207C | 2353 |
| 591 | IA208 | 2041 |
| 592 | IA209 | 2044 |
| 640 | IA21 | 3030 |
| 593 | IA210 | 2045 |
| 594 | IA211 | 2046 |
| 595 | IA212 | 2047 |
| 597 | IA213 | 2065 |
| 596 | IA213A | 2064 |
| 603 | IA216 | 3065 |
| 604 | IA217 | 3066 |
| 606 | IA218 | 3072 |

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| | | |
|-----|--------|------|
| 605 | IA218A | 3067 |
| 607 | IA219 | 3102 |
| 642 | IA22 | 3031 |
| 608 | IA220 | 2147 |
| 609 | IA221 | 2347 |
| 641 | IA22A | 3032 |
| 643 | IA24 | 3146 |
| 645 | IA25 | 3152 |
| 644 | IA25A | 3147 |
| 646 | IA26 | 3154 |
| 648 | IA27 | 3156 |
| 647 | IA27A | 3155 |
| 649 | IA28 | 3162 |
| 650 | IA29 | 3165 |
| 651 | IA30 | 3167 |
| 652 | IA31 | 3245 |
| 653 | IA32 | 3247 |
| 654 | IA33 | 3033 |
| 655 | IA34 | 3134 |
| 656 | IA34A | 3163 |
| 657 | IA34C | 3164 |
| 658 | IA34D | 3166 |
| 659 | IA34E | 3172 |
| 660 | IA34F | 3173 |
| 661 | IA34G | 3174 |
| 662 | IA38 | 3135 |
| 663 | IA38A | 3176 |
| 664 | IA38C | 3531 |
| 665 | IA38D | 3533 |
| 666 | IA38E | 3201 |
| 667 | IA38G | 3202 |
| 668 | IA39 | 3040 |
| 669 | IA39B | 3203 |
| 670 | IA39C | 3206 |
| 671 | IA39D | 3212 |
| 672 | IA40 | 3041 |
| 673 | IA41 | 3050 |
| 674 | IA41B | 3215 |
| 602 | IA50A | 3063 |
| 626 | IA60 | 3070 |
| 627 | IA60A | 3103 |
| 628 | IA60B | 3106 |
| 632 | IA60D | 3476 |
| 630 | IA60E | 3477 |
| 629 | IA60F | 3107 |
| 631 | IA60H | 3112 |
| 633 | IA65 | 3104 |
| 634 | IA66A | 3113 |
| 635 | IA67 | 3126 |
| 636 | IA68 | 3127 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|----------|------|
| 637 | IA69 | 3521 |
| 638 | IA70 | 3523 |
| 625 | IA76 | 3015 |
| 639 | IA78 | 3105 |
| 675 | IA85 | 3051 |
| 676 | IA86 | 3060 |
| 677 | IA87 | 3061 |
| 678 | IA87A | 3216 |
| 680 | IA89 | 3101 |
| 624 | IA90 | 3014 |
| 623 | IA99 | 3011 |
| 541 | IIA10 | 1226 |
| 542 | IIA11 | 1227 |
| 543 | IIA12 | 1230 |
| 544 | IIA13 | 1203 |
| 533 | IIAA01 | 1325 |
| 534 | IIAA02 | 1220 |
| 535 | IIAA03 | 1201 |
| 537 | IIAA04 | 1173 |
| 536 | IIAA05 | 1172 |
| 538 | IIAA06 | 1222 |
| 539 | IIAA07 | 1224 |
| 540 | IIAA08 | 1225 |
| 352 | ILLO1 | 650 |
| 1321 | ILLEGAL1 | 313 |
| 1322 | ILLEGAL2 | 315 |
| 1323 | ILLEGAL3 | 317 |
| 1344 | ILLEIGHT | 237 |
| 1341 | ILLFIVE | 234 |
| 1340 | ILLFOUR | 233 |
| 1343 | ILLSEVEN | 236 |
| 1342 | ILLSIX | 235 |
| 1335 | ILLTHREE | 230 |
| 1333 | ILLTWO | 226 |
| 119 | INCO1 | 552 |
| 155 | INCO3 | 432 |
| 137 | INCB01 | 572 |
| 171 | INCB02 | 532 |
| 834 | INIT00 | 3420 |
| 835 | INIT01 | 3412 |
| 836 | INIT02 | 3421 |
| 837 | INIT03 | 3422 |
| 838 | INIT04 | 3016 |
| 839 | INIT05 | 3423 |
| 840 | INIT06 | 3076 |
| 841 | INIT07 | 3424 |
| 842 | INIT08 | 3116 |
| 843 | INIT09 | 3425 |
| 844 | INIT10 | 3136 |
| 845 | INIT11 | 3035 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 846 | INIT12 | 3153 |
| 847 | INIT13 | 3426 |
| 848 | INIT14 | 3427 |
| 849 | INIT15 | 3175 |
| 850 | INIT16 | 3213 |
| 852 | INIT17 | 3527 |
| 851 | INIT17A | 3430 |
| 853 | INIT18 | 3431 |
| 854 | INIT19 | 3547 |
| 855 | INIT20 | 3434 |
| 856 | INIT21 | 3327 |
| 857 | INIT22 | 3435 |
| 860 | INIT23 | 3442 |
| 858 | INIT23A | 3440 |
| 859 | INIT23B | 3441 |
| 861 | INIT24 | 3256 |
| 862 | INIT25 | 3275 |
| 863 | INIT26 | 3313 |
| 864 | INIT27 | 3347 |
| 865 | INIT28 | 3443 |
| 866 | INIT29 | 3667 |
| 867 | INIT30 | 3677 |
| 1078 | INT01 | 1133 |
| 1079 | INT02 | 1422 |
| 1080 | INT03 | 1424 |
| 1081 | INT04 | 1425 |
| 1082 | INT05 | 1426 |
| 389 | INTRO1 | 23 |
| 390 | INTRO1A | 323 |
| 391 | INTRO2 | 324 |
| 392 | INTRO3 | 325 |
| 393 | INTRO4 | 125 |
| 348 | IOTO1 | 64 |
| 402 | JAM01 | 777 |
| 403 | JAM01A | 1020 |
| 404 | JAM01B | 1024 |
| 405 | JAM02 | 1025 |
| 406 | JAM02A | 1036 |
| 407 | JAM02C | 1030 |
| 408 | JAM02D | 1031 |
| 409 | JAM02E | 1034 |
| 410 | JAM03 | 1037 |
| 411 | JAM04 | 3007 |
| 412 | JAM05 | 1057 |
| 420 | JAM06 | 1431 |
| 421 | JAM07 | 1044 |
| 422 | JAM08 | 1045 |
| 423 | JAM09 | 1050 |
| 424 | JAM10 | 1051 |
| 425 | JAM11 | 1054 |

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| | | |
|------|-------------|------|
| 416 | JAM15 | 1205 |
| 417 | JAM16 | 1207 |
| 418 | JAM17 | 1035 |
| 419 | JAM18 | 1041 |
| 415 | JAM25 | 3013 |
| 414 | JAM27 | 3012 |
| 413 | JAM28 | 3611 |
| 1229 | JAMDEF, T01 | 6006 |
| 918 | JAMINIT | 3277 |
| 528 | JCPE01 | 1326 |
| 529 | JCPE02 | 3047 |
| 532 | JDEF01 | 1331 |
| 1226 | JDEF02 | 1605 |
| 1227 | JDEF03 | 1735 |
| 1228 | JDEF04 | 1737 |
| 256 | JMP02 | 651 |
| 257 | JMP03 | 652 |
| 258 | JMP04 | 170 |
| 259 | JMP05 | 653 |
| 260 | JMP06 | 654 |
| 261 | JMP07 | 655 |
| 262 | JMP08 | 171 |
| 263 | JMP09 | 656 |
| 264 | JMP10 | 174 |
| 265 | JMP11 | 101 |
| 266 | JMP12 | 103 |
| 267 | JMP13 | 657 |
| 268 | JMP14 | 176 |
| 269 | JMP15 | 200 |
| 270 | JMP16 | 201 |
| 271 | JMP17 | 202 |
| 272 | JMP18 | 105 |
| 273 | JMP19 | 107 |
| 274 | JMP20 | 503 |
| 275 | JMP21 | 203 |
| 277 | JMP22 | 206 |
| 278 | JMP23 | 501 |
| 276 | JMP24 | 204 |
| 255 | JSR01 | 57 |
| 527 | KT01 | 1324 |
| 1070 | LAD01 | 1135 |
| 1071 | LAD02 | 1412 |
| 1072 | LAD03 | 1413 |
| 1073 | LAD04 | 1414 |
| 1074 | LAD05 | 1415 |
| 1075 | LAD06 | 1416 |
| 1076 | LAD07 | 1420 |
| 1077 | LAD08 | 1421 |
| 2041 | LDCFETCH | 4620 |
| 1291 | LDCP | 277 |

