KE44-A

CIS INSTR EXER
CZKEEBO

AH-F227B-MC
FICHE 1 OF 3

FEB 1981

KE44-A

CIS INSTR EXER
CZKEEBO

AH-F227B-MC
FICHE 2 OF 3

KE44-A

CIS INSTR EXER
CZKEEBO

AH-F227B-MC
FICHE 3 OF 3

FEB 1981

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                                IDENTIFICATION
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                      PRODUCT CODE:   AC-F226B-MC

                      PRODUCT NAME:   CZKEEBO PDP-11 CIS INST EXERCISER

                      DATE:           OCTOBER, 1980

                      MAINTAINER:     BASE SYSTEMS DIAGNOSTIC ENGINEERING






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                           DEC             DECUS           DECTAPE
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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THE CIS INSTRUCTION EXERCISER TESTS ALL CIS INSTRUCTIONS IN BOTH REGISTER AND IN-LINE MODES. EACH INSTRUCTION IS TESTED USING ALL COMBINATIONS OF OPERAND DATA TYPES, IN EACH OF THE THREE POSSIBLE PROCESSOR MODES (USER, SUPERVISOR, KERNEL), WITH MEMORY MANAGEMENT ENABLED/DISABLED ,WITH D-SPACE ENABLED/DISABLED, IN AN INTERRUPT ENVIRONMENT, FOR MANY CASES OF STRING LENGTH, STRING ADDRESS AND STRING DATA.

THIS PROGRAM IS NOT DIRECTED AT ANY ONE CIS HARDWARE IMPLEMENTATION BUT RATHER IS INTENDED TO PROVIDE THOROUGH INSTRUCTION EXERCISING FOR ALL PDP-11 CIS PROCESSORS.

1.1.1 STRUCTURE OF PROGRAM

THIS DIAGNOSTIC OCCUPIES 28K WORDS OF MEMORY AND IS COMPATIBLE WITH XXDP, ACT AND APT. IT CAN BE RUN STANDALONE UNDER XXDP, AND CAN BE CHAINED UNDER XXDP, ACT AND APT (REFERENCE XXDP USERS MANUAL FOR DETAILS OF CHAINING PROCEDURE).

THIS PROGRAM SETS UP FOR AND EXECUTES ONE CIS INSTRUCTION AT A TIME AND THEN COMPARES RESULTS WITH EXPECTED RESULTS. ERROR MESSAGES IDENTIFY ALL OPERANDS AND STRING DATA ASSOCIATED WITH THE FAILING INSTRUCTION TEST CASE. THE PROGRAM IS STRUCTURED AS A SINGLE COMPLEX LOOP WHICH GETS REEXECUTED ONCE FOR EACH INSTRUCTION TEST CASE. INSTRUCTION OPERANDS FOR EACH TEST CASE ARE EITHER EXTRACTED FROM INPUT TABLES OR GENERATED USING A RANDOM NUMBER GENERATOR. EXPECTED RESULTS ARE COMPUTED IN THE LOOP BY EMULATING CIS INSTRUCTIONS USING THE BASIC PDP-11 INSTRUCTIONS.

1.1.2 DIAGNOSTIC INFORMATION

1.2 SYSTEM REQUIREMENTS

1.2.1 HARDWARE REQUIREMENTS

PDP-11 PROCESSOR (WITH CIS CAPABILITY) WITH 28K OR MORE OF MEMORY
CONSOLE DEVICE (LA30,LA36,VT50,ETC.)
PROGRAM LOAD DEVICE (PAPER TAPE, APT, ACT, DISK, MAGTAPE, ETC)
OPTIONAL HARDWARE:
    1 OR 2 KW11-P PROGRAMMABLE REAL TIME CLOCKS
    1 MHZ OSCILLATOR

1.2.2 SOFTWARE REQUIREMENTS

1.3 RELATED DOCUMENTS AND STANDARDS

XXDP USERS MANUAL
DEC STANDARD 168 (PDP11 EXTENDED INSTRUCTIONS)

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

ALL BASE PROCESSOR DIAGNOSTICS AND THE CIS DIAGNOSTIC SHOULD BE RUN ERROR FREE BEFORE ATTEMPTING TO EXECUTE THIS CIS INSTRUCTION EXERCISER.

1.5 ASSUMPTIONS

THE HARDWARE OTHER THAN THE SUBSYSTEM BEING TESTED IS ASSUMED TO WORK PROPERLY. FALSE ERRORS MAY BE REPORTED IF THE PROCESSOR, MEMORY, ETC., DO NOT FUNCTION PROPERLY.

2.0 OPERATING INSTRUCTIONS

2.1 LOADING AND STARTING PROCEDURES

2.1.1 LOADING PROCEDURES

THIS PROGRAM MAY BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER. IT MAY ALSO BE LOADED FROM ANY XXDP LOAD MEDIA. THE PROGRAM IS BOTH APT AND ACT COMPATIBLE AND CAN BE DOWN LINE LOADED INTO THE SYSTEM UNDER TEST FROM THE APT OR ACT HOST PROCESSOR.

2.1.2 STEPS FOR QUICK AND SIMPLE EXECUTION

THE DIAGNOSTIC CAN BE EXECUTED STANDALONE WITHOUT READING THE REMAINDER OF THIS DOCUMENT, AS FOLLOWS:

A) LOAD THE DIAGNOSTIC
B) START AT ADDRESS 200
G) GET END OF PASS MESSAGES OR ERROR MESSAGES

2.1.3 STARTING PROCEDURE

```
THE NORMAL PROGRAM STARTING ADDRESS IS 200.  AN OPTIONAL STARTING
ADDRESS (204) PROVIDES FOR USER SELECTION OF INSTRUCTION(S) TO
TEST AND USER CONTROL OVER TEST ENVIRONMENT. AN OPTIONAL
STARTING ADDRESS (210) PROVIDES A QUICK VERIFY (ONLY) MODE TAILORED
TO THE PROCESSOR TYPE UNDER TEST TO RUN IN LESS THAN 5 MINUTES
PER PASS AND PROVIDE A FAIR LEVEL OF MICROCODE COVERAGE (>80%).

STARTING ADDRESS = 200

-----------------------

STARTING AT ADDRESS 200 RESULTS IN EXECUTION OF THE STANDARD
TEST SEQUENCE.  A QV PASS IS RUN FIRST (SUBSET OF ALL TABLED TEST CASES).
THIS QV PASS IS FOLLOWED BY A END OF QV PASS INDICATION.
THEN ALL TABLED TEST CASES FOR ALL INSTRUCTIONS
ARE EXECUTED (APPROX 30 MINUTES) FOLLOWED BY
AN END OF PASS INDICATION.  TESTING THEN PROCEEDS IN A RANDOM
MODE UNTIL THE OPERATOR TERMINATES EXECUTION.

CIS INSTRUCTION INTERRUPTABILITY IS EXERCISED PROVIDED THE
SYSTEM UNDER TEST HAS A LINE TIME CLOCK (KW11-L TYPE).

PROCESSOR MODE (KERNEL,SUPERVISOR,USER) IS SELECTED RANDOMLY
PRIOR TO EXECUTION OF EACH CIS INSTRUCTION TEST CASE. MEMORY MANAGEMENT
IS ENABLED WITH THE D-SPACE ENABLE/DISABLE STATE
SELECTED RANDOMLY PRIOR TO EACH TEST CASE. MODE IS SWITCHED TO
THE TEST MODE AND MEMORY MANAGEMENT IS TURNED ON JUST PRIOR TO
EXECUTION OF THE CIS INSTRUCTION UNDER TEST.  DURING INTERRUPT
SERVICE AND IMMEDIATELY FOLLOWING THE COMPLETION
OF THE CIS INSTRUCTION EXECUTION THE MODE IS SWITCHED BACK
TO KERNEL AND MEMORY MANAGEMENT IS SHUT OFF.

TABLED TEST CASES ARE EXHAUSTED FOR A GIVEN INSTRUCTION BEFORE PROCEEDING
TO TEST THE NEXT CIS INSTRUCTION.  AT THE START OF EACH NEW
INSTRUCTION (NON-RANDOM MODE) A MESSAGE IS DISPLAYED AS A
PROGRESS INDICATOR IDENTIFYING THE CIS INSTRUCTION UNDER TEST.
A 'CONTROL T' ENTERED AT ANY TIME WILL CAUSE THE PROGRAM TO
DISPLAY THE INSTRUCTION UNDER TEST AND THE CURRENT INSTRUCTION
COUNT.  THE FOLLOWING LIST IDENTIFIES THE ORDER IN
WHICH INSTRUCTIONS ARE TESTED (NON-RANDOM MODE) AND THE
APPROXIMATE NUMBER OF TESTS EXECUTED FOR EACH INSTRUCTION
(AFTER THE QV PASS).

        INSTRUCTION          # OF TESTS

        -----------          ----------

        L2D                  8
        L3D                  8
        MOVC                 354
        LOCC                 36
        CMPC                 362
        MOVRC                354
        MOVTC                354
        SKPC                 30
```

```
                MATC                 904
                SCANC                126
                SPANC                126
                CVTPN                226
                CVTNP                568
                CVTLP                170
                CVTLN                323
                CVTPL                53
                CVTNL                99
                ADDP                 1970
                ADDN                 3872
                SUBP                 1970
                SUBN                 3746
                CMPP                 502
                CMPN                 1089
                ASHP                 1972
                ASHN                 3872
                MULP                 1993
                DIVP                 1973


        AFTER BEING STARTED AT LOCATION 200 THE PROGRAM SHOULD
        RESPOND AS FOLLOWS:

                CZKEEBO PDP-11 CIS INSTRUCTION EXERCISER
                QUICK VERIFY PASS TIME: LESS THAN 5 MINUTES
                L2DO     INST CT: XX XXXXX
                         .
                         .
                         .
                DIVP     INST CT: XX XXXXX
                END OF QUICK VERIFY PASS
                INST UNDER TEST WILL BE DISPLAYED ..........
                PASS TIME:    APPROX. 30 MIN
                L2DO     INST CT: XX  XXXXX
                         .
                         .
                         .
                DIVP     INST CT: XX  XXXXX
                END OF PASS (EXECUTION OF TABLED TEST CASES COMPLETE)
                ENTERING RANDOM TEST MODE
                NO FURTHER END OF PASS MESSAGES WILL BE ISSUED
                RANDOM # GENERATOR SEED CONSTANTS WILL BE PRINTED
                         EVERY 1024 CIS INSTRUCTION TESTS
                RANDOM # GENERATOR SEED  XXXXXX  XXXXXX  XXXXXX
                                .
                                .
                                .
                                .
                   (UNTIL PROGRAM EXECUTION IS TERMINATED BY USER)


        THE INSTRUCTION COUNT DISPLAYED AT THE START OF TESTING FOR
        EACH INSTRUCTION IS CUMULATIVE FROM THE FIRST L2DO CIS INSTRUCTION
```

```
TESTED.  THE LOWER 5 DIGIT COUNT GETS INCREMENTED ONCE PER CIS
INSTRUCTION TEST (I.E. ONCE PER CIS INSTRUCTION EXECUTED)
AND COUNTS FROM 0 TO 65,535 (DECIMAL).  THE UPPER 2
DIGIT COUNT GETS INCREMENTED ONCE PER 65,535 TESTS.  THE
INSTRUCTION COUNT IS ZEROED AT THE START OF RANDOM MODE
TESTING.  CONTROL T MUST BE USED TO DISPLAY THE INSTRUCTION COUNT
IN RANDOM MODE.

IN XXDP CHAIN AND ACT CHAIN MODE TESTING TERMINATES AFTER
THE END OF PASS INDICATION AND CONTROL IS RETURNED TO THE
RESPECTIVE MONITOR.  RANDOM MODE IS NOT ENTERED IN THESE CHAIN
MODES.  RANDOM TEST MODE IS ENTERED AUTOMATICALLY IN ALL OTHER
ENVIRONMENTS (STANDALONE,XXDP MANUAL,ACT DUMP,APT).

THE RANDOM # GENERATOR SEED CONSTANTS ARE DISPLAYED TO PERMIT
THE USER TO STOP AND LATER RESUME RANDOM TESTING FROM THE
TERMINATION POINT.  THIS IS EXPLAINED BELOW UNDER
THE HEADING "STARTING ADDRESS = 214".

STARTING ADDRESS = 204

----------------------

STARTING AT ADDRESS 204 REQUIRES THE OPERATOR TO RESPOND
TO QUESTIONS TO SELECT INSTRUCTION(S) FOR TEST, TEST
MODE, AND TEST ENVIRONMENT.

AFTER BEING STARTED AT LOCATION 204 THE PROGRAM SHOULD
RESPOND AS FOLLOWS:

        CZKEEBO PDP-11 CIS INSTRUCTION EXERCISER
        TEST INTERRUPTABILITY OF CIS INSTRUCTIONS (Y OR N)?
        RANDOM EXERCISE MODE (Y OR N)?
        ENTER INSTRUCTION TO TEST <ALL>

IF THE USER ANSWERS YES (Y) TO THE INTERRUPTABILITY QUESTION
THE PROGRAM WILL PROMPT FOR WHAT INTERRUPT SOURCE TO USE (LTC- LINE TIME CLOCK,
KW11-P @ 100KHZ,KW11-P @10KHZ, KW11-P WITH EXTERNAL 1 MHZ OSCILLATOR).
IF THE LTC IS SELECTED, THE PROGRAM CONTROLS INTERRUPT TIMING
TO ASSURE THAT MOST CIS INSTRUCTIONS ARE INTERRUPTED ONCE.
IF THE KW11-P WITH A 1 MHZ EXTERNAL OSCILLATOR IS SELECTED,
EACH CIS INSTRUCTION WILL BE INTERRUPTED AND FORCED TO SUSPEND
EXECUTION AT ALL POSSIBLE SERVICE EXIT POINTS. USE OF THE
P-CLK WILL GREATLY INCREASE RUN TIME.

IF EITHER THE KW11-P @100KHZ OR THE KW11-P WITH EXTERNAL
OSCILLATOR IS SELECTED, THE PROGRAM WILL ASK WHETHER
OR NOT TO ALLOW AN INTERRUPT DURING THE CIS INST (DIVP - STATE DISTURBING
INSTRUCTION) NORMALLY EXECUTED WITHIN THE KW11-P INTERRUPT
SERVICE ROUTINE.

IF THE USER ANSWERS YES (Y) TO THE RANDOM EXERCISE MODE QUESTION,
MEMORY MANAGEMENT TEST STATE, PROCESSOR TEST MODE,
TEST OPERANDS AND STRING DATA FOR EACH CIS INSTRUCTION
TEST WILL BE DERIVED USING A RANDOM NUMBER GENERATOR.  A
```

```
NO (N) ANSWER WILL CAUSE EXECUTION OF CIS INSTRUCTION
TESTS WITH ALL TEST OPERANDS AND STRING DATA PROVIDED
FROM PROGRAM INPUT AND PARAMETER TABLES. FOLLOWING A (N) RESPONSE,
THE PROGRAM WILL PROMPT FOR PROCESSOR TEST MODE
(KERNEL,SUPERVISOR,USER) AND MEMORY MANAGEMENT TEST STATE
(OFF,ON WITH D SPACE ENABLED, ON WITH D SPACE DISABLED).

THE LAST QUESTION ENABLES THE USER TO SELECT ONE OR ALL CIS
INSTRUCTIONS FOR TEST.  TO SELECT A SINGLE INSTRUCTION FOR TEST
ENTER THE NMEUMONIC FOR THE DESIRED INSTRUCTION FROM THE INSTRUCTION
LIST ABOVE.  THE SAME QUESTION WILL BE REASKED IF THE INSTRUCTION
IS INCORRECTLY ENTERED.  TO SELECT ALL CIS
INSTRUCTIONS FOR TEST (THE DEFAULT CASE) SIMPLY RESPOND WITH
A CARRIAGE RETURN.

IF THE RANDOM MODE QUESTION IS ANSWERED YES (Y) AND THE INSTRUCTION(S)
FOR TEST IS ANSWERED 'ALL', THE ACTUAL INSTRUCTION UNDER
TEST ON ANY GIVEN TEST WILL BE SELECTED AT RANDOM.

STARTING ADDRESS = 210
----------------------

STARTING AT ADDRESS 210 PROVIDES REPETITIVE QUICK VERIFY PASSES.
NOTE THAT THE QV PASS IS  DESIGNED TO
GIVE A FAIR LEVEL OF MICROCODE COVERAGE (>80%) IN LESS
THAN 5 MINUTES PER PASS.

THIS QV MODE RESULTS IN EXECUTION OF A SUBSET OF THE TABLED
TEST CASES.  THE SUBSET HAS BEEN VERIFIED TO PROVIDE AT LEAST
THE DESIRED 80% LEVEL OF COVERAGE.  NOTE, THE SUBSET OF TABLED TEST
CASES THAT GETS RUN IN QV MODE VARIES WITH PROCESSOR TYPE.  ALSO
NOTE THAT SOME CIS INSTRUCTIONS MAY NOT BE EXECUTED AT ALL
IN QV MODE BECAUSE IT HAS BEEN DETERMINED THAT DUE TO COMMON
ROUTINES WITHIN THE MICROCODE IMPLEMENTATION IT IS POSSIBLE
TO GET THE 80% COVERAGE WITHOUT EXERCISING ALL INSTRUCTIONS.

THE INSTRUCTION COUNTS LISTED UNDER THE NORMAL RUN MODE
(STARTING ADDRESS 200) ABOVE DO NOT APPLY IN QV MODE.

CIS INSTRUCTION INTERRUPTABILITY IS EXERCISED PROVIDED THAT
THE SYSTEM UNDER TEST HAS EITHER A LINE TIME CLOCK OR A
PROGRAMMABLE REAL TIME CLOCK (KW11-P).

PROCESSOR TEST MODE(KERNEL,SUPERVISOR, USER) AND MEMORY MANAGEMENT
TEST STATE ARE SELECTED RANDOMLY AS IN THE 'STARTING ADDRESS = 200'
SECTION ABOVE.

AFTER BEING STARTED AT LOCATION 210, THE PROGRAM SHOULD RESPOND
AS FOLLOWS:

        CZKEAA0 PDP-11 CIS INSTRUCTION EXERCISER
        QUICK VERIFY PASS TIME:  LESS THAN 5 MINUTES
        L2D0    INST CT: XX XXXXX
                .
```

```
                            .
                            .
                DIVP    INST CT: XX XXXXX
                END OF QUICK VERIFY PASS

        RANDOM MODE EXERCISING IS NOT INVOKED DURING A QUICK VERIFY
        PASS.

        STARTING ADDRESS = 214
        ----------------------

        STARTING AT ADDRESS 214 ALLOWS THE USER TO MODIFY RANDOM
        NUMBER GENERATOR SEED CONSTANTS. THIS IS DESIRABLE IN 2
        SITUATIONS.

        IF THE USER DESIRES TO RUN IN RANDOM TEST MODE FOR
        VERY LONG PERIODS OF TIME (DAYS, WEEKS, ETC), THE RANDOM
        NUMBER GEN. SEED CONSTANTS PRINTED EVERY 1024 TESTS PROVIDE
        FOR STOPPING AND LATER CONTINUING WITHOUT REPEATING PRIOR
        TESTS RUN. (REMEMBER THAT THE RANDOM # GENERATOR USED IS
        PSEUDO RANDOM - I.E. THE SAME SEQUENCE OF RANDOM TESTS IS
        EXECUTED EVERY TIME THE PROGRAM IS RESTARTED FROM THE
        BEGINNING).

        THE SEED CONSTANTS ARE ALSO DISPLAYED WITH THE STANDARD
        ERROR REPORT.  THIS PERMITS THE USER TO START WITH THE
        FAILING TEST AT SOME FUTURE TIME.

        AFTER STARTING AT 214 THE PROGRAM QUERIES FOR RANDOM
        NUMBER SEED CONSTANTS:

                ENTER THE 3 RANDOM NUMBER GEN. SEED CONSTANTS:

        AFTER THE THIRD SEED IS ENTERED THE PROGRAM WILL CONTINUE
        AS IF STARTED AT 204.  ANSWER YES TO THE RANDOM EXERCISE
        MODE QUESTION AND <CR> TO THE ENTER INST TO TEST QUESTION.
        THE FIRST TEST EXECUTED WILL BE GENERATED USING THE NEW
        SEEDS.


2.2 SPECIAL ENVIRONMENTS
    --------------------

        APT  -  THE CIS INSTRUCTION EXERCISER IS FULLY APT COMPATIBLE,
                HOWEVER ITS OPERATION UNDER APT IS SOMEWHAT DIFFERENT
                THAN THAT OF OTHER DIAGNOSTICS.  THE FIRST 2 PASSES UNDER
                APT ARE IDENTICAL TO THE TESTS RUN IN STANDALONE
                - 1 QV PASS AND 1 FULL TABLED TEST CASE PASS.
                 SUBSEQUENT PASSES ARE NOT IDENTICAL
                TO THE 2ND PASS BUT RATHER BLOCKS OF 20,000
                (OCTAL) RANDOM MODE TEST CASES. THAT IS, EACH PASS
                (BEYOND THE FIRST) IS A UNIQUE SET OF RANDOM CIS
                INSTRUCTION TEST CASES.
```

```
                THE INFORMATION RECORDED (AND SUBSEQUENTLY DISPLAYED)
                BY APT ON ERROR INCLUDES TEST NUMBER AND FATAL ERROR
                NUMBER.  THE FATAL ERROR NUMBER SHOULD BE INTERPRETED AS
                FOLLOWS:

                        BITS 5-0  FAILING CIS INST (REF OCTAL CODING TABLE)
                        BIT 6     INST TYPE (0=REG; 1=IN LINE)
                        BIT 9     ACTIVE REGISTER SET
                        BITS 13-12 PROCESSOR MODE (11=USER,01=SUP,00=KERNEL)
                        BIT 14     INTERRUPT (1=INST WAS INTERRUPTED)


2.3 PROGRAM OPTIONS
    ---------------

        THE FOLLOWING CONTROL CHARACTERS ARE RECOGNIZED BY THE
        EXERCISER DURING TEST EXECUTION:

                CNTL T - DISPLAY INST UNDER TEST AND TEST #
                CNTL C - (RECOGNIZED ONLY IF PROGRAM WAS STARTED
                         AT 204). RESTART EXERCISER.
                CNTL D - DISPLAY ALL TEST CASE OPERANDS AND RESULTS
                         SUBSEQUENT TO EACH CIS INST TEST. CONTINUE (WITHOUT
                         QUERY) TO NEXT TEST.
                CNTL E - DISPLAY ALL TEST CASE OPERANDS AND RESULTS
                         SUBSEQUENT TO EACH CIS INST TEST.  QUERY FOR
                         CONTINUE.
                CNTL N - CANCEL PRIOR CNTL D OR CNTL E REQUEST
                CNTL O - CONTROL OVER PROGRESS INDICATION PRINTOUT
                         (I.E. INST AND INST CNT; RANDOM NUMBER
                         GENERATOR SEED). ON - OFF TOGGLE.

        SWITCH REGISTER OPTIONS:
                NOTE: ON MACHINES WITH NO HARDWARE SWITCH REGISTER
                (11/24) LOCATION 176 IS THE SOFTWARE SWITCH REGISTER.

                BIT 0 - STOP ON TEST; PROGRAM WILL QUERY USER FOR TEST
                        (DECIMAL) TO STOP ON AND DISPLAY.


2.4 EXECUTION TIMES
    ---------------

        THE FIRST PASS RUN TIME (TABLED TEST CASES ONLY) IS
        APPROXIMATELY: 30 MINUTES

        AFTER THE FIRST PASS THE PROGRAM ENTERS RANDOM TEST MODE
        AND EXECUTES RANDOMLY GENERATED TEST CASES INDEFINITELY.

        IN QV MODE THE PASS TIME IS LESS THAN 5 MINUTES.
        REFER TO DOCUMENTATION ABOVE FOR DEFINITION OF QV MODE.

3.0 ERROR INFORMATION
    -----------------
```

```

IF THE COMPUTER HALTS WITHOUT ERROR DISPLAY THE FOLLOWING
LOCATIONS SHOULD BE EXAMINED TO DETERMINE INFORMATION
ABOUT THE FAILING TEST.

        TINST --- CIS INSTRUCTION UNDER TEST

        TR0 - TR6 --- CIS INSTRUCTION OPERANDS (LENGTHS,ADDRESSES,ETC)


INFORMATION DISPLAYED UPON DETECTION OF AN ERROR DESCRIBES
THE COMPLETE ENVIRONMENT OF THE FAILURE.  ALL INSTRUCTION ERRORS
ARE DISPLAYED WITH ONE FORMAT.  THE FORMAT CONTAINS SLIGHT
VARIATIONS TO ACCOUNT FOR DIFFERENCES BETWEEN CHARACTER
AND DECIMAL STRING INSTRUCTIONS.


CHARACTER STRING INSTRUCTION ERROR DISPLAY
-----------------------------------------


ERROR #000001 -------------------------------------------------------------
  MOVC  INST CNT: 00 00004  INTR CNT:0010  REG SET:0  MODE:K  D EN:N
                    SL     SA     DL     DA     F                    NZVC
  INPUT   R0-R6,CC/ 003760 111241 000054 111046 000344 155555 053444 1111
  EXP OUT R0-R6,CC/ 003704 000000 000000 000000 000344 155555 053444 0000
  ACT OUT R0-R6,CC/        000001                                    1000
  EXP BUFFER  111246/ 057
  ACT BUFFER  100246/ 344
  C=CONT.;R=REPEAT TEST;S=RESTART;D=DISPLAY MEMORY;H=REPEAT AND HALT AT CIS?



DECIMAL STRING INSTRUCTION ERROR DISPLAY
---------------------------------------


ERROR #000002-------------------------------------------------------------
  ASHP  INST CNT: 00 00250  INTR CNT: 0000  REG SET:1  MODE:S  D EN:Y
                    SL     SA     DL     DA     R,S                  NZVC
  INPUT   R0-R6,CC/ 070000 110200 070000 110206 000005 155555 053444 0100
  EXP OUT R0-R6,CC/ 000000 000000 070000 000206 000000 155555 053444 1011
  ACT OUT R0-R6,CC/                                                  1000
  SRC                    0+  SIGN BYTE=0F
  EXP RESULT             0+  SIGN BYTE=0F
  ACT RESULT             0+  SIGN BYTE=0F
  C=CONT.;R=REPEAT TEST;S=RESTART;D=DISPLAY MEMORY;H=REPEAT AND HALT AT CIS?


THE WORD 'ERROR' FOLLOWED BY A COUNT OF THE NUMBER OF ERRORS WHICH
HAVE OCCURRED UP TO AND INCLUDING THIS TEST FAILURE AND A LONG
STRING OF DASHES IS USED TO SEPARATE ONE TEST FAILURE DISPLAY
FROM THE NEXT.