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| | | |
|------|----------|------|
| 1889 | LDCPW1 | 377 |
| 1898 | LDCPW10 | 4107 |
| 1899 | LDCPW11 | 4126 |
| 1900 | LDCPW12 | 4535 |
| 1901 | LDCPW13 | 4536 |
| 1902 | LDCPW14 | 4540 |
| 1903 | LDCPW15 | 2471 |
| 1904 | LDCPW16 | 4127 |
| 1905 | LDCPW17 | 4550 |
| 1890 | LDCPW2 | 2466 |
| 1891 | LDCPW3 | 2470 |
| 1892 | LDCPW4 | 2316 |
| 1893 | LDCPW5 | 2317 |
| 1894 | LDCPW6 | 2545 |
| 1895 | LDCPW7 | 2547 |
| 1896 | LDCPW8 | 4534 |
| 1897 | LDCPW9 | 4106 |
| 1277 | LDCT2 | 1606 |
| 1278 | LDCT3 | 1251 |
| 1279 | LDCT4 | 424 |
| 1280 | LDCT5 | 1253 |
| 1281 | LDCT6 | 425 |
| 1282 | LDCT7 | 426 |
| 1276 | LDCTNZ | 276 |
| 1857 | LDCTNZW | 376 |
| 1866 | LDCTW10 | 4505 |
| 1867 | LDCTW10B | 4510 |
| 1868 | LDCTW11 | 4451 |
| 1869 | LDCTW12 | 4453 |
| 1870 | LDCTW13 | 4455 |
| 1871 | LDCTW14 | 4457 |
| 1872 | LDCTW15 | 4511 |
| 1973 | LDCTW16 | 4443 |
| 1874 | LDCTW17 | 4514 |
| 1875 | LDCTW18 | 4516 |
| 1876 | LDCTW19 | 4520 |
| 1858 | LDCTW2 | 630 |
| 1877 | LDCTW20 | 4762 |
| 1878 | LDCTW21 | 4521 |
| 1879 | LDCTW22 | 4763 |
| 1880 | LDCTW23 | 4524 |
| 1881 | LDCTW24 | 4312 |
| 1882 | LDCTW25 | 4313 |
| 1883 | LDCTW26 | 4525 |
| 1884 | LDCTW27 | 4341 |
| 1885 | LDCTW28 | 4343 |
| 1886 | LDCTW29 | 4530 |
| 1859 | LDCTW3 | 640 |
| 1887 | LDCTW30 | 4531 |
| 1888 | LDCTW31 | 4532 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 1860 | LDCTW4 | 4500 |
| 1861 | LDCTW5 | 4502 |
| 1862 | LDCTW6 | 4712 |
| 1863 | LDCTW7 | 4713 |
| 1864 | LDCTW8 | 4441 |
| 1865 | LDCTW9 | 4504 |
| 1275 | LDCTZ | 275 |
| 1856 | LDCTZW | 375 |
| 1646 | LDDW | 3223 |
| 1647 | LDDW2 | 3666 |
| 1272 | LDEXP | 272 |
| 1845 | LDEXP10 | 3726 |
| 1846 | LDEXP11 | 3405 |
| 1847 | LDEXP12 | 3407 |
| 1848 | LDEXP13 | 3727 |
| 1849 | LDEXP14 | 3332 |
| 1850 | LDEXP15 | 3333 |
| 1851 | LDEXP16 | 3731 |
| 1852 | LDEXP17 | 3052 |
| 1853 | LDEXP18 | 3732 |
| 1854 | LDEXP19 | 3733 |
| 1838 | LDEXP3 | 3715 |
| 1839 | LDEXP4 | 3722 |
| 1840 | LDEXP5 | 3723 |
| 1841 | LDEXP6 | 3140 |
| 1842 | LDEXP7 | 3141 |
| 1843 | LDEXP8 | 3142 |
| 1844 | LDEXP9 | 3143 |
| 1273 | LDEXPDM6 | 273 |
| 1836 | LDEXPDM6W | 373 |
| 1855 | LDEXPHOT | 3053 |
| 1837 | LDEXPNZW | 374 |
| 1274 | LDEXPX | 274 |
| 1835 | LDEXPZW | 372 |
| 1346 | LDFPS | 505 |
| 1347 | LDFPS2 | 472 |
| 1348 | LDFPS3 | 473 |
| 1349 | LDFPS4 | 163 |
| 1350 | LDFPS5 | 500 |
| 1351 | LDFPS6 | 162 |
| 1352 | LDFPS7 | 502 |
| 1353 | LDFPS8 | 504 |
| 1354 | LDFPS9 | 510 |
| 1330 | LDUBRK | 223 |
| 2223 | LEFTSHFSF | 2626 |
| 2234 | LFSHFSF10 | 2617 |
| 2224 | LFSHFSF2 | 2322 |
| 2225 | LFSHFSF2B | 2603 |
| 2226 | LFSHFSF3 | 2323 |
| 2227 | LFSHFSF4 | 2630 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 2228 | LFSHFSF5 | 2631 |
| 2229 | LFSHFSF6 | 2632 |
| 2230 | LFSHFSF7 | 2613 |
| 2231 | LFSHFSF8 | 2467 |
| 2232 | LFSHFSF8B | 2463 |
| 2233 | LFSHFSF9 | 2607 |
| 1251 | LOADNZS | 254 |
| 1650 | LOADNZH | 354 |
| 1651 | LOADNZH2 | 4076 |
| 1652 | LOADNZH3 | 4077 |
| 1653 | LOADNZH3B | 4325 |
| 1654 | LOADNZH4 | 4330 |
| 1655 | LOADNZH5 | 4332 |
| 1249 | LOADSIX | 253 |
| 1250 | LOADSIX2 | 4154 |
| 1648 | LOADSIXW | 353 |
| 1649 | LOADSIXW2 | 4324 |
| 1248 | LOADZ | 252 |
| 1641 | LOADZH | 352 |
| 1642 | LOADZH2 | 172 |
| 1643 | LOADZH2B | 173 |
| 1644 | LOADZH3 | 3665 |
| 1645 | LOADZH4 | 3222 |
| 926 | LOG01 | 3534 |
| 927 | LOG02 | 3535 |
| 928 | LOG02A | 3241 |
| 930 | LOG02B | 3243 |
| 929 | LOG02C | 3252 |
| 932 | LOG02E | 3540 |
| 948 | LOG03 | 3565 |
| 933 | LOG03A | 3541 |
| 931 | LOG03D | 3536 |
| 934 | LOG03F | 3542 |
| 935 | LOG03G | 3543 |
| 936 | LOG03H | 3544 |
| 937 | LOG03I | 3545 |
| 938 | LOG03J | 3546 |
| 939 | LOG03K | 3550 |
| 940 | LOG03L | 3552 |
| 941 | LOG03M | 3554 |
| 942 | LOG03N | 3556 |
| 943 | LOG03O | 3560 |
| 944 | LOG03P | 3561 |
| 945 | LOG03Q | 3562 |
| 946 | LOG03R | 3563 |
| 947 | LOG03S | 3564 |
| 949 | LOG04 | 3566 |
| 950 | LOG15 | 3567 |
| 951 | LOG16 | 3570 |
| 952 | LOG17 | 3571 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 953 | LOG18 | 3572 |
| 960 | LOG19 | 3605 |
| 954 | LOG19A | 3573 |
| 955 | LOG19B | 3574 |
| 956 | LOG19C | 3576 |
| 957 | LOG19D | 3600 |
| 958 | LOG19E | 3602 |
| 959 | LOG19F | 3604 |
| 961 | LOG20 | 3606 |
| 962 | LOG21 | 3607 |
| 963 | LOG22 | 3610 |
| 964 | LOG23 | 3612 |
| 965 | LOG24A | 3614 |
| 966 | LOG24B | 3616 |
| 967 | LOG24C | 3617 |
| 968 | LOG24D | 3620 |
| 969 | LOG24E | 3621 |
| 970 | LOG24F | 3622 |
| 971 | LOG24G | 3623 |
| 972 | LOG25 | 3253 |
| 973 | LOG25A | 3624 |
| 974 | LOG27 | 3625 |
| 975 | LOG28 | 3626 |
| 976 | LOG29 | 3630 |
| 977 | LOG30 | 3401 |
| 978 | LOG31 | 3403 |
| 979 | LOG31A | 3631 |
| 1045 | LSR01 | 1165 |
| 1047 | LSR02 | 1364 |
| 1046 | LSR02A | 1363 |
| 1048 | LSR03 | 1365 |
| 1049 | LSR04 | 1366 |
| 1050 | LSR05 | 1370 |
| 1051 | LSR06 | 1371 |
| 1052 | LSR07 | 1372 |
| 1053 | LSR08 | 1373 |
| 1987 | MAINTTRAP | 4547 |
| 333 | MARK00 | 51 |
| 334 | MARK01 | 303 |
| 335 | MARK02 | 4104 |
| 336 | MARK03 | 4105 |
| 337 | MARK04 | 4110 |
| 698 | MED01 | 333 |
| 699 | MED02 | 3274 |
| 700 | MED03 | 3276 |
| 701 | MED04 | 3302 |
| 702 | MED05 | 3303 |
| 703 | MED06 | 3306 |
| 705 | MED10 | 3312 |
| 704 | MED10A | 3307 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|-----|--------|------|
| 706 | MED11 | 3316 |
| 707 | MED12A | 3322 |
| 708 | MED12B | 3323 |
| 709 | MED12C | 3601 |
| 710 | MED12D | 3603 |
| 711 | MED13 | 3324 |
| 712 | MED14 | 3325 |
| 713 | MED14A | 3326 |
| 714 | MED15 | 3336 |
| 715 | MED16 | 3342 |
| 716 | MED17 | 3207 |
| 717 | MED18 | 3205 |
| 719 | MED19 | 3637 |
| 718 | MED19A | 2066 |
| 720 | MED20 | 3265 |
| 807 | MED200 | 3720 |
| 808 | MED201 | 3721 |
| 816 | MED202 | 3355 |
| 817 | MED203 | 3373 |
| 818 | MED204 | 3376 |
| 809 | MED205 | 3340 |
| 810 | MED206 | 3366 |
| 811 | MED207 | 3367 |
| 812 | MED208 | 3725 |
| 813 | MED209 | 3730 |
| 721 | MED21 | 3267 |
| 729 | MED22 | 3004 |
| 730 | MED22A | 3636 |
| 731 | MED23 | 3200 |
| 732 | MED23A | 2070 |
| 733 | MED24 | 3204 |
| 734 | MED24A | 3635 |
| 735 | MED25 | 3020 |
| 736 | MED25A | 2071 |
| 737 | MED26 | 3024 |
| 738 | MED26A | 3716 |
| 739 | MED26B | 3717 |
| 740 | MED27 | 3210 |
| 741 | MED27A | 2074 |
| 742 | MED28 | 3034 |
| 743 | MED28A | 3736 |
| 744 | MED28B | 3737 |
| 745 | MED29 | 3214 |
| 746 | MED29A | 2076 |
| 747 | MED30 | 3220 |
| 748 | MED30A | 3633 |
| 749 | MED31 | 3044 |
| 750 | MED31A | 2100 |
| 751 | MED32 | 3224 |
| 752 | MED32A | 3627 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|-----|--------|------|
| 753 | MED33 | 3230 |
| 754 | MED33A | 2101 |
| 755 | MED34 | 3054 |
| 756 | MED34A | 3436 |
| 757 | MED34B | 3437 |
| 758 | MED35 | 3234 |
| 759 | MED35A | 2104 |
| 760 | MED36 | 3240 |
| 761 | MED36A | 3416 |
| 762 | MED36B | 3417 |
| 763 | MED37 | 3064 |
| 764 | MED37A | 2105 |
| 765 | MED38 | 3364 |
| 766 | MED39 | 3365 |
| 767 | MED40 | 3074 |
| 768 | MED41 | 3075 |
| 769 | MED42 | 3144 |
| 770 | MED43 | 3145 |
| 771 | MED44 | 3150 |
| 772 | MED45 | 3151 |
| 773 | MED46 | 3254 |
| 774 | MED47 | 3255 |
| 775 | MED48 | 3260 |
| 776 | MED49 | 3261 |
| 777 | MED50 | 3270 |
| 778 | MED51 | 3271 |
| 779 | MED52 | 3300 |
| 780 | MED53 | 3301 |
| 781 | MED54 | 3304 |
| 782 | MED55 | 3305 |
| 783 | MED56 | 3310 |
| 784 | MED57 | 3311 |
| 785 | MED58 | 3314 |
| 786 | MED59 | 3315 |
| 787 | MED60 | 3330 |
| 788 | MED61 | 3331 |
| 789 | MED62 | 3334 |
| 790 | MED63 | 3335 |
| 791 | MED64 | 3370 |
| 792 | MED65 | 3371 |
| 793 | MED66 | 3374 |
| 794 | MED67 | 3375 |
| 795 | MED68 | 3360 |
| 796 | MED69 | 3361 |
| 797 | MED70 | 3160 |
| 798 | MED71 | 3161 |
| 799 | MED71A | 3356 |
| 800 | MED71B | 3362 |
| 801 | MED71C | 3363 |
| 802 | MED72 | 3170 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|---------|------|
| 803 | MED73 | 3171 |
| 805 | MED74 | 3320 |
| 804 | MED74A | 3321 |
| 806 | MED75 | 3341 |
| 814 | MED76 | 3344 |
| 815 | MED76A | 3372 |
| 819 | MED77 | 3351 |
| 820 | MED78 | 3377 |
| 821 | MED79 | 3354 |
| 822 | MED79A | 3400 |
| 823 | MED79B | 3402 |
| 824 | MED79C | 3404 |
| 825 | MED80 | 3724 |
| 826 | MED81 | 3406 |
| 827 | MED82 | 3350 |
| 828 | MED83 | 3410 |
| 833 | MED84 | 3345 |
| 722 | MED85 | 3343 |
| 723 | MEDX1 | 3346 |
| 724 | MEDX2 | 3352 |
| 725 | MEDZ1 | 3005 |
| 726 | MEDZ2 | 3353 |
| 727 | MEDZ3 | 3506 |
| 728 | MEDZ4 | 3507 |
| 571 | MFAT00 | 53 |
| 573 | MFAT02 | 2004 |
| 574 | MFAT03 | 2005 |
| 575 | MFAT04 | 2020 |
| 576 | MFAT05 | 2022 |
| 577 | MFAT09 | 2024 |
| 578 | MFAT10 | 2521 |
| 580 | MFAT11 | 2523 |
| 581 | MFAT12 | 2026 |
| 582 | MFAT14 | 2027 |
| 583 | MFAT15 | 2034 |
| 579 | MFAT17 | 2025 |
| 572 | MFIX00 | 331 |
| 1433 | MFRAC | 2253 |
| 1443 | MFRAC10 | 2220 |
| 1444 | MFRAC11 | 2224 |
| 1445 | MFRAC12 | 2225 |
| 1446 | MFRAC13 | 2226 |
| 1447 | MFRAC14 | 2221 |
| 1448 | MFRAC15 | 2227 |
| 1449 | MFRAC16 | 2230 |
| 1450 | MFRAC17 | 2231 |
| 1435 | MFRAC2 | 2204 |
| 1436 | MFRAC3 | 2205 |
| 1437 | MFRAC4 | 2206 |
| 1438 | MFRAC5 | 2207 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 1439 | MFRAC6 | 2210 |
| 1440 | MFRAC7 | 2212 |
| 1441 | MFRAC8 | 2214 |
| 1442 | MFRAC9 | 2215 |
| 1434 | MFRACD | 2403 |
| 1451 | MFRACF | 2402 |
| 1461 | MFRACF10 | 2244 |
| 1462 | MFRACF11 | 2245 |
| 1463 | MFRACF12 | 2623 |
| 1464 | MFRACF12B | 2627 |
| 1465 | MFRACF13 | 2246 |
| 1466 | MFRACF14 | 2250 |
| 1467 | MFRACF15 | 2251 |
| 1468 | MFRACF16 | 2252 |
| 1469 | MFRACF17 | 2254 |
| 1470 | MFRACF18 | 2255 |
| 1471 | MFRACF19 | 2256 |
| 1452 | MFRACF2 | 2234 |
| 1472 | MFRACF20 | 2260 |
| 1473 | MFRACF21 | 2262 |
| 1474 | MFRACF21B | 2264 |
| 1475 | MFRACF22 | 2265 |
| 1476 | MFRACF23 | 2266 |
| 1477 | MFRACF24 | 2267 |
| 1478 | MFRACF25 | 2270 |
| 1453 | MFRACF28 | 1615 |
| 1454 | MFRACF3 | 1616 |
| 1455 | MFRACF4 | 1620 |
| 1456 | MFRACF5 | 1621 |
| 1457 | MFRACF6 | 2235 |
| 1458 | MFRACF7 | 2240 |
| 1459 | MFRACF8 | 2241 |
| 1460 | MFRACF9 | 2242 |
| 2395 | MLOOP2 | 1714 |
| 2396 | MLOOP3 | 1636 |
| 2397 | MLOOP4 | 1637 |
| 2398 | MLOOP5 | 1642 |
| 2399 | MLOOP6 | 1643 |
| 2400 | MLOOP7 | 1646 |
| 2401 | MLOOP8 | 1647 |
| 895 | MMROINIT | 3037 |
| 1260 | MOD | 247 |
| 1489 | MOD10W | 2302 |
| 1490 | MOD11W | 2304 |
| 1491 | MOD12W | 2305 |
| 1492 | MOD13W | 2062 |
| 1493 | MOD14W | 2072 |
| 1494 | MOD15W | 2073 |
| 1495 | MOD16W | 2211 |
| 1496 | MOD17W | 2310 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-------------|------|
| 1497 | MOD1CLSS | 2060 |
| 1506 | MOD1CLSS10 | 2321 |
| 1507 | MOD1CLSS11 | 2306 |
| 1508 | MOD1CLSS12 | 2307 |
| 1509 | MOD1CLSS13 | 2330 |
| 1510 | MOD1CLSS14 | 2331 |
| 1511 | MOD1CLSS15 | 2334 |
| 1512 | MOD1CLSS16 | 2335 |
| 1513 | MOD1CLSS17 | 2340 |
| 1514 | MOD1CLSS18 | 2332 |
| 1515 | MOD1CLSS19 | 2333 |
| 1498 | MOD1CLSS2 | 2312 |
| 1499 | MOD1CLSS3 | 2314 |
| 1500 | MOD1CLSS4 | 2301 |
| 1501 | MOD1CLSS5 | 2315 |
| 1502 | MOD1CLSS6 | 2303 |
| 1503 | MOD1CLSS7 | 2320 |
| 1504 | MOD1CLSS8 | 2716 |
| 1505 | MOD1CLSS9 | 2717 |
| 1516 | MOD2CLSS | 2021 |
| 1530 | MOD3CLSS108 | 2477 |
| 1517 | MOD3CLSS | 2023 |
| 1529 | MOD3CLSS10 | 2476 |
| 1531 | MOD3CLSS11 | 2364 |
| 1532 | MOD3CLSS12 | 2365 |
| 1533 | MOD3CLSS13 | 2174 |
| 1534 | MOD3CLSS14 | 2175 |
| 1535 | MOD3CLSS15 | 2176 |
| 1536 | MOD3CLSS16 | 2177 |
| 1537 | MOD3CLSS17 | 2236 |
| 1538 | MOD3CLSS18 | 2237 |
| 1539 | MOD3CLSS19 | 2370 |
| 1518 | MOD3CLSS2 | 2341 |
| 1540 | MOD3CLSS20 | 2516 |
| 1541 | MOD3CLSS21 | 2517 |
| 1542 | MOD3CLSS22 | 2371 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1543 | MOD3CLSS23 | 2576 |
| 1544 | MOD3CLSS24 | 2577 |
| 1545 | MOD3CLSS25 | 2374 |
| 1546 | MOD3CLSS26 | 2636 |
| 1547 | MOD3CLSS27 | 2637 |
| 1548 | MOD3CLSS28 | 2363 |
| 1549 | MOD3CLSS29 | 2375 |
| 1519 | MOD3CLSS28 | 2342 |
| 1520 | MOD3CLSS3 | 2343 |
| 1550 | MOD3CLSS30 | 2400 |
| 1551 | MOD3CLSS31 | 2401 |
| 1521 | MOD3CLSS3B | 2344 |
| 1522 | MOD3CLSS3C | 2345 |
| 1523 | MOD3CLSS3D | 2350 |
| 1524 | MOD3CLSS3E | 2352 |
| 1525 | MOD3CLSS4 | 2360 |
| 1526 | MOD3CLSS6 | 2361 |
| 1527 | MOD3CLSS8 | 2000 |
| 1528 | MOD3CLSS9 | 2001 |
| 1552 | MOD4CLSS | 2213 |
| 1483 | MOD4W | 2125 |
| 1553 | MOD5CLSS | 2061 |
| 1554 | MOD5CLSS2 | 2404 |
| 1555 | MOD5CLSS3 | 2405 |
| 1556 | MOD5CLSS4 | 2421 |
| 1557 | MOD5CLSS5 | 2423 |
| 1558 | MOD5CLSS5B | 2410 |
| 1559 | MOD5CLSS6 | 2136 |
| 1560 | MOD5CLSS7 | 2411 |
| 1561 | MOD5CLSS7B | 2232 |
| 1562 | MOD5CLSS7C | 2233 |
| 1563 | MOD5CLSS8 | 2412 |
| 1564 | MOD5CLSS9 | 2137 |
| 1484 | MOD5W | 2274 |
| 1485 | MOD6W | 2127 |
| 1486 | MOD7W | 2275 |
| 1487 | MOD8W | 2276 |
| 1488 | MOD9W | 2300 |
| 2052 | MODEALTER | 4635 |
| 2053 | MODEALTER2 | 4640 |
| 2056 | MODEALTER3 | 4645 |
| 2057 | MODEALTER4 | 4650 |
| 2058 | MODEALTER5 | 4501 |
| 2054 | MODEALTR2B | 4641 |
| 2055 | MODEALTR2C | 4644 |
| 2059 | MODELATER6 | 4503 |
| 1479 | MODW | 347 |
| 1480 | MODW3 | 2277 |
| 1481 | MODW3B | 2271 |
| 1482 | MODW3C | 2272 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|-----|-------|-----|
| 188 | MOV01 | 441 |
| 200 | MOV02 | 451 |
| 201 | MOV03 | 130 |
| 204 | MOV04 | 131 |
| 210 | MOV05 | 621 |
| 221 | MOV06 | 631 |
| 189 | MOV07 | 601 |
| 211 | MOV08 | 671 |
| 202 | MOV09 | 611 |
| 222 | MOV10 | 151 |
| 251 | MOV11 | 26 |
| 190 | MOV12 | 602 |
| 212 | MOV13 | 672 |
| 203 | MOV14 | 612 |
| 223 | MOV15 | 152 |
| 191 | MOV16 | 124 |
| 213 | MOV17 | 134 |
| 224 | MOV18 | 137 |
| 192 | MOV19 | 603 |
| 214 | MOV20 | 673 |
| 205 | MOV21 | 613 |
| 225 | MOV22 | 153 |
| 238 | MOV23 | 566 |
| 236 | MOV24 | 564 |
| 239 | MOV25 | 567 |
| 237 | MOV26 | 565 |
| 240 | MOV27 | 161 |
| 243 | MOV28 | 706 |
| 241 | MOV29 | 704 |
| 244 | MOV30 | 707 |
| 242 | MOV31 | 705 |
| 193 | MOV32 | 604 |
| 215 | MOV33 | 674 |
| 206 | MOV34 | 614 |
| 226 | MOV35 | 154 |
| 197 | MOV36 | 605 |
| 216 | MOV37 | 675 |
| 207 | MOV38 | 615 |
| 227 | MOV39 | 155 |
| 232 | MOV40 | 144 |
| 198 | MOV41 | 606 |
| 217 | MOV42 | 676 |
| 208 | MOV43 | 616 |
| 228 | MOV44 | 156 |
| 245 | MOV45 | 164 |
| 233 | MOV46 | 146 |
| 218 | MOV47 | 135 |
| 234 | MOV48 | 150 |
| 235 | MOV49 | 160 |
| 248 | MOV50 | 766 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 246 | MOV51 | 764 |
| 249 | MOV52 | 767 |
| 247 | MOV53 | 765 |
| 199 | MOV54 | 607 |
| 219 | MOV55 | 677 |
| 209 | MOV56 | 617 |
| 230 | MOV57 | 157 |
| 220 | MOV58 | 136 |
| 229 | MOV59 | 140 |
| 231 | MOV60 | 141 |
| 252 | MOV61 | 27 |
| 250 | MOV62 | 166 |
| 194 | MOV601 | 145 |
| 195 | MOV602 | 147 |
| 196 | MOV603 | 126 |
| 2235 | MOVFDSTSF | 4745 |
| 2239 | MOVSFDDST | 4747 |
| 531 | MPE01 | 1330 |
| 2333 | MULDIV | 1367 |
| 1244 | MULDZ | 245 |
| 1405 | MULDZW | 345 |
| 1407 | MULFDW | 2273 |
| 1243 | MULFZ | 244 |
| 1404 | MULFZW | 344 |
| 1408 | MULMODW | 2152 |
| 1417 | MULMODW10 | 2003 |
| 1418 | MULMODW11 | 2006 |
| 1419 | MULMODW12 | 2007 |
| 1420 | MULMODW13 | 2116 |
| 1421 | MULMODW14 | 2156 |
| 1422 | MULMODW15 | 2160 |
| 1423 | MULMODW16 | 2161 |
| 1424 | MULMODW17 | 2257 |
| 1425 | MULMODW18 | 2722 |
| 1426 | MULMODW19 | 2164 |
| 1409 | MULMODW2 | 2154 |
| 1427 | MULMODW20 | 2165 |
| 1428 | MULMODW21 | 2170 |
| 1429 | MULMODW22 | 2172 |
| 1430 | MULMODW23 | 2200 |
| 1431 | MULMODW24 | 2723 |
| 1432 | MULMODW25 | 2202 |
| 1410 | MULMODW3 | 2075 |
| 1411 | MULMODW4 | 2077 |
| 1412 | MULMODW5 | 2117 |
| 1413 | MULMODW6 | 2153 |
| 1414 | MULMODW7 | 2157 |
| 1415 | MULMODW8 | 2155 |
| 1416 | MULMODW9 | 2002 |
| 2374 | MULT | 1607 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 2383 | MULT10 | 1023 |
| 2384 | MULT11 | 1702 |
| 2385 | MULT12 | 1704 |
| 2386 | MULT13 | 1705 |
| 2387 | MULT14 | 1706 |
| 2388 | MULT15 | 1707 |
| 2389 | MULT16 | 1710 |
| 2390 | MULT17 | 1711 |
| 2391 | MULT18 | 1125 |
| 2392 | MULT19 | 1127 |
| 2375 | MULT2 | 1071 |
| 2376 | MULT3 | 1122 |
| 2377 | MULT4 | 1666 |
| 2378 | MULT5 | 1123 |
| 2379 | MULT6 | 1667 |
| 2380 | MULT7 | 1073 |
| 2381 | MULT8 | 1022 |
| 2382 | MULT9 | 1700 |
| 2393 | MULTLOOP | 1712 |
| 2394 | MULTLOOP3 | 1713 |
| 1245 | MULXNZ | 246 |
| 1406 | MULXM | 346 |
| 2236 | MVFDSTSF2 | 4423 |
| 2237 | MVFDSTSF3 | 4746 |
| 2238 | MVFDSTSF4 | 4422 |
| 2240 | MVSFFDST2 | 4760 |
| 2241 | MVSFFDST3 | 4073 |
| 2242 | MVSFFDST4 | 4761 |
| 2243 | MVSFFDST5 | 4072 |
| 121 | NEG01 | 554 |
| 122 | NEG02 | 54 |
| 157 | NEG03 | 434 |
| 158 | NEG04 | 106 |
| 139 | NEGB01 | 574 |
| 140 | NEGB02 | 77 |
| 173 | NEGB03 | 534 |
| 174 | NEGB04 | 111 |
| 1401 | NEGNZM | 2657 |
| 1402 | NEGNZM2 | 2150 |
| 1403 | NEGNZM3 | 2151 |
| 1372 | NEGZM | 3457 |
| 1014 | NMRC01 | 1235 |
| 1015 | NMRC02 | 1312 |
| 1016 | NMRC02A | 1313 |
| 1017 | NMRC03 | 1314 |
| 1018 | NMRC04 | 1315 |
| 1019 | NMRC05 | 1316 |
| 1021 | NMRC06 | 1332 |
| 1020 | NMRC06A | 1317 |
| 1022 | NMRC07A | 1333 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1023 | MMRC07B | 1334 |
| 1024 | MMRC08 | 1335 |
| 1025 | MMRC09 | 1340 |
| 1026 | MMRC10 | 1341 |
| 1027 | MMRC11 | 1342 |
| 1028 | MMRC12 | 1343 |
| 475 | NOSMP01 | 3615 |
| 476 | NOSMP02 | 3045 |
| 477 | NOSMP03 | 3653 |
| 478 | NOSMP04 | 3657 |
| 479 | NOSMP05 | 3046 |
| 2189 | NOTNZER01 | 4250 |
| 2190 | NOTNZER02 | 4251 |
| 2191 | NOTNZER03 | 4252 |
| 2008 | NOTRAP | 4027 |
| 1906 | NROUND | 2362 |
| 1916 | NROUND10 | 2447 |
| 1917 | NROUND11 | 2502 |
| 1918 | NROUND12 | 2504 |
| 1919 | NROUND13 | 2141 |
| 1920 | NROUND14 | 2142 |
| 1921 | NROUND15 | 2143 |
| 1922 | NROUND16 | 2505 |
| 1923 | NROUND17 | 2376 |
| 1924 | NROUND18 | 2377 |
| 1925 | NROUND19 | 2222 |
| 1907 | NROUND2 | 2132 |
| 1926 | NROUND20 | 2223 |
| 1927 | NROUND21 | 2506 |
| 1928 | NROUND22 | 2510 |
| 1929 | NROUND23 | 2511 |
| 1930 | NROUND24 | 2512 |
| 1931 | NROUND26 | 2201 |
| 1932 | NROUND27 | 2203 |
| 1933 | NROUND28 | 2513 |
| 1934 | NROUND29 | 2111 |
| 1908 | NROUND3 | 2133 |
| 1935 | NROUND30 | 2113 |
| 1936 | NROUND31 | 2514 |
| 1937 | NROUND32 | 2216 |
| 1938 | NROUND33 | 2455 |
| 1939 | NROUND34 | 2457 |
| 1940 | NROUND35 | 2406 |
| 1941 | NROUND36 | 2043 |
| 1942 | NROUND37 | 2515 |
| 1943 | NROUND38 | 2042 |
| 1944 | NROUND39 | 2520 |
| 1909 | NROUND4 | 2474 |
| 1945 | NROUND40 | 2522 |
| 1946 | NROUND41 | 2407 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1947 | NROUND42 | 2440 |
| 1948 | NROUND43 | 2441 |
| 1949 | NROUND44 | 2442 |
| 1950 | NROUND45 | 2524 |
| 1951 | NROUND46 | 2311 |
| 1952 | NROUND47 | 2313 |
| 1953 | NROUND48 | 2525 |
| 1954 | NROUND49 | 2530 |
| 1910 | NROUND48 | 2475 |
| 1911 | NROUND5 | 2500 |
| 1955 | NROUND50 | 2531 |
| 1956 | NROUND51 | 2534 |
| 1957 | NROUND52 | 2217 |
| 1958 | NROUND53 | 2552 |
| 1959 | NROUND54 | 2553 |
| 1960 | NROUND55 | 2535 |
| 1961 | NROUND56 | 2540 |
| 1912 | NROUND6 | 2501 |
| 1913 | NROUND7 | 2140 |
| 1914 | NROUND8 | 2162 |
| 1915 | NROUND9 | 2163 |
| 1619 | NROUNDEND | 4326 |
| 1620 | NROUNDEND1 | 4533 |
| 1621 | NROUNDEND2 | 4537 |
| 1622 | NROUNDEND3 | 4554 |
| 1623 | NROUNDEND4 | 4555 |
| 1624 | NROUNDEND5 | 4556 |
| 1625 | NROUNDEND6 | 4557 |
| 355 | NTRP00 | 310 |
| 356 | NTRP01 | 312 |
| 2192 | NZERO | 4253 |
| 2193 | NZERO2 | 4355 |
| 2194 | NZERO3 | 4357 |
| 2195 | NZERO4 | 4744 |
| 1985 | NZEROTRAP | 4546 |
| 1986 | NZTRAP2 | 4574 |
| 518 | OAO1 | 1322 |
| 1224 | ODOPCDISO1 | 6004 |
| 1977 | OFLOTRAP | 4560 |
| 1971 | OPCODERR | 4541 |
| 1972 | OPERR2 | 4602 |
| 1973 | OPERRHOT | 4603 |
| 285 | OTH01 | 417 |
| 498 | PF01 | 1662 |
| 499 | PF04 | 1160 |
| 426 | PST01 | 1056 |
| 427 | PST01A | 1060 |
| 428 | PST02 | 1061 |
| 429 | PST03 | 1064 |
| 430 | PST04 | 1065 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 431 | PST05 | 1070 |
| 432 | PST06 | 1476 |
| 437 | PST07 | 1477 |
| 433 | PST08 | 1072 |
| 434 | PST09 | 1074 |
| 435 | PST10 | 1075 |
| 436 | PST11 | 1501 |
| 441 | PST12 | 1503 |
| 442 | PST13 | 1076 |
| 443 | PST14 | 1077 |
| 444 | PST15 | 1100 |
| 446 | PST16 | 1104 |
| 445 | PST16A | 1102 |
| 448 | PST17 | 1106 |
| 447 | PST17A | 1105 |
| 449 | PST18 | 1107 |
| 450 | PST19 | 1110 |
| 451 | PST19A | 1111 |
| 438 | PST21 | 1651 |
| 439 | PST23 | 1655 |
| 440 | PST24 | 1657 |
| 911 | PSWINIT | 3177 |
| 480 | PWRSUB01 | 1121 |
| 483 | PWRSUB02 | 1130 |
| 481 | PWRSUB02A | 1124 |
| 482 | PWRSUB02B | 1126 |
| 484 | PWRSUB03 | 1132 |
| 921 | PWRTST | 3357 |
| 922 | PWRTST01 | 3530 |
| 923 | PWRTST02 | 3641 |
| 924 | PWRTST04 | 3532 |
| 925 | PWRTST05 | 3643 |
| 1729 | QUOLEFT1 | 2473 |
| 1737 | QUOLEFT10 | 2445 |
| 1738 | QUOLEFT11 | 2446 |
| 1739 | QUOLEFT12 | 2454 |
| 1730 | QUOLEFT2 | 2435 |
| 1731 | QUOLEFT3 | 2436 |
| 1732 | QUOLEFT4 | 2443 |
| 1733 | QUOLEFT7 | 2472 |
| 1734 | QUOLEFT8 | 2444 |
| 1735 | QUOLEFT9 | 2707 |
| 1736 | QUOLEFT9B | 2703 |
| 896 | REGINIT01 | 3537 |
| 897 | REGINIT02 | 3475 |
| 898 | REGINIT03 | 3504 |
| 899 | REGINIT04 | 3505 |
| 900 | REGINIT05 | 3510 |
| 901 | REGINIT06 | 3512 |
| 902 | REGINIT07 | 3514 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|--------------|------|
| 903 | REGINIT08 | 3515 |
| 904 | REGINIT09 | 3516 |
| 905 | REGINIT10 | 3517 |
| 906 | REGINIT11 | 3071 |
| 907 | REGINIT12 | 3520 |
| 908 | REGINIT14A | 3522 |
| 909 | REGINIT15 | 3073 |
| 341 | RES01 | 67 |
| 342 | RES02 | 307 |
| 343 | RES03 | 306 |
| 344 | RES04 | 3006 |
| 2244 | RESTART | 2633 |
| 2254 | RESTART10 | 2651 |
| 2255 | RESTART11 | 4764 |
| 2256 | RESTART12 | 4765 |
| 2257 | RESTART13 | 4766 |
| 2258 | RESTART14 | 4767 |
| 2259 | RESTART15 | 641 |
| 2260 | RESTART16 | 2452 |
| 2261 | RESTART17 | 2453 |
| 2262 | RESTART17B | 2677 |
| 2263 | RESTART17C | 2036 |
| 2264 | RESTART17D | 2652 |
| 2265 | RESTART17E | 2653 |
| 2266 | RESTART17F | 2660 |
| 2267 | RESTART17G | 2661 |
| 2245 | RESTART2 | 2634 |
| 2246 | RESTART3 | 2635 |
| 2247 | RESTART4 | 2644 |
| 2248 | RESTART5 | 2450 |
| 2249 | RESTART5B | 2451 |
| 2250 | RESTART6 | 2667 |
| 2251 | RESTART7 | 2037 |
| 2252 | RESTART8 | 2645 |
| 2253 | RESTART9 | 2650 |
| 2277 | RESTARTCSP10 | 2676 |
| 2278 | RESTARTCSP11 | 2700 |
| 2279 | RESTARTCSP12 | 2701 |
| 2280 | RESTARTCSP13 | 2702 |
| 2281 | RESTARTCSP14 | 2704 |
| 2282 | RESTARTCSP15 | 2705 |
| 2283 | RESTARTCSP16 | 644 |
| 2284 | RESTARTCSP17 | 646 |
| 2269 | RESTARTCSP2 | 2663 |
| 2270 | RESTARTCSP3 | 2664 |
| 2271 | RESTARTCSP4 | 2665 |
| 2272 | RESTARTCSP5 | 2666 |
| 2273 | RESTARTCSP6 | 2670 |
| 2274 | RESTARTCSP7 | 2672 |
| 2275 | RESTARTCSP8 | 2674 |

11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 2276 | RESTCSP9 | 2675 |
| 2268 | RESTORECSP | 2662 |
| 1740 | RMDLEFT1 | 2367 |
| 1749 | RMDLEFT10 | 2465 |
| 1741 | RMDLEFT2 | 2456 |
| 1742 | RMDLEFT3 | 2460 |
| 1743 | RMDLEFT4 | 2461 |
| 1744 | RMDLEFT5 | 2366 |
| 1745 | RMDLEFT6 | 2462 |
| 1746 | RMDLEFT7 | 2464 |
| 1747 | RMDLEFT8 | 2646 |
| 1748 | RMDLEFT9 | 2647 |
| 129 | ROL01 | 541 |
| 163 | ROL03 | 421 |
| 147 | ROLB01 | 561 |
| 179 | ROLB02 | 521 |
| 128 | ROR01 | 540 |
| 146 | RORB01 | 560 |
| 2299 | RSHFDSTN | 2715 |
| 2300 | RSHFDSTN2 | 2106 |
| 2301 | RSHFDSTN3 | 2107 |
| 2302 | RSHFDSTN4 | 2736 |
| 2303 | RSHFDSTN5 | 2737 |
| 2304 | RSHFDSTN6 | 2507 |
| 2305 | RSHFDSTN7 | 2503 |
| 1193 | RSVD01 | 40 |
| 1194 | RSVD02 | 60 |
| 1195 | RSVD03 | 334 |
| 1196 | RSVD04 | 330 |
| 1197 | RSVD05 | 332 |
| 315 | RTI01 | 62 |
| 316 | RTI02 | 4044 |
| 317 | RTI03 | 4045 |
| 318 | RTI04 | 4054 |
| 319 | RTI05 | 4055 |
| 320 | RTI06 | 4064 |
| 321 | RTI07 | 4322 |
| 322 | RTI08 | 4323 |
| 323 | RTI09 | 4065 |
| 324 | RTI10 | 301 |
| 308 | RTS01 | 66 |
| 309 | RTS02 | 4034 |
| 310 | RTS03 | 4035 |
| 311 | RTS04 | 300 |
| 2285 | RTSHFDST | 2706 |
| 2297 | RTSHFDST10 | 2713 |
| 2298 | RTSHFDST11 | 2714 |
| 2286 | RTSHFDST2 | 2526 |
| 2287 | RTSHFDST2B | 2067 |
| 2288 | RTSHFDST2C | 2063 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 2289 | RTSHFDST3 | 2527 |
| 2290 | RTSHFDST4 | 2556 |
| 2291 | RTSHFDST5 | 2557 |
| 2292 | RTSHFDST6 | 2710 |
| 2293 | RTSHFDST7 | 2437 |
| 2294 | RTSHFDST7B | 2433 |
| 2295 | RTSHFDST8 | 2711 |
| 2296 | RTSHFDST9 | 2712 |
| 2306 | RTSHFSF | 2720 |
| 2318 | RTSHFSF10 | 2725 |
| 2319 | RTSHFSF11 | 2573 |
| 2307 | RTSHFSF2 | 2532 |
| 2308 | RTSHFSF2B | 2247 |
| 2309 | RTSHFSF2C | 2243 |
| 2310 | RTSHFSF3 | 2533 |
| 2311 | RTSHFSF4 | 2536 |
| 2312 | RTSHFSF5 | 2537 |
| 2313 | RTSHFSF6 | 2721 |
| 2314 | RTSHFSF7 | 2417 |
| 2315 | RTSHFSF7B | 2413 |
| 2316 | RTSHFSF8 | 2567 |
| 2317 | RTSHFSF9 | 2724 |
| 2320 | RTSHFSFSN | 2726 |
| 2321 | RTSHFSFSN2 | 2166 |
| 2322 | RTSHFSFSN3 | 2167 |
| 312 | RTT01 | 76 |
| 313 | RTT02 | 4040 |
| 314 | RTT03 | 4042 |
| 522 | RZ01 | 1323 |
| 523 | RZ08 | 1210 |
| 524 | RZ09 | 1212 |
| 525 | RZ11 | 4152 |
| 526 | RZ12 | 327 |
| 124 | SBC01 | 556 |
| 125 | SBC02 | 65 |
| 126 | SBC03 | 72 |
| 160 | SBC05 | 436 |
| 161 | SBC07 | 110 |
| 142 | SBC801 | 576 |
| 143 | SBC802 | 100 |
| 144 | SBC803 | 102 |
| 176 | SBC805 | 536 |
| 177 | SBC806 | 114 |
| 1132 | SBRA01 | 1505 |
| 1133 | SBRA02 | 1506 |
| 1134 | SBRA03 | 1507 |
| 1135 | SBRA04 | 1514 |
| 1136 | SBRA05 | 1515 |
| 1137 | SBRA06 | 1516 |
| 1138 | SBRA07 | 1517 |

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11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|--------|------|
| 1139 | SBRA08 | 1520 |
| 1140 | SBRA09 | 1522 |
| 1141 | SBRA10 | 1524 |
| 1142 | SBRA11 | 1526 |
| 1143 | SBRA12 | 1534 |
| 1144 | SBRA13 | 1536 |
| 1145 | SBRA14 | 1544 |
| 1146 | SBRA15 | 1546 |
| 1147 | SBRA16 | 1550 |
| 1148 | SBRA17 | 1551 |
| 1149 | SBP001 | 1552 |
| 1150 | SBP002 | 1553 |
| 1151 | SBP003 | 1554 |
| 1152 | SBRC01 | 1555 |
| 1153 | SBRC02 | 1556 |
| 1154 | SBRC03 | 1557 |
| 1155 | SBRC04 | 1214 |
| 1156 | SBRC05 | 1215 |
| 1157 | SBRC06 | 1216 |
| 1158 | SBRC07 | 1217 |
| 1159 | SBRC08 | 1021 |
| 1160 | SBRD01 | 1560 |
| 1161 | SBRD02 | 1562 |
| 1162 | SBRD03 | 1564 |
| 1163 | SBRE01 | 1566 |
| 1164 | SBRE02 | 1600 |
| 1165 | SBRE03 | 1601 |
| 302 | SCC00 | 70 |
| 303 | SCC01 | 4024 |
| 304 | SCC02 | 4026 |
| 305 | SCC03 | 4030 |
| 306 | SCC04 | 4221 |
| 307 | SCC05 | 4223 |
| 500 | SCPE01 | 1661 |
| 501 | SCPE02 | 1162 |
| 502 | SCPE03 | 1164 |
| 503 | SCPE04 | 1701 |
| 507 | SCPE05 | 1703 |
| 504 | SCPE06 | 1352 |
| 505 | SCPE07 | 1353 |
| 506 | SCPE09 | 1336 |
| 509 | SCPE10 | 1337 |
| 508 | SCPE11 | 1166 |
| 510 | SCPE12 | 1170 |
| 511 | SCPE13 | 1171 |
| 512 | SCPE14 | 1174 |
| 513 | SCPE15 | 1175 |
| 514 | SCPE16 | 1200 |
| 994 | SDCD01 | 1002 |
| 998 | SDCD02 | 1304 |

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11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 999 | SDCD03 | 1310 |
| 1000 | SDCD04 | 1311 |
| 1001 | SDCD05 | 1231 |
| 1002 | SDCD06 | 1156 |
| 1003 | SDCD07 | 1157 |
| 1004 | SDCD08 | 1066 |
| 1005 | SDCD09 | 1067 |
| 1006 | SDCD10 | 1233 |
| 1008 | SDCD11 | 1113 |
| 1009 | SDCD12 | 1012 |
| 1010 | SDCD13 | 1013 |
| 1011 | SDCD14 | 1117 |
| 995 | SDCD15 | 1301 |
| 1012 | SDCD16 | 1167 |
| 1013 | SDCD17 | 1237 |
| 996 | SDCD18 | 1302 |
| 997 | SDCD19 | 1303 |
| 1007 | SDCD20 | 1305 |
| 515 | SDEF01 | 1665 |
| 516 | SDEF02 | 1202 |
| 517 | SDEF03 | 1731 |
| 385 | SER01 | 701 |
| 387 | SER02 | 703 |
| 386 | SER02A | 321 |
| 1317 | SER02F | 4723 |
| 388 | SER03 | 322 |
| 394 | SER04 | 21 |
| 395 | SER05 | 326 |
| 396 | SER06 | 1005 |
| 397 | SER07 | 1010 |
| 398 | SER08 | 1011 |
| 399 | SER09 | 1014 |
| 400 | SER10 | 1046 |
| 401 | SER11 | 1016 |
| 1237 | SETCLASS | 240 |
| 1238 | SETCLASS2 | 205 |
| 1239 | SETCLASS3 | 207 |
| 1240 | SETCLASS4 | 215 |
| 1241 | SETCLASS5 | 217 |
| 1242 | SETCLASS6 | 335 |
| 1320 | SETCLASSW | 340 |
| 1336 | SETD | 231 |
| 1337 | SETDM2 | 470 |
| 1327 | SETF | 221 |
| 1325 | SETFD02 | 460 |
| 1324 | SETFDW | 311 |
| 2323 | SETFZFN | 2727 |
| 2324 | SETFZFN2 | 2730 |
| 1328 | SETI | 222 |
| 1329 | SETI2 | 461 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1338 | SETL | 232 |
| 1339 | SETL2 | 471 |
| 1626 | SF2SCOMP | 4275 |
| 1629 | SF2SCOMP01 | 4507 |
| 1630 | SF2SCOMP02 | 4304 |
| 1631 | SF2SCOMP03 | 4305 |
| 1627 | SF2SCOMPF | 4300 |
| 1628 | SF2SCOMPF1 | 4301 |
| 1632 | SF2SCOMPF2 | 4506 |
| 1633 | SF2SCOMPF3 | 4310 |
| 1035 | SIN01 | 1033 |
| 1036 | SIN02 | 1354 |
| 1037 | SIN03 | 1355 |
| 1038 | SIN05 | 1356 |
| 1039 | SIN06 | 1423 |
| 1040 | SIN08 | 1427 |
| 894 | SLRINIT | 3137 |
| 325 | SOB01 | 50 |
| 326 | SOB02 | 302 |
| 327 | SOB03 | 4070 |
| 328 | SOB04 | 4071 |
| 329 | SOB05 | 4074 |
| 330 | SOB06 | 4263 |
| 332 | SOB07 | 4261 |
| 331 | SOB08 | 4075 |
| 4 | SRC01 | 711 |
| 5 | SRC02 | 712 |
| 6 | SRC03 | 713 |
| 7 | SRC04 | 714 |
| 8 | SRC05 | 715 |
| 9 | SRC06 | 716 |
| 10 | SRC07 | 717 |
| 13 | SRC09 | 4014 |
| 14 | SRC10 | 4 |
| 11 | SRC11 | 4004 |
| 15 | SRC12 | 4016 |
| 16 | SRC13 | 4020 |
| 12 | SRC14 | 4005 |
| 17 | SRC15 | 4022 |
| 18 | SRC16 | 5 |
| 21 | SRC17 | 466 |
| 19 | SRC18 | 462 |
| 22 | SRC19 | 467 |
| 20 | SRC20 | 463 |
| 23 | SRC21 | 661 |
| 36 | SRC22 | 10 |
| 30 | SRC23 | 627 |
| 37 | SRC24 | 752 |
| 38 | SRC29 | 753 |
| 32 | SRC30 | 772 |

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11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 33 | SRC31 | 773 |
| 24 | SRC32 | 662 |
| 25 | SRC33 | 663 |
| 26 | SRC34 | 664 |
| 27 | SRC35 | 665 |
| 28 | SRC36 | 666 |
| 29 | SRC37 | 667 |
| 31 | SRC38 | 637 |
| 34 | SRC39 | 12 |
| 35 | SRC40 | 13 |
| 530 | SST01 | 1327 |
| 1680 | ST1W | 360 |
| 1681 | ST2W | 361 |
| 1682 | ST5W | 3670 |
| 2001 | STATUPDT1 | 4517 |
| 2002 | STATUPDT2 | 4601 |
| 2003 | STATUPDT3 | 4604 |
| 2004 | STATUPDT4 | 4605 |
| 2005 | STATUPDT5 | 4610 |
| 1259 | STATUS | 241 |
| 1345 | STATUSW | 341 |
| 1093 | STC01 | 1145 |
| 1094 | STC02 | 1147 |
| 1095 | STC04 | 1441 |
| 1096 | STC05 | 1442 |
| 1097 | STC06 | 1443 |
| 1098 | STC07 | 1444 |
| 1099 | STC08 | 1177 |
| 1100 | STC09 | 1176 |
| 1101 | STC12 | 1446 |
| 1102 | STC13 | 1450 |
| 1103 | STC14 | 1452 |
| 2042 | STCFLT | 4621 |
| 1270 | STCPNZ | 271 |
| 1271 | STCPNZ2 | 4156 |
| 1806 | STCPNZW | 371 |
| 1813 | STCPW10 | 4135 |
| 1814 | STCPW11 | 4133 |
| 1815 | STCPW12 | 4452 |

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11/60 MICROCODE CROSS REFERENCE #1 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|---------|------|
| 1816 | STCPW13 | 4137 |
| 1817 | STCPW14 | 4146 |
| 1818 | STCPW15 | 4147 |
| 1819 | STCPW16 | 4454 |
| 1820 | STCPW17 | 4456 |
| 1821 | STCPW18 | 4460 |
| 1822 | STCPW19 | 4141 |
| 1804 | STCPW2 | 142 |
| 1823 | STCPW20 | 4143 |
| 1824 | STCPW21 | 4462 |
| 1825 | STCPW22 | 4151 |
| 1826 | STCPW23 | 4153 |
| 1827 | STCPW24 | 4464 |
| 1828 | STCPW25 | 4466 |
| 1829 | STCPW26 | 4470 |
| 1830 | STCPW27 | 4472 |
| 1831 | STCPW28 | 4155 |
| 1832 | STCPW29 | 4157 |
| 1805 | STCPW3 | 143 |
| 1833 | STCPW30 | 4474 |
| 1834 | STCPW31 | 4476 |
| 1807 | STCPW4 | 4444 |
| 1808 | STCPW5 | 4445 |
| 1809 | STCPW6 | 4121 |
| 1810 | STCPW7 | 4123 |
| 1811 | STCPW8 | 4450 |
| 1812 | STCPW9 | 4132 |
| 1269 | STCPZ | 270 |
| 1803 | STCPZW | 370 |
| 1285 | STCT | 267 |
| 1286 | STCT2 | 440 |
| 1287 | STCT3 | 450 |
| 1288 | STCT4 | 4200 |
| 1289 | STCT5 | 4732 |
| 1290 | STCT6 | 4733 |
| 1757 | STCTW | 367 |
| 1766 | STCTW10 | 4003 |
| 1767 | STCTW11 | 4400 |
| 1768 | STCTW12 | 4401 |
| 1769 | STCTW13 | 4006 |
| 1770 | STCTW14 | 4007 |
| 1771 | STCTW15 | 4404 |
| 1772 | STCTW16 | 4405 |
| 1773 | STCTW17 | 4021 |
| 1774 | STCTW18 | 4023 |
| 1775 | STCTW19 | 4410 |
| 1758 | STCTW2 | 4362 |
| 1776 | STCTW20 | 4411 |
| 1777 | STCTW21 | 4420 |
| 1778 | STCTW22 | 4421 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1779 | STCTW23 | 4424 |
| 1780 | STCTW24 | 4000 |
| 1781 | STCTW25 | 4425 |
| 1782 | STCTW26 | 4050 |
| 1783 | STCTW27 | 4051 |
| 1784 | STCTW28 | 4001 |
| 1785 | STCTW29 | 4426 |
| 1759 | STCTW3 | 4364 |
| 1786 | STCTW30 | 4041 |
| 1767 | STCTW31 | 4043 |
| 1788 | STCTW32 | 4062 |
| 1789 | STCTW33 | 4063 |
| 1790 | STCTW34 | 4430 |
| 1791 | STCTW35 | 4432 |
| 1792 | STCTW36 | 4434 |
| 1793 | STCTW37 | 4015 |
| 1794 | STCTW38 | 4435 |
| 1795 | STCTW39 | 4036 |
| 1760 | STCTW4 | 4366 |
| 1796 | STCTW40 | 4037 |
| 1797 | STCTW41 | 4017 |
| 1798 | STCTW42 | 4436 |
| 1799 | STCTW43 | 4440 |
| 1800 | STCTW44 | 4046 |
| 1801 | STCTW45 | 4047 |
| 1802 | STCTW46 | 4442 |
| 1761 | STCTW5 | 4370 |
| 1762 | STCTW6 | 4372 |
| 1763 | STCTW7 | 4374 |
| 1764 | STCTW8 | 4376 |
| 1765 | STCTW9 | 4002 |
| 2071 | STDMOFLT | 4353 |
| 2072 | STDMOFLT2 | 4113 |
| 2073 | STDMOFLT3 | 4660 |
| 2074 | STDMOFLT4 | 4112 |
| 2019 | STDMOINT | 2010 |
| 2020 | STDM1INT | 2011 |
| 2021 | STDM2INT | 2012 |
| 2022 | STDM3INT | 2013 |
| 2023 | STDM4INT | 2014 |
| 2024 | STDM5INT | 2015 |
| 2149 | STDM67FLT | 4367 |
| 2150 | STDM67FLT2 | 4377 |
| 2025 | STDM6INT | 2016 |
| 2026 | STDM7INT | 2017 |
| 1753 | STEXP2 | 600 |
| 1754 | STEXP3 | 610 |
| 1755 | STEXP4 | 620 |
| 1756 | STEXP5 | 1622 |
| 1267 | STEXPHOT | 401 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1268 | STEXPH0T2 | 411 |
| 1262 | STFD | 260 |
| 1263 | STFD2 | 261 |
| 2125 | STFLT10 | 4716 |
| 2126 | STFLT11 | 4717 |
| 2127 | STFLT12 | 4720 |
| 2128 | STFLT13 | 4256 |
| 2129 | STFLT14 | 4257 |
| 2116 | STFLT2 | 4207 |
| 2117 | STFLT2A | 4217 |
| 2118 | STFLT3 | 4012 |
| 2119 | STFLT4 | 4711 |
| 2120 | STFLT5 | 4572 |
| 2121 | STFLT6 | 4236 |
| 2122 | STFLT7 | 4237 |
| 2123 | STFLT8 | 4714 |
| 2124 | STFLT9 | 4715 |
| 1355 | STFPS | 506 |
| 1356 | STFPS2 | 544 |
| 2170 | STIMM1 | 4467 |
| 2171 | STIMM2 | 4477 |
| 2172 | STIMM3 | 4672 |
| 2173 | STIMM4 | 4673 |
| 2174 | STIMM5 | 4676 |
| 2175 | STIMM6 | 4677 |
| 2049 | STINTLG2 | 4703 |
| 2050 | STINTLG3 | 4634 |
| 2051 | STINTLG4 | 4707 |
| 2036 | STORE | 2173 |
| 2037 | STORE2 | 2566 |
| 2038 | STORE3 | 2570 |
| 2061 | STOREFLT | 4654 |
| 2130 | STOREHOT | 4013 |
| 2131 | STOREHOT2 | 4656 |
| 2132 | STOREHOT2B | 4657 |
| 2133 | STOREHOT2C | 4721 |
| 2134 | STOREHOT2D | 4724 |
| 2135 | STOREHOT2E | 4725 |
| 2136 | STOREHOT2F | 4727 |
| 2137 | STOREHOT3 | 4573 |
| 2138 | STOREHOT4 | 4622 |
| 2139 | STOREHOT5 | 4623 |
| 2140 | STOREHOT6 | 4726 |
| 2141 | STOREHOT7 | 4730 |
| 2142 | STOREHOT8 | 4731 |
| 2143 | STOREHOT9 | 4734 |
| 2010 | STOREINT | 2551 |
| 2048 | STOREINTLG | 4632 |
| 1264 | STOREXP | 264 |
| 1265 | STOREXPD | 265 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1751 | STOREXPDM | 365 |
| 1750 | STOREXPW | 364 |
| 1266 | STOREXPX | 266 |
| 1752 | STOREXPXM | 366 |
| 1357 | STST | 507 |
| 1358 | STST2 | 1612 |
| 1359 | STST3 | 1614 |
| 2115 | STSYNC | 4205 |
| 2145 | STSYNC2 | 4365 |
| 2169 | STSYNC3 | 4465 |
| 79 | SUB01 | 456 |
| 90 | SUB02 | 636 |
| 100 | SUB03 | 736 |
| 101 | SUB04 | 45 |
| 111 | SUB05 | 416 |
| 112 | SUB06 | 52 |
| 1253 | SUBNZ | 256 |
| 1568 | SUBNZM | 356 |
| 1569 | SUBW01 | 4230 |
| 1252 | SUBZ | 255 |
| 1567 | SUBZM | 355 |
| 1584 | SUMDFGSF | 4033 |
| 1578 | SUMP | 4331 |
| 1586 | SUMSFGDF | 4032 |
| 1587 | SUMSFGDF1 | 4254 |
| 1230 | SVCDEF | 1733 |
| 1231 | SVCDEF02 | 1026 |
| 1232 | SVCDEF03 | 1027 |
| 1233 | SVCDEFLO1 | 6007 |
| 1234 | SVCDEFLO2 | 6005 |
| 919 | SVSINIT | 3526 |
| 288 | SWB20 | 212 |
| 286 | SWB01 | 71 |
| 287 | SWB02 | 211 |
| 289 | SWB03 | 73 |
| 290 | SWB04 | 720 |
| 291 | SWB05 | 213 |
| 292 | SWB06 | 214 |
| 296 | SXT01 | 44 |
| 297 | SXT02 | 216 |
| 298 | SXT03 | 464 |
| 299 | SXT04 | 465 |
| 300 | SXT05 | 740 |
| 301 | SXT06 | 427 |
| 490 | TBIT01 | 1047 |
| 491 | TBIT02 | 1140 |
| 492 | TBIT03 | 1142 |
| 493 | TBIT04 | 1144 |
| 494 | TBIT05 | 1146 |
| 1969 | TPREAMBLE | 2544 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 350 | TRAP01 | 56 |
| 1988 | TRAPEND | 4576 |
| 917 | TRKINIT | 3257 |
| 357 | TRP00 | 127 |
| 358 | TRP01 | 314 |
| 359 | TRP02 | 316 |
| 361 | TRP03 | 4114 |
| 360 | TRP03A | 4111 |
| 362 | TRP04 | 4115 |
| 364 | TRP05 | 4117 |
| 363 | TRP05A | 4116 |
| 365 | TRP06 | 4120 |
| 366 | TRP07 | 4631 |
| 367 | TRP08 | 4122 |
| 368 | TRP09 | 4124 |
| 370 | TRP10 | 4134 |
| 369 | TRP10A | 4125 |
| 371 | TRP12 | 4136 |
| 372 | TRP13 | 4140 |
| 373 | TRP14 | 4142 |
| 375 | TRP15 | 4144 |
| 374 | TRP15A | 4031 |
| 376 | TRP16 | 4427 |
| 377 | TRP17 | 4437 |
| 378 | TRP18 | 320 |
| 1970 | TRPE2 | 2546 |
| 127 | TST01 | 557 |
| 162 | TST02 | 437 |
| 145 | TSTB01 | 577 |
| 178 | TSTB02 | 537 |
| 2187 | TSTNZERO | 4317 |
| 2188 | TSTNZERO2 | 4743 |
| 1380 | TSTNZW | 2655 |
| 1381 | TSTNZW2 | 2122 |
| 1382 | TSTNZW3 | 2124 |
| 1383 | TSTNZW4 | 4224 |
| 1384 | TSTNZW5 | 4226 |
| 1385 | TSTNZW6 | 4636 |
| 1386 | TSTNZW7 | 4637 |
| 1367 | TSTZW | 3455 |
| 546 | UB01 | 1320 |
| 547 | UB02 | 1232 |
| 548 | UB03 | 1234 |
| 549 | UB04 | 1236 |
| 550 | UB05 | 1240 |
| 551 | UB06 | 1241 |
| 552 | UB07 | 1242 |
| 553 | UB08 | 1451 |
| 557 | UB09 | 1453 |
| 554 | UB11 | 1243 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 555 | UB12 | 1721 |
| 556 | UB13 | 1723 |
| 920 | UBINIT | 3317 |
| 1991 | UDIS | 4613 |
| 1983 | UFLOTRAP | 4545 |
| 1183 | USERDISP01 | 6002 |
| 1984 | UTRAP2 | 4571 |
| 1997 | UVDIS | 4615 |
| 1998 | UVDIS2 | 4642 |
| 1999 | UVDIS3 | 4643 |
| 1990 | VDIS | 4611 |
| 1978 | VTRAP2 | 4561 |
| 1979 | VTRAP3 | 4564 |
| 1980 | VTRAP4 | 4566 |
| 1981 | VTRAP5 | 4544 |
| 1982 | VTRAP6 | 4570 |
| 338 | WAIT01 | 61 |
| 339 | WAIT02 | 4402 |
| 340 | WAIT03 | 4403 |
| 1992 | WARMDIS | 4446 |
| 1993 | WARMDIS2 | 4600 |
| 1994 | WARMDIS3 | 4406 |
| 1995 | WARMDIS4 | 4407 |
| 379 | WCS01 | 4633 |
| 380 | WCS02 | 4145 |
| 381 | WCS05 | 4431 |
| 1109 | WCSDIAG01 | 6010 |
| 1199 | WCSINIT01 | 3337 |
| 1200 | WCSINIT02 | 3632 |
| 1201 | WCSINIT03 | 3634 |
| 1202 | WCSINIT04 | 3640 |
| 1203 | WCSINIT05 | 3711 |
| 1204 | WCSINIT06 | 3642 |
| 1205 | WCSINIT07 | 3644 |
| 1206 | WCSINIT08 | 3713 |
| 1223 | WCSODOPC01 | 4433 |
| 1209 | WCSRDDR | 3110 |
| 1210 | WCSRDDAT01 | 3124 |
| 1211 | WCSRDDAT02 | 3646 |
| 1212 | WCSRDDAT05 | 3647 |
| 1213 | WCSRDDAT06 | 3650 |
| 1214 | WCSRDDAT07 | 3651 |
| 1220 | WCSR DST01 | 3114 |
| 1221 | WCSR DST02 | 3656 |
| 1222 | WCSR DST03 | 3662 |
| 1198 | WCSRVD01 | 6003 |
| 1207 | WCSWRADR01 | 3111 |
| 1208 | WCSWRADR02 | 3645 |
| 1215 | WCSWRDAT01 | 3125 |
| 1216 | WCSWRDAT02 | 3652 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1217 | WCSWRDAT03 | 3654 |
| 1218 | WCSWRDAT04 | 3655 |
| 1219 | WCSWRST01 | 3115 |
| 1318 | WFORK | 474 |
| 1319 | WFORKNVALD | 476 |
| 871 | WHI02 | 3445 |
| 869 | WHI02A | 3077 |
| 870 | WHI02B | 3444 |
| 874 | WHI03 | 3450 |
| 872 | WHI03A | 3446 |
| 873 | WHI03B | 3447 |
| 875 | WHI04 | 3452 |
| 876 | WHI05 | 3460 |
| 877 | WHI06 | 3470 |
| 878 | WHI07 | 3472 |
| 879 | WHI08 | 3471 |
| 880 | WHI09 | 3473 |
| 881 | WHI10 | 3461 |
| 882 | WHI11 | 3462 |
| 885 | WHI12 | 3465 |
| 883 | WHI12A | 3463 |
| 884 | WHI12B | 3464 |
| 886 | WHI13 | 3466 |
| 887 | WHI14 | 3451 |
| 888 | WHI15 | 3453 |
| 889 | WHI16 | 3467 |
| 1670 | WORDCMP | 2414 |
| 1671 | WORDCMP2 | 2640 |
| 1672 | WORDCMP3 | 2641 |
| 1673 | WORDCMP4 | 2642 |
| 1674 | WORDCMP5 | 2643 |
| 1675 | WORDCMP6 | 2415 |
| 1676 | WORDCMP7 | 2671 |
| 1677 | WORDCMP8 | 2673 |
| 1225 | XCSUB01 | 6000 |
| 1166 | XFC01 | 447 |
| 1167 | XFC02 | 1602 |
| 1168 | XFC03 | 1447 |
| 1169 | XFC04 | 1670 |
| 1171 | XFC05 | 1671 |
| 1173 | XFC06 | 1672 |
| 1175 | XFC07 | 1673 |
| 1177 | XFC08 | 1674 |
| 1179 | XFC09 | 1675 |
| 1181 | XFC10 | 1676 |
| 1182 | XFC11 | 1677 |
| 1184 | XFC12 | 1445 |
| 1185 | XFC13 | 1603 |
| 1186 | XFC14 | 1604 |
| 1187 | XFC15 | 1455 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|----------|------|
| 1188 | XFC16 | 1457 |
| 1189 | XFC17 | 1467 |
| 1190 | XFC18 | 1466 |
| 1170 | XFCOTH01 | 6001 |
| 1172 | XFCOTH10 | 6011 |
| 1174 | XFCOTH20 | 6012 |
| 1176 | XFCOTH30 | 6013 |
| 1178 | XFCOTH40 | 6014 |
| 1180 | XFCOTH50 | 6015 |
| 293 | XOR01 | 46 |
| 294 | XOR02 | 47 |
| 295 | XOR03 | 407 |
| 353 | YTRP00 | 304 |
| 354 | YTRP01 | 305 |
| 495 | YZ01 | 1660 |
| 496 | YZ02 | 1154 |
| 497 | YZ03 | 1155 |
| 1974 | ZERODIV | 4542 |