```

THE SECOND LINE OF THE ERROR REPORT IDENTIFIES THE CIS INSTRUCTION THAT FAILED, A COUNT OF THE NUMBER OF CIS INSTRUCTIONS WHICH HAVE EXECUTED, A COUNT OF THE NUMBER OF TIMES THE FAILING INSTRUCTION TEST CASE WAS SUSPENDED DUE TO INTERRUPT,THE ACTIVE REGISTER SET (0 OR 1), THE TEST MODE (KERNEL,SUPERVISOR,USER), AND WHETHER D SPACE (MEMORY MGMT) WAS ENABLED DURING CIS INSTRUCTION EXECUTION.

THE THIRD LINE GIVES HEADER LABELS TO IDENTIFY REGISTER OR IN-LINE OPERANDS FOR THE PARTICULAR CIS INSTRUCTION UNDER TEST. 'SL' IDENTIFIES THE SOURCE LENGTH OPERAND; 'DA' IDENTIFIES THE DESTINATION ADDRESS, ETC. CONDITION CODE LABELS ARE INCLUDED AT THE END OF THIS LINE.

THE FOURTH LINE DISPLAYS ACTUAL OPERAND VALUES AND CONDITION CODES USED AS CIS INSTRUCTION INPUTS.

THE FIFTH LINE DISPLAYS EXPECTED REGISTER AND CONDITION CODE CONTENTS AT THE COMPLETION OF CIS INSTRUCTION EXECUTION. THESE EXPECTED VALUES ARE DERIVED BY EMULATION AS NOTED ABOVE.

THE SIXTH LINE, ACTUAL CIS INSTRUCTION OUTPUT, IS DISPLAYED ONLY IF ANY OF THE ACTUAL REGISTER OR CONDITION CODE OUTPUTS DO NOT AGREE WITH THE EXPECTED VALUES. ONLY THOSE SPECIFIC RESULTS WHICH ARE NOT IN AGREEMENT ARE DISPLAYED.

THE REMAINING PORTION OF THE ERROR PRINTOUT VARIES WITH THE CIS INSTRUCTION UNDER TEST. SOURCE OPERANDS,EXPECTED AND ACTUAL OPERATION RESULTS ARE DISPLAYED WITH EACH NIBBLE REPRESENTED BY A HEXADECIMAL DIGIT. SIGNS ARE DISPLAYED IN SYMBOLIC FORMAT (+,-) AND THE SIGN BYTE IS GIVEN AS TWO HEXADECIMAL HIBBLES.

'BUFFER XXXXXX' IS DISPLAYED ONLY WHEN THE BUFFER ASSOCIATED WITH ACTUAL CIS INSTRUCTION EXECUTION DIFFERS FROM THAT ASSOCIATED WITH EMULATION. ONLY THE FIRST BYTE (STARTING FROM THE LOW ADDRESS END OF THE BUFFERS UNDER CONSIDERATION) IN DISAGREEMENT IS PRINTED.

THE LAST LINE DISPLAYED AS PART OF EACH ERROR REPORT PERMITS THE USER SEVERAL OPTIONS RELATING TO HOW TO PROCEED FOLLOWING AN ERROR. CONTINUE (C) PROCEEDS TO THE NEXT INSTRUCTION TEST CASE AS IF THE ERROR HAD NEVER OCCURRED. DISPLAY MEMORY (D) ALLOWS THE USER TO DISPLAY ANY BYTES(S) IN MEMORY. RESTART (S) RETURNS CONTROL TO THE BEGINNING OF THE PROGRAM. REPEAT TEST (R) REPEATS THE FAILING TEST CASE. THE SAME ERROR MESSAGE WILL BE DISPLAYED AGAIN PROVIDED THE TEST FAILS DURING THE REPEAT TEST. THE REPEAT AND HALT OPTION REPEATS THE FAILING TEST BUT HALTS JUST PRIOR TO EXECUTING THE CIS INSTRUCTION UNDER TEST. THIS MODE ALLOWS THE USER TO SINGLE STEP THROUGH THE FAILING CIS MICROCODE USING CONSOLE COMMANDS.

4.0 PERFORMANCE AND PROGRESS REPORTS

4.1 PERFORMANCE REPORTS

NONE

4.2 PROGRESS REPORTS

THE CIS INSTRUCTION AND THE TEST COUNT IS DISPLAYED AT THE START OF TESTING FOR EACH CIS INSTRUCTION TYPE (EXCEPT IN RANDOM TEST MODE). NOTE, AS STATED IN SECTION 2.1.3 ABOVE THAT MANY TEST CASES ARE EXECUTED FOR EACH CIS INSTRUCTION.

IN RANDOM TEST MODE THE RANDOM NUMBER GENERATOR SEED CONSTANTS ARE DISPLAYED EVERY 1024 TESTS. IF THE DIAGNOSTIC IS TO BE RUN FOR A PROLONGED PERIOD IN THIS MODE, THESE CONSTANTS PROVIDE A MECHANISM FOR STOPPING AND LATER CONTINUING THE DIAG AT ANY FUTURE TIME.
REFER TO SECTION 2.1.3 UNDER THE HEADING "STARTING ADDRESS = 214" FOR INSTRUCTIONS ON HOW TO USE THE RANDOM # GENERATOR SEED CONSTANTS.