11/60 MICROCODE CROSS REFERENCE #2 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|----------|------|
| 2 | FET02 | 1 |
| 36 | SRC22 | 10 |
| 143 | SBC802 | 100 |
| 383 | CON99B | 1000 |
| 486 | DISP02 | 1001 |
| 994 | SDC001 | 1002 |
| 991 | CSR08 | 1003 |
| 384 | CON99C | 1004 |
| 396 | SER06 | 1005 |
| 1124 | E0S07 | 1006 |
| 1125 | E0S07A | 1007 |
| 265 | JMP11 | 101 |
| 397 | SER07 | 1010 |
| 398 | SER08 | 1011 |
| 1009 | SDC012 | 1012 |
| 1010 | SDC013 | 1013 |
| 399 | SER09 | 1014 |
| 2405 | ASH004 | 1015 |
| 401 | SER11 | 1016 |
| 2407 | ASHZ00 | 1017 |
| 144 | SBC803 | 102 |
| 403 | JAM01A | 1020 |
| 1159 | SBRC08 | 1021 |
| 2381 | MULT8 | 1022 |
| 2383 | MULT10 | 1023 |
| 404 | JAM01B | 1024 |
| 405 | JAM02 | 1025 |
| 1231 | SVCDEF02 | 1026 |
| 1232 | SVCDEF03 | 1027 |
| 266 | JMP12 | 103 |
| 407 | JAM02C | 1030 |
| 408 | JAM02D | 1031 |
| 1029 | HLT01 | 1032 |
| 1035 | SIN01 | 1033 |
| 409 | JAM02E | 1034 |
| 418 | JAM17 | 1035 |
| 406 | JAM02A | 1036 |
| 410 | JAM03 | 1037 |
| 149 | ASR802 | 104 |
| 382 | CON99 | 1040 |
| 419 | JAM18 | 1041 |
| 1061 | EXM03 | 1042 |
| 1065 | EXM06 | 1043 |
| 421 | JAM07 | 1044 |
| 422 | JAM08 | 1045 |
| 400 | SER10 | 1046 |
| 490 | TBIT01 | 1047 |
| 272 | JMP18 | 105 |
| 423 | JAM09 | 1050 |
| 424 | JAM10 | 1051 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 1085 | DEP03 | 1052 |
| 1088 | DEP06 | 1053 |
| 425 | JAM11 | 1054 |
| 584 | IA01 | 1055 |
| 426 | PST01 | 1056 |
| 412 | JAM05 | 1057 |
| 158 | NEG04 | 106 |
| 427 | PST01A | 1060 |
| 428 | PST02 | 1061 |
| 1130 | EOS12 | 1062 |
| 1131 | EOS13 | 1063 |
| 429 | PST03 | 1064 |
| 430 | PST04 | 1065 |
| 1004 | SDCD08 | 1066 |
| 1005 | SDCD09 | 1067 |
| 273 | JMP19 | 107 |
| 431 | PST05 | 1070 |
| 2375 | MULT2 | 1071 |
| 433 | PST08 | 1072 |
| 2380 | MULT7 | 1073 |
| 434 | PST09 | 1074 |
| 435 | PST10 | 1075 |
| 442 | PST13 | 1076 |
| 443 | PST14 | 1077 |
| 53 | DST08 | 11 |
| 161 | SBC07 | 110 |
| 444 | PST15 | 1100 |
| 2417 | ASH016 | 1101 |
| 445 | PST16A | 1102 |
| 2418 | ASH017 | 1103 |
| 446 | PST16 | 1104 |
| 447 | PST17A | 1105 |
| 448 | PST17 | 1106 |
| 449 | PST18 | 1107 |
| 174 | NEGB04 | 111 |
| 450 | PST19 | 1110 |
| 451 | PST19A | 1111 |
| 452 | BOOT01 | 1112 |
| 1008 | SDCD11 | 1113 |
| 453 | BOOT02 | 1114 |
| 454 | BOOT03 | 1115 |
| 455 | BOOT03A | 1116 |
| 1011 | SDCD14 | 1117 |
| 182 | ASRB07 | 112 |
| 457 | BOOT05 | 1120 |
| 480 | PWRSUB01 | 1121 |
| 2376 | MULT3 | 1122 |
| 2378 | MULT5 | 1123 |
| 481 | PWRSUB02A | 1124 |
| 2391 | MULT18 | 1125 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 482 | PWRSUB028 | 1126 |
| 2392 | MULT19 | 1127 |
| 184 | ASR809 | 113 |
| 483 | PWRSUB02 | 1130 |
| 1083 | DEP01 | 1131 |
| 484 | PWRSUB03 | 1132 |
| 1078 | INT01 | 1133 |
| 485 | DISP01 | 1134 |
| 1070 | LAD01 | 1135 |
| 489 | DISP05 | 1136 |
| 1059 | EXM01 | 1137 |
| 177 | SBC806 | 114 |
| 491 | TBIT02 | 1140 |
| 1104 | DIAG01 | 1141 |
| 492 | TBIT03 | 1142 |
| 1110 | BOOT | 1143 |
| 493 | TBIT04 | 1144 |
| 1093 | STC01 | 1145 |
| 494 | TBIT05 | 1146 |
| 1094 | STC02 | 1147 |
| 181 | ASR806 | 115 |
| 2430 | ASHEX04 | 1150 |
| 2431 | ASHEX05 | 1151 |
| 2432 | ASHEX06 | 1152 |
| 2433 | ASHEX07 | 1153 |
| 496 | YZ02 | 1154 |
| 497 | YZ03 | 1155 |
| 1002 | SDCD06 | 1156 |
| 1003 | SDCD07 | 1157 |
| 166 | ASR07 | 116 |
| 499 | PFO4 | 1160 |
| 1054 | DIS01 | 1161 |
| 501 | SCPE02 | 1162 |
| 1041 | DSR01 | 1163 |
| 502 | SCPE03 | 1164 |
| 1045 | LSR01 | 1165 |
| 508 | SCPE11 | 1166 |
| 1012 | SDCD16 | 1167 |
| 167 | ASR08 | 117 |
| 510 | SCPE12 | 1170 |
| 511 | SCPE13 | 1171 |
| 536 | I1AA05 | 1172 |
| 537 | I1AA04 | 1173 |
| 512 | SCPE14 | 1174 |
| 513 | SCPE15 | 1175 |
| 1100 | STC09 | 1176 |
| 1099 | STC08 | 1177 |
| 34 | SRC39 | 12 |
| 183 | ASR808 | 120 |
| 514 | SCPE16 | 1200 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 535 | IIAA03 | 1201 |
| 516 | SDEF02 | 1202 |
| 544 | IIA13 | 1203 |
| 520 | EOE02 | 1204 |
| 416 | JAM15 | 1205 |
| 521 | EOE03 | 1206 |
| 417 | JAM16 | 1207 |
| 185 | ASRB10 | 121 |
| 523 | RZ08 | 1210 |
| 487 | DISP03 | 1211 |
| 524 | RZ09 | 1212 |
| 488 | DISP04 | 1213 |
| 1155 | SBRC04 | 1214 |
| 1156 | SBRC05 | 1215 |
| 1157 | SBRC06 | 1216 |
| 1158 | SBRC07 | 1217 |
| 1361 | CTANZW2 | 122 |
| 534 | IIAA02 | 1220 |
| 2413 | ASH012 | 1221 |
| 538 | IIAA06 | 1222 |
| 2410 | ASH007 | 1223 |
| 539 | IIAA07 | 1224 |
| 540 | IIAA08 | 1225 |
| 541 | IIA10 | 1226 |
| 542 | IIA11 | 1227 |
| 1362 | CTANZW3 | 123 |
| 543 | IIA12 | 1230 |
| 1001 | S0CD05 | 1231 |
| 547 | UB02 | 1232 |
| 1006 | S0CD10 | 1233 |
| 548 | UB03 | 1234 |
| 1014 | NMRC01 | 1235 |
| 549 | UB04 | 1236 |
| 1013 | S0CD17 | 1237 |
| 191 | MOV16 | 124 |
| 550 | UB05 | 1240 |
| 551 | UB06 | 1241 |
| 552 | UB07 | 1242 |
| 554 | UB11 | 1243 |
| 558 | ETRP01 | 1244 |
| 559 | ETRP02 | 1245 |
| 560 | ETRP03 | 1246 |
| 561 | ETRP04 | 1247 |
| 393 | INTRO4 | 125 |
| 562 | ETRP05 | 1250 |
| 1278 | LDCT3 | 1251 |
| 563 | ETRP06 | 1252 |
| 1280 | LDCT5 | 1253 |
| 564 | FLG01 | 1254 |
| 565 | FLG02 | 1255 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|---------|------|
| 566 | FLG03 | 1256 |
| 567 | FLG04 | 1257 |
| 196 | MOVFO3 | 126 |
| 568 | FLGS01 | 1260 |
| 569 | FLGC01 | 1261 |
| 570 | FLGC02 | 1262 |
| 981 | CSR04 | 1263 |
| 982 | CSR05 | 1264 |
| 983 | CSR06A | 1265 |
| 984 | CSR06B | 1266 |
| 357 | TRP00 | 127 |
| 985 | CSR06C | 1270 |
| 986 | CSR06 | 1271 |
| 987 | CSR06D | 1272 |
| 988 | CSR06E | 1273 |
| 989 | CSR12 | 1274 |
| 990 | CSR07 | 1275 |
| 992 | CSR09 | 1276 |
| 2428 | ASHEX02 | 1277 |
| 35 | SRC40 | 13 |
| 201 | MOV03 | 130 |
| 993 | CSR10 | 1300 |
| 995 | SDCD15 | 1301 |
| 996 | SDCD18 | 1302 |
| 997 | SDCD19 | 1303 |
| 998 | SDCD02 | 1304 |
| 1007 | SDCD20 | 1305 |
| 204 | MOV04 | 131 |
| 999 | SDCD03 | 1310 |
| 1000 | SDCD04 | 1311 |
| 1015 | NMRC02 | 1312 |
| 1016 | NMRC02A | 1313 |
| 1017 | NMRC03 | 1314 |
| 1018 | NMRC04 | 1315 |
| 1019 | NMRC05 | 1316 |
| 1020 | NMRC06A | 1317 |
| 346 | HALT02 | 132 |
| 546 | UB01 | 1320 |
| 545 | CSPE01 | 1321 |
| 518 | OA01 | 1322 |
| 522 | RZ01 | 1323 |
| 527 | KT01 | 1324 |
| 533 | I1AA01 | 1325 |
| 528 | JCPE01 | 1326 |
| 530 | SST01 | 1327 |
| 347 | HALT03 | 133 |
| 531 | MPE01 | 1330 |
| 532 | JOEF01 | 1331 |
| 1021 | NMRC06 | 1332 |
| 1022 | NMRC07A | 1333 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|---------|------|
| 1023 | NMRC07B | 1334 |
| 1024 | NMRC08 | 1335 |
| 506 | SCPE09 | 1336 |
| 509 | SCPE10 | 1337 |
| 213 | MOV17 | 134 |
| 1025 | NMRC09 | 1340 |
| 1026 | NMRC10 | 1341 |
| 1027 | NMRC11 | 1342 |
| 1028 | NMRC12 | 1343 |
| 1030 | HLT02 | 1344 |
| 1031 | HLT03 | 1345 |
| 1032 | HLT04 | 1346 |
| 2414 | ASH013 | 1347 |
| 218 | MOV47 | 135 |
| 1033 | HLT05A | 1350 |
| 1034 | HLT05 | 1351 |
| 504 | SCPE06 | 1352 |
| 505 | SCPE07 | 1353 |
| 1036 | SIN02 | 1354 |
| 1037 | SIN03 | 1355 |
| 1038 | SIN05 | 1356 |
| 2415 | ASH014 | 1357 |
| 220 | MOV58 | 136 |
| 1042 | DSR02A | 1360 |
| 1043 | DSR02 | 1361 |
| 1044 | DSR03 | 1362 |
| 1046 | LSR02A | 1363 |
| 1047 | LSR02 | 1364 |
| 1048 | LSR03 | 1365 |
| 1049 | LSR04 | 1366 |
| 2333 | MULDIV | 1367 |
| 224 | MOV18 | 137 |
| 1050 | LSR05 | 1370 |
| 1051 | LSR06 | 1371 |
| 1052 | LSR07 | 1372 |
| 1053 | LSR08 | 1373 |
| 1055 | DIS04 | 1374 |
| 1056 | DIS02 | 1375 |
| 1057 | DIS03 | 1376 |
| 2402 | ASH001 | 1377 |
| 54 | DST09 | 14 |
| 229 | MOV59 | 140 |
| 1058 | DIS06 | 1400 |
| 1060 | EXM02 | 1401 |
| 1062 | EXM04 | 1402 |
| 1063 | EXM05 | 1403 |
| 1064 | EXM07A | 1404 |
| 1066 | EXM07 | 1405 |
| 1067 | EXM08 | 1406 |
| 2426 | ASHEX00 | 1407 |

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| | | |
|------|---------|------|
| 231 | MOV60 | 141 |
| 1068 | EXM09 | 1410 |
| 1069 | EXM10 | 1411 |
| 1071 | LAD02 | 1412 |
| 1072 | LAD03 | 1413 |
| 1073 | LAD04 | 1414 |
| 1074 | LAD05 | 1415 |
| 1075 | LAD06 | 1416 |
| 2427 | ASHEX01 | 1417 |
| 1804 | STCPW2 | 142 |
| 1076 | LAD07 | 1420 |
| 1077 | LAD08 | 1421 |
| 1079 | INT02 | 1422 |
| 1039 | SIN06 | 1423 |
| 1080 | INT03 | 1424 |
| 1081 | INT04 | 1425 |
| 1082 | INT05 | 1426 |
| 1040 | SIN08 | 1427 |
| 1805 | STCPW3 | 143 |
| 1084 | DEP02 | 1430 |
| 420 | JAM06 | 1431 |
| 1086 | DEP04 | 1432 |
| 519 | EOE01 | 1433 |
| 1087 | DEP05 | 1434 |
| 1089 | DEP07A | 1435 |
| 1090 | DEP07B | 1436 |
| 1091 | DEP07 | 1437 |
| 232 | MOV40 | 144 |
| 1092 | DEP08 | 1440 |
| 1095 | STC04 | 1441 |
| 1096 | STC05 | 1442 |
| 1097 | STC06 | 1443 |
| 1098 | STC07 | 1444 |
| 1184 | XFC12 | 1445 |
| 1101 | STC12 | 1446 |
| 1168 | XFC03 | 1447 |
| 194 | MOVF01 | 145 |
| 1102 | STC13 | 1450 |
| 553 | UB08 | 1451 |
| 1103 | STC14 | 1452 |
| 557 | UB09 | 1453 |
| 1105 | DIAG02 | 1454 |
| 1187 | XFC15 | 1455 |
| 1106 | DIAG03 | 1456 |
| 1188 | XFC16 | 1457 |
| 233 | MOV46 | 146 |
| 1111 | EOS1A | 1460 |
| 1112 | EOS1B | 1461 |
| 1113 | EOS01 | 1462 |
| 1114 | EOS02 | 1463 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|--------|------|
| 1115 | E0S03 | 1464 |
| 1116 | E0S03A | 1465 |
| 1190 | XFC18 | 1466 |
| 1189 | XFC17 | 1467 |
| 195 | MOV02 | 147 |
| 1117 | E0S38 | 1470 |
| 1119 | E0S04A | 1471 |
| 1118 | E0S04 | 1472 |
| 1122 | E0S05 | 1473 |
| 1123 | E0S06 | 1474 |
| 1126 | E0S08 | 1475 |
| 432 | PST06 | 1476 |
| 437 | PST07 | 1477 |
| 59 | DST29 | 15 |
| 234 | MOV48 | 150 |
| 1127 | E0S09 | 1500 |
| 436 | PST11 | 1501 |
| 1128 | E0S10 | 1502 |
| 441 | PST12 | 1503 |
| 1129 | E0S11 | 1504 |
| 1132 | SBRA01 | 1505 |
| 1133 | SBRA02 | 1506 |
| 1134 | SBRA03 | 1507 |
| 222 | MOV10 | 151 |
| 2423 | ASHL00 | 1510 |
| 2424 | ASHL01 | 1511 |
| 1107 | DIAG04 | 1512 |
| 1108 | DIAG05 | 1513 |
| 1135 | SBRA04 | 1514 |
| 1136 | SBRA05 | 1515 |
| 1137 | SBRA06 | 1516 |
| 1138 | SBRA07 | 1517 |
| 223 | MOV15 | 152 |
| 1139 | SBRA08 | 1520 |
| 2355 | DIV21 | 1521 |
| 1140 | SBRA09 | 1522 |
| 2356 | DIV22 | 1523 |
| 1141 | SBRA10 | 1524 |
| 2358 | DIV24 | 1525 |
| 1142 | SBRA11 | 1526 |
| 2359 | DIV25 | 1527 |
| 225 | MOV22 | 153 |
| 2362 | DIV28 | 1530 |
| 2363 | DIV29 | 1531 |
| 2364 | DIV30 | 1532 |
| 2365 | DIV31 | 1533 |
| 1143 | SBRA12 | 1534 |
| 2368 | DIV34 | 1535 |
| 1144 | SBRA13 | 1536 |
| 2369 | DIV35 | 1537 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 226 | MOV35 | 154 |
| 2339 | DIV05 | 1540 |
| 2340 | DIV06 | 1541 |
| 2341 | DIV07 | 1542 |
| 2342 | DIV08 | 1543 |
| 1145 | SBRA14 | 1544 |
| 2343 | DIV09 | 1545 |
| 1146 | SBRA15 | 1546 |
| 2344 | DIV10 | 1547 |
| 227 | MOV39 | 155 |
| 1147 | SBRA16 | 1550 |
| 1146 | SBRA17 | 1551 |
| 1149 | SBRB01 | 1552 |
| 1150 | SBRB02 | 1553 |
| 1151 | SBRB03 | 1554 |
| 1152 | SBRC01 | 1555 |
| 1153 | SBRC02 | 1556 |
| 1154 | SBRC03 | 1557 |
| 228 | MOV44 | 156 |
| 1160 | SBRD01 | 1560 |
| 2345 | DIV11 | 1561 |
| 1161 | SBRD02 | 1562 |
| 2346 | DIV12 | 1563 |
| 1162 | SBRD03 | 1564 |
| 2349 | DIV15 | 1565 |
| 1163 | SBRE01 | 1566 |
| 2350 | DIV16 | 1567 |
| 230 | MOV57 | 157 |
| 2352 | DIV18 | 1570 |
| 2353 | DIV19 | 1571 |
| 2366 | DIV32 | 1572 |
| 2371 | DIV37 | 1573 |
| 2419 | ASHR00 | 1574 |
| 2420 | ASHR01 | 1575 |
| 2421 | ASHR02 | 1576 |
| 2422 | ASHR03 | 1577 |
| 132 | ASR03 | 16 |
| 235 | MOV49 | 160 |
| 1164 | SBRE02 | 1600 |
| 1165 | SBRE03 | 1601 |
| 1167 | XFC02 | 1602 |
| 1185 | XFC13 | 1603 |
| 1186 | XFC14 | 1604 |
| 1226 | JDEF02 | 1605 |
| 1277 | LDCT2 | 1606 |
| 2374 | MULT | 1607 |
| 240 | MOV27 | 161 |
| 1302 | HFPPSVC2 | 1610 |
| 1120 | E0S04B | 1611 |
| 1358 | STST2 | 1612 |