5.0 REVISION HISTORY

REVISION B - MADE COMPATIBLE WITH 11/23 AND 11/24 CIS
- ADDED STOP ON TEST FEATURE; SEE SECTION 2.3

6.0 PROGRAM TABLE OF CONTENTS

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 6235                           .ENABL ABS,AMA
 6351                           .TITLE  PDP-11 CIS INST EXERCISER
  (1)                           ;*COPYRIGHT (C) 1979
  (1)                           ;*DIGITAL EQUIPMENT CORP.
  (1)                           ;*MAYNARD, MASS. 01754
  (1)                           ;*
  (1)                           ;*PROGRAM BY BARRY POLAND
  (1)                           ;*
  (1)                           ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
  (1)                           ;*PACKAGE (MAINDEC-11-DZQAC-B1),AUG 29,1975.
  (1)                           ;*
  (1)          000001           $TN=1
  (1)          160000           $SWR=160000     ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT
 6356
  (1)                           .SBTTL  BASIC DEFINITIONS
  (1)
  (1)                           ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
  (1)          001100           STACK=  1100            ;;FIRST ADDRESS OF THE STACK
  (1)          001100           KERSTK= STACK           ;;KERNEL STACK
  (1)          000700           SUPSTK= STACK-200       ;;SUPERVISOR STACK
  (1)          000600           USESTK= STACK-300       ;;USER STACK
  (1)                           .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
  (1)                           .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL
  (1)          177776           PS=     177776          ;;PROCESSOR STATUS WORD
  (1)                           .EQUIV  PS,PSW
  (1)          177774           STKLMT= 177774          ;;STACK LIMIT REGISTER
  (1)          177772           PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
  (1)          177570           DSWR=   177570          ;;SWITCH REGISTER
  (1)          177570           DDISP=177570
  (1)
  (1)                           ;*MISCELLANEOUS DEFINITIONS
  (1)          000011           HT=     11              ;;CODE FOR HORIZONTAL TAB
  (1)          000012           LF=     12              ;;CODE LINE FEED
  (1)          000015           CR=     15              ;;CODE CARRIAGE RETURN
  (1)          000200           CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
  (1)
  (1)                           ;*GENERAL PURPOSE REGISTER DEFINITIONS
  (1)          000000           R0=     %0              ;;GENERAL REGISTER
  (1)          000001           R1=     %1              ;;GENERAL REGISTER
  (1)          000002           R2=     %2              ;;GENERAL REGISTER
  (1)          000003           R3=     %3              ;;GENERAL REGISTER
  (1)          000004           R4=     %4              ;;GENERAL REGISTER
  (1)          000005           R5=     %5              ;;GENERAL REGISTER
  (1)          000006           R6=     %6              ;;GENERAL REGISTER
  (1)          000007           R7=     %7              ;;GENERAL REGISTER
  (1)                           .EQUIV  R0,R10          ;;GENERAL REGISTER
  (1)                           .EQUIV  R1,R11          ;;GENERAL REGISTER
  (1)                           .EQUIV  R2,R12          ;;GENERAL REGISTER
  (1)                           .EQUIV  R3,R13          ;;GENERAL REGISTER
  (1)                           .EQUIV  R4,R14          ;;GENERAL REGISTER
  (1)                           .EQUIV  R5,R15          ;;GENERAL REGISTER
  (1)                           .EQUIV  R6,SP           ;;STACK POINTER
  (1)                           .EQUIV  SP,KSP          ;;KERNEL STACK POINTER
  (1)                           .EQUIV  SP,SSP          ;;SUPERVISOR STACK POINTER
```

```
(1)                             .EQUIV  SP,USP            ;;USER STACK POINTER
(1)                             .EQUIV  R7,PC             ;;PROGRAM COUNTER
(1)
(1)                             ;*PRIORITY LEVEL DEFINITIONS
(1)     000000                  PR0=    0                 ;;PRIORITY LEVEL 0
(1)     000040                  PR1=    40                ;;PRIORITY LEVEL 1
(1)     000100                  PR2=    100               ;;PRIORITY LEVEL 2
(1)     000140                  PR3=    140               ;;PRIORITY LEVEL 3
(1)     000200                  PR4=    200               ;;PRIORITY LEVEL 4
(1)     000240                  PR5=    240               ;;PRIORITY LEVEL 5
(1)     000300                  PR6=    300               ;;PRIORITY LEVEL 6
(1)     000340                  PR7=    340               ;;PRIORITY LEVEL 7
(1)
(1)                             ;*"SWITCH REGISTER" SWITCH DEFINITIONS
(1)     100000                  SW15=   100000
(1)     040000                  SW14=   40000
(1)     020000                  SW13=   20000
(1)     010000                  SW12=   10000
(1)     004000                  SW11=   4000
(1)     002000                  SW10=   2000
(1)     001000                  SW09=   1000
(1)     000400                  SW08=   400
(1)     000200                  SW07=   200
(1)     000100                  SW06=   100
(1)     000040                  SW05=   40
(1)     000020                  SW04=   20
(1)     000010                  SW03=   10
(1)     000004                  SW02=   4
(1)     000002                  SW01=   2
(1)     000001                  SW00=   1
(1)                             .EQUIV  SW09,SW9
(1)                             .EQUIV  SW08,SW8
(1)                             .EQUIV  SW07,SW7
(1)                             .EQUIV  SW06,SW6
(1)                             .EQUIV  SW05,SW5
(1)                             .EQUIV  SW04,SW4
(1)                             .EQUIV  SW03,SW3
(1)                             .EQUIV  SW02,SW2
(1)                             .EQUIV  SW01,SW1
(1)                             .EQUIV  SW00,SW0
(1)
(1)                             ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(1)     100000                  BIT15=  100000
(1)     040000                  BIT14=  40000
(1)     020000                  BIT13=  20000
(1)     010000                  BIT12=  10000
(1)     004000                  BIT11=  4000
(1)     002000                  BIT10=  2000
(1)     001000                  BIT09=  1000
(1)     000400                  BIT08=  400
(1)     000200                  BIT07=  200
(1)     000100                  BIT06=  100
(1)     000040                  BIT05=  40
(1)     000020                  BIT04=  20
```

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(1)  000010          BIT03=  10
(1)  000004          BIT02=  4
(1)  000002          BIT01=  2
(1)  000001          BIT00=  1
(1)                  .EQUIV  BIT09,BIT9
(1)                  .EQUIV  BIT08,BIT8
(1)                  .EQUIV  BIT07,BIT7
(1)                  .EQUIV  BIT06,BIT6
(1)                  .EQUIV  BIT05,BIT5
(1)                  .EQUIV  BIT04,BIT4
(1)                  .EQUIV  BIT03,BIT3
(1)                  .EQUIV  BIT02,BIT2
(1)                  .EQUIV  BIT01,BIT1
(1)                  .EQUIV  BIT00,BIT0
(1)
(1)                  ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(1)  000004          ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
(1)  000010          RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
(1)  000014          TBITVEC=14              ;;"T" BIT
(1)  000014          TRTVEC= 14              ;;TRACE TRAP
(1)  000014          BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
(1)  000020          IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(1)  000024          PWRVEC= 24              ;;POWER FAIL
(1)  000030          EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
(1)  000034          TRAPVEC=34              ;;"TRAP" TRAP
(1)  000060          TKVEC=  60              ;;TTY KEYBOARD VECTOR
(1)  000064          TPVEC=  64              ;;TTY PRINTER VECTOR
(1)  000114          CACHVEC=114             ;;CACHE ERROR INTERRUPT VECTOR
(1)  000240          PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
(1)  000250          MMVEC=  250             ;;MEMORY MANAGEMENT VECTOR
(1)
(1)                  .SBTTL  CACHE   REGISTER DEFINITIONS
(1)
(1)
(1)  177740          LOADRS = 177740         ;;LOWER 16 BITS OF ADDRESS THAT CAUSED ERROR
(1)  177742          HIADRS = 177742         ;;UPPER SIX BITS OF ADDRESS THAT CAUSED ERROR
(1)  177744          MEMERR = 177744         ;;CACHE ERROR REGISTER
(1)  177746          CONTRL = 177746         ;;MEMORY CONTROL REGISTER
(1)  177750          MAINT  = 177750         ;;MEMORY MAINTENENCE REGISTER
(1)  177752          HITMIS = 177752         ;;HIT MISS REGISTER "1" IMPLIES HIT IN CACHE
(1)
(1)
(1)                  .SBTTL  CPU REGISTER DEFINITIONS
(1)
(1)
(1)  177760          SIZELO = 177760         ;;MEMORY SIZE REGISTER NUMBER TO PUT INTO A PAR
(1)                                          ;;TO GET TO THE LAST 32 WORDS OF MEMORY
(1)  177762          SIZEHI = 177762         ;;HIGH SIZE REGISTER, RESERVED FOR FUTURE USE
(1)                                          ;;CURRENTLY ALL ZERO
(1)  177764          SYSTID = 177764         ;;SYSTEM ID REGISTER
(1)  177766          CPUERR = 177766         ;;CPU ERROR REGISTER HOLDS CONDITION THAT CAUSED
(1)                                          ;;THE TRAP TO ERRVEC (000004)
(1)
(1)
(1)
```

```
    (1)
    (1)
    (1)                                 .SBTTL  MEMORY MANAGEMENT DEFINITIONS
    (1)
    (1)
    (1)                                 ;*MEMORY MANAGEMENT STATUS REGISTER ADDRESSES
    (1)
    (1)        177572                   MMR0=   177572
    (1)        177574                   MMR1=   177574
    (1)        177576                   MMR2=   177576
    (1)        172516                   MMR3=   172516
    (1)                                 .EQUIV  MMR0,SR0
    (1)                                 .EQUIV  MMR1,SR1
    (1)                                 .EQUIV  MMR2,SR2
    (1)                                 .EQUIV  MMR3,SR3
    (1)
    (1)                                 ;*USER "I" PAGE DESCRIPTOR REGISTERS
    (1)
    (1)        177600                   UIPDR0= 177600
    (1)        177602                   UIPDR1= 177602
    (1)        177604                   UIPDR2= 177604
    (1)        177606                   UIPDR3= 177606
    (1)        177610                   UIPDR4= 177610
    (1)        177612                   UIPDR5= 177612
    (1)        177614                   UIPDR6= 177614
    (1)        177616                   UIPDR7= 177616
    (1)
    (1)                                 ;*USER "D" PAGE DESCRIPTOR REGISTORS
    (1)
    (1)        177620                   UDPDR0= 177620
    (1)        177622                   UDPDR1= 177622
    (1)        177624                   UDPDR2= 177624
    (1)        177626                   UDPDR3= 177626
    (1)        177630                   UDPDR4= 177630
    (1)        177632                   UDPDR5= 177632
    (1)        177634                   UDPDR6= 177634
    (1)        177636                   UDPDR7= 177636
    (1)
    (1)                                 ;*USER "I" PAGE ADDRESS REGISTERS
    (1)
    (1)        177640                   UIPAR0= 177640
    (1)        177642                   UIPAR1= 177642
    (1)        177644                   UIPAR2= 177644
    (1)        177646                   UIPAR3= 177646
    (1)        177650                   UIPAR4= 177650
    (1)        177652                   UIPAR5= 177652
    (1)        177654                   UIPAR6= 177654
    (1)        177656                   UIPAR7= 177656
    (1)
    (1)                                 ;*USER "D" PAGE ADDRESS REGISTERS
    (1)
    (1)        177660                   UDPAR0= 177660
    (1)        177662                   UDPAR1= 177662
    (1)        177664                   UDPAR2= 177664
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    (1)         177666          UDPAR3= 177666
    (1)         177670          UDPAR4= 177670
    (1)         177672          UDPAR5= 177672
    (1)         177674          UDPAR6= 177674
    (1)         177676          UDPAR7= 177676
    (1)
    (1)                         ;*SUPERVISOR "I" PAGE DESCRIPTOR REGISTERS
    (1)
    (1)         172200          SIPDR0= 172200
    (1)         172202          SIPDR1= 172202
    (1)         172204          SIPDR2= 172204
    (1)         172206          SIPDR3= 172206
    (1)         172210          SIPDR4= 172210
    (1)         172212          SIPDR5= 172212
    (1)         172214          SIPDR6= 172214
    (1)         172216          SIPDR7= 172216
    (1)
    (1)                         ;*SUPERVISOR "D" PAGE DESCRIPTOR REGISTERS
    (1)
    (1)         172220          SDPDR0= 172220
    (1)         172222          SDPDR1= 172222
    (1)         172224          SDPDR2= 172224
    (1)         172226          SDPDR3= 172226
    (1)         172230          SDPDR4= 172230
    (1)         172232          SDPDR5= 172232
    (1)         172234          SDPDR6= 172234
    (1)         172236          SDPDR7= 172236
    (1)
    (1)                         ;*SUPERVISOR "I" PAGE ADDRESS REGISTERS
    (1)
    (1)         172240          SIPAR0= 172240
    (1)         172242          SIPAR1= 172242
    (1)         172244          SIPAR2= 172244
    (1)         172246          SIPAR3= 172246
    (1)         172250          SIPAR4= 172250
    (1)         172252          SIPAR5= 172252
    (1)         172254          SIPAR6= 172254
    (1)         172256          SIPAR7= 172256
    (1)
    (1)                         ;*SUPERVISOR "D" PAGE ADDRESS REGISTERS
    (1)
    (1)         172260          SDPAR0= 172260
    (1)         172262          SDPAR1= 172262
    (1)         172264          SDPAR2= 172264
    (1)         172266          SDPAR3= 172266
    (1)         172270          SDPAR4= 172270
    (1)         172272          SDPAR5= 172272
    (1)         172274          SDPAR6= 172274
    (1)         172276          SDPAR7= 172276
    (1)
    (1)                         ;*KERNEL "I" PAGE DESCRIPTOR REGISTERS
    (1)
    (1)         172300          KIPDR0= 172300
    (1)         172302          KIPDR1= 172302
```

```
   (1)          172304                  KIPDR2= 172304
   (1)          172306                  KIPDR3= 172306
   (1)          172310                  KIPDR4= 172310
   (1)          172312                  KIPDR5= 172312
   (1)          172314                  KIPDR6= 172314
   (1)          172316                  KIPDR7= 172316
   (1)
   (1)                                  ;*KERNEL "D" PAGE DESCRIPTOR REGISTERS
   (1)
   (1)          172320                  KDPDR0= 172320
   (1)          172322                  KDPDR1= 172322
   (1)          172324                  KDPDR2= 172324
   (1)          172326                  KDPDR3= 172326
   (1)          172330                  KDPDR4= 172330
   (1)          172332                  KDPDR5= 172332
   (1)          172334                  KDPDR6= 172334
   (1)          172336                  KDPDR7= 172336
   (1)
   (1)                                  ;*KERNEL "I" PAGE ADDRESS REGISTERS
   (1)
   (1)          172340                  KIPAR0= 172340
   (1)          172342                  KIPAR1= 172342
   (1)          172344                  KIPAR2= 172344
   (1)          172346                  KIPAR3= 172346
   (1)          172350                  KIPAR4= 172350
   (1)          172352                  KIPAR5= 172352
   (1)          172354                  KIPAR6= 172354
   (1)          172356                  KIPAR7= 172356
   (1)
   (1)                                  ;*KERNEL "D" PAGE ADDRESS REGISTERS
   (1)
   (1)          172360                  KDPAR0= 172360
   (1)          172362                  KDPAR1= 172362
   (1)          172364                  KDPAR2= 172364
   (1)          172366                  KDPAR3= 172366
   (1)          172370                  KDPAR4= 172370
   (1)          172372                  KDPAR5= 172372
   (1)          172374                  KDPAR6= 172374
   (1)          172376                  KDPAR7= 172376
   (1)
   (1)
   (1)
   (1)
   (1)                                  .SBTTL  UNIBUS MAP REGISTER DEFINITIONS
   (1)
   (1)
   (1)                                  ;*THE LOWER 16 BITS OF THE MAP REGISTERS ARE LABELED 'MAPLXX'
   (1)                                  ;*THE UPPER 6 BITS OF THE MAP REGISTERS ARE LABELED 'MAPHXX'
   (1)
   (1)
   (1)          170200                  MAPL00 = 170200
   (1)          170202                  MAPH00 = 170202
   (1)          170204                  MAPL01 = 170204
   (1)          170206                  MAPH01 = 170206
```