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| | | |
|------|------------|------|
| 1121 | E0S04C | 1613 |
| 1359 | STST3 | 1614 |
| 1453 | MFRACF28 | 1615 |
| 1454 | MFRACF3 | 1616 |
| 2334 | DIV01 | 1617 |
| 1351 | LDFPS6 | 162 |
| 1455 | MFRACF4 | 1620 |
| 1456 | MFRACF5 | 1621 |
| 1756 | STEXPS | 1622 |
| 2219 | FD-TOGGLE | 1623 |
| 2220 | FDTGL2 | 1624 |
| 2221 | FDTGL3 | 1625 |
| 2222 | FDTGL4 | 1626 |
| 2332 | EIS02 | 1627 |
| 1349 | LDFPS4 | 163 |
| 2335 | DIV018 | 1630 |
| 2336 | DIV02 | 1631 |
| 2337 | DIV03 | 1632 |
| 2338 | DIV04 | 1633 |
| 2347 | DIV13 | 1634 |
| 2348 | DIV14 | 1635 |
| 2396 | ML00P3 | 1636 |
| 2397 | ML00P4 | 1637 |
| 245 | MOV45 | 164 |
| 2351 | DIV17 | 1640 |
| 2354 | DIV20 | 1641 |
| 2398 | ML00P5 | 1642 |
| 2399 | ML00P6 | 1643 |
| 2357 | DIV23 | 1644 |
| 2360 | DIV26 | 1645 |
| 2400 | ML00P7 | 1646 |
| 2401 | ML00P8 | 1647 |
| 1292 | HOTDMOSYNC | 165 |
| 2361 | DIV27 | 1650 |
| 438 | PST21 | 1651 |
| 2367 | DIV33 | 1652 |
| 456 | BOOT04 | 1653 |
| 2370 | DIV36 | 1654 |
| 439 | PST23 | 1655 |
| 2372 | DIV38 | 1656 |
| 440 | PST24 | 1657 |
| 250 | MOV62 | 166 |
| 495 | YZ01 | 1660 |
| 500 | SCPE01 | 1661 |
| 498 | PF01 | 1662 |
| 1301 | HFPPSVC | 1663 |
| 980 | CSR01 | 1664 |
| 515 | SDEF01 | 1665 |
| 2377 | MULT4 | 1666 |
| 2379 | MULT6 | 1667 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1293 | HTDMOSYNC2 | 167 |
| 1169 | XFC04 | 1670 |
| 1171 | XFC05 | 1671 |
| 1173 | XFC06 | 1672 |
| 1175 | XFC07 | 1673 |
| 1177 | XFC08 | 1674 |
| 1179 | XFC09 | 1675 |
| 1181 | XFC10 | 1676 |
| 1182 | XFC11 | 1677 |
| 133 | ASRD4 | 17 |
| 258 | JMP04 | 170 |
| 2382 | MULT9 | 1700 |
| 503 | SCPE04 | 1701 |
| 2384 | MULT11 | 1702 |
| 507 | SCPE05 | 1703 |
| 2385 | MULT12 | 1704 |
| 2386 | MULT13 | 1705 |
| 2387 | MULT14 | 1706 |
| 2388 | MULT15 | 1707 |
| 262 | JMP08 | 171 |
| 2389 | MULT16 | 1710 |
| 2390 | MULT17 | 1711 |
| 2393 | MULTLOOP | 1712 |
| 2394 | MULTLOOP3 | 1713 |
| 2395 | MLOOP2 | 1714 |
| 2403 | ASH002 | 1715 |
| 2404 | ASH003 | 1716 |
| 2406 | ASH005 | 1717 |
| 1642 | LOADZW2 | 172 |
| 2408 | ASHZ01 | 1720 |
| 555 | UB12 | 1721 |
| 2409 | ASH006 | 1722 |
| 556 | UB13 | 1723 |
| 2411 | ASH010 | 1724 |
| 2412 | ASH011 | 1725 |
| 2416 | ASH015 | 1726 |
| 2425 | ASHL02 | 1727 |
| 1643 | LOADZW2B | 173 |
| 2429 | ASHEX03 | 1730 |
| 517 | SDEF03 | 1731 |
| 1230 | SVCDEF | 1733 |
| 1227 | JDEF03 | 1735 |
| 1228 | JDEF04 | 1737 |
| 264 | JMP10 | 174 |
| 1294 | HTDMOSYNC3 | 175 |
| 268 | JMP14 | 176 |
| 1295 | HTDMOSYNC4 | 177 |
| 280 | BRA02 | 2 |
| 60 | DST30 | 20 |
| 269 | JMP15 | 200 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1527 | MOD3CLSS8 | 2000 |
| 1528 | MOD3CLSS9 | 2001 |
| 1416 | MULMODW9 | 2002 |
| 1417 | MULMODW10 | 2003 |
| 573 | MFAT02 | 2004 |
| 574 | MFAT03 | 2005 |
| 1418 | MULMODW11 | 2006 |
| 1419 | MULMODW12 | 2007 |
| 270 | JMP16 | 201 |
| 2019 | STDM0INT | 2010 |
| 2020 | STDM1INT | 2011 |
| 2021 | STDM2INT | 2012 |
| 2022 | STDM3INT | 2013 |
| 2023 | STDM4INT | 2014 |
| 2024 | STDM5INT | 2015 |
| 2025 | STDM6INT | 2016 |
| 2026 | STDM7INT | 2017 |
| 271 | JMP17 | 202 |
| 575 | MFAT04 | 2020 |
| 1516 | MOD2CLSS | 2021 |
| 576 | MFAT05 | 2022 |
| 1517 | MOD3CLSS | 2023 |
| 577 | MFAT09 | 2024 |
| 579 | MFAT17 | 2025 |
| 581 | MFAT12 | 2026 |
| 582 | MFAT14 | 2027 |
| 275 | JMP21 | 203 |
| 2325 | FCCHEX0 | 2030 |
| 2326 | FCCHEX1 | 2031 |
| 2327 | FCCHEX2 | 2032 |
| 2328 | FCCHEX3 | 2033 |
| 583 | MFAT15 | 2034 |
| 585 | IA05 | 2035 |
| 2263 | RESTART17C | 2036 |
| 2251 | RESTART7 | 2037 |
| 276 | JMP24 | 204 |
| 588 | IA207A | 2040 |
| 591 | IA208 | 2041 |
| 1943 | NROUND38 | 2042 |
| 1941 | NROUND36 | 2043 |
| 592 | IA209 | 2044 |
| 593 | IA210 | 2045 |
| 594 | IA211 | 2046 |
| 595 | IA212 | 2047 |
| 1238 | SETCLASS2 | 205 |
| 2011 | FDM0INT | 2050 |
| 2012 | FDM1INT | 2051 |
| 2013 | FDM2INT | 2052 |
| 2014 | FDM3INT | 2053 |
| 2015 | FDM4INT | 2054 |

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| | | |
|------|------------|------|
| 2016 | FDMSINT | 2055 |
| 2017 | FDM6INT | 2056 |
| 2018 | FDM7INT | 2057 |
| 277 | JMP22 | 206 |
| 1497 | MOD1CLS | 2060 |
| 1553 | MOD5CLS | 2061 |
| 1492 | MOD13M | 2062 |
| 2288 | RTSHFDST2C | 2063 |
| 596 | IA213A | 2064 |
| 597 | IA213 | 2065 |
| 718 | MED19A | 2066 |
| 2287 | RTSHFDST2B | 2067 |
| 1239 | SETCLASS3 | 207 |
| 732 | MED23A | 2070 |
| 736 | MED25A | 2071 |
| 1493 | MOD14M | 2072 |
| 1494 | MOD15M | 2073 |
| 741 | MED27A | 2074 |
| 1410 | MULMODW3 | 2075 |
| 746 | MED29A | 2076 |
| 1411 | MULMODW4 | 2077 |
| 394 | SER04 | 21 |
| 284 | BR06 | 210 |
| 750 | MED31A | 2100 |
| 754 | MED33A | 2101 |
| 1394 | ANWRTBAK5 | 2102 |
| 1395 | ANWRTBAK6 | 2103 |
| 759 | MED35A | 2104 |
| 764 | MED37A | 2105 |
| 2300 | RSHFDSTSN2 | 2106 |
| 2301 | RSHFDSTSN3 | 2107 |
| 287 | SWB02 | 211 |
| 1258 | CTANNZ4 | 2110 |
| 1934 | NROUND29 | 2111 |
| 1374 | CTANNZM2 | 2112 |
| 1935 | NROUND30 | 2113 |
| 1376 | CLRNZM2 | 2114 |
| 1377 | CLRNZM3 | 2115 |
| 1420 | MULMODW13 | 2116 |
| 1412 | MULMODW5 | 2117 |
| 288 | SWAB20 | 212 |
| 1379 | CLRNZM5 | 2120 |
| 1393 | ANWRTBAK4 | 2121 |
| 1381 | TSTNZM2 | 2122 |
| 1399 | ANWRTBAK10 | 2123 |
| 1382 | TSTNZM3 | 2124 |
| 1483 | MOD4M | 2125 |
| 1388 | ABSNZM2 | 2126 |
| 1485 | MOD6M | 2127 |
| 291 | SWB05 | 213 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1389 | ABS NZH3 | 2130 |
| 1392 | ANWRTBAK3 | 2131 |
| 1907 | NROUND2 | 2132 |
| 1908 | NROUND3 | 2133 |
| 1396 | ANWRTBAK7 | 2134 |
| 1397 | ANWRTBAK8 | 2135 |
| 1559 | MODSCLSS6 | 2136 |
| 1564 | MODSCLSS9 | 2137 |
| 292 | SHB06 | 214 |
| 1913 | NROUND7 | 2140 |
| 1919 | NROUND13 | 2141 |
| 1920 | NROUND14 | 2142 |
| 1921 | NROUND15 | 2143 |
| 1398 | ANWRTBAK9 | 2144 |
| 586 | IA06 | 2145 |
| 1400 | ANWRTBAK11 | 2146 |
| 608 | IA220 | 2147 |
| 1240 | SETCLASS4 | 215 |
| 1402 | NEG NZH2 | 2150 |
| 1403 | NEG NZH3 | 2151 |
| 1408 | MULMODW | 2152 |
| 1413 | MULMODW6 | 2153 |
| 1409 | MULMODW2 | 2154 |
| 1415 | MULMODW8 | 2155 |
| 1421 | MULMODW14 | 2156 |
| 1414 | MULMODW7 | 2157 |
| 297 | SXT02 | 216 |
| 1422 | MULMODW15 | 2160 |
| 1423 | MULMODW16 | 2161 |
| 1914 | NROUND8 | 2162 |
| 1915 | NROUND9 | 2163 |
| 1426 | MULMODW19 | 2164 |
| 1427 | MULMODW20 | 2165 |
| 2321 | RTSHFSFSN2 | 2166 |
| 2322 | RTSHFSFSN3 | 2167 |
| 1241 | SETCLASS5 | 217 |
| 1428 | MULMODW21 | 2170 |

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| | | |
|------|------------|------|
| 2033 | FETCH | 2171 |
| 1429 | MULMODW22 | 2172 |
| 2036 | STORE | 2173 |
| 1533 | MOD3CLSS13 | 2174 |
| 1534 | MOD3CLSS14 | 2175 |
| 1535 | MOD3CLSS15 | 2176 |
| 1536 | MOD3CLSS16 | 2177 |
| 61 | DST35 | 22 |
| 1326 | CFCC | 220 |
| 1430 | MULMODW23 | 2200 |
| 1931 | NROUND26 | 2201 |
| 1432 | MULMODW25 | 2202 |
| 1932 | NROUND27 | 2203 |
| 1435 | MFRAC2 | 2204 |
| 1436 | MFRAC3 | 2205 |
| 1437 | MFRAC4 | 2206 |
| 1438 | MFRAC5 | 2207 |
| 1327 | SETF | 221 |
| 1439 | MFRAC6 | 2210 |
| 1495 | MOD16W | 2211 |
| 1440 | MFRAC7 | 2212 |
| 1552 | MOD4CLSS | 2213 |
| 1441 | MFRAC8 | 2214 |
| 1442 | MFRAC9 | 2215 |
| 1937 | NROUND32 | 2216 |
| 1957 | NROUND52 | 2217 |
| 1328 | SETI | 222 |
| 1443 | MFRAC10 | 2220 |
| 1447 | MFRAC14 | 2221 |
| 1925 | NROUND19 | 2222 |
| 1926 | NROUND20 | 2223 |
| 1444 | MFRAC11 | 2224 |
| 1445 | MFRAC12 | 2225 |
| 1446 | MFRAC13 | 2226 |
| 1448 | MFRAC15 | 2227 |
| 1330 | LDUBRK | 223 |
| 1449 | MFRAC16 | 2230 |
| 1450 | MFRAC17 | 2231 |
| 1561 | MOD5CLSS7B | 2232 |
| 1562 | MOD5CLSS7C | 2233 |
| 1452 | MFRACF2 | 2234 |
| 1457 | MFRACF6 | 2235 |
| 1537 | MOD3CLSS17 | 2236 |
| 1538 | MOD3CLSS18 | 2237 |
| 1331 | FPPMAINT1 | 224 |
| 1458 | MFRACF7 | 2240 |
| 1459 | MFRACF8 | 2241 |
| 1460 | MFRACF9 | 2242 |
| 2309 | RTSHFSF2C | 2243 |
| 1461 | MFRACF10 | 2244 |

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| | | |
|------|------------|------|
| 1462 | MFRACF11 | 2245 |
| 1465 | MFRACF13 | 2246 |
| 2308 | RTSHFSF28 | 2247 |
| 1332 | FPPMAINT2 | 225 |
| 1466 | MFRACF14 | 2250 |
| 1467 | MFRACF15 | 2251 |
| 1468 | MFRACF16 | 2252 |
| 1433 | MFRAC | 2253 |
| 1469 | MFRACF17 | 2254 |
| 1470 | MFRACF18 | 2255 |
| 1471 | MFRACF19 | 2256 |
| 1424 | MULMODW17 | 2257 |
| 1333 | ILL TWO | 226 |
| 1472 | MFRACF20 | 2260 |
| 1390 | ANWRTBAK | 2261 |
| 1473 | MFRACF21 | 2262 |
| 1391 | ANWRTBAK2 | 2263 |
| 1474 | MFRACF21B | 2264 |
| 1475 | MFRACF22 | 2265 |
| 1476 | MFRACF23 | 2266 |
| 1477 | MFRACF24 | 2267 |
| 1334 | FPPMAINT3 | 227 |
| 1478 | MFRACF25 | 2270 |
| 1481 | MODW3B | 2271 |
| 1482 | MODW3C | 2272 |
| 1407 | MULFDW | 2273 |
| 1484 | MOD5W | 2274 |
| 1486 | MOD7W | 2275 |
| 1487 | MOD8W | 2276 |
| 1480 | MODW3 | 2277 |
| 389 | INTRO1 | 23 |
| 1335 | ILL THREE | 230 |
| 1488 | MOD9W | 2300 |
| 1500 | MOD1CLSS4 | 2301 |
| 1489 | MOD10W | 2302 |
| 1502 | MOD1CLSS6 | 2303 |
| 1490 | MOD11W | 2304 |
| 1491 | MOD12W | 2305 |
| 1507 | MOD1CLSS11 | 2306 |
| 1508 | MOD1CLSS12 | 2307 |
| 1336 | SETD | 231 |
| 1496 | MOD17W | 2310 |
| 1951 | NROUND46 | 2311 |
| 1498 | MOD1CLSS2 | 2312 |
| 1952 | NROUND47 | 2313 |
| 1499 | MOD1CLSS3 | 2314 |
| 1501 | MOD1CLSS5 | 2315 |
| 1892 | LDCPW4 | 2316 |
| 1893 | LDCPW5 | 2317 |
| 1338 | SETL | 232 |

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| | | |
|------|------------|------|
| 1503 | MOD1CLSS7 | 2320 |
| 1506 | MOD1CLSS10 | 2321 |
| 2224 | LFSHFSF2 | 2322 |
| 2226 | LFSHFSF3 | 2323 |
| 1724 | DFRACADD | 2324 |
| 1719 | DFRACSUB | 2325 |
| 1697 | DIVFDW14 | 2326 |
| 1698 | DIVFDW15 | 2327 |
| 1340 | ILLFOUR | 233 |
| 1509 | MOD1CLSS13 | 2330 |
| 1510 | MOD1CLSS14 | 2331 |
| 1514 | MOD1CLSS18 | 2332 |
| 1515 | MOD1CLSS19 | 2333 |
| 1511 | MOD1CLSS15 | 2334 |
| 1512 | MOD1CLSS16 | 2335 |
| 2031 | FSDM6INT2 | 2336 |
| 2032 | FSDM7INT | 2337 |
| 1341 | ILLFIVE | 234 |
| 1513 | MOD1CLSS17 | 2340 |
| 1518 | MOD3CLSS2 | 2341 |
| 1519 | MOD3CLSS2B | 2342 |
| 1520 | MOD3CLSS3 | 2343 |
| 1521 | MOD3CLSS3B | 2344 |
| 1522 | MOD3CLSS3C | 2345 |
| 587 | IA207 | 2346 |
| 609 | IA221 | 2347 |
| 1342 | ILLSIX | 235 |
| 1523 | MOD3CLSS3D | 2350 |
| 589 | IA207B | 2351 |
| 1524 | MOD3CLSS3E | 2352 |
| 590 | IA207C | 2353 |
| 1689 | DIVFDW6 | 2354 |
| 1690 | DIVFDW7 | 2355 |
| 1691 | DIVFDW8 | 2356 |
| 1692 | DIVFDW9 | 2357 |
| 1343 | ILLSEVEN | 236 |
| 1525 | MOD3CLSS4 | 2360 |
| 1526 | MOD3CLSS6 | 2361 |
| 1906 | NROUND | 2362 |
| 1548 | MOD3CLSS28 | 2363 |
| 1531 | MOD3CLSS11 | 2364 |
| 1532 | MOD3CLSS12 | 2365 |
| 1744 | RMDRLEFT5 | 2366 |
| 1740 | RMDRLEFT1 | 2367 |
| 1344 | ILLEIGHT | 237 |
| 1539 | MOD3CLSS19 | 2370 |
| 1542 | MOD3CLSS22 | 2371 |
| 1722 | DFRACSUB4 | 2372 |
| 1720 | DFRACSUB2 | 2373 |
| 1545 | MOD3CLSS25 | 2374 |

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| | | |
|------|------------|------|
| 1549 | MOD3CLSS29 | 2375 |
| 1923 | NROUND17 | 2376 |
| 1924 | NROUND18 | 2377 |
| 62 | DST36 | 24 |
| 1237 | SETCLASS | 240 |
| 1550 | MOD3CLSS30 | 2400 |
| 1551 | MOD3CLSS31 | 2401 |
| 1451 | MFRACF | 2402 |
| 1434 | MFRACD | 2403 |
| 1554 | MODSCLSS2 | 2404 |
| 1555 | MODSCLSS3 | 2405 |
| 1940 | NROUND35 | 2406 |
| 1946 | NROUND41 | 2407 |
| 1259 | STATUS | 241 |
| 1558 | MODSCLSS58 | 2410 |
| 1560 | MODSCLSS7 | 2411 |
| 1563 | MODSCLSS9 | 2412 |
| 2315 | RTSHFSF7B | 2413 |
| 1670 | WORDCMP | 2414 |
| 1675 | WORDCMP6 | 2415 |
| 1678 | CMPIEQUAL | 2416 |
| 2314 | RTSHFSF7 | 2417 |
| 1254 | CTANZ | 242 |
| 1679 | CMPIEQUAL2 | 2420 |
| 1556 | MODSCLSS4 | 2421 |
| 1687 | DIVFDW4 | 2422 |
| 1557 | MODSCLSS5 | 2423 |
| 1688 | DIVFDW5 | 2424 |
| 1699 | DIVFDW16 | 2425 |
| 1700 | DIVFDW17 | 2426 |
| 1718 | DFRAC18 | 2427 |
| 1255 | CTANZ | 243 |
| 1721 | DFRACSUB3 | 2430 |
| 1723 | DFRACSUB5 | 2431 |
| 1726 | DFRACADD3 | 2432 |
| 2294 | RTSHFDST7B | 2433 |
| 1728 | DFRACADD5 | 2434 |
| 1730 | QUOLEFT2 | 2435 |
| 1731 | QUOLEFT3 | 2436 |
| 2293 | RTSHFDST7 | 2437 |
| 1243 | MULFZ | 244 |
| 1947 | NROUND42 | 2440 |
| 1948 | NROUND43 | 2441 |
| 1949 | NROUND44 | 2442 |
| 1732 | QUOLEFT4 | 2443 |
| 1734 | QUOLEFT8 | 2444 |
| 1737 | QUOLEFT10 | 2445 |
| 1738 | QUOLEFT11 | 2446 |
| 1916 | NROUND10 | 2447 |
| 1244 | MULDZ | 245 |