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    (1)         170210                  MAPL02 = 170210
    (1)         170212                  MAPH02 = 170212
    (1)         170214                  MAPL03 = 170214
    (1)         170216                  MAPH03 = 170216
    (1)         170220                  MAPL04 = 170220
    (1)         170222                  MAPH04 = 170222
    (1)         170224                  MAPL05 = 170224
    (1)         170226                  MAPH05 = 170226
    (1)         170230                  MAPL06 = 170230
    (1)         170232                  MAPH06 = 170232
    (1)         170234                  MAPL07 = 170234
    (1)         170236                  MAPH07 = 170236
    (1)         170240                  MAPL10 = 170240
    (1)         170242                  MAPH10 = 170242
    (1)         170244                  MAPL11 = 170244
    (1)         170246                  MAPH11 = 170246
    (1)         170250                  MAPL12 = 170250
    (1)         170252                  MAPH12 = 170252
    (1)         170254                  MAPL13 = 170254
    (1)         170256                  MAPH13 = 170256
    (1)         170260                  MAPL14 = 170260
    (1)         170262                  MAPH14 = 170262
    (1)         170264                  MAPL15 = 170264
    (1)         170266                  MAPH15 = 170266
    (1)         170270                  MAPL16 = 170270
    (1)         170272                  MAPH16 = 170272
    (1)         170274                  MAPL17 = 170274
    (1)         170276                  MAPH17 = 170276
    (1)         170300                  MAPL20 = 170300
    (1)         170302                  MAPH20 = 170302
    (1)         170304                  MAPL21 = 170304
    (1)         170306                  MAPH21 = 170306
    (1)         170310                  MAPL22 = 170310
    (1)         170312                  MAPH22 = 170312
    (1)         170314                  MAPL23 = 170314
    (1)         170316                  MAPH23 = 170316
    (1)         170320                  MAPL24 = 170320
    (1)         170320                  MAPH24 = 170320
    (1)         170324                  MAPL25 = 170324
    (1)         170326                  MAPH25 = 170326
    (1)         170330                  MAPL26 = 170330
    (1)         170332                  MAPH26 = 170332
    (1)         170334                  MAPL27 = 170334
    (1)         170336                  MAPH27 = 170336
    (1)         170340                  MAPL30 = 170340
    (1)         170342                  MAPH30 = 170342
    (1)         170344                  MAPL31 = 170344
    (1)         170346                  MAPH31 = 170346
    (1)         170350                  MAPL32 = 170350
    (1)         170352                  MAPH32 = 170352
    (1)         170354                  MAPL33 = 170354
    (1)         170356                  MAPH33 = 170356
    (1)         170360                  MAPL34 = 170360
    (1)         170362                  MAPH34 = 170362
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 (1)     170364          MAPL35 = 170364
 (1)     170366          MAPH35 = 170366
 (1)     170370          MAPL36 = 170370
 (1)     170372          MAPH36 = 170372
 (1)     170374          MAPL37 = 170374
 (1)     170376          MAPH37 = 170376
 (1)                     .EQUIV  MAPL00,MAPL0
 (1)                     .EQUIV  MAPH00,MAPH0
 (1)                     .EQUIV  MAPL01,MAPL1
 (1)                     .EQUIV  MAPH01,MAPH1
 (1)                     .EQUIV  MAPL02,MAPL2
 (1)                     .EQUIV  MAPH02,MAPH2
 (1)                     .EQUIV  MAPL03,MAPL3
 (1)                     .EQUIV  MAPH03,MAPH3
 (1)                     .EQUIV  MAPL04,MAPL4
 (1)                     .EQUIV  MAPH04,MAPH4
 (1)                     .EQUIV  MAPL05,MAPL5
 (1)                     .EQUIV  MAPH05,MAPH5
 (1)                     .EQUIV  MAPL06,MAPL6
 (1)                     .EQUIV  MAPH06,MAPH6
 (1)                     .EQUIV  MAPL07,MAPL7
 (1)                     .EQUIV  MAPH07,MAPH7
 (1)
 (1)
 (1)
 (1)
                         ;
         076175          DIVPI==076175
         170000          BS0==170000
         100000          BS00==100000
         174000          BS2==174000
         176000          BS4==176000
         177000          BS8==177000
         177400          BS16==177400
         177600          BS32==177600
         177700          BS64==177700
         177740          BS128==177740
         177760          BS256==177760
         177770          BS512==177770
         177777          BSNULL==177777
         177400          BY==177400
         006000          MP06000==006000                 ;MASK (176000) THEN OFFSET (6000)
         004000          MP04000==004000
         000000          WD==0
         125252          EOT==125252
         000020          MP020==000020
         000070          MP070==000070
         000100          MP0100==000100
         000140          MP0140==000140
         002000          MP02000==002000
         004040          MP04040==004040
         152525          DSCPTR==152525
         022000          MP02200==22000
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```
                                    .SBTTL  TRAP CATCHER

        000000                              .=0
                                    ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                    ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                    ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
        000174                              .=174
000174  000000                              DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
000176  000000                              SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER

                                    .SBTTL  STARTING ADDRESS(ES)
000200  000137  036760                      JMP     @#START         ;;JUMP TO STARTING ADDRESS OF PROGRAM
000204  000137  037154                      JMP DVTST
000210  000137  036766                      JMP QVST
000214  000137  036750                      JMP SEEDST

                                    ;*************************************************************

                                    .SBTTL  ACT11 HOOKS
                                    ;HOOKS REQUIRED BY ACT11
        000220                              $SVPC=.                 ;SAVE PC
        000046                              .=46
000046  053424                              ENDAD                   ;;1)SET LOC.46 TO ADDRESS OF ENDAD
        000052                              .=52
000052  000000                              .WORD   0               ;;2)SET LOC.52 TO ZERO
        000220                              .=$SVPC                 ;; RESTORE PC
        001100                      .=1100
                                    ;*************************************************************

                                    .SBTTL  APT PARAMETER BLOCK
                                    ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                    ;*************************************************************
        001100                              .$X=.    ;;SAVE CURRENT LOCATION
        000024                              .=24     ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                              200      ;;FOR APT START UP
        000044                              .=44     ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  001100                              $APTHDR ;;POINT TO APT HEADER BLOCK
        001100                              .=.$X    ;;RESET LOCATION COUNTER
                                    ;*************************************************************
                                    ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                                    ;INTERFACE SPEC.

001100                              $APTHD:
001100  000000                      $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
001102  001114                      $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
001104  000170                      $TSTM:  .WORD   120.    ;;RUN TIM OF LONGEST TEST
001106  000454                      $PASTM: .WORD   300.    ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
001110  000000                      $UNITM: .WORD   0       ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
001112  000016                              .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
                                    ;*************************************************************

                                    .SBTTL  APT MAILBOX-ETABLE
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```
  (1)
  (1)                                              .EVEN
  (1)   001114                             $MAIL:                              ;;APT MAILBOX
  (1)   001114  000000                     $MSGTY: .WORD    AMSGTY   ;;MESSAGE TYPE CODE
  (1)   001116  000000                     $FATAL: .WORD    AFATAL   ;;FATAL ERROR NUMBER
  (1)   001120  000000                     $TESTN: .WORD    ATESTN   ;;TEST NUMBER
  (1)   001122  000000                     $PASS:  .WORD    APASS    ;;PASS COUNT
  (1)   001124  000000                     $DEVCT: .WORD    ADEVCT   ;;DEVICE COUNT
  (1)   001126  000000                     $UNIT:  .WORD    AUNIT    ;;I/O UNIT NUMBER
  (1)   001130  000000                     $MSGAD: .WORD    AMSGAD   ;;MESSAGE ADDRESS
  (1)   001132  000000                     $MSGLG: .WORD    AMSGLG   ;;MESSAGE LENGTH
  (1)   001134                             $ETABLE:                  ;;APT ENVIRONMENT TABLE
  (1)   001134     000                     $ENV:   .BYTE    AENV     ;;ENVIRONMENT BYTE
  (1)   001135     000                     $ENVM:  .BYTE    AENVM    ;;ENVIRONMENT MODE BITS
  (1)   001136  000000                     $SWREG: .WORD    ASWREG   ;;APT SWITCH REGISTER
  (1)   001140  000000                     $USWR:  .WORD    AUSWR    ;;USER SWITCHES
  (1)   001142  000000                     $CPUOP: .WORD    ACPUOP   ;;CPU TYPE,OPTIONS
  (1)                                      ;*                        BITS 15-11=CPU TYPE
  (1)                                      ;*                                11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
  (1)                                      ;*                                11/70=06,PDQ=07,Q=10
  (1)                                      ;*                        BIT 10=REAL TIME CLOCK
  (1)                                      ;*                        BIT  9=FLOATING POINT PROCESSOR
  (1)                                      ;*                        BIT  8=MEMORY MANAGEMENT
  (1)   001144     000                     $MAMS1: .BYTE    AMAMS1   ;;HIGH ADDRESS,M.S. BYTE
  (1)   001145     000                     $MTYP1: .BYTE    AMTYP1   ;;MEM. TYPE,BLK#1
  (1)                                      ;*                        MEM.TYPE BYTE   --  (HIGH BYTE)
  (1)                                      ;*                                900 NSEC CORE=001
  (1)                                      ;*                                300 NSEC BIPOLAR=002
  (1)                                      ;*                                500 NSEC MOS=003
  (1)   001146  000000                     $MADR1: .WORD    AMADR1   ;;HIGH ADDRESS,BLK#1
  (1)                                      ;*                          MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
  (1)   001150                             $ETEND:
  (1)                                              .MEXIT
                                           ;*************************************************************
  (1)
  (1)                                      .SBTTL   APT COMMUNICATIONS ROUTINE
  (1)   001150  112737  000001  001414     $ATY1:  MOVB     #1,$FFLG          ;TO REPORT FATAL ERROR
  (1)   001156  112737  000001  001412     $ATY3:  MOVB     #1,$MFLG          ;TO TYPE A MESSAGE
  (1)   001164  000403                             BR       $ATYC
  (1)   001166  112737  000001  001414     $ATY4:  MOVB     #1,$FFLG          ;TO ONLY REPORT FATAL ERROR
  (2)   001174                             $ATYC:
  (3)   001174  010046                             MOV      R0,-(SP)          ;;PUSH R0 ON STACK
  (3)   001176  010146                             MOV      R1,-(SP)          ;;PUSH R1 ON STACK
  (1)   001200  105737  001412                     TSTB     $MFLG             ;SHOULD TYPE A MESSAGE?
  (1)   001204  001450                             BEQ      5$                ;IF NOT:  BR
  (1)   001206  122737  000001  001134             CMPB     #APTENV,$ENV      ;OPERATING UNDER APT?
  (1)   001214  001031                             BNE      3$                ;IF NOT:  BR
  (1)   001216  132737  000100  001135             BITB     #APTSPOOL,$ENVM   ;SHOULD SPOOL MESSAGES?
  (1)   001224  001425                             BEQ      3$                ;IF NOT:  BR
  (1)   001226  017600  000004                     MOV      @4(SP),R0         ;GET MESSAGE ADDR.
  (1)   001232  062766  000002  000004             ADD      #2,4(SP)                   ;BUMP RETURN ADDR.
  (1)   001240  005737  001114             1$:     TST      $MSGTYPE          ;SEE IF DONE W/ LAST XMISSION?
  (1)   001244  001375                             BNE      1$                ;IF NOT:  WAIT
  (1)   001246  010037  001130                     MOV      R0,$MSGAD         ;PUT ADDR IN MAILBOX
```

```
   (1)  001252  105720                          2$:     TSTB    (R0)+              ;FIND END OF MESSAGE
   (1)  001254  001376                                  BNE     2$
   (1)  001256  163700  001130                          SUB     $MSGAD,R0          ;SUB START OF MESSAGE
   (1)  001262  006200                                  ASR     R0                 ;GET MESSAGE LNGTH IN WORDS
   (1)  001264  010037  001132                          MOV     R0,$MSGLGT         ;PUT LENGTH IN MAILBOX
   (1)  001270  012737  000004  001114                  MOV     #4,$MSGTYPE        ;TELL APT TO TAKE MSG.
   (1)  001276  000413                                  BR      5$
   (1)  001300  017637  000004  001324      3$:         MOV     @4(SP),4$          ;PUT MSG ADDR IN JSR LINKAGE
   (1)  001306  062766  000002  000004                  ADD     #2,4(SP)                   ;BUMP RETURN ADDRESS
   (3)  001314  013746  177776                          MOV     177776,-(SP)       ;;PUSH 177776 ON STACK
   (1)  001320  004737  110640                          JSR     PC,$TYPE           ;CALL TYPE MACRO
   (1)  001324  000000                          4$:     .WORD   0
   (1)  001326                                  5$:
   (1)  001326  105737  001414                  10$:    TSTB    $FFLG              ;SHOULD REPORT FATAL ERROR?
   (1)  001332  001416                                  BEQ     12$                ;IF NOT:  BR
   (1)  001334  005737  001134                          TST     $ENV               ;RUNNING UNDER APT?
   (1)  001340  001413                                  BEQ     12$                ;IF NOT:  BR
   (1)  001342  005737  001114                  11$:    TST     $MSGTYPE           ;FINISHED LAST MESSAGE?
   (1)  001346  001375                                  BNE     11$                ;IF NOT:  WAIT
   (1)  001350  017637  000004  001116                  MOV     @4(SP),$FATAL      ;GET ERROR #
   (1)  001356  062766  000002  000004                  ADD     #2,4(SP)                   ;BUMP RETURN ADDR.
   (1)  001364  005237  001114                          INC     $MSGTYPE           ;TELL APT TO TAKE ERROR
   (1)  001370  105037  001414                  12$:    CLRB    $FFLG              ;CLEAR FATAL FLAG
   (1)  001374  105037  001413                          CLRB    $LFLG              ;CLEAR LOG FLAG
   (1)  001400  105037  001412                          CLRB    $MFLG              ;CLEAR MESSAGE FLAG
   (3)  001404  012601                                  MOV     (SP)+,R1           ;;POP STACK INTO R1
   (3)  001406  012600                                  MOV     (SP)+,R0           ;;POP STACK INTO R0
   (1)  001410  000207                                  RTS     PC                 ;RETURN
   (1)
   (1)  001412     000                          $MFLG:  .BYTE   0                  ;MESSG. FLAG
   (1)  001413     000                          $LFLG:  .BYTE   0                  ;LOG FLAG
   (1)  001414     000                          $FFLG:  .BYTE   0                  ;FATAL FLAG
   (1)          001416                                  .EVEN
   (1)          000200                          APTSIZE=200
   (1)          000001                          APTENV=001
   (1)          000100                          APTSPOOL=100
   (1)          000040                          APTCSUP=040
  6407                                          ;*****************************************************************
```

```
                                      .SBTTL  GLOBAL DATA SECTION


                                      .SBTTL          TEST COUNTS
      001416  000000                  TOTTCH: .WORD 0                 ;TEST COUNT MULTIPLIER
      001420  000000                  TOTTC:  .WORD 0                 ;TOTAL TEST COUNT
      001422  000000                  INVTC:  .WORD 0                 ;INVALID TEST COUNT
      001424  000000                  REDTC:  .WORD 0                 ;REDUNDANT TEST COUNT
```

```
                                        .SBTTL          INPUT TABLE ENTRY TYPE DISPATCH TABLE
                                        ;INPUT TABLE ENTRY TYPE DISPATCH TABLE.
                                        ;
      001426                            ITYPE:
      001426  041062                            .WORD TYPE0
      001430  041232                            .WORD TYPE1
      001432  000000                            .WORD 0
      001434  000000                            .WORD 0
```

```
                                        .SBTTL          POINTERS TO CIS INST FLOW TABLES
                                        ;POINTERS TO CIS INSTRUCTION FLOW TABLES.
                                        ;
 001436                                 INO:
 001436  000000                                 .WORD 0
 001440  006334                                 .WORD XMOVC
 001442  006334                                 .WORD XMOVRC
 001444  006414                                 .WORD XMOVTC
 001446  006776                                 .WORD XLOCC
 001450  006776                                 .WORD XSKPC
 001452  007134                                 .WORD XSCANC
 001454  007134                                 .WORD XSPANC
 001456  006476                                 .WORD XCMPC
 001460  006560                                 .WORD XMATCHC
 001462  007044                                 .WORD XADDN
 001464  007044                                 .WORD XSUBN
 001466  006642                                 .WORD XCMPN
 001470  007344                                 .WORD XCVTNL
 001472  007216                                 .WORD XCVTPN
 001474  007216                                 .WORD XCVTNP
 001476  006716                                 .WORD XASHN
 001500  007274                                 .WORD XCVTLN
 001502  007044                                 .WORD XADDP
 001504  007044                                 .WORD XSUBP
 001506  006642                                 .WORD XCMPP
 001510  007344                                 .WORD XCVTPL
 001512  007044                                 .WORD XMULP
 001514  007044                                 .WORD XDIVP
 001516  006716                                 .WORD XASHP
 001520  007274                                 .WORD XCVTLP
 001522  007406                                 .WORD XL2D
 001524  007406                                 .WORD XL3D
```

```
                                .SBTTL          FLOW COMMAND DISPATCH TABLE
                                ;FLOW COMMAND DISPATCH TABLE
                                ;
001526                          FLODIS:
001526  053564                          .WORD FC00
001530  042052                          .WORD FC01
001532  042262                          .WORD FC02
001534  042362                          .WORD FC03
001536  042432                          .WORD FC04
001540  042540                          .WORD FC05
001542  042646                          .WORD FC06
001544  042756                          .WORD FC07
001546  045742                          .WORD FC10
001550  045776                          .WORD FC11
001552  046174                          .WORD FC12
001554  050226                          .WORD FC13
001556  051326                          .WORD FC14
001560  054234                          .WORD FC15              ;FLOW COMMANDS 16,& 17 ARE UNUSED.
001562  053564                          .WORD FC00
001564  053564                          .WORD FC00
```

```
                                .SBTTL          PARAMETER TABLE POINTERS
                                ;PARAMETER TABLE POINTERS
                                ;
001566                          PTP:
001566  000000                          .WORD 0
001570  000000                  PTP01:  .WORD 0
001572  000000                  PTP02:  .WORD 0
001574  000000                  PTP03:  .WORD 0
001576  000000                  PTP04:  .WORD 0
001600  000000                  PTP05:  .WORD 0
001602  000000                  PTP06:  .WORD 0
001604  000000                  PTP07:  .WORD 0
001606  000000                  PTP10:  .WORD 0
001610  000000                  PTP11:  .WORD 0
001612  000000                  PTP12:  .WORD 0
001614  000000                  PTP13:  .WORD 0
001616  000000                  PTP14:  .WORD 0
001620  000000                  PTP15:  .WORD 0
001622  000000                  PTP16:  .WORD 0
001624  000000                  PTP17:  .WORD 0
001626  000000                  PTP20:  .WORD 0
001630  000000                  PTP21:  .WORD 0
001632  000000                  PTP22:  .WORD 0
001634  000000                  PTP23:  .WORD 0
001636  000000                  PTP24:  .WORD 0
```

```
                                .SBTTL          MISCELLANEOUS CONSTANTS
                                ;MISCELLANEOUS CONSTANTS
                                ;
001640  130000                  TBADR:  .WORD 130000            ;TEST BUFFER STARTING ADDRESS
001642  002000                  TBLEN:  .WORD  2000             ;TEST BUFFER LENGTH
001644  010000                  RTBLEN: .WORD 10000             ;RANDOM MODE TEST BUFFER LENGTH
001646  140000                  EBADR:  .WORD 140000            ;EMULATION BUFFER STARTING ADDRESS
001650  002000                  EBLEN:  .WORD  2000             ;EMULATION BUFFER LENGTH
001652  020000                  TPERP:  .WORD 20000             ;# OF TESTS PER APT PASS IN RANDOM MODE
001654  002000                  PSEED:  .WORD 2000              ;# OF TESTS TO EXECUTE IN RANDOM MODE



001656  000024                  IPNU:   .WORD 24                ;# OF INPUT PARAMETERS PER INPUT
                                                                ;  TABLE ENTRY.
001660  000001                  INCSQ1: .WORD 1                 ;INCREMENT SEQUENCE WORD 1
001662  000002                  INCSQ2: .WORD 2                 ;INCREMENT SEQUENCE WORD 2
001664  177776                  TPSW:   .WORD  177776           ;PSW
001666  177560                  TKS:    177560
001670  000240                  KNOP:   NOP
001672  000000                  KHALT:  HALT
001674  000405                  KBR5:   .WORD 405
001676  000403                  KBR3:   .WORD 403
001700  000402                  KBR2:   .WORD 402
001702  123321                  NOTREG: .WORD 123321            ;PATTERN LOADED INTO REG SET NO SELECTED FOR TEST
001704  000002                  EL74:   .WORD 2                 ;11/74 PROCESSOR TYPE
001706  000001                  EL44:   .WORD 1                 ;11/44 PROCESSOR TYPE
001710  000003                  EL2324: .WORD 3                 ;11/23/24 PROCESSOR TYPE
                                                                ;  BETWEEN PRINTING OF RNG SEED.
                                                                ;NOTE: ONLY 1 BIT IS ALLOWED TO BE SET IN PSEED.
001712  177562                  TKB:    177562
001714  177564                  TPS:    177564
001716  177566                  TPB:    177566
        000015                  CR=     15
        000012                  LF=     12
        000057                  SL=     57
        000010                  BS=     10
        000007                  MFPT=   7
001720  177777                  PAT0:   .WORD 177777
001722  111111                  PAT1:   .WORD 111111
001724  122222                  PAT2:   .WORD 122222
001726  133333                  PAT3:   .WORD 133333
001730  144444                  PAT4:   .WORD 144444
001732  155555                  PAT5:   .WORD 155555
001734  120606                  IXLTB1: .WORD XLTBL1
001736  177570                  SWR:    .WORD DSWR              ;ADDRESS OF SWITCH REGISTER
001740  177570                  DISPLAY:.WORD DDISP             ;ADDRESS OF DISPLAY REGISTER
```

```

                                .SBTTL          MISCELLANEOUS VARIABLES
                                ;MISCELLANEOUS VARIABLES
                                ;
001742  000000                  FLOPTR: .WORD 0
001744  000000                  ESEED:  .WORD 0
001746  000000                  DENS:   .WORD 0
001750  000000                  N200M:  .WORD 0
001752  000000                  TSTPSW: .WORD 0
001754  000000                  TBEND:  .WORD 0
001756  000000                  SBR:    .WORD 0
001760  000000                  RANDOM: .WORD 0
001762  000000                  CTACT:  .WORD 0
001764  000000                  PMASK:  .WORD 0
001766  177417                  ZMSK:   .WORD 177417
001770  000000                  RANDTA: .WORD 0
001772  000000                  LIMSTG: .WORD 0
001774  000000                  RNIB:   .WORD 0
001776  000000                  STRNC:  .WORD 0
002000  000000                  STRP1:  .WORD 0
002002  000000                  STRP2:  .WORD 0
002004  000000                  SXRNC:  .WORD 0
002006  000000                  SXRP1:  .WORD 0
002010  000000                  SXRP2:  .WORD 0
002012  000000                  SYRNC:  .WORD 0
002014  000000                  SYRP1:  .WORD 0
002016  000000                  SYRP2:  .WORD 0
002020  000000                  SWRNC:  .WORD 0
002022  000000                  SWRP1:  .WORD 0
002024  000000                  SWRP2:  .WORD 0
002026  000000                  SVRNC:  .WORD 0
002030  000000                  SVRP1:  .WORD 0
002032  000000                  SVRP2:  .WORD 0
002034  000000                  ZCCR:   .WORD 0
002036  000000                  SPCV:   .WORD 0
002040  000000                  TPRECS: .WORD 0
002042  000000                  NOERDS: .WORD 0
002044  000000                  PROGD:  .WORD 0
002046  000000                  SURLEN: .WORD 0
002050  000000                  SURADR: .WORD 0
002052  000000                  REGSET: .WORD 0
002054  000000                  ERRCT:  .WORD 0
002056  000000                  ERRS:   .WORD 0
002060  000000                  TWOSETS:.WORD 0
002062  000000                  FSAVR5: .WORD 0
002064  000000                  FSAVR4: .WORD 0
002066  000000                  FSAVR3: .WORD 0
002070  000000                  FSAVR2: .WORD 0
002072  000000                  FSAVR1: .WORD 0
002074  000000                  FSRUN:  .WORD 0
002076  000000                  MSEED:  .WORD 0
002100  000000                  NBLKS:  .WORD 0
002102  000000                  TRA:    .WORD 0
002104  000000                  TRL:    .WORD 0
```

```
002106 000000          STGDS1: .WORD 0
002110 000000          STGDS2: .WORD 0
002112 000000          STGLN:  .WORD 0
002114 000000          STGAD:  .WORD 0
002116 000000          SAVSL:  .WORD 0
002120 000000          SAVSA:  .WORD 0
002122 000000          SAVSGL: .WORD 0
002124 000000          SIGN:   .WORD 0
002126 000000          VIP:    .WORD 0
002130 000000          PTW1:   .WORD 0
002132 000000          FATAL:  .WORD 0
002134 000000          INPTP:  .WORD 0
002136 000000          PTPTR:  .WORD 0
002140 000000          SPHAND: .WORD 0
002142 000000          EMPTR:  .WORD 0
002144 000000          ERRCC:  .WORD 0
002146 000000          ERRREG: .WORD 0
002150 000000          ERRBUF: .WORD 0
002152 000000          ERRSTK: .WORD 0
002154 000000          PT34:   .WORD 0         ;11/34 TYPE PROCESSOR FLAG
002156 000000          MMFLG:  .WORD 0         ;WHEN NON ZERO, TESTING WITH MEMORY MGMT ON
002160 000000          MODE:   .WORD 0         ;PROCESSOR MODE USED FOR CIS INST TEST
                                               ;  (0=KERNEL,1=SUPERVISOR,3=USER)
002162 000000          DEN:    .WORD 0         ;D-SPACE ENABLED(1)/DISABLED(0)
002164 000000          NMODES: .WORD 0         ;# OF PROCESSOR MODES ON MACHINE UNDER TEST
                                               ; (I.E. KERNEL,SUP,USER)
002166 000000          TRPLOC: .WORD 0
002170 000000          HLTLOC: .WORD 0
002172 000000          IRXLT:  .WORD 0
002174 000000          AEADR:  .WORD 0
002176 000000          AEDTA:  .WORD 0
002200 000000          EMADR:  .WORD 0
002202 000000          EMDTA:  .WORD 0
002204 000000          QRYFLG: .WORD 0
002206 000000          QVMODE: .WORD 0
002210 000000          MMSTAT: .WORD 0
002212 000000          PTQV:   .WORD 0
002214 000000          ICOMPC: .WORD 0
002216 000000          STOPTF: .WORD 0
002220 000000          STOPT:  .WORD 0
002222 000000          RLL:    .WORD 0
002224 000000          RUL:    .WORD 0
002226 000000          BAD:    .WORD 0
002230 000000          TSP:    .WORD 0
002232 000000          NXFLD:  .WORD 0
002234 000000          TTR0:   .WORD 0
002236 000000          TTR1:   .WORD 0
002240 000000          TTR2:   .WORD 0
002242 000000          TTR3:   .WORD 0
002244 000000          TTR4:   .WORD 0
002246 000000          TTR5:   .WORD 0
002250 000000          TTR6:   .WORD 0
002252 000000          TER0R:  .WORD 0
002254 000000          TER1R:  .WORD 0
```

```
002256  000000          TER2R:  .WORD 0
002260  000000          TER3R:  .WORD 0
002262  000000          TER4R:  .WORD 0
002264  000000          TER5R:  .WORD 0
002266  000000          TER6R:  .WORD 0
002270  000000          TERR:   .WORD 0
002272  000000          RPTFLG: .WORD 0
002274  000000          FILLS2: .WORD 0
002276  000000          OCTIC:  .WORD 0
002300  000000          TW1:    .WORD 0
002302  000000          TW2:    .WORD 0
002304  000000          PRTSGN: .WORD 0
002306  000000          STGDIG: .WORD 0
002310  000000          STGTYP: .WORD 0
002312  044072          TYPTAB: .WORD TYPSZ             ;SIGNED ZONED
002314  044124                  .WORD TYPUZ             ;UNSIGNED ZONED
002316  044126                  .WORD TYPTO             ;TRAILING OVERPUNCH
002320  044234                  .WORD TYPLO             ;LEADING OVERPUNCH
002322  044244                  .WORD TYPTS             ;TRAILING SEPARATE
002324  044310                  .WORD TYPLS             ;LEADING SEPARATE
002326  002332                  .WORD TYPSP             ;RESERVED
002330  002332                  .WORD TYPSP             ;RESERVED
002332  000000          TYPSP:  HALT
002334     175          NEGTAB: .BYTE 175               ;-0
002335     112                  .BYTE 112               ;-1
002336     113                  .BYTE 113               ;-2
002337     114                  .BYTE 114               ;-3
002340     115                  .BYTE 115               ;-4
002341     116                  .BYTE 116               ;-5
002342     117                  .BYTE 117               ;-6
002343     120                  .BYTE 120               ;-7
002344     121                  .BYTE 121               ;-8
002345     122                  .BYTE 122               ;-9
002346     135          NEGTB1: .BYTE 135               ;-0
002347     112                  .BYTE 112               ;-1
002350     113                  .BYTE 113               ;-2
002351     114                  .BYTE 114               ;-3
002352     115                  .BYTE 115               ;-4
002353     116                  .BYTE 116               ;-5
002354     117                  .BYTE 117               ;-6
002355     120                  .BYTE 120               ;-7
002356     121                  .BYTE 121               ;-8
002357     122                  .BYTE 122               ;-9
002360     173          POSTAB: .BYTE 173               ;+0
002361     101                  .BYTE 101               ;+1
002362     102                  .BYTE 102               ;+2
002363     103                  .BYTE 103               ;+3
002364     104                  .BYTE 104               ;+4
002365     105                  .BYTE 105               ;+5
002366     106                  .BYTE 106               ;+6
002367     107                  .BYTE 107               ;+7
002370     110                  .BYTE 110               ;+8
002371     111                  .BYTE 111               ;+9
002372     060          POSTB1: .BYTE 060               ;+0
```

```
002373     061                    .BYTE 061                    ;+1
002374     062                    .BYTE 062                    ;+2
002375     063                    .BYTE 063                    ;+3
002376     064                    .BYTE 064                    ;+4
002377     065                    .BYTE 065                    ;+5
002400     066                    .BYTE 066                    ;+6
002401     067                    .BYTE 067                    ;+7
002402     070                    .BYTE 070                    ;+8
002403     071                    .BYTE 071                    ;+9
002404     133           POSTB2:  .BYTE 133                    ;+0
002405     061                    .BYTE 061                    ;+1
002406     062                    .BYTE 062                    ;+2
002407     063                    .BYTE 063                    ;+3
002410     064                    .BYTE 064                    ;+4
002411     065                    .BYTE 065                    ;+5
002412     066                    .BYTE 066                    ;+6
002413     067                    .BYTE 067                    ;+7
002414     070                    .BYTE 070                    ;+8
002415     071                    .BYTE 071                    ;+9
002416  045244           PTYPTA:  .WORD PTYPSZ                 ;SIGNED ZONED
002420  045740                    .WORD EISTG                  ;UNSIGNED ZONED
002422  045106                    .WORD PTYPTO                 ;TRAILING OVERPUNCH
002424  045254                    .WORD PTYPLO                 ;LEADING OVERPUNCH
002426  045264                    .WORD PTYPTS                 ;TRAILING SEPARATE
002430  045300                    .WORD PTYPLS                 ;LEADING SEPARATE
002432  002332                    .WORD TYPSP                  ;RESERVED
002434  002332                    .WORD TYPSP                  ;RESERVED
002436  000000           ONEBEY:  .WORD 0
002440  000000           DECINS:  .WORD 0
002442  000006           S1TYPE:  .WORD 6
002444  000006           S2TYPE:  .WORD 6
002446  000006           S3TYPE:  .WORD 6
002450  070000           TYPFLD:  .WORD 070000
002452  000000           MIXTYP:  .WORD 0                      ;MANUALLY SET TO ANY NONZERO VALUE
                                                               ;  TO CAUSE TESTING OF MIXED DATA TYPES
                                                               ;  WITHIN INST.  NOTE: THIS WILL
                                                               ;  GREATLY INCREASE RUN TIME!!!!
002454  000000           PKPTW:   .WORD 0
002456  000000           NDESC:   .WORD 0
002460  000000           ZPM:     .WORD 0
002462  000000           ACINST:  .WORD 0
002464  000000                    .WORD 0
002466  000000                    .WORD 0
002470  000000           ONEINS:  .WORD 0
002472  000000           PZCODE:  .WORD 0
002474  000000           SAVPTR:  .WORD 0
002476  000000           SAVSRF:  .WORD 0
002500  000000           INSRC1:  .WORD 0          ;SRC1 STRING SAVE BUFFER DESCRIPTOR
002502  003041                    .WORD BUFSR1
002504  000000           INSRC2:  .WORD 0          ;SRC2 STRING SAVE BUFFER DESCRIPTOR
002506  003102                    .WORD BUFSR2

002510  120000           RANDSC:  .WORD 120000
002512  000000                    .WORD 0
```

```
                                .SBTTL          PROGRAMMABLE CLOCK CONSTANTS
                                ;PROGRAMMABLE CLOCK CONSTANTS
002514  000104                  PCLK1V: .WORD 104               ;P-CLK 1
002516  000106                  PCLK1P: .WORD 106
002520  172540                  PC1CSR: .WORD 172540
002522  172542                  PC1CSB: .WORD 172542
002524  172544                  PC1CTR: .WORD 172544
002526  000000                  PCLK2V: .WORD 000               ;P-CLK 2
002530  172550                  PC2CSR: .WORD 172550
002532  172552                  PC2CSB: .WORD 172552
002534  172554                  PC2CTR: .WORD 172554
002536  000004                  TIMOUT: .WORD 4