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| 2248 | RESTART5 | 2450 |
| 2249 | RESTART5B | 2451 |
| 2260 | RESTART16 | 2452 |
| 2261 | RESTART17 | 2453 |
| 1739 | QUOLEFT12 | 2454 |
| 1938 | NROUND33 | 2455 |
| 1741 | RMDRLEFT2 | 2456 |
| 1939 | NROUND34 | 2457 |
| 1245 | MULXNZ | 246 |
| 1742 | RMDRLEFT3 | 2460 |
| 1743 | RMDRLEFT4 | 2461 |
| 1745 | RMDRLEFT6 | 2462 |
| 2232 | LFSHFSF88 | 2463 |
| 1746 | RMDRLEFT7 | 2464 |
| 1749 | RMDRLEFT10 | 2465 |
| 1890 | LDCPW2 | 2466 |
| 2231 | LFSHFSF8 | 2467 |
| 1260 | MOD | 247 |
| 1891 | LDCPW3 | 2470 |
| 1903 | LDCPW15 | 2471 |
| 1733 | QUOLEFT7 | 2472 |
| 1729 | QUOLEFT1 | 2473 |
| 1909 | NROUND4 | 2474 |
| 1910 | NROUND4B | 2475 |
| 1529 | MOD3CLSS10 | 2476 |
| 1530 | MOD3CLS10B | 2477 |
| 64 | DST39 | 25 |
| 1246 | ADDZ | 250 |
| 1911 | NROUND5 | 2500 |
| 1912 | NROUND6 | 2501 |
| 1917 | NROUND11 | 2502 |
| 2305 | RSHFDSTSN7 | 2503 |
| 1918 | NROUND12 | 2504 |
| 1922 | NROUND16 | 2505 |
| 1927 | NROUND21 | 2506 |
| 2304 | RSHFDSTSN6 | 2507 |
| 1247 | ADDNZ | 251 |
| 1928 | NROUND22 | 2510 |
| 1929 | NROUND23 | 2511 |
| 1930 | NROUND24 | 2512 |
| 1933 | NROUND28 | 2513 |
| 1936 | NROUND31 | 2514 |
| 1942 | NROUND37 | 2515 |
| 1540 | MOD3CLSS20 | 2516 |
| 1541 | MOD3CLSS21 | 2517 |
| 1248 | LOADZ | 252 |
| 1944 | NROUND39 | 2520 |
| 578 | MFAT10 | 2521 |
| 1945 | NROUND40 | 2522 |
| 580 | MFAT11 | 2523 |

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| 1950 | NROUND45 | 2524 |
| 1953 | NROUND48 | 2525 |
| 2286 | RTSHFDST2 | 2526 |
| 2289 | RTSHFDST3 | 2527 |
| 1249 | LOADSIX | 253 |
| 1954 | NROUND49 | 2530 |
| 1955 | NROUND50 | 2531 |
| 2307 | RTSHFSF2 | 2532 |
| 2310 | RTSHFSF3 | 2533 |
| 1956 | NROUND51 | 2534 |
| 1960 | NROUND55 | 2535 |
| 2311 | RTSHFSF4 | 2536 |
| 2312 | RTSHFSF5 | 2537 |
| 1251 | LOADNZS | 254 |
| 1961 | NROUND56 | 2540 |
| 2217 | EXPTST5 | 2541 |
| 1962 | FINISH | 2542 |
| 2218 | EXPTST6 | 2543 |
| 1969 | TPREAMBLE | 2544 |
| 1894 | LDCPW6 | 2545 |
| 1970 | TRPE2 | 2546 |
| 1895 | LDCPW7 | 2547 |
| 1252 | SUBZ | 255 |
| 2009 | FETCHINT | 2550 |
| 2010 | STOREINT | 2551 |
| 1958 | NROUND53 | 2552 |
| 1959 | NROUND54 | 2553 |
| 2027 | FSDM3INT | 2554 |
| 2028 | FSDM3INT2 | 2555 |
| 2290 | RTSHFDST4 | 2556 |
| 2291 | RTSHFDST5 | 2557 |
| 1253 | SUBM2 | 256 |
| 2029 | FSDM5INT | 2560 |
| 2030 | FSDM6INT | 2561 |
| 1727 | DFRACADD4 | 2562 |
| 1725 | DFRACADD2 | 2563 |
| 2034 | FETCH2 | 2564 |
| 2035 | FETCH3 | 2565 |
| 2037 | STORE2 | 2566 |
| 2316 | RTSHFSF8 | 2567 |
| 1261 | CMP | 257 |
| 2038 | STORE3 | 2570 |
| 2196 | DATAPREP | 2571 |
| 2197 | DPREP2 | 2572 |
| 2319 | RTSHFSF11 | 2573 |
| 2198 | DPREP28 | 2574 |
| 2199 | DPREP3 | 2575 |
| 1543 | MOD3CLSS23 | 2576 |
| 1544 | MOD3CLSS24 | 2577 |
| 251 | MOV11 | 26 |

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| 1262 | STFD | 260 |
| 2200 | DPREP4 | 2600 |
| 2201 | DPREP5 | 2601 |
| 2202 | DPREP6 | 2602 |
| 2225 | LFSHFSF28 | 2603 |
| 2203 | DPREP7 | 2604 |
| 2204 | DPREP8 | 2605 |
| 2205 | DPREP9 | 2606 |
| 2233 | LFSHFSF9 | 2607 |
| 1263 | STFD2 | 261 |
| 2206 | DPREP10 | 2610 |
| 2207 | DPREP11 | 2611 |
| 2208 | DPREP12 | 2612 |
| 2230 | LFSHFSF7 | 2613 |
| 2209 | DPREP13 | 2614 |
| 2210 | DPREP14 | 2615 |
| 2211 | DPREP15 | 2616 |
| 2234 | LFSHFSF10 | 2617 |
| 1283 | DIVZ | 262 |
| 2212 | DPREP16 | 2620 |
| 2213 | EXPTST | 2621 |
| 2214 | EXPTST2 | 2622 |
| 1463 | MFRACF12 | 2623 |
| 2215 | EXPTST3 | 2624 |
| 2216 | EXPTST4 | 2625 |
| 2223 | LEFTSHFSF | 2626 |
| 1464 | MFRACF128 | 2627 |
| 1284 | DIVNZ | 263 |
| 2227 | LFSHFSF4 | 2630 |
| 2228 | LFSHFSF5 | 2631 |
| 2229 | LFSHFSF6 | 2632 |
| 2244 | RESTART | 2633 |
| 2245 | RESTART2 | 2634 |
| 2246 | RESTART3 | 2635 |
| 1546 | MOD3CLSS26 | 2636 |
| 1547 | MOD3CLSS27 | 2637 |
| 1264 | STOREXP | 264 |
| 1671 | WORDCMP2 | 2640 |
| 1672 | WORDCMP3 | 2641 |
| 1673 | WORDCMP4 | 2642 |
| 1674 | WORDCMP5 | 2643 |
| 2247 | RESTART4 | 2644 |
| 2252 | RESTART8 | 2645 |
| 1747 | RMDLEFT8 | 2646 |
| 1748 | RMDLEFT9 | 2647 |
| 1265 | STOREXP0 | 265 |
| 2253 | RESTART9 | 2650 |
| 2254 | RESTART10 | 2651 |
| 2264 | RESTART17D | 2652 |
| 2265 | RESTART17E | 2653 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1375 | CLRNZW | 2654 |
| 1380 | TSTNZW | 2655 |
| 1387 | ABSNZW | 2656 |
| 1401 | NEGNZW | 2657 |
| 1266 | STOREPX | 266 |
| 2266 | RESTART17F | 2660 |
| 2267 | RESTART17G | 2661 |
| 2268 | RESTORECSP | 2662 |
| 2269 | RESTCSP2 | 2663 |
| 2270 | RESTCSP3 | 2664 |
| 2271 | RESTCSP4 | 2665 |
| 2272 | RESTCSP5 | 2666 |
| 2250 | RESTART6 | 2667 |
| 1285 | STCT | 267 |
| 2273 | RESTCSP6 | 2670 |
| 1676 | WORDCMP7 | 2671 |
| 2274 | RESTCSP7 | 2672 |
| 1677 | WORDCMP8 | 2673 |
| 2275 | RESTCSP8 | 2674 |
| 2276 | RESTCSP9 | 2675 |
| 2277 | RESTCSP10 | 2676 |
| 2262 | RESTART17B | 2677 |
| 252 | MOV61 | 27 |
| 1269 | STCPZ | 270 |
| 2278 | RESTCSP11 | 2700 |
| 2279 | RESTCSP12 | 2701 |
| 2280 | RESTCSP13 | 2702 |
| 1736 | QUOLEFT98 | 2703 |
| 2281 | RESTCSP14 | 2704 |
| 2282 | RESTCSP15 | 2705 |
| 2285 | RTSHFDST | 2706 |
| 1735 | QUOLEFT9 | 2707 |
| 1270 | STCPNZ | 271 |
| 2292 | RTSHFDST6 | 2710 |
| 2295 | RTSHFDST8 | 2711 |
| 2296 | RTSHFDST9 | 2712 |
| 2297 | RTSHFDST10 | 2713 |
| 2298 | RTSHFDST11 | 2714 |
| 2299 | RSHFDSTSN | 2715 |
| 1504 | MOD1CL58 | 2716 |
| 1505 | MOD1CL59 | 2717 |
| 1272 | LDEXP | 272 |
| 2306 | RTSHFSF | 2720 |
| 2313 | RTSHFSF6 | 2721 |
| 1425 | MULMODW18 | 2722 |
| 1431 | MULMODW24 | 2723 |
| 2317 | RTSHFSF9 | 2724 |
| 2318 | RTSHFSF10 | 2725 |
| 2320 | RTSHFSFSN | 2726 |
| 2323 | SETFZFN | 2727 |

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| 1273 | LDEXPM6 | 273 |
| 2324 | SETFZFN2 | 2730 |
| 2329 | DTOFCC1 | 2731 |
| 2330 | DTOFCC2 | 2732 |
| 2302 | RSHFDSTSN4 | 2736 |
| 2303 | RSHFDSTSN5 | 2737 |
| 1274 | LDEXPX | 274 |
| 1275 | LDCTZ | 275 |
| 1276 | LDCTNZ | 276 |
| 1291 | LDCP | 277 |
| 283 | BRA05 | 3 |
| 65 | DST40 | 30 |
| 311 | RTS04 | 300 |
| 618 | IA16 | 3000 |
| 621 | IA19 | 3001 |
| 619 | IA17 | 3002 |
| 620 | IA18 | 3003 |
| 729 | MED22 | 3004 |
| 725 | MEDZ1 | 3005 |
| 344 | RES04 | 3006 |
| 411 | JAM04 | 3007 |
| 324 | RTI10 | 301 |
| 622 | IA20 | 3010 |
| 623 | IA99 | 3011 |
| 414 | JAM27 | 3012 |
| 415 | JAM25 | 3013 |
| 624 | IA90 | 3014 |
| 625 | IA76 | 3015 |
| 838 | INIT04 | 3016 |
| 868 | HFPINIT | 3017 |
| 326 | SOB02 | 302 |
| 735 | MED25 | 3020 |
| 459 | CONDIAG02 | 3021 |
| 462 | CONDIAG05 | 3022 |
| 463 | CONDIAG06 | 3023 |
| 737 | MED26 | 3024 |
| 464 | CONDIAG07 | 3025 |
| 465 | CONDIAG08 | 3026 |
| 466 | CONDIAG09 | 3027 |
| 334 | MARK01 | 303 |
| 640 | IA21 | 3030 |
| 642 | IA22 | 3031 |
| 641 | IA22A | 3032 |
| 654 | IA33 | 3033 |
| 742 | MED28 | 3034 |
| 845 | INIT11 | 3035 |
| 470 | CONDIAG13 | 3036 |
| 895 | MMROINIT | 3037 |
| 353 | YTRP00 | 304 |
| 668 | IA39 | 3040 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 672 | IA40 | 3041 |
| 471 | CONDIAG14 | 3042 |
| 473 | CONDIAG16A | 3043 |
| 749 | MED31 | 3044 |
| 476 | NOSWP02 | 3045 |
| 479 | NOSWP05 | 3046 |
| 529 | JCPE02 | 3047 |
| 354 | YTRP01 | 305 |
| 673 | IA41 | 3050 |
| 675 | IA85 | 3051 |
| 1852 | LDEXP17 | 3052 |
| 1855 | LDEXPHOT | 3053 |
| 755 | MED34 | 3054 |
| 598 | IA100 | 3055 |
| 599 | IA101 | 3056 |
| 600 | IA102 | 3057 |
| 343 | RES03 | 306 |
| 676 | IA86 | 3060 |
| 677 | IA87 | 3061 |
| 601 | IA103 | 3062 |
| 602 | IA50A | 3063 |
| 763 | MED37 | 3064 |
| 603 | IA216 | 3065 |
| 604 | IA217 | 3066 |
| 605 | IA218A | 3067 |
| 342 | RES02 | 307 |
| 626 | IA60 | 3070 |
| 906 | REGINIT11 | 3071 |
| 606 | IA218 | 3072 |
| 909 | REGINIT15 | 3073 |
| 767 | MED40 | 3074 |
| 768 | MED41 | 3075 |
| 840 | INIT06 | 3076 |
| 869 | WHI02A | 3077 |
| 66 | DST24 | 31 |
| 355 | NTRP00 | 310 |
| 679 | IA15 | 3100 |
| 680 | IA89 | 3101 |
| 507 | IA219 | 3102 |
| 627 | IA60A | 3103 |
| 633 | IA65 | 3104 |
| 639 | IA78 | 3105 |
| 628 | IA60B | 3106 |
| 629 | IA60F | 3107 |
| 1324 | SETFDW | 311 |
| 1209 | WCSRADR | 3110 |
| 1207 | WCSRADR01 | 3111 |
| 631 | IA60H | 3112 |
| 634 | IA66A | 3113 |
| 1220 | WCSRST01 | 3114 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1219 | WCSWRST01 | 3115 |
| 842 | INIT08 | 3116 |
| 890 | FGI01 | 3117 |
| 356 | NTRP01 | 312 |
| 610 | IA07 | 3120 |
| 613 | IA10 | 3121 |
| 611 | IA08 | 3122 |
| 612 | IA09 | 3123 |
| 1210 | WCSRDDAT01 | 3124 |
| 1215 | WCSWRDAT01 | 3125 |
| 635 | IA67 | 3126 |
| 636 | IA68 | 3127 |
| 1321 | ILLEGAL1 | 313 |
| 614 | IA11 | 3130 |
| 617 | IA14 | 3131 |
| 615 | IA12 | 3132 |
| 616 | IA13 | 3133 |
| 655 | IA34 | 3134 |
| 662 | IA38 | 3135 |
| 844 | INIT10 | 3136 |
| 894 | SLRINIT | 3137 |
| 358 | TRP01 | 314 |
| 1841 | LDEXP6 | 3140 |
| 1842 | LDEXP7 | 3141 |
| 1843 | LDEXP8 | 3142 |
| 1844 | LDEXP9 | 3143 |
| 769 | MED42 | 3144 |
| 770 | MED43 | 3145 |
| 643 | IA24 | 3146 |
| 644 | IA25A | 3147 |
| 1322 | ILLEGAL2 | 315 |
| 771 | MED44 | 3150 |
| 772 | MED45 | 3151 |
| 645 | IA25 | 3152 |
| 846 | INIT12 | 3153 |
| 646 | IA26 | 3154 |
| 647 | IA27A | 3155 |
| 648 | IA27 | 3156 |
| 910 | CCRINIT | 3157 |
| 359 | TRP02 | 316 |
| 797 | MED70 | 3160 |
| 798 | MED71 | 3161 |
| 649 | IA28 | 3162 |
| 656 | IA34A | 3163 |
| 657 | IA34C | 3164 |
| 650 | IA29 | 3165 |
| 658 | IA34D | 3166 |
| 651 | IA30 | 3167 |
| 1323 | ILLEGAL3 | 317 |
| 802 | MED72 | 3170 |

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|------|----------|------|
| 803 | MED73 | 3171 |
| 659 | IA34E | 3172 |
| 660 | IA34F | 3173 |
| 661 | IA34G | 3174 |
| 849 | INIT15 | 3175 |
| 663 | IA38A | 3176 |
| 911 | PSWINIT | 3177 |
| 253 | BYTE01 | 32 |
| 378 | TRP18 | 320 |
| 731 | MED23 | 3200 |
| 666 | IA38E | 3201 |
| 667 | IA38G | 3202 |
| 669 | IA39B | 3203 |
| 733 | MED24 | 3204 |
| 717 | MED18 | 3205 |
| 670 | IA39C | 3206 |
| 716 | MED17 | 3207 |
| 386 | SER02A | 321 |
| 740 | MED27 | 3210 |
| 913 | CAINIT02 | 3211 |
| 671 | IA39D | 3212 |
| 850 | INIT16 | 3213 |
| 745 | MED29 | 3214 |
| 674 | IA41B | 3215 |
| 678 | IA87A | 3216 |
| 912 | CAINIT01 | 3217 |
| 388 | SER03 | 322 |
| 747 | MED30 | 3220 |
| 681 | IA110 | 3221 |
| 1645 | LOADZW4 | 3222 |
| 1646 | LDDW | 3223 |
| 751 | MED32 | 3224 |
| 682 | IA111 | 3225 |
| 1365 | CLRFZW | 3226 |
| 1366 | CLRDZW | 3227 |
| 390 | INTRO1A | 323 |
| 753 | MED33 | 3230 |
| 693 | IA112A | 3231 |
| 1709 | DFRAC9 | 3232 |
| 1710 | DFRAC10 | 3233 |
| 758 | MED35 | 3234 |
| 1369 | ABSZW2 | 3235 |
| 684 | IA113B | 3236 |
| 1370 | ABSZW3 | 3237 |
| 391 | INTRO2 | 324 |
| 760 | MED36 | 3240 |
| 928 | LOG02A | 3241 |
| 685 | IA113 | 3242 |
| 930 | LOG02B | 3243 |
| 686 | IA114B | 3244 |

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|------|---------|------|
| 652 | IA31 | 3245 |
| 687 | IA114C | 3246 |
| 653 | IA32 | 3247 |
| 392 | INTR03 | 325 |
| 688 | IA114D | 3250 |
| 689 | IA114E | 3251 |
| 929 | LOG02C | 3252 |
| 972 | LOG25 | 3253 |
| 773 | MED46 | 3254 |
| 774 | MED47 | 3255 |
| 861 | INIT24 | 3256 |
| 917 | TRKINIT | 3257 |
| 395 | SER05 | 326 |
| 775 | MED48 | 3260 |
| 776 | MED49 | 3261 |
| 690 | IA114F | 3262 |
| 691 | IA114 | 3263 |
| 693 | IA115A | 3264 |
| 720 | MED20 | 3265 |
| 694 | IA115D | 3266 |
| 721 | MED21 | 3267 |
| 526 | RZ12 | 327 |
| 777 | MED50 | 3270 |
| 778 | MED51 | 3271 |
| 695 | IA115E | 3272 |
| 696 | IA115C | 3273 |
| 699 | MED02 | 3274 |
| 862 | INIT25 | 3275 |
| 700 | MED03 | 3276 |
| 918 | JAMINIT | 3277 |
| 254 | BYTE02 | 33 |
| 1196 | RSVD04 | 330 |
| 779 | MED52 | 3300 |
| 780 | MED53 | 3301 |
| 701 | MED04 | 3302 |
| 702 | MED05 | 3303 |
| 781 | MED54 | 3304 |
| 782 | MED55 | 3305 |
| 703 | MED06 | 3306 |
| 704 | MED10A | 3307 |
| 572 | MFIX00 | 331 |
| 783 | MED56 | 3310 |
| 784 | MED57 | 3311 |
| 705 | MED10 | 3312 |
| 863 | INIT26 | 3313 |
| 785 | MED58 | 3314 |
| 786 | MED59 | 3315 |
| 706 | MED11 | 3316 |
| 920 | UBINIT | 3317 |
| 1197 | RSVD05 | 332 |

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|------|-----------|------|
| 805 | MED74 | 3320 |
| 804 | MED74A | 3321 |
| 707 | MED12A | 3322 |
| 708 | MED12B | 3323 |
| 711 | MED13 | 3324 |
| 712 | MED14 | 3325 |
| 713 | MED14A | 3326 |
| 856 | INIT21 | 3327 |
| 698 | MED01 | 333 |
| 787 | MED60 | 3330 |
| 788 | MED61 | 3331 |
| 1849 | LDEXP14 | 3332 |
| 1850 | LDEXP15 | 3333 |
| 789 | MED62 | 3334 |
| 790 | MED63 | 3335 |
| 714 | MED15 | 3336 |
| 1199 | WCSINIT01 | 3337 |
| 1195 | RSVD03 | 334 |
| 809 | MED205 | 3340 |
| 806 | MED75 | 3341 |
| 715 | MED16 | 3342 |
| 722 | MED85 | 3343 |
| 814 | MED76 | 3344 |
| 833 | MED84 | 3345 |
| 723 | MEDX1 | 3346 |
| 864 | INIT27 | 3347 |
| 1242 | SETCLASS6 | 335 |
| 817 | MED82 | 3350 |
| 819 | MED77 | 3351 |
| 724 | MEDX2 | 3352 |
| 726 | MEDZ2 | 3353 |
| 821 | MED79 | 3354 |
| 816 | MED202 | 3355 |
| 799 | MED71A | 3356 |
| 921 | PWRTST | 3357 |
| 1256 | CTANNZ2 | 336 |

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| | | |
|------|-----------|------|
| 795 | MED68 | 3360 |
| 796 | MED69 | 3361 |
| 800 | MED71B | 3362 |
| 801 | MED71C | 3363 |
| 765 | MED38 | 3364 |
| 766 | MED39 | 3365 |
| 810 | MED206 | 3366 |
| 811 | MED207 | 3367 |
| 1257 | CTANNZ3 | 337 |
| 791 | MED64 | 3370 |
| 792 | MED65 | 3371 |
| 815 | MED76A | 3372 |
| 817 | MED203 | 3373 |
| 793 | MED66 | 3374 |
| 794 | MED67 | 3375 |
| 818 | MED204 | 3376 |
| 820 | MED78 | 3377 |
| 71 | DST23 | 34 |
| 1320 | SETCLASSW | 340 |
| 822 | MED79A | 3400 |
| 977 | LOG30 | 3401 |
| 823 | MED79B | 3402 |
| 978 | LOG31 | 3403 |
| 824 | MED79C | 3404 |
| 1846 | LDEXP11 | 3405 |
| 826 | MED81 | 3406 |
| 1847 | LDEXP12 | 3407 |
| 1345 | STATUSW | 341 |
| 828 | MED83 | 3410 |
| 692 | IA115 | 3411 |
| 835 | INIT01 | 3412 |
| 697 | IA116 | 3413 |
| 830 | CAWRT02 | 3414 |
| 832 | CAREAD02 | 3415 |
| 761 | MED36A | 3416 |
| 762 | MED36B | 3417 |
| 1360 | CTANZW | 342 |
| 834 | INIT00 | 3420 |
| 836 | INIT02 | 3421 |
| 837 | INIT03 | 3422 |
| 839 | INIT05 | 3423 |
| 841 | INIT07 | 3424 |
| 843 | INIT09 | 3425 |
| 847 | INIT13 | 3426 |
| 848 | INIT14 | 3427 |
| 1373 | CTANNZW | 343 |
| 851 | INIT17A | 3430 |
| 853 | INIT18 | 3431 |
| 1716 | DFRAC16 | 3432 |
| 1717 | DFRAC17 | 3433 |