002540  000000                  PROGCT: .WORD 0
002542  000000                  LATCT:  .WORD 0
002544  000000                  LATEN:  .WORD 0
002546  000000                  INTCT:  .WORD 0
002550  000240                  KNOP1:  .WORD NOP
002552  000240                  KNOP2:  .WORD NOP
002554  000240                  KNOP3:  .WORD NOP
002556  000000                  INTRVL: .WORD 0
002560  000000                  STOPLA: .WORD 0                 ;IF NONZERO & LATENCY EXCEEDS THIS VALUE PROGRAM HALTS
002562  001000                  MAXIVL: .WORD 1000              ;USER DEFINED MAXIMUM INTERVAL ALLOWED

002564  000000                  STATPS: .WORD 0
002566  000000                  STATR0: .WORD 0
002570  000000                  STATR1: .WORD 0
002572  000000                  STATR2: .WORD 0
002574  000000                  STATR3: .WORD 0
002576  000000                  STATR4: .WORD 0
002600  000000                  STATR5: .WORD 0
002602  000000                  STATR6: .WORD 0
002604  000100                          .BLKW ^D64
003004                          SCSTK:

003004  000000                  SGPR0:  .WORD 0
003006  000000                  SGPR1:  .WORD 0
003010  000000                  SGPR2:  .WORD 0
003012  000000                  SGPR3:  .WORD 0
003014  000000                  SGPR4:  .WORD 0
003016  000000                  SGPR5:  .WORD 0
003020  000000                  SGPR6:  .WORD 0
```

```
                                        .SBTTL          LINE TIME CLOCK CONSTANTS
                                        ;LINE TIME CLOCK CONSTANTS
003022  000100                          LTCIV:  .WORD 100
003024  000102                          LTCIP:  .WORD 102
003026  177546                          LKS:    .WORD 177546
003030  000000                          LCNT:   .WORD 0
003032  000000                          VLCNT:  .WORD 0
003034  000240                          KNOP4:  .WORD 240
003036  000000                          LTCDLY: .WORD 0
```

```
                                         .SBTTL         SOURCE STRING STORAGE BUFFER
                                         ;SOURCE STRING STORAGE BUFFER - USED BY ERROR PRINTOUT ROUTINES
                                         ;
      003040       000                           .BYTE 0
      003041    000040                   BUFSR1: .BLKB ^D32                  ;S1 BUFFER
      003101       000                           .BYTE 0
      003102    000040                   BUFSR2: .BLKB ^D32                  ;S2 BUFFER



      003142       000                   PB0:    .BYTE           0           ;DISPLAY BUFFER
      003143       000                   PB1:    .BYTE           0
      003144       000                   PB2:    .BYTE           0
      003145       000                   PB3:    .BYTE           0
      003146       000                   PB4:    .BYTE           0
      003147       000                   PB5:    .BYTE           0
      003150       000                   PB6:    .BYTE           0
      003151       000                   PB7:    .BYTE           0
```

```
                                ;DESCRIPTORS AND DESTINATION BUFFER FOR INTERRUPTABILITY SERVICE
                                ;  ROUTINE DIVPI INST.
                                ;
003152  000012                  DIVDS:   .WORD 12               ;SOURCE 1 & 2 DESC
003154  003250                           .WORD SSTG2
003156  000020                  DIVDD:   .WORD 20               ;DESTINATION DESC
003160  003162                           .WORD DESTBUF
003162  000031                  DESTBUF: .BLKW 31
```

```
                                        .SBTTL          PRE-SPECIFIED STRINGS
                                        ;PRE-SPECIFIED STRINGS
                                        ;
 003244        001                      SSTG1:  .BYTE 001
 003245        001                              .BYTE 001
 003246        007                              .BYTE 007
 003247        000                              .BYTE 000

 003250     012002                      SSTG2:  .WORD 012002            ;PACKED 2,147,483,648   +MAX+1
 003252     101564                              .WORD 101564
 003254     106144                              .WORD 106144

 003256     024404                      SSTG2A: .WORD 024404            ;PACKED 4,294,967,294    +MAX * 2
 003260     063511                              .WORD 063511
 003262     046051                              .WORD 046051

 003264     112102                      SSTG2B: .WORD 112102            ;PACKED 42,949,672,940  +MAX * 20
 003266     071226                              .WORD 071226
 003270     006224                              .WORD 006224

 003272     000402                      SSTG3:  .WORD 000402            ;ZONED 2,147,483,648    +MAX+1
 003274     003404                              .WORD 003404
 003276     034064                              .WORD 034064
 003300     003003                              .WORD 003003
 003302     034164                              .WORD 034164

 003304     012002                      SSTG4:  .WORD 012002            ;PACKED 2,147,483,647    +MAX
 003306     101564                              .WORD 101564
 003310     076144                              .WORD 076144

 003312     000402                      SSTG5:  .WORD 000402            ;ZONED 2,147,483,647     +MAX
 003314     003404                              .WORD 003404
 003316     034064                              .WORD 034064
 003320     003003                              .WORD 003003
 003322     033564                              .WORD 033564

 003324     012002                      SSTG6:  .WORD 012002            ;PACKED  -2,147,483,648  -MAX
 003326     101564                              .WORD 101564
 003330     106544                              .WORD 106544

 003332     000402                      SSTG7:  .WORD 000402            ;ZONED  -2,147,483,648   -MAX
 003334     003404                              .WORD 003404
 003336     034064                              .WORD 034064
 003340     003003                              .WORD 003003
 003342     074164                              .WORD 074164

 003344     012002                      SSTG10: .WORD 012002            ;PACKED   -2,147,483,649  -MAX-1
 003346     101564                              .WORD 101564
 003350     116544                              .WORD 116544

 003352     000402                      SSTG11: .WORD 000402            ;ZONED  -2,147,483,649  -MAX-1
 003354     003404                              .WORD 003404
 003356     034064                              .WORD 034064
 003360     003003                              .WORD 003003
```

```
003362  074564                     .WORD 074564

003364  032022            SSTG12:  .WORD 032022            ;PACKED STRING
003366  074126                     .WORD 074126            ; 1234567891234567891234000891233
003370  021621                     .WORD 021621
003372  063505                     .WORD 063505
003374  011211                     .WORD 011211
003376  000064                     .WORD 000064
003400  110410                     .WORD 110410
003402  036043                     .WORD 036043

003404  000000            STG12B:  .WORD 000000            ;PACKED STRING
003406  000000                     .WORD 000000
003410  000000                     .WORD 000000
003412  000000                     .WORD 000000
003414  000000                     .WORD 000000
003416  000000                     .WORD 000000
003420  000000                     .WORD 000000
003422  106610                     .WORD 106610            ; 000888-

003424  000100            STG12C:  .WORD 000100            ;PACKED STRING
003426  000000                     .WORD 000000            ; 4000000000000000000000000000000-
003430  000000                     .WORD 000000
003432  000000                     .WORD 000000
003434  000000                     .WORD 000000
003436  000000                     .WORD 000000
003440  000000                     .WORD 000000
003442  006400                     .WORD 006400

003444  001001            SSTG13:  .WORD 001001            ;ZONED STRING
003446  002003                     .WORD 002003            ;  1234567891234567891234000891233
003450  003005                     .WORD 003005
003452  004007                     .WORD 004007
003454  000411                     .WORD 000411
003456  101602                     .WORD 101602
003460  072564                     .WORD 072564
003462  073566                     .WORD 073566
003464  034470                     .WORD 034470
003466  031061                     .WORD 031061
003470  002003                     .WORD 002003
003472  000000                     .WORD 000000
003474  004000                     .WORD 004000
003476  000411                     .WORD 000411
003500  001402                     .WORD 001402
003502  000063                     .WORD 000063

003504  000000            STG13B:  .WORD 000000            ;ZONED STRING
003506  000000                     .WORD 000000
003510  000000                     .WORD 000000
003512  000000                     .WORD 000000
003514  000000                     .WORD 000000
003516  000000                     .WORD 000000
003520  000000                     .WORD 000000
003522  000000                     .WORD 000000
```

```
003524  000000                      .WORD 000000
003526  000000                      .WORD 000000
003530  000000                      .WORD 000000
003532  000000                      .WORD 000000
003534  000000                      .WORD 000000
003536  000000                      .WORD 000000
003540  004000                      .WORD 004000             ; 000888-
003542  074010                      .WORD 074010

003544  000004             STG13C:  .WORD 000004             ;ZONED STRING
003546  000000                      .WORD 000000             ; 4000000000000000000000000000000-
003550  000000                      .WORD 000000
003552  000000                      .WORD 000000
003554  000000                      .WORD 000000
003556  000000                      .WORD 000000
003560  000000                      .WORD 000000
003562  000000                      .WORD 000000
003564  000000                      .WORD 000000
003566  000000                      .WORD 000000
003570  000000                      .WORD 000000
003572  000000                      .WORD 000000
003574  000000                      .WORD 000000
003576  000000                      .WORD 000000
003600  000000                      .WORD 000000
003602  000160                      .WORD 000160

003604  042006             SSTG14:  .WORD 042006             ;PACKED STRING 3X2**31
003606  050044                      .WORD 050044             ;   6442450944 +
003610  046224                      .WORD 046224

003612  042006             SSTG15:  .WORD 42006              ;PACKED STRING 3X2**31 -
003614  050044                      .WORD 50044              ;6442450944 -
003616  046624                      .WORD 46624

003620  000000             SSTG16:  .WORD 000000             ;PACKED STRING
003622  000000                      .WORD 000000             ; 000000000000333+
003624  000000                      .WORD 000000
003626  036063                      .WORD 036063

```

```
                                        .SBTTL          TEST AND EMULATION OPERANDS
                                        ;TEST OPERANDS
                                        ;
        003630                          TRN:
        003630  000000                  TR0:    .WORD 0
        003632  000000                  TR1:    .WORD 0
        003634  000000                  TR2:    .WORD 0
        003636  000000                  TR3:    .WORD 0
        003640  000000                  TR4:    .WORD 0
        003642  000000                  TR5:    .WORD 0
        003644  000000                  TR6:    .WORD 0
        003646  000000                  TCC:    .WORD 0

                                        ;TEST RESULTS - REGISTERS
                                        ;
        003650                          TRNR:
        003650  000000                  TR0R:   .WORD 0
        003652  000000                  TR1R:   .WORD 0
        003654  000000                  TR2R:   .WORD 0
        003656  000000                  TR3R:   .WORD 0
        003660  000000                  TR4R:   .WORD 0
        003662  000000                  TR5R:   .WORD 0
        003664  000000                  TR6R:   .WORD 0

                                        ;TEST RESULTS - CONDITION CODES
                                        ;
        003666  000000                  TCCR:   .WORD 0

                                        ;EMULATION OPERANDS
                                        ;
        003670                          ERN:
        003670  000000                  ER0:    .WORD 0
        003672  000000                  ER1:    .WORD 0
        003674  000000                  ER2:    .WORD 0
        003676  000000                  ER3:    .WORD 0
        003700  000000                  ER4:    .WORD 0
        003702  000000                  ER5:    .WORD 0
        003704  000000                  ER6:    .WORD 0

                                        ;EMULATION RESULTS - REGISTERS
                                        ;
        003706                          ERNR:
        003706  000000                  ER0R:   .WORD 0
        003710  000000                  ER1R:   .WORD 0
        003712  000000                  ER2R:   .WORD 0
        003714  000000                  ER3R:   .WORD 0
        003716  000000                  ER4R:   .WORD 0
        003720  000000                  ER5R:   .WORD 0
        003722  000000                  ER6R:   .WORD 0

                                        ;EMULATION RESULTS - CONDITION CODES
                                        ;
        003724  000000                  ECCR:   .WORD 0
```

```
                               .SBTTL          OCTAL CODING FOR EACH CIS INSTRUCTION
                               ;OCTAL CODING FOR EACH CIS INSTRUCTION
                               ;
003726  000000                 OINST:  .WORD 0                 ; 0 - UNASSIGNED
003730  076030                         .WORD 76030             ; 1 - MOVC
003732  076031                         .WORD 76031             ; 2 - MOVRC
003734  076032                         .WORD 76032             ; 3 - MOVTC
003736  076040                         .WORD 76040             ; 4 - LOCC
003740  076041                         .WORD 76041             ; 5 - SKPC
003742  076042                         .WORD 76042             ; 6 - SCANC
003744  076043                         .WORD 76043             ; 7 - SPANC
003746  076044                         .WORD 76044             ;10 - CMPC
003750  076045                         .WORD 76045             ;11 - MATCHC
003752  076050                         .WORD 76050             ;12 - ADDN
003754  076051                         .WORD 76051             ;13 - SUBN
003756  076052                         .WORD 76052             ;14 - CMPN
003760  076053                         .WORD 76053             ;15 - CVTNL
003762  076054                         .WORD 76054             ;16 - CVTPN
003764  076055                         .WORD 76055             ;17 - CVTNP
003766  076056                         .WORD 76056             ;20 - ASHN
003770  076057                         .WORD 76057             ;21 - CVTLN
003772  076070                         .WORD 76070             ;22 - ADDP
003774  076071                         .WORD 76071             ;23 - SUBP
003776  076072                         .WORD 76072             ;24 - CMPP
004000  076073                         .WORD 76073             ;25 - CVTPL
004002  076074                         .WORD 76074             ;26 - MULP
004004  076075                         .WORD 76075             ;27 - DIVP
004006  076076                         .WORD 76076             ;30 - ASHP
004010  076077                         .WORD 76077             ;31 - CVTLP
004012  076020                         .WORD 76020             ;32 - L2DR
004014  076060                         .WORD 76060             ;33 - L3DR
```

```
                                        .SBTTL          CONDITION CODE USAGE RECORD
                                        ;CONDITION CODE USAGE RECORD
                                        ;LOW 4 BITS OF LOW BYTE = '1' STATE EXERCISED; LOW 4 BITS OF HIGH BYTE = '0' STATE EXERC
004016  000000                          CCREC:  .WORD 0                         ; 0 - UNASSIGNED
004020  000000                                  .WORD 0                         ; 1 - MOVC
004022  000000                                  .WORD 0                         ; 2 - MOVRC
004024  000000                                  .WORD 0                         ; 3 - MOVTC
004026  000003                                  .WORD 3                         ; 4 - LOCC
004030  000003                                  .WORD 3                         ; 5 - SKPC
004032  000003                                  .WORD 3                         ; 6 - SCANC
004034  000003                                  .WORD 3                         ; 7 - SPANC
004036  000000                                  .WORD 0                         ;10 - CMPC
004040  000003                                  .WORD 3                         ;11 - MATCHC
004042  000001                                  .WORD 1                         ;12 - ADDN
004044  000001                                  .WORD 1                         ;13 - SUBN
004046  000003                                  .WORD 3                         ;14 - CMPN
004050  000000                                  .WORD 0                         ;15 - CVTNL
004052  000001                                  .WORD 1                         ;16 - CVTPN
004054  000001                                  .WORD 1                         ;17 - CVTNP
004056  000001                                  .WORD 1                         ;20 - ASHN
004060  000001                                  .WORD 1                         ;21 - CVTLN
004062  000001                                  .WORD 1                         ;22 - ADDP
004064  000001                                  .WORD 1                         ;23 - SUBP
004066  000003                                  .WORD 3                         ;24 - CMPP
004070  000000                                  .WORD 0                         ;25 - CVTPL
004072  000001                                  .WORD 1                         ;26 - MULP
004074  000000                                  .WORD 0                         ;27 - DIVP
004076  000001                                  .WORD 1                         ;30 - ASHP
004100  000001                                  .WORD 1                         ;31 - CVTLP
004102  000000                                  .WORD 0                         ;32 - L2DR
004104  000000                                  .WORD 0                         ;33 - L3DR
```

```
                                 .SBTTL        INTERRUPT LATENCY TABLE
                                 ;INTERRUPT LATENCY TABLE (WORST CASE VALUE FOR GIVEN INST)
                                 ;
004106  000000                   ILATEN: .WORD 0                 ; 0 - UNASSIGNED
004110  000000                           .WORD 0                 ; 1 - MOVC
004112  000000                           .WORD 0                 ; 2 - MOVRC
004114  000000                           .WORD 0                 ; 3 - MOVTC
004116  000000                           .WORD 0                 ; 4 - LOCC
004120  000000                           .WORD 0                 ; 5 - SKPC
004122  000000                           .WORD 0                 ; 6 - SCANC
004124  000000                           .WORD 0                 ; 7 - SPANC
004126  000000                           .WORD 0                 ;10 - CMPC
004130  000000                           .WORD 0                 ;11 - MATCHC
004132  000000                           .WORD 0                 ;12 - ADDN
004134  000000                           .WORD 0                 ;13 - SUBN
004136  000000                           .WORD 0                 ;14 - CMPN
004140  000000                           .WORD 0                 ;15 - CVTNL
004142  000000                           .WORD 0                 ;16 - CVTPN
004144  000000                           .WORD 0                 ;17 - CVTNP
004146  000000                           .WORD 0                 ;20 - ASHN
004150  000000                           .WORD 0                 ;21 - CVTLN
004152  000000                           .WORD 0                 ;22 - ADDP
004154  000000                           .WORD 0                 ;23 - SUBP
004156  000000                           .WORD 0                 ;24 - CMPP
004160  000000                           .WORD 0                 ;25 - CVTPL
004162  000000                           .WORD 0                 ;26 - MULP
004164  000000                           .WORD 0                 ;27 - DIVP
004166  000000                           .WORD 0                 ;30 - ASHP
004170  000000                           .WORD 0                 ;31 - CVTLP
004172  000000                           .WORD 0                 ;32 - L2DR
004174  000000                   LATEND: .WORD 0                 ;33 - L3DR
```

```
                                        .SBTTL          RANDOM EXERCISE MODE MASK TABLE POINTERS
                                        ;RANDOM EXERCISE MODE MASK TABLE POINTERS
                                        ;
004176  000000                          MINST:  .WORD 0                 ; 0 - UNASSIGNED
004200  006070                                  .WORD MMOVC             ; 1 - MOVC
004202  006070                                  .WORD MMOVRC            ; 2 - MOVRC
004204  006104                                  .WORD MMOVTC            ; 3 - MOVTC
004206  006140                                  .WORD MLOCC             ; 4 - LOCC
004210  006140                                  .WORD MSKPC             ; 5 - SKPC
004212  006150                                  .WORD MSCANC            ; 6 - SCANC
004214  006150                                  .WORD MSPANC            ; 7 - SPANC
004216  006070                                  .WORD MCMPC             ;10 - CMPC
004220  006164                                  .WORD MMTCHC            ;11 - MATCHC
004222  006244                                  .WORD MADDN             ;12 - ADDN
004224  006244                                  .WORD MSUBN             ;13 - SUBN
004226  006272                                  .WORD MCMPN             ;14 - CMPN
004230  006226                                  .WORD MCVTNL            ;15 - CVTNL
004232  006200                                  .WORD MCVTPN            ;16 - CVTPN
004234  006200                                  .WORD MCVTNP            ;17 - CVTNP
004236  006316                                  .WORD MASHN             ;20 - ASHN
004240  006214                                  .WORD MCVTLN            ;21 - CVTLN
004242  006244                                  .WORD MADDP             ;22 - ADDP
004244  006244                                  .WORD MSUBP             ;23 - SUBP
004246  006272                                  .WORD MCMPP             ;24 - CMPP
004250  006226                                  .WORD MCVTPL            ;25 - CVTPL
004252  006244                                  .WORD MMULP             ;26 - MULP
004254  006244                                  .WORD MDIVP             ;27 - DIVP
004256  006316                                  .WORD MASHP             ;30 - ASHP
004260  006214                                  .WORD MCVTLP            ;31 - CVTLP
```

```
                                .SBTTL          DECIMAL INST DATA TYPE CONTROL WORDS
                                ;DECIMAL INSTRUCTION DATA TYPE CONTROL WORDS
                                ;
004262  004214                  DECTYP: .WORD DECTTB-50

004264  001400                  DECTTB: .WORD 1400              ;ADDN   NDESC,PKPTW
004266  002000                          .WORD 2000              ;       ZPM,SXTYPE
004270  001400                          .WORD 1400              ;SUBN
004272  002000                          .WORD 2000
004274  001000                          .WORD 1000              ;CMPN
004276  002000                          .WORD 2000
004300  000400                          .WORD 0400              ;CVTNL
004302  002000                          .WORD 2000
004304  001006                          .WORD 1006              ;CVTPN
004306  004006                          .WORD 4006
004310  001060                          .WORD 1060              ;CVTNP
004312  003060                          .WORD 3060
004314  001000                          .WORD 1000              ;ASHN
004316  002000                          .WORD 2000
004320  000400                          .WORD 0400              ;CVTLN
004322  002000                          .WORD 2000
004324  001400                          .WORD 1400              ;ADDP
004326  001777                          .WORD 1777
004330  001400                          .WORD 1400              ;SUBP
004332  001777                          .WORD 1777
004334  001000                          .WORD 1000              ;CMPP
004336  001777                          .WORD 1777
004340  000400                          .WORD 0400              ;CVTPL
004342  001777                          .WORD 1777
004344  001400                          .WORD 1400              ;MULP
004346  001777                          .WORD 1777
004350  001400                          .WORD 1400              ;DIVP
004352  001777                          .WORD 1777
004354  001000                          .WORD 1000              ;ASHP
004356  001777                          .WORD 1777
004360  000400                          .WORD 0400              ;CVTLP
004362  001777                          .WORD 1777
```

```
                                  .SBTTL        TYPE 0  INDIRECTLY SPECIFIED PARAMETERS
                                  ;TYPE 0 ENTRY - INDIRECTLY SPECIFIED PARAMETERS

004364  000000                    INSTID: .WORD 0                ;UNASSIGNED
004366     006                            .BYTE 6                ;MOVC
004367     000                            .BYTE 0
004370     006                            .BYTE 6                ;MOVRC
004371     000                            .BYTE 0
004372     006                            .BYTE 6                ;MOVTC
004373     015                            .BYTE 15
004374     004                            .BYTE 4                ;LOCC
004375     000                            .BYTE 0
004376     004                            .BYTE 4                ;SKPC
004377     000                            .BYTE 0
004400     006                            .BYTE 6                ;SCANC
004401     011                            .BYTE 11
004402     006                            .BYTE 6                ;SPANC
004403     011                            .BYTE 11
004404     006                            .BYTE 6                ;CMPC
004405     011                            .BYTE 11
004406     006                            .BYTE 6                ;MATCHC
004407     011                            .BYTE 11
004410     007                            .BYTE 7                ;ADDN
004411     012                            .BYTE 12
004412     007                            .BYTE 7                ;SUBN
004413     012                            .BYTE 12
004414     006                            .BYTE 6                ;CMPN
004415     011                            .BYTE 11
004416     003                            .BYTE 3                ;CVTNL
004417     000                            .BYTE 0
004420     005                            .BYTE 5                ;CVTPN
004421     000                            .BYTE 0
004422     005                            .BYTE 5                ;CVTNP
004423     000                            .BYTE 0
004424     006                            .BYTE 6                ;ASHN
004425     000                            .BYTE 0
004426     000                            .BYTE 0                ;CVTLN
004427     000                            .BYTE 0
004430     007                            .BYTE 7                ;ADDP
004431     012                            .BYTE 12
004432     007                            .BYTE 7                ;SUBP
004433     012                            .BYTE 12
004434     006                            .BYTE 6                ;CMPP
004435     011                            .BYTE 11
004436     003                            .BYTE 3                ;CVTPL
004437     000                            .BYTE 0
004440     007                            .BYTE 7                ;MULP
004441     012                            .BYTE 12
004442     007                            .BYTE 7                ;DIVP
004443     012                            .BYTE 12
004444     006                            .BYTE 6                ;ASHP
004445     000                            .BYTE 0
004446     000                            .BYTE 0                ;CVTLP
004447     000                            .BYTE 0
```

```
                                             .SBTTL          ASCII TABLE FOR CIS INST NMEUMONICS
                                             ;
                                             ;ASCII TABLE FOR CIS INSTRUCTION NMEUMONICS
                                             ;
     004450                                  ASZINS:
     004450  047515  041526  000000                  .ASCII  /MOVC/<0><0>
     004456  072352                                  .WORD IMOVC
     004460  047515  041526  000061                  .ASCII  /MOVC1/<0>
     004466  072426                                  .WORD IMOVC1
     004470  047515  041526  000062                  .ASCII  /MOVC2/<0>
     004476  072502                                  .WORD IMOVC2
     004500  047514  041503  000000                  .ASCII  /LOCC/<0><0>
     004506  072556                                  .WORD ILOCC
     004510  047514  041503  000061                  .ASCII  /LOCC1/<0>
     004516  072632                                  .WORD ILOCC1
     004520  047514  041503  000062                  .ASCII  /LOCC2/<0>
     004526  072706                                  .WORD ILOCC2
     004530  046503  041520  000000                  .ASCII  /CMPC/<0><0>
     004536  072762                                  .WORD ICMPC
     004540  046503  041520  000061                  .ASCII  /CMPC1/<0>
     004546  073036                                  .WORD ICMPC1
     004550  046503  041520  000062                  .ASCII  /CMPC2/<0>
     004556  073112                                  .WORD ICMPC2
     004560  047515  051126  000103                  .ASCII  /MOVRC/<0>
     004566  073166                                  .WORD IMOVR
     004570  047515  051126  030503                  .ASCII  /MOVRC1/
     004576  073242                                  .WORD IMOVR1
     004600  047515  051126  031103                  .ASCII  /MOVRC2/
     004606  073316                                  .WORD IMOVR2
     004610  047515  052126  000103                  .ASCII  /MOVTC/<0>
     004616  073372                                  .WORD IMOVT
     004620  047515  052126  030503                  .ASCII  /MOVTC1/
     004626  073446                                  .WORD IMOVT1
     004630  047515  052126  031103                  .ASCII  /MOVTC2/
     004636  073522                                  .WORD IMOVT2
     004640  045523  041520  000000                  .ASCII  /SKPC/<0><0>
     004646  073576                                  .WORD   ISKPC
     004650  045523  041520  000061                  .ASCII  /SKPC1/<0>
     004656  073652                                  .WORD ISKPC1
     004660  045523  041520  000062                  .ASCII  /SKPC2/<0>
     004666  073726                                  .WORD ISKPC2
     004670  040515  041524  000000                  .ASCII  /MATC/<0><0>
     004676  074002                                  .WORD IMATC
     004700  040515  041524  000061                  .ASCII  /MATC1/<0>
     004706  074056                                  .WORD IMATC1
     004710  040515  041524  000062                  .ASCII  /MATC2/<0>
     004716  074132                                  .WORD IMATC2
     004720  041523  047101  000103                  .ASCII  /SCANC/<0>
     004726  074206                                  .WORD ISCAN
     004730  041523  047101  030503                  .ASCII  /SCANC1/
     004736  074262                                  .WORD ISCAN1
     004740  041523  047101  031103                  .ASCII  /SCANC2/
     004746  074336                                  .WORD ISCAN2
     004750  050123  047101  000103                  .ASCII  /SPANC/<0>
```

```
004756  074412                          .WORD ISPAN
004760  050123  047101  030503          .ASCII  /SPANC1/
004766  074466                          .WORD ISPAN1
004770  050123  047101  031103          .ASCII  /SPANC2/
004776  074542                          .WORD ISPAN2
005000  053103  050124  000116          .ASCII  /CVTPN/<0>
005006  074616                          .WORD ICPZ
005010  053103  050124  030516          .ASCII  /CVTPN1/
005016  074672                          .WORD ICPZ1
005020  053103  047124  000120          .ASCII  /CVTNP/<0>
005026  074746                          .WORD ICZP
005030  053103  047124  030520          .ASCII  /CVTNP1/
005036  075022                          .WORD ICZP1
005040  053103  047124  031120          .ASCII  /CVTNP2/
005046  075076                          .WORD ICZP2
005050  053103  046124  000120          .ASCII  /CVTLP/<0>
005056  075152                          .WORD ICLP
005060  053103  046124  030520          .ASCII  /CVTLP1/
005066  075226                          .WORD ICLP1
005070  053103  046124  031120          .ASCII  /CVTLP2/
005076  075302                          .WORD ICLP2
005100  053103  046124  000116          .ASCII  /CVTLN/<0>
005106  075356                          .WORD ICLZ
005110  053103  046124  030516          .ASCII  /CVTLN1/
005116  075432                          .WORD ICLZ1
005120  053103  050124  000114          .ASCII  /CVTPL/<0>
005126  075506                          .WORD ICPL
005130  053103  050124  030514          .ASCII  /CVTPL1/
005136  075562                          .WORD ICPL1
005140  053103  050124  031114          .ASCII  /CVTPL2/
005146  075636                          .WORD ICPL2
005150  053103  050124  031514          .ASCII  /CVTPL3/
005156  075712                          .WORD ICPL3
005160  053103  047124  000114          .ASCII  /CVTNL/<0>
005166  075766                          .WORD ICZL
005170  053103  047124  030514          .ASCII  /CVTNL1/
005176  076042                          .WORD ICZL1
005200  053103  047124  031114          .ASCII  /CVTNL2/
005206  076116                          .WORD ICZL2
005210  042101  050104  000000          .ASCII  /ADDP/<0><0>
005216  076172                          .WORD IADDP
005220  042101  050104  000061          .ASCII  /ADDP1/<0>
005226  076246                          .WORD IADDP1
005230  042101  050104  000062          .ASCII  /ADDP2/<0>
005236  076322                          .WORD IADDP2
005240  042101  050104  000063          .ASCII  /ADDP3/<0>
005246  076376                          .WORD IADDP3
005250  042101  050104  000064          .ASCII  /ADDP4/<0>
005256  076452                          .WORD IADDP4
005260  042101  047104  000000          .ASCII  /ADDN/<0><0>
005266  076526                          .WORD IADDN
005270  042101  047104  000061          .ASCII  /ADDN1/<0>
005276  076602                          .WORD IADDN1
005300  042101  047104  000062          .ASCII  /ADDN2/<0>
```

```
005306  076656                          .WORD IADDN2
005310  042101  047104  000063          .ASCII  /ADDN3/<0>
005316  076732                          .WORD IADDN3
005320  042101  047104  000064          .ASCII  /ADDN4/<0>
005326  077006                          .WORD IADDN4
005330  052523  050102  000000          .ASCII  /SUBP/<0><0>
005336  077136                          .WORD ISUBP
005340  052523  050102  000061          .ASCII  /SUBP1/<0>
005346  077212                          .WORD ISUBP1
005350  052523  050102  000062          .ASCII  /SUBP2/<0>
005356  077266                          .WORD ISUBP2
005360  052523  050102  000063          .ASCII  /SUBP3/<0>
005366  077342                          .WORD ISUBP3
005370  052523  050102  000064          .ASCII  /SUBP4/<0>
005376  077416                          .WORD ISUBP4
005400  052523  047102  000000          .ASCII  /SUBN/<0><0>
005406  077472                          .WORD ISUBN
005410  052523  047102  000061          .ASCII  /SUBN1/<0>
005416  077546                          .WORD ISUBN1
005420  052523  047102  000062          .ASCII  /SUBN2/<0>
005426  077622                          .WORD ISUBN2
005430  052523  047102  000063          .ASCII  /SUBN3/<0>
005436  077676                          .WORD ISUBN3
005440  052523  047102  000064          .ASCII  /SUBN4/<0>
005446  077752                          .WORD ISUBN4
005450  046503  050120  000000          .ASCII  /CMPP/<0><0>
005456  100026                          .WORD ICMPP
005460  046503  050120  000061          .ASCII  /CMPP1/<0>
005466  100102                          .WORD ICMPP1
005470  046503  050120  000062          .ASCII  /CMPP2/<0>
005476  100156                          .WORD ICMPP2
005500  046503  050120  000063          .ASCII  /CMPP3/<0>
005506  100232                          .WORD ICMPP3
005510  046503  050120  000064          .ASCII  /CMPP4/<0>
005516  100306                          .WORD ICMPP4
005520  046503  047120  000000          .ASCII  /CMPN/<0><0>
005526  100362                          .WORD ICMPN
005530  046503  047120  000061          .ASCII  /CMPN1/<0>
005536  100436                          .WORD ICMPN1
005540  046503  047120  000062          .ASCII  /CMPN2/<0>
005546  100512                          .WORD ICMPN2
005550  046503  047120  000063          .ASCII  /CMPN3/<0>
005556  100566                          .WORD ICMPN3
005560  046503  047120  000064          .ASCII  /CMPN4/<0>
005566  100642                          .WORD ICMPN4
005570  051501  050110  000000          .ASCII  /ASHP/<0><0>
005576  100716                          .WORD IASHP
005600  051501  050110  000061          .ASCII  /ASHP1/<0>
005606  100772                          .WORD IASHP1
005610  051501  050110  000062          .ASCII  /ASHP2/<0>
005616  101046                          .WORD IASHP2
005620  051501  047110  000000          .ASCII  /ASHN/<0><0>
005626  101122                          .WORD IASHN
005630  051501  047110  000061          .ASCII  /ASHN1/<0>
```