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|------|-----------|------|
| 855 | INIT20 | 3434 |
| 857 | INIT22 | 3435 |
| 756 | MED34A | 3436 |
| 757 | MED34B | 3437 |
| 1404 | MULFZW | 344 |
| 858 | INIT23A | 3440 |
| 859 | INIT23B | 3441 |
| 860 | INIT23 | 3442 |
| 865 | INIT28 | 3443 |
| 870 | WHI02B | 3444 |
| 871 | WHI02 | 3445 |
| 872 | WHI03A | 3446 |
| 873 | WHI03B | 3447 |
| 1405 | MULDZW | 345 |
| 874 | WHI03 | 3450 |
| 887 | WHI14 | 3451 |
| 875 | WHI04 | 3452 |
| 888 | WHI15 | 3453 |
| 1364 | CLRZW | 3454 |
| 1367 | TSTZW | 3455 |
| 1368 | ABSZW | 3456 |
| 1372 | NEGZW | 3457 |
| 1406 | MULXW | 346 |
| 876 | WHI05 | 3460 |
| 881 | WHI10 | 3461 |
| 882 | WHI11 | 3462 |
| 883 | WHI12A | 3463 |
| 884 | WHI12B | 3464 |
| 885 | WHI12 | 3465 |
| 886 | WHI13 | 3466 |
| 889 | WHI16 | 3467 |
| 1479 | MODW | 347 |
| 877 | WHI06 | 3470 |
| 879 | WHI08 | 3471 |
| 878 | WHI07 | 3472 |
| 880 | WHI09 | 3473 |
| 893 | FGI04 | 3474 |
| 897 | REGINIT02 | 3475 |
| 632 | IA60D | 3476 |
| 630 | IA60E | 3477 |
| 85 | CMPO3 | 35 |
| 1565 | ADDZW | 350 |
| 468 | CONDIAG11 | 3500 |
| 469 | CONDIAG12 | 3501 |
| 474 | CONDIAG16 | 3502 |
| 467 | CONDIAG10 | 3503 |
| 898 | REGINIT03 | 3504 |
| 899 | REGINIT04 | 3505 |
| 727 | MEDZ3 | 3506 |
| 728 | MEDZ4 | 3507 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1566 | ADDNZW | 351 |
| 900 | REGINIT05 | 3510 |
| 891 | FGI02 | 3511 |
| 901 | REGINIT06 | 3512 |
| 892 | FGI03 | 3513 |
| 902 | REGINIT07 | 3514 |
| 903 | REGINIT08 | 3515 |
| 904 | REGINIT09 | 3516 |
| 905 | REGINIT10 | 3517 |
| 1641 | LOADZW | 352 |
| 907 | REGINIT12 | 3520 |
| 637 | IA69 | 3521 |
| 908 | REGINIT14A | 3522 |
| 638 | IA70 | 3523 |
| 915 | BASINIT02 | 3524 |
| 916 | BASINIT03 | 3525 |
| 919 | SVSINIT | 3526 |
| 852 | INIT17 | 3527 |
| 1648 | LOADSIXW | 353 |
| 922 | PWRTST01 | 3530 |
| 664 | IA38C | 3531 |
| 924 | PWRTST04 | 3532 |
| 665 | IA38D | 3533 |
| 926 | LOG01 | 3534 |
| 927 | LOG02 | 3535 |
| 931 | LOG03D | 3536 |
| 896 | REGINIT01 | 3537 |
| 1650 | LOADNZW | 354 |
| 932 | LOG02E | 3540 |
| 933 | LOG03A | 3541 |
| 934 | LOG03F | 3542 |
| 935 | LOG03G | 3543 |
| 936 | LOG03H | 3544 |
| 937 | LOG03I | 3545 |
| 938 | LOG03J | 3546 |
| 854 | INIT19 | 3547 |
| 1567 | SUBZW | 355 |
| 939 | LOG03K | 3550 |
| 1966 | FINISH5 | 3551 |
| 940 | LOG03L | 3552 |
| 1967 | FINISH6 | 3553 |
| 941 | LOG03M | 3554 |
| 1968 | FINISH7 | 3555 |
| 942 | LOG03N | 3556 |
| 914 | BASINIT01 | 3557 |
| 1568 | SUBNZW | 356 |
| 943 | LOG03O | 3560 |
| 944 | LOG03P | 3561 |
| 945 | LOG03Q | 3562 |
| 946 | LOG03R | 3563 |

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11/60 MICROCODE CROSS REFERENCE #2 - 1160.ROM

BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 947 | LOG03S | 3564 |
| 948 | LOG03 | 3565 |
| 949 | LOG04 | 3566 |
| 950 | LOG15 | 3567 |
| 1656 | CMPW | 357 |
| 951 | LOG16 | 3570 |
| 952 | LOG17 | 3571 |
| 953 | LOG18 | 3572 |
| 954 | LOG19A | 3573 |
| 955 | LOG19B | 3574 |
| 460 | CONDIAG03 | 3575 |
| 956 | LOG19C | 3576 |
| 461 | CONDIAG04 | 3577 |
| 150 | ASR803 | 36 |
| 1680 | ST1W | 360 |
| 957 | LOG19D | 3600 |
| 709 | MED12C | 3601 |
| 958 | LOG19E | 3602 |
| 710 | MED12D | 3603 |
| 959 | LOG19F | 3604 |
| 960 | LOG19 | 3605 |
| 961 | LOG20 | 3606 |
| 962 | LOG21 | 3607 |
| 1681 | ST2W | 361 |
| 963 | LOG22 | 3610 |
| 413 | JAM28 | 3611 |
| 964 | LOG23 | 3612 |
| 458 | CONDIAG01 | 3613 |
| 965 | LOG24A | 3614 |
| 475 | NOSWP01 | 3615 |
| 966 | LOG24B | 3616 |
| 967 | LOG24C | 3617 |
| 1683 | DIVZW | 362 |
| 968 | LOG24D | 3620 |
| 969 | LOG24E | 3621 |
| 970 | LOG24F | 3622 |
| 971 | LOG24G | 3623 |
| 973 | LOG25A | 3624 |
| 974 | LOG27 | 3625 |
| 975 | LOG28 | 3626 |
| 752 | MED32A | 3627 |
| 1684 | DIVNZW | 363 |
| 976 | LOG29 | 3630 |
| 979 | LOG31A | 3631 |
| 1200 | WCSINIT02 | 3632 |
| 748 | MED30A | 3633 |
| 1201 | WCSINIT03 | 3634 |
| 734 | MED24A | 3635 |
| 730 | MED22A | 3636 |
| 719 | MED19 | 3637 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1750 | STOREXPW | 364 |
| 1202 | WCSINIT04 | 3640 |
| 923 | PWRTST03 | 3641 |
| 1204 | WCSINIT06 | 3642 |
| 925 | PWRTST05 | 3643 |
| 1205 | WCSINIT07 | 3644 |
| 1208 | WCSMRADR02 | 3645 |
| 1211 | WCSRDDAT02 | 3646 |
| 1212 | WCSRDDAT05 | 3647 |
| 1751 | STOREXP0W | 365 |
| 1213 | WCSRDDAT06 | 3650 |
| 1214 | WCSRDDAT07 | 3651 |
| 1216 | WCSMRDAT02 | 3652 |
| 477 | NOSMP03 | 3653 |
| 1217 | WCSMRDAT03 | 3654 |
| 1218 | WCSMRDAT04 | 3655 |
| 1221 | WCSR0ST02 | 3656 |
| 478 | NOSMP04 | 3657 |
| 1752 | STOREXPXW | 366 |
| 829 | CAMRT01 | 3660 |
| 831 | CAREAD01 | 3661 |
| 1222 | WCSR0ST03 | 3662 |
| 1363 | CTANZW38 | 3663 |
| 1371 | ABSZW4 | 3664 |
| 1644 | LOADZW3 | 3665 |
| 1647 | LDDW2 | 3666 |
| 866 | INIT29 | 3667 |
| 1757 | STCTW | 367 |
| 1682 | STSW | 3670 |
| 1693 | DIVFDW10 | 3671 |
| 1694 | DIVFDW11 | 3672 |
| 1695 | DIVFDW12 | 3673 |
| 1696 | DIVFDW13 | 3674 |
| 1701 | DFRAC | 3675 |
| 1702 | DFRAC2 | 3676 |
| 867 | INIT30 | 3677 |
| 151 | ASR804 | 37 |
| 1803 | STCPZW | 370 |
| 1703 | DFRAC3 | 3700 |
| 1704 | DFRAC4 | 3701 |
| 1705 | DFRAC5 | 3702 |
| 1706 | DFRAC6 | 3703 |
| 1707 | DFRAC7 | 3704 |
| 1708 | DFRAC8 | 3705 |
| 1711 | DFRAC11 | 3706 |
| 1712 | DFRAC12 | 3707 |
| 1806 | STCPNZW | 371 |
| 1713 | DFRAC13 | 3710 |
| 1203 | WCSINIT05 | 3711 |
| 1714 | DFRAC14 | 3712 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1206 | WCSINIT08 | 3713 |
| 1715 | DFRAC15 | 3714 |
| 1838 | LDEXP3 | 3715 |
| 738 | MED26A | 3716 |
| 739 | MED26B | 3717 |
| 1835 | LDEXP2W | 372 |
| 807 | MED200 | 3720 |
| 808 | MED201 | 3721 |
| 1839 | LDEXP4 | 3722 |
| 1840 | LDEXP5 | 3723 |
| 825 | MED80 | 3724 |
| 812 | MED208 | 3725 |
| 1845 | LDEXP10 | 3726 |
| 1848 | LDEXP13 | 3727 |
| 1836 | LDEXPDM6W | 373 |
| 813 | MED209 | 3730 |
| 1851 | LDEXP16 | 3731 |
| 1853 | LDEXP18 | 3732 |
| 1854 | LDEXP19 | 3733 |
| 1963 | FINISH3 | 3734 |
| 1964 | FINISH4 | 3735 |
| 743 | MED28A | 3736 |
| 744 | MED28B | 3737 |
| 1837 | LDEXPNZW | 374 |
| 1965 | FINISH4 | 3740 |
| 1856 | LDCTZW | 375 |
| 1857 | LDCTNZW | 376 |
| 1889 | LDCPW1 | 377 |
| 14 | SRC10 | 4 |
| 1193 | RSYD01 | 40 |
| 69 | DST41 | 400 |
| 1780 | STCTW24 | 4000 |
| 1784 | STCTW28 | 4001 |
| 1765 | STCTW9 | 4002 |
| 1766 | STCTW10 | 4003 |
| 11 | SRC11 | 4004 |
| 12 | SRC14 | 4005 |
| 1769 | STCTW13 | 4006 |
| 1770 | STCTW14 | 4007 |
| 1267 | STEXPHOT | 401 |
| 1598 | ADDSHFSFF1 | 4010 |
| 1599 | ADDSHFSFF2 | 4011 |
| 2118 | STFLT3 | 4012 |
| 2130 | STOREHOT | 4013 |
| 13 | SRC09 | 4014 |
| 1793 | STCTW37 | 4015 |
| 15 | SRC12 | 4016 |
| 1797 | STCTW41 | 4017 |
| 106 | CMPOS | 402 |
| 16 | SRC13 | 4020 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|------------|------|
| 1773 | STCTW17 | 4021 |
| 17 | SRC15 | 4022 |
| 1774 | STCTW18 | 4023 |
| 303 | SCC01 | 4024 |
| 2006 | FLTPTRAP | 4025 |
| 304 | SCC02 | 4026 |
| 2008 | NOTRAP | 4027 |
| 107 | BIT04 | 403 |
| 305 | SCC03 | 4030 |
| 374 | TRP15A | 4031 |
| 1586 | SUMSFGDF | 4032 |
| 1584 | SUMDFGSF | 4033 |
| 309 | RTS02 | 4034 |
| 310 | RTS03 | 4035 |
| 1795 | STCTW39 | 4036 |
| 1796 | STCTW40 | 4037 |
| 108 | BIC04 | 404 |
| 313 | RTT02 | 4040 |
| 1786 | STCTW30 | 4041 |
| 314 | RTT03 | 4042 |
| 1787 | STCTW31 | 4043 |
| 316 | RTI02 | 4044 |
| 317 | RTI03 | 4045 |
| 1800 | STCTW44 | 4046 |
| 1801 | STCTW45 | 4047 |
| 109 | BIS04 | 405 |
| 1782 | STCTW26 | 4050 |
| 1783 | STCTW27 | 4051 |
| 1589 | ADDW10 | 4052 |
| 1588 | ADDW09 | 4053 |
| 318 | RTI04 | 4054 |
| 319 | RTI05 | 4055 |
| 1662 | CMPW7 | 4056 |
| 1663 | CMPW8 | 4057 |
| 110 | ADD04 | 406 |
| 1601 | ADDSHFSFD1 | 4060 |
| 1602 | ADDW20A | 4061 |
| 1788 | STCTW32 | 4062 |
| 1789 | STCTW33 | 4063 |
| 320 | RTI06 | 4064 |
| 323 | RTI09 | 4065 |
| 2099 | FFLT3 | 4066 |
| 2103 | FFLT7 | 4067 |
| 295 | XOR03 | 407 |
| 327 | S0B03 | 4070 |
| 328 | S0B04 | 4071 |
| 2243 | MVSFFDST5 | 4072 |
| 2241 | MVSFFDST3 | 4073 |
| 329 | S0B05 | 4074 |
| 331 | S0B08 | 4075 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1651 | LOADNZW2 | 4076 |
| 1652 | LOADNZW3 | 4077 |
| 1192 | FASTX1 | 41 |
| 70 | DST42 | 410 |
| 1605 | ADDSHFDF1 | 4100 |
| 1606 | ADDSHFDF2 | 4101 |
| 2104 | FFLT8 | 4102 |
| 2105 | FFLT9 | 4103 |
| 335 | MARK02 | 4104 |
| 336 | MARK03 | 4105 |
| 1897 | LDCPW9 | 4106 |
| 1898 | LDCPW10 | 4107 |
| 1268 | STEXPHOT2 | 411 |
| 337 | MARK04 | 4110 |
| 360 | TRP03A | 4111 |
| 2074 | STDMOFLT4 | 4112 |
| 2072 | STDMOFLT2 | 4113 |
| 361 | TRP03 | 4114 |
| 362 | TRP04 | 4115 |
| 363 | TRP05A | 4116 |
| 364 | TRP05 | 4117 |
| 113 | CMPB04 | 412 |
| 365 | TRP06 | 4120 |
| 1809 | STCPW6 | 4121 |
| 367 | TRP08 | 4122 |
| 1810 | STCPW7 | 4123 |
| 368 | TRP09 | 4124 |
| 369 | TRP10A | 4125 |
| 1899 | LDCPW11 | 4126 |
| 1904 | LDCPW16 | 4127 |
| 114 | BITB04 | 413 |
| 1608 | ADDSHFDFD1 | 4130 |
| 1609 | ADDW20 | 4131 |
| 1812 | STCPW9 | 4132 |
| 1814 | STCPW11 | 4133 |
| 370 | TRP10 | 4134 |
| 1813 | STCPW10 | 4135 |
| 371 | TRP12 | 4136 |
| 1816 | STCPW13 | 4137 |
| 115 | BICB04 | 414 |
| 372 | TRP13 | 4140 |
| 1822 | STCPW19 | 4141 |
| 373 | TRP14 | 4142 |
| 1823 | STCPW20 | 4143 |
| 375 | TRP15 | 4144 |
| 380 | WCS02 | 4145 |
| 1817 | STCPW14 | 4146 |
| 1818 | STCPW15 | 4147 |
| 116 | BISB04 | 415 |
| 472 | CONDIAG15 | 4150 |

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BOX NO. MICROWORD LBL ADDRESS

| | | |
|------|-----------|------|
| 1825 | STCPW22 | 4151 |
| 525 | RZ11 | 4152 |
| 1826 | STCPW23 | 4153 |
| 1250 | LOADSIX2 | 4154 |
| 1831 | STCPW28 | 4155 |
| 1271 | STCPN22 | 4156 |
| 1832 | STCPW29 | 4157 |
| 111 | SUB05 | 416 |
| 2062 | FSDM0FLT | 4160 |
| 2075 | FSDM1FLT | 4161 |
| 2076 | FSDM2FLT | 4162 |
| 2077 | FSDM3FLT | 4163 |
| 2080 | FSDM4FLT | 4164 |
| 2084 | FSDM5FLT | 4165 |
| 2088 | FSDM6FLT | 4166 |
| 2091 | FSDM7FLT | 4167 |
| 285 | OTH01 | 417 |
| 2151 | FS2DM0FLT | 4170 |
| 2152 | FS2DM1FLT | 4171 |
| 2153 | FS2DM2FLT | 4172 |
| 2154 | FS2DM3FLT | 4173 |
| 2155 | FS2DM4FLT | 4174 |
| 2158 | FS2DM5FLT | 4175 |
| 2159 | FS2DM6FLT | 4176 |
| 2160 | FS2DM7FLT | 4177 |
| 2331 | EIS01 | 42 |
| 165 | ASR06 | 420 |
| 1288 | STCT4 | 4200 |
| 2096 | FFLT SYNC | 4201 |
| 1303 | HFPSPVC3 | 4202 |
| 2097 | FFLT1 | 4203 |
| 1304 | HFPSPVC4 | 4204 |
| 2115 | STSYNC | 4205 |
| 1305 | HFPSPVC5 | 4206 |
| 2116 | STFLT2 | 4207 |
| 163 | ROL03 | 421 |
| 1306 | HFPSPVC6 | 4210 |
| 2176 | FPPABORT1 | 4211 |
| 1310 | HFPPTRAP3 | 4212 |
| 2177 | FPPABORT2 | 4213 |
| 1311 | HFPPTRAP4 | 4214 |
| 2178 | FPPABORT3 | 4215 |
| 1312 | HFPPTRAP5 | 4216 |
| 2117 | STFLT2A | 4217 |
| 164 | ASR05 | 422 |
| 1313 | HFPPTRAP6 | 4220 |
| 306 | SCC04 | 4221 |
| 1314 | HFPPTRAP7 | 4222 |
| 307 | SCC05 | 4223 |
| 1383 | TSTNZW4 | 4224 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1593 | BIGEXPEND | 4225 |
| 1384 | TSTNZM5 | 4226 |
| 1592 | BIGEXDFGSF | 4227 |
| 168 | ASL03 | 423 |
| 1569 | SUBM01 | 4230 |
| 1309 | HFPPTRAP2 | 4231 |
| 1570 | ADDW01 | 4232 |
| 1315 | FETO1F2 | 4233 |
| 1571 | ADDW02 | 4234 |
| 1573 | ADDW04 | 4235 |
| 2121 | STFLT6 | 4236 |
| 2122 | STFLT7 | 4237 |
| 1279 | LDCT4 | 424 |
| 1574 | ADDW05 | 4240 |
| 1575 | ADDW06 | 4241 |
| 2108 | FFLT12 | 4242 |
| 2112 | FFLT16 | 4243 |
| 1576 | ADDW07 | 4244 |
| 1577 | ADDW08 | 4245 |
| 2082 | FSDM4FLT3 | 4246 |
| 2083 | FSDM4FLT4 | 4247 |
| 1281 | LDCT6 | 425 |
| 2189 | NOTNZERO1 | 4250 |
| 2190 | NOTNZERO2 | 4251 |
| 2191 | NOTNZERO3 | 4252 |
| 2192 | NZERO | 4253 |
| 1587 | SUMSFGDF1 | 4254 |
| 1590 | ADDW11 | 4255 |
| 2128 | STFLT13 | 4256 |
| 2129 | STFLT14 | 4257 |
| 1282 | LDCT7 | 426 |
| 1595 | ADDW12B | 4260 |
| 332 | S0B07 | 4261 |
| 1610 | ADDW21 | 4262 |
| 330 | S0B06 | 4263 |
| 1612 | ADD002 | 4264 |
| 1603 | ADDSHFDF | 4265 |
| 1613 | ADD003 | 4266 |
| 1596 | ADDSHFSF | 4267 |
| 301 | SXT06 | 427 |
| 1614 | ADD004 | 4270 |
| 1616 | ADDFO2 | 4271 |
| 2163 | FFLTIMM2 | 4272 |
| 2164 | FFLTIMM3 | 4273 |
| 1617 | ADDFO3 | 4274 |
| 1626 | SF2SCOMP | 4275 |
| 2113 | FFLT17 | 4276 |
| 2114 | FFLT18 | 4277 |
| 1191 | FIS01 | 43 |
| 153 | CLR02 | 430 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1627 | SF2SCMPF | 4300 |
| 1628 | SF2SCMPF1 | 4301 |
| 2166 | FFLTMM5 | 4302 |
| 2167 | FFLTMM6 | 4303 |
| 1630 | SF2SCMPD2 | 4304 |
| 1631 | SF2SCMPD3 | 4305 |
| 1597 | ADDSHFSFF | 4306 |
| 1600 | ADDSHFSFD | 4307 |
| 154 | COMD3 | 431 |
| 1633 | SF2SCMPF3 | 4310 |
| 1634 | FDST2SC | 4311 |
| 1881 | LDCTW24 | 4312 |
| 1882 | LDCTW25 | 4313 |
| 1635 | FDST2SCF1 | 4314 |
| 1637 | FDST2SCD2 | 4315 |
| 2111 | FFLT15 | 4316 |
| 2187 | TSTNZERO | 4317 |
| 155 | INC03 | 432 |
| 1638 | FDST2SCD3 | 4320 |
| 1640 | FDST2SCF3 | 4321 |
| 321 | RTI07 | 4322 |
| 322 | RTI08 | 4323 |
| 1649 | LOADSIXW2 | 4324 |
| 1653 | LOADNZW3B | 4325 |
| 1619 | NROUNDEND | 4326 |
| 1618 | ADDFD4 | 4327 |
| 156 | DECO3 | 433 |
| 1654 | LOADNZW4 | 4330 |
| 1578 | SUMP | 4331 |
| 1655 | LOADNZW5 | 4332 |
| 1579 | DIFP | 4333 |
| 1657 | CMPW2 | 4334 |
| 1658 | CMPW3 | 4335 |
| 2090 | FSDM6FLT3 | 4336 |
| 2092 | FSDM7FLT2 | 4337 |
| 157 | NEG03 | 434 |
| 1659 | CMPW4 | 4340 |
| 1884 | LDCTW27 | 4341 |
| 1660 | CMPW5 | 4342 |
| 1885 | LDCTW28 | 4343 |
| 1661 | CMPW6 | 4344 |
| 1664 | CMPW9 | 4345 |
| 2065 | FSDMOFLT4 | 4346 |
| 2064 | FSDMOFLT3 | 4347 |
| 159 | ADC03 | 435 |
| 1665 | CMPW10 | 4350 |
| 2067 | FDMOFLT | 4351 |
| 1666 | CMPW11 | 4352 |
| 2071 | STDMOFLT | 4353 |
| 1667 | CMPW12 | 4354 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 2193 | NZERO2 | 4355 |
| 1668 | CMPW13 | 4356 |
| 2194 | NZERO3 | 4357 |
| 160 | SBC05 | 436 |
| 1669 | CMPW14 | 4360 |
| 2144 | FFLTSYNC2 | 4361 |
| 1758 | STCTW2 | 4362 |
| 2146 | FDM67FLT | 4363 |
| 1759 | STCTW3 | 4364 |
| 2145 | STSYNC2 | 4365 |
| 1760 | STCTW4 | 4366 |
| 2149 | STDM67FLT | 4367 |
| 162 | TST02 | 437 |
| 1761 | STCTW5 | 4370 |
| 2179 | FPPABORT4 | 4371 |
| 1762 | STCTW6 | 4372 |
| 2180 | FPPABORT5 | 4373 |
| 1763 | STCTW7 | 4374 |
| 2181 | FPPABORT6 | 4375 |
| 1764 | STCTW8 | 4376 |
| 2150 | STDM67FLT2 | 4377 |
| 296 | SXT01 | 44 |
| 1286 | STCT2 | 440 |
| 1767 | STCTW11 | 4400 |
| 1768 | STCTW12 | 4401 |
| 339 | WAIT02 | 4402 |
| 340 | WAIT03 | 4403 |
| 1771 | STCTW15 | 4404 |
| 1772 | STCTW16 | 4405 |
| 1994 | WARMDIS3 | 4406 |
| 1995 | WARMDIS4 | 4407 |
| 188 | MOV01 | 441 |
| 1775 | STCTW19 | 4410 |
| 1776 | STCTW20 | 4411 |
| 1604 | ADDSHFDF | 4412 |
| 1607 | ADDSHFDFD | 4413 |
| 1572 | ADDW03 | 4414 |
| 1580 | ADDSFEZ | 4415 |
| 1581 | ADDFEZ | 4416 |
| 1582 | ADDSDFEZ | 4417 |
| 74 | CMP01 | 442 |
| 1777 | STCTW21 | 4420 |
| 1778 | STCTW22 | 4421 |
| 2238 | MVFDSTSF4 | 4422 |
| 2236 | MVFDSTSF2 | 4423 |
| 1779 | STCTW23 | 4424 |
| 1781 | STCTW25 | 4425 |
| 1785 | STCTW29 | 4426 |
| 376 | TRP16 | 4427 |
| 75 | BIT01 | 443 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1790 | STCTW34 | 4430 |
| 381 | WCS05 | 4431 |
| 1791 | STCTW35 | 4432 |
| 1223 | WCS0DDPC01 | 4433 |
| 1792 | STCTW36 | 4434 |
| 1794 | STCTW38 | 4435 |
| 1798 | STCTW42 | 4436 |
| 377 | TRP17 | 4437 |
| 76 | BIC01 | 444 |
| 1799 | STCTW43 | 4440 |
| 1864 | LDCTW8 | 4441 |
| 1802 | STCTW46 | 4442 |
| 1873 | LDCTW16 | 4443 |
| 1807 | STCPW4 | 4444 |
| 1808 | STCPW5 | 4445 |
| 1992 | WARMDIS | 4446 |
| 1996 | HOTDIS | 4447 |
| 77 | BIS01 | 445 |
| 1811 | STCPW8 | 4450 |
| 1868 | LDCTW11 | 4451 |
| 1815 | STCPW12 | 4452 |
| 1869 | LDCTW12 | 4453 |
| 1819 | STCPW16 | 4454 |
| 1870 | LDCTW13 | 4455 |
| 1820 | STCPW17 | 4456 |
| 1871 | LDCTW14 | 4457 |
| 78 | ADD01 | 446 |
| 1821 | STCPW18 | 4460 |
| 2161 | FFLTSYNC3 | 4461 |
| 1824 | STCPW21 | 4462 |
| 2162 | FFLTMM | 4463 |
| 1827 | STCPW24 | 4464 |
| 2169 | STSYNC3 | 4465 |
| 1828 | STCPW25 | 4466 |
| 2170 | STMM1 | 4467 |
| 1166 | XFC01 | 447 |
| 1829 | STCPW26 | 4470 |
| 2182 | FPPABORT7 | 4471 |
| 1830 | STCPW27 | 4472 |
| 2183 | FPPABORT8 | 4473 |
| 1833 | STCPW30 | 4474 |
| 2184 | FPPABORT9 | 4475 |
| 1834 | STCPW31 | 4476 |
| 2171 | STMM2 | 4477 |
| 101 | SUB04 | 45 |
| 1287 | STCT3 | 450 |
| 1860 | LDCTW4 | 4500 |
| 2058 | MODEALTER5 | 4501 |
| 1861 | LDCTW5 | 4502 |
| 2059 | MODELATER6 | 4503 |

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|---------|---------------|---------|
| 1865 | LDCTW9 | 4504 |
| 1866 | LDCTW10 | 4505 |
| 1632 | SF2SCMPF2 | 4506 |
| 1629 | SF2SCMPD1 | 4507 |
| 200 | MOV02 | 451 |
| 1867 | LDCTW10B | 4510 |
| 1872 | LDCTW15 | 4511 |
| 1594 | ADDW12 | 4512 |
| 1591 | BIGEXPDI | 4513 |
| 1874 | LDCTW17 | 4514 |
| 1989 | DISAB | 4515 |
| 1875 | LDCTW18 | 4516 |
| 2001 | STATUPDT1 | 4517 |
| 80 | CMPB01 | 452 |
| 1876 | LDCTW19 | 4520 |
| 1878 | LDCTW21 | 4521 |
| 1615 | ADDF01 | 4522 |
| 1611 | ADDD01 | 4523 |
| 1880 | LDCTW23 | 4524 |
| 1883 | LDCTW26 | 4525 |
| 1639 | FDST2SCF2 | 4526 |
| 1636 | FDST2SCD1 | 4527 |
| 81 | BITB01 | 453 |
| 1886 | LDCTW29 | 4530 |
| 1887 | LDCTW30 | 4531 |
| 1888 | LDCTW31 | 4532 |
| 1620 | NROUNDEND1 | 4533 |
| 1896 | LDCPW8 | 4534 |
| 1900 | LDCPW12 | 4535 |
| 1901 | LDCPW13 | 4536 |
| 1621 | NROUNDEND2 | 4537 |
| 82 | BICB01 | 454 |
| 1902 | LDCPW14 | 4540 |
| 1971 | OPCODERR | 4541 |
| 1974 | ZERODIV | 4542 |
| 1975 | CONVTRAP | 4543 |

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| | | |
|------|------------|------|
| 1981 | VTRAP5 | 4544 |
| 1983 | UFLOTRAP | 4545 |
| 1985 | NZEROTRAP | 4546 |
| 1987 | MAINTTRAP | 4547 |
| 83 | BISB01 | 455 |
| 1905 | LDCPW17 | 4550 |
| 1976 | CTRAP2 | 4551 |
| 2101 | FFLT5 | 4552 |
| 2102 | FFLT6 | 4553 |
| 1622 | NROUNDEND3 | 4554 |
| 1623 | NROUNDEND4 | 4555 |
| 1624 | NROUNDEND5 | 4556 |
| 1625 | NROUNDEND6 | 4557 |
| 79 | SUB01 | 456 |
| 1977 | OFLOTRAP | 4560 |
| 1978 | VTRAP2 | 4561 |
| 2070 | FDMOFLT4 | 4562 |
| 2068 | FDMOFLT2 | 4563 |
| 1979 | VTRAP3 | 4564 |
| 1297 | HOTSYNC | 4565 |
| 1980 | VTRAP4 | 4566 |
| 1298 | HOTSYNC2 | 4567 |
| 1296 | HTDMOSYNCS | 457 |
| 1982 | VTRAP6 | 4570 |
| 1984 | UTRAP2 | 4571 |
| 2120 | STFLT5 | 4572 |
| 2137 | STOREHOT3 | 4573 |
| 1986 | NZTRAP2 | 4574 |
| 1299 | HOTSYNC3 | 4575 |
| 1988 | TRAPEND | 4576 |
| 1300 | HOTSYNC4 | 4577 |
| 293 | XOR01 | 46 |
| 1325 | SETFD02 | 460 |
| 1993 | WARMDIS2 | 4600 |
| 2002 | STATUPDT2 | 4601 |
| 1972 | OPERR2 | 4602 |
| 1973 | OPERRHOT | 4603 |
| 2003 | STATUPDT3 | 4604 |
| 2004 | STATUPDT4 | 4605 |
| 2063 | FSDMOFLT2 | 4606 |
| 2066 | FSDMOFLT5 | 4607 |
| 1329 | SETI2 | 461 |
| 2005 | STATUPDT5 | 4610 |
| 1990 | VDIS | 4611 |
| 2007 | FLTPTRAP2 | 4612 |
| 1991 | UDIS | 4613 |
| 2039 | FETCHFLT | 4614 |
| 1997 | UVDIS | 4615 |
| 2040 | FFLTDEFER | 4616 |
| 2000 | CDIS | 4617 |

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| | | |
|------|------------|------|
| 19 | SRC18 | 462 |
| 2041 | LDCFETH | 4620 |
| 2042 | STCFLT | 4621 |
| 2138 | STOREHOT4 | 4622 |
| 2139 | STOREHOT5 | 4623 |
| 2043 | FETCHINTLG | 4624 |
| 2046 | FINTLG4 | 4625 |
| 1307 | HFPSPVC7 | 4626 |
| 1308 | HFPSTRAP | 4627 |
| 20 | SRC20 | 463 |
| 2047 | FINTLG5 | 4630 |
| 366 | TRP07 | 4631 |
| 2048 | STOREINTLG | 4632 |
| 379 | WCS01 | 4633 |
| 2050 | STINTLG3 | 4634 |
| 2052 | MODEALTER | 4635 |
| 1385 | TSTNZW6 | 4636 |
| 1386 | TSTNZW7 | 4637 |
| 298 | SXT03 | 464 |
| 2053 | MODEALTER2 | 4640 |
| 2054 | MODEALTR2B | 4641 |
| 1998 | UVDIS2 | 4642 |
| 1999 | UVDIS3 | 4643 |
| 2055 | MODEALTR2C | 4644 |
| 2056 | MODEALTER3 | 4645 |
| 1585 | DIFSFGDF | 4646 |
| 1583 | DIFDFGSF | 4647 |
| 299 | SXT04 | 465 |
| 2057 | MODEALTER4 | 4650 |
| 2060 | FETCHFLT2 | 4651 |
| 2147 | FDM67FLT2 | 4652 |
| 2148 | FDM67FLT3 | 4653 |
| 2061 | STOREFLT | 4654 |
| 2069 | FDMOFLT3 | 4655 |
| 2131 | STOREHOT2 | 4656 |
| 2132 | STOREHOT2G | 4657 |
| 21 | SRC17 | 466 |
| 2073 | STDMOFLT3 | 4660 |
| 2078 | FSDM3FLT2 | 4661 |
| 2079 | FSDM3FLT3 | 4662 |
| 2044 | FINTLG2 | 4663 |
| 2081 | FSDM4FLT2 | 4664 |
| 2085 | FSDM5FLT2 | 4665 |
| 2086 | FSDM5FLT3 | 4666 |
| 2045 | FINTLG3 | 4667 |
| 22 | SRC19 | 467 |
| 2087 | FSDM5FLT4 | 4670 |
| 2089 | FSDM6FLT2 | 4671 |
| 2172 | STIMM3 | 4672 |
| 2173 | STIMM4 | 4673 |

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| | | |
|------|------------|------|
| 2093 | FSDM7FLT3 | 4674 |
| 2094 | FSDM7FLT4 | 4675 |
| 2174 | STIMM5 | 4676 |
| 2175 | STIMM6 | 4677 |
| 294 | XOR02 | 47 |
| 1337 | SETDW2 | 470 |
| 2095 | FSDM7FLT5 | 4700 |
| 2098 | FFLT2 | 4701 |
| 2100 | FFLT4 | 4702 |
| 2049 | STINTLG2 | 4703 |
| 2106 | FFLT10 | 4704 |
| 2107 | FFLT11 | 4705 |
| 2109 | FFLT13 | 4706 |
| 2051 | STINTLG4 | 4707 |
| 1339 | SETL2 | 471 |
| 2110 | FFLT14 | 4710 |
| 2119 | STFLT4 | 4711 |
| 1862 | LDCTW6 | 4712 |
| 1863 | LDCTW7 | 4713 |
| 2123 | STFLT8 | 4714 |
| 2124 | STFLT9 | 4715 |
| 2125 | STFLT10 | 4716 |
| 2126 | STFLT11 | 4717 |
| 1347 | LDFPS2 | 472 |
| 2127 | STFLT12 | 4720 |
| 2133 | STOREHOT2C | 4721 |
| 1316 | FETO1F | 4722 |
| 1317 | SERO2F | 4723 |
| 2134 | STOREHOT2D | 4724 |
| 2135 | STOREHOT2E | 4725 |
| 2140 | STOREHOT6 | 4726 |
| 2136 | STOREHOT2F | 4727 |
| 1348 | LDFPS3 | 473 |
| 2141 | STOREHOT7 | 4730 |
| 2142 | STOREHOT8 | 4731 |
| 1289 | STCT5 | 4732 |
| 1290 | STCT6 | 4733 |
| 2143 | STOREHOT9 | 4734 |
| 2156 | FS2DM4FLT2 | 4735 |
| 2157 | FS2DM4FLT3 | 4736 |
| 2165 | FFLTIMM4 | 4737 |
| 1318 | WFORK | 474 |
| 2168 | FFLTIMM7 | 4740 |
| 2185 | FPPABORT10 | 4741 |
| 2186 | FPPABORT11 | 4742 |
| 2188 | TSTNZERO2 | 4743 |
| 2195 | NZERO4 | 4744 |
| 2235 | MOVFDSTSF | 4745 |
| 2237 | MVFDSTSF3 | 4746 |
| 2239 | MOVSFDDST | 4747 |

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| BOX NO. | MICROWORD LBL | ADDRESS |
|---------|---------------|---------|
| 1235 | HFORK | 475 |
| 1319 | WFORKNVALD | 476 |
| 2240 | MVSFFDST2 | 4760 |
| 2242 | MVSFFDST4 | 4761 |
| 1877 | LDCTW20 | 4762 |
| 1879 | LDCTW22 | 4763 |
| 2255 | RESTART11 | 4764 |
| 2256 | RESTART12 | 4765 |
| 2257 | RESTART13 | 4766 |
| 2258 | RESTART14 | 4767 |
| 1236 | HFORKNVALD | 477 |
| 18 | SRC16 | 5 |
| 325 | SOB01 | 50 |
| 1350 | LDFPS5 | 500 |
| 278 | JMP23 | 501 |
| 1352 | LDFPS7 | 502 |
| 274 | JMP20 | 503 |
| 1353 | LDFPS8 | 504 |
| 1346 | LDFPS | 505 |
| 1355 | STFPS | 506 |
| 1357 | STST | 507 |
| 333 | MARK00 | 51 |
| 1354 | LDFPS9 | 510 |
| 39 | DST01 | 511 |
| 40 | DST02 | 512 |
| 41 | DST03 | 513 |
| 42 | DST04 | 514 |
| 43 | DST05 | 515 |
| 44 | DST06 | 516 |
| 45 | DST07 | 517 |
| 112 | SUB06 | 52 |
| 186 | ASRB11 | 520 |
| 179 | ROLB02 | 521 |
| 180 | ASRB05 | 522 |
| 187 | ASLB02 | 523 |
| 55 | DST21 | 524 |
| 56 | DST22 | 525 |
| 57 | DST19 | 526 |
| 58 | DST20 | 527 |
| 571 | MFAT00 | 53 |
| 169 | CLRB02 | 530 |
| 170 | COMB02 | 531 |
| 171 | INCB02 | 532 |
| 172 | DECB02 | 533 |
| 173 | NEGB03 | 534 |
| 175 | ADCB02 | 535 |
| 176 | SBCB05 | 536 |
| 178 | TSTB02 | 537 |
| 122 | NEG02 | 54 |
| 128 | ROR01 | 540 |

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| | | |
|------|------------|------|
| 129 | ROL01 | 541 |
| 130 | ASR01 | 542 |
| 134 | ASL01 | 543 |
| 1356 | STFPS2 | 544 |
| 1378 | CLRNZM4 | 545 |
| 1685 | DIVFDW2 | 546 |
| 1685 | DIVFDW3 | 547 |
| 351 | EMT01 | 55 |
| 117 | CLR01 | 550 |
| 118 | COM01 | 551 |
| 119 | INC01 | 552 |
| 120 | DEC01 | 553 |
| 121 | NEG01 | 554 |
| 123 | ADC01 | 555 |
| 124 | SBC01 | 556 |
| 127 | TST01 | 557 |
| 350 | TRAP01 | 56 |
| 146 | RORB01 | 560 |
| 147 | ROLB01 | 561 |
| 148 | ASRB01 | 562 |
| 152 | ASLB01 | 563 |
| 236 | MOV24 | 564 |
| 237 | MOV26 | 565 |
| 238 | MOV23 | 566 |
| 239 | MOV25 | 567 |
| 255 | JSR01 | 57 |
| 135 | CLRB01 | 570 |
| 136 | COMB01 | 571 |
| 137 | INCB01 | 572 |
| 138 | DECB01 | 573 |
| 139 | NEGB01 | 574 |
| 141 | ADCB01 | 575 |
| 142 | SBCB01 | 576 |
| 145 | TSTB01 | 577 |
| 281 | BRA04 | 6 |
| 1194 | RSVD02 | 60 |
| 1753 | STEXP2 | 600 |
| 1225 | XCSUB01 | 6000 |
| 1170 | XFCOTH01 | 6001 |
| 1183 | USERDISP01 | 6002 |
| 1198 | WCSRSVD01 | 6003 |
| 1224 | ODOPCDIS01 | 6004 |
| 1234 | SVCDEFLT02 | 6005 |
| 1229 | JAMDEFLT01 | 6006 |
| 1233 | SVCDEFLT01 | 6007 |
| 189 | MOV07 | 601 |
| 1109 | WCSDIAG01 | 6010 |
| 1172 | XFCOTH10 | 6011 |
| 1174 | XFCOTH20 | 6012 |
| 1176 | XFCOTH30 | 6013 |

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| | | |
|------|-----------|------|
| 1178 | XFCOTH40 | 6014 |
| 1180 | XFCOTH50 | 6015 |
| 190 | MOV12 | 602 |
| 192 | MOV19 | 603 |
| 193 | MOV32 | 604 |
| 197 | MOV36 | 605 |
| 198 | MOV41 | 606 |
| 199 | MOV54 | 607 |
| 338 | WAIT01 | 61 |
| 1754 | STEXP3 | 610 |
| 202 | MOV09 | 611 |
| 203 | MOV14 | 612 |
| 205 | MOV21 | 613 |
| 206 | MOV34 | 614 |
| 207 | MOV38 | 615 |
| 208 | MOV43 | 616 |
| 209 | MOV56 | 617 |
| 315 | RTI01 | 62 |
| 1755 | STEXP4 | 620 |
| 210 | MOV05 | 621 |
| 84 | CMP02 | 622 |
| 86 | BIT02 | 623 |
| 87 | BIC02 | 624 |
| 88 | BIS02 | 625 |
| 89 | ADD02 | 626 |
| 30 | SRC23 | 627 |
| 349 | BPT01 | 63 |
| 1858 | LDCTW2 | 630 |
| 221 | MOV06 | 631 |
| 91 | CMPB02 | 632 |
| 92 | BITB02 | 633 |
| 93 | BICB02 | 634 |
| 94 | BISB02 | 635 |
| 90 | SUB02 | 636 |
| 31 | SRC38 | 637 |
| 348 | IOT01 | 64 |
| 1859 | LDCTW3 | 640 |
| 2259 | RESTART15 | 641 |
| 72 | DST25 | 642 |
| 73 | DST26 | 643 |
| 2283 | RETCSP16 | 644 |
| 63 | DST38 | 645 |
| 2284 | RETCSP!7 | 646 |
| 2373 | DIV39 | 647 |
| 125 | SBC02 | 65 |
| 352 | ILLO1 | 650 |
| 256 | JMP02 | 651 |
| 257 | JMP03 | 652 |
| 259 | JMP05 | 653 |
| 260 | JMP06 | 654 |

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| | | |
|-----|--------|-----|
| 261 | JMP07 | 655 |
| 263 | JMP09 | 656 |
| 267 | JMP13 | 657 |
| 308 | RTS01 | 66 |
| 23 | SRC21 | 661 |
| 24 | SRC32 | 662 |
| 25 | SRC33 | 663 |
| 26 | SRC34 | 664 |
| 27 | SRC35 | 665 |
| 28 | SRC36 | 666 |
| 29 | SRC37 | 667 |
| 341 | RES01 | 67 |
| 211 | MOV08 | 671 |
| 212 | MOV13 | 672 |
| 214 | MOV20 | 673 |
| 215 | MOV33 | 674 |
| 216 | MOV37 | 675 |
| 217 | MOV42 | 676 |
| 219 | MOV55 | 677 |
| 282 | BRA03 | 7 |
| 302 | SCC00 | 70 |
| 3 | FET03 | 700 |
| 385 | SER01 | 701 |
| 1 | FET01 | 702 |
| 387 | SER02 | 703 |
| 241 | MOV29 | 704 |
| 242 | MOV31 | 705 |
| 243 | MOV28 | 706 |
| 244 | MOV30 | 707 |
| 286 | SWB01 | 71 |
| 4 | SRC01 | 711 |
| 5 | SRC02 | 712 |
| 6 | SRC03 | 713 |
| 7 | SRC04 | 714 |
| 8 | SRC05 | 715 |
| 9 | SRC06 | 716 |
| 10 | SRC07 | 717 |
| 126 | SBC03 | 72 |
| 290 | SWB04 | 720 |
| 95 | CMP04 | 722 |
| 96 | BIT03 | 723 |
| 97 | BIC03 | 724 |
| 98 | BIS03 | 725 |
| 99 | ADD03 | 726 |
| 289 | SWB03 | 73 |
| 102 | CMPB03 | 732 |
| 103 | BITB03 | 733 |
| 104 | BICB03 | 734 |
| 105 | BISB03 | 735 |
| 100 | SUB03 | 736 |

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| | | |
|-----|--------|-----|
| 345 | HALT01 | 74 |
| 300 | SXT05 | 740 |
| 46 | DST11 | 741 |
| 47 | DST12 | 742 |
| 48 | DST13 | 743 |
| 49 | DST14 | 744 |
| 50 | DST15 | 745 |
| 51 | DST16 | 746 |
| 52 | DST17 | 747 |
| 131 | ASR02 | 75 |
| 37 | SRC24 | 752 |
| 38 | SRC29 | 753 |
| 279 | BRA01 | 757 |
| 312 | RTT01 | 76 |
| 67 | DST27 | 762 |
| 68 | DST28 | 763 |
| 246 | MOV51 | 764 |
| 247 | MOV53 | 765 |
| 248 | MOV50 | 766 |
| 249 | MOV52 | 767 |
| 140 | NEG02 | 77 |
| 32 | SRC30 | 772 |
| 33 | SRC31 | 773 |
| 402 | JAM01 | 777 |

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