```
005636  101176                          .WORD IASHN1
005640  051501  047110  000062          .ASCII  /ASHN2/<0>
005646  101252                          .WORD IASHN2
005650  052515  050114  000000          .ASCII  /MULP/<0><0>
005656  101326                          .WORD IMULP
005660  052515  050114  000061          .ASCII  /MULP1/<0>
005666  101402                          .WORD IMULP1
005670  052515  050114  000062          .ASCII  /MULP2/<0>
005676  101456                          .WORD IMULP2
005700  052515  050114  000063          .ASCII  /MULP3/<0>
005706  101532                          .WORD IMULP3
005710  052515  050114  000064          .ASCII  /MULP4/<0>
005716  101606                          .WORD IMULP4
005720  052515  050114  000065          .ASCII  /MULP5/<0>
005726  101662                          .WORD IMULP5
005730  052515  050114  000066          .ASCII  /MULP6/<0>
005736  101736                          .WORD IMULP6
005740  052515  050114  000067          .ASCII  /MULP7/<0>
005746  102012                          .WORD IMULP7
005750  044504  050126  000000          .ASCII  /DIVP/<0><0>
005756  102066                          .WORD IDIVP
005760  044504  050126  000061          .ASCII  /DIVP1/<0>
005766  102142                          .WORD IDIVP1
005770  044504  050126  000062          .ASCII  /DIVP2/<0>
005776  102216                          .WORD IDIVP2
006000  044504  050126  000063          .ASCII  /DIVP3/<0>
006006  102272                          .WORD IDIVP3
006010  044504  050126  000064          .ASCII  /DIVP4/<0>
006016  102346                          .WORD IDIVP4
006020  044504  050126  000065          .ASCII  /DIVP5/<0>
006026  102422                          .WORD IDIVP5
006030  044504  050126  000066          .ASCII  /DIVP6/<0>
006036  102476                          .WORD IDIVP6
006040  031114  000104  000000          .ASCII  /L2D/<0><0><0>
006046  072222                          .WORD IL2D
006050  031514  000104  000000          .ASCII  /L3D/<0><0><0>
006056  072276                          .WORD IL3D
006060  000000                          .WORD 0
006062  000000                          .WORD 0
006064  000000                          .WORD 0
006066  000000                          .WORD 0
```

```
                                  .SBTTL        RANDOM EXERCISE MASK TABLES
                                  ;
                                  ;RANDOM EXERCISING MASK TABLES
                                  ;

006070                            MMOVC:
006070                            MCMPC:
006070                            MMOVRC:
006070  174000                            .WORD BS2            ;IP1 MASK       (LEN)
006072  176000                            .WORD BS4            ;IP2            (ADR)
006074  174000                            .WORD BS2            ;IP3            (LEN)
006076  174000                            .WORD BS2            ;IP4            (ADR)
006100  177400                            .WORD BY             ;IP5            (FILL)
006102  125252                            .WORD EOT




006104                            MMOVTC:
006104  174000                            .WORD BS2            ;IP1 MASK       (LEN)
006106  176000                            .WORD BS4            ;IP2            (ADR)
006110  174000                            .WORD BS2            ;IP3            (LEN)
006112  002000                            .WORD MP02000        ;IP4            (ADR)
006114  177400                            .WORD BY             ;IP5            (FILL)
006116  177777                            .WORD BSNULL         ;IP6
006120  177777                            .WORD BSNULL         ;IP7
006122  177777                            .WORD BSNULL         ;IP10
006124  177777                            .WORD BSNULL         ;IP11
006126  177777                            .WORD BSNULL         ;IP12
006130  177777                            .WORD BSNULL         ;IP13
006132  177777                            .WORD BSNULL         ;IP14
006134  022000                            .WORD MP02200        ;IP15           (TABLE ADR)
006136  125252                            .WORD EOT
```

```
                                        ;
                                        ;RANDOM EXERCISE MASK TABLES (CONTINUED)
                                        ;

 006140                                 MLOCC:
 006140                                 MSKPC:
 006140  174000                                 .WORD BS2               ;IP1 MASK       (LEN)
 006142  174000                                 .WORD BS2               ;IP2            (ADR)
 006144  177400                                 .WORD BY                ;IP3            (CHAR)
 006146  125252                                 .WORD EOT



 006150                                 MSCANC:
 006150                                 MSPANC:
 006150  174000                                 .WORD BS2               ;IP1 MASK       (LEN)
 006152  174000                                 .WORD BS2               ;IP2            (ADR)
 006154  177400                                 .WORD BY                ;IP3            (TABLE LEN)
 006156  177400                                 .WORD BY                ;IP4            (TABLE MASK)
 006160  174000                                 .WORD BS2               ;IP5            (TABLE ADR)
 006162  125252                                 .WORD EOT


 006164                                 MMTCHC:
 006164  177000                                 .WORD BS8               ;IP1 MASK       (LEN)
 006166  176000                                 .WORD BS4               ;IP2            (ADR)
 006170  174000                                 .WORD BS2               ;IP3            (LEN)
 006172  174000                                 .WORD BS2               ;IP4            (ADR)
 006174  177400                                 .WORD BY                ;IP5            (DATA)
 006176  125252                                 .WORD EOT
```

```
 7618
 7619                                    ;
 7620                                    ;RANDOM EXERCISE MODE MASK TABLES (CONTINUED)
 7621                                    ;
 7622
 7623   006200                           MCVTNP:
 7624   006200  177740                   MCVTPN: .WORD BS128                ;IP1 MASK       (LEN)
 7626   006202  176000                           .WORD BS4                  ;IP2            (ADR)
 7631   006204  177740                           .WORD BS128                ;IP3            (LEN)
 7633   006206  004000                           .WORD MP04000              ;IP4            (ADR)
 7638   006210  152525                           .WORD DSCPTR               ;IP5            (DESC POINTER)
 7639   006212  125252                           .WORD EOT
 7640
 7641
 7642   006214                           MCVTLP:
 7643   006214  000000                   MCVTLN: .WORD WD                   ;IP1 MASK       (LONG-HIGH)
 7644   006216  000000                           .WORD WD                   ;IP2            (LONG-LOW)
 7645   006220  177740                           .WORD BS128                ;IP3            (LEN)
 7647   006222  174000                           .WORD BS2                  ;IP4            (ADR)
 7652   006224  125252                           .WORD EOT
 7653
 7654
 7655   006226                           MCVTPL:
 7656   006226  177740                   MCVTNL: .WORD BS128                ;IP1 MASK       (LEN)
 7658   006230  174000                           .WORD BS2                  ;IP2            (ADR)
 7663   006232  152525                           .WORD DSCPTR               ;IP3            (DESC POINTER)
 7664   006234  177777                           .WORD BSNULL               ;IP4
 7665   006236  177777                           .WORD BSNULL               ;IP5
 7666   006240  177400                           .WORD BY                   ;IP6            (DATA)
 7667   006242  125252                           .WORD EOT
```

```

                                   ;
                                   ;RANDOM EXERCISE MODE MASK TABLES (CONTINUED)
                                   ;

 006244                            MADDP:
 006244                            MADDN:
 006244                            MSUBP:
 006244                            MSUBN:
 006244                            MMULP:
 006244                            MDIVP:
 006244  177740                            .WORD BS128         ;IP1 MASK       (LEN)
 006246  177000                            .WORD BS8           ;IP2            (ADR)
 006250  177740                            .WORD BS128         ;IP3            (LEN)
 006252  002000                            .WORD MP02000       ;IP4            (ADR)
 006254  177740                            .WORD BS128         ;IP5            (LEN)
 006256  004040                            .WORD MP04040       ;IP6            (ADR)
 006260  152525                            .WORD DSCPTR        ;IP7            (DESC POINTER)
 006262  177777                            .WORD BSNULL        ;IP10
 006264  177777                            .WORD BSNULL        ;IP11
 006266  152525                            .WORD DSCPTR        ;IP12           (DESC POINTER)
 006270  125252                            .WORD EOT


 006272                            MCMPN:
 006272                            MCMPP:
 006272  177740                            .WORD BS128         ;IP1 MASK       (LEN)
 006274  176000                            .WORD BS4           ;IP2            (ADR)
 006276  177740                            .WORD BS128         ;IP3            (LEN)
 006300  004000                            .WORD MP04000       ;IP4            (ADR)
 006302  177400                            .WORD BY            ;IP5            (DATA)
 006304  152525                            .WORD DSCPTR        ;IP6            (DESC POINTER)
 006306  177777                            .WORD BSNULL        ;IP7
 006310  177777                            .WORD BSNULL        ;IP10
 006312  152525                            .WORD DSCPTR        ;IP11           (DESC POINTER)
 006314  125252                            .WORD EOT
```

```
                                        ;
                                        ;RANDOM EXERCISE MODE MASK TABLES (CONTINUED)
                                        ;

006316                                  MASHP:
006316                                  MASHN:
006316  177740                                  .WORD BS128             ;IP1 MASK       (LEN)
006320  176000                                  .WORD BS4               ;IP2            (ADR)
006322  170000                                  .WORD BS0               ;IP3            (RD,SC)
006324  177740                                  .WORD BS128             ;IP4            (LEN)
006326  004000                                  .WORD MP04000           ;IP5            (ADR)
006330  152525                                  .WORD DSCPTR            ;IP6            (DESC POINTER)
006332  125252                                  .WORD EOT
```

```
                                   .SBTTL          CIS INST FLOW TABLES
                                   ;CIS INSTRUCTION FLOW TABLES
                                   ;
006334                             XMOVC:                                   ;MOVC FLOW TABLE S1=SRC, S2=DST
006334                             XMOVRC:                                  ;MOVRC FLOW TABLE S1=SRC, S2=DST
006334  151600                             .WORD 151600                     ;LOAD SPECIAL HANDLING WORD FROM PTP16
006336  010100                             .WORD 010100                     ;LOAD TR0 FROM PTP01
006340  010201                             .WORD 010201                     ;LOAD TR1 FROM PTP02
006342  010302                             .WORD 010302                     ;LOAD TR2 FROM PTP03
006344  010504                             .WORD 010504                     ;LOAD TR4 FROM PTP05
006346  020403                             .WORD 020403                     ;GENERATE TR3 FROM PTP04
006350  031001                             .WORD 031001                     ;VERIFY THAT S1.ADR-S1.SURR.LEN >=20
006352  031303                             .WORD 031303                     ;VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
006354  041001                             .WORD 041001                     ;VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLEN
006356  041323                             .WORD 041323                     ;VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLEN
006360  051300                             .WORD 051300                     ;ADD TEST BUFFER ADDRESS TO TR1 AND TR3
006362  060000                             .WORD 060000                     ;INITIALIZE TEST BUFFER
006364  071123                             .WORD 071123                     ;INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
006366  001312                             .WORD 001312
006370  070601                             .WORD 070601                     ;INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
006372  001007                             .WORD 001007
006374  100000                             .WORD 100000                     ;COPY TEST BUFFER INTO EMULATION BUFFER
006376  111300                             .WORD 111300                     ;SETUP EMULATION OPERANDS & EMULATE INST
006400  122400                             .WORD 122400                     ;SETUP CC & REGS AND EXECUTE CIS INST.
006402  001300                             .WORD 001300
006404  000000                             .WORD 000000
006406  007000                             .WORD 007000
006410  137000                             .WORD 137000                     ;COMPARE RESULTS
006412  140000                             .WORD 140000                     ;UPDATE PTRS FOR NEXT TEST CONDITION.
                                                                            ;  RETURN TO START EXECUTING NEXT TEST CONDITION.
```

```
                                ;
        006414                  XMOVTC:                         ;MOVRC FLOW TABLE S1=SRC, S2=DST
        006414  151600                  .WORD 151600            ;LOAD SPECIAL HANDLING WORD FROM PTP16
        006416  010100                  .WORD 010100            ;LOAD TR0 FROM PTP01
        006420  010201                  .WORD 010201            ;LOAD TR1 FROM PTP02
        006422  010302                  .WORD 010302            ;LOAD TR2 FROM PTP03
        006424  010504                  .WORD 010504            ;LOAD TR4 FROM PTP05
        006426  011505                  .WORD 011505            ;LOAD TR5 FROM PTP15 (TRANSLATION TABLE)
        006430  020403                  .WORD 020403            ;GENERATE TR3 FROM PTP04
        006432  031001                  .WORD 031001            ;VERIFY THAT S1.ADR-S1.SURR.LEN >=20
        006434  031303                  .WORD 031303            ;VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
        006436  041001                  .WORD 041001            ;VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLEN
        006440  041323                  .WORD 041323            ;VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLEN
        006442  051300                  .WORD 051300            ;ADD TEST BUFFER ADDRESS TO TR1 AND TR3
        006444  060000                  .WORD 060000            ;INITIALIZE TEST BUFFER
        006446  071123                  .WORD 071123            ;INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
        006450  001312                  .WORD 001312
        006452  070601                  .WORD 070601            ;INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
        006454  001007                  .WORD 001007
        006456  100000                  .WORD 100000            ;COPY TEST BUFFER INTO EMULATION BUFFER
        006460  111300                  .WORD 111300            ;SETUP EMULATION OPERANDS & EMULATE INST
        006462  122450                  .WORD 122450            ;SETUP CC & REGS AND EXECUTE CIS INST.
        006464  001300                  .WORD 001300
        006466  000000                  .WORD 000000
        006470  007000                  .WORD 007000
        006472  137000                  .WORD 137000            ;COMPARE RESULTS
        006474  140000                  .WORD 140000            ;UPDATE PTRS FOR NEXT TEST CONDITION.
                                                                ;  RETURN TO START EXECUTING NEXT TEST CONDITION.
```

```


006476                     XCMPC:                              ;CMPC FLOW TABLE S1=SRC1, S2=SRC2
006476  151500                         .WORD 151500            ;LOAD SPECIAL HANDLING WORD FROM PTP15
006500  010100                         .WORD 010100            ;LOAD TR0 FROM PTP01
006502  010201                         .WORD 010201            ;LOAD TR1 FROM PTP02
006504  010302                         .WORD 010302            ;LOAD TR2 FROM PTP03
006506  010504                         .WORD 010504            ;LOAD TR4 FROM PTP05
006510  020403                         .WORD 020403            ;GENERATE TR3 FROM PTP04
006512  031001                         .WORD 031001            ;VERIFY THAT S1.ADR-S1.SURR.LEN >=20
006514  031303                         .WORD 031303            ;VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
006516  041001                         .WORD 041001            ;VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLEN
006520  041323                         .WORD 041323            ;VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLEN
006522  051300                         .WORD 051300            ;ADD TEST BUFFER ADDRESS TO TR1 AND TR3
006524  060000                         .WORD 060000            ;INITIALIZE TEST BUFFER
006526  071123                         .WORD 071123            ;INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
006530  001312                         .WORD 001312
006532  070601                         .WORD 070601            ;INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
006534  001007                         .WORD 001007
006536  100000                         .WORD 100000            ;COPY TEST BUFFER INTO EMULATION BUFFER
006540  111300                         .WORD 111300            ;SETUP EMULATION OPERANDS & EMULATE INST
006542  122400                         .WORD 122400            ;SETUP CC & REGS AND EXECUTE CIS INST.
006544  001300                         .WORD 001300
006546  000000                         .WORD 000000
006550  007000                         .WORD 007000
006552  131370                         .WORD 131370            ;COMPARE RESULTS
006554  007000                         .WORD 007000
006556  140000                         .WORD 140000            ;UPDATE PTRS FOR NEXT TEST CONDITION.
                                                               ;  RETURN TO START EXECUTING NEXT TEST CONDITION.
```

```
006560                  XMATCHC:                     ;MATCHC FLOW TABLE S1=SRC, S2=OBJ
006560  151500                  .WORD 151500         ;LOAD SPECIAL HANDLING WORD FROM PTP15
006562  010300                  .WORD 010300         ;LOAD TR0 FROM PTP03
006564  010102                  .WORD 010102         ;LOAD TR2 FROM PTP01
006566  010203                  .WORD 010203         ;LOAD TR3 FROM PTP02
006570  010504                  .WORD 010504         ;LOAD TR4 FROM PTP05
006572  020401                  .WORD 020401         ;GENERATE TR1 FROM PTP04
006574  031301                  .WORD 031301         ;VERIFY THAT S1.ADR-S1.SURR.LEN >=20
006576  031003                  .WORD 031003         ;VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
006600  041301                  .WORD 041301         ;VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLEN
006602  041023                  .WORD 041023         ;VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLEN
006604  051300                  .WORD 051300         ;ADD TEST BUFFER ADDRESS TO TR1 AND TR3
006606  060000                  .WORD 060000         ;INITIALIZE TEST BUFFER
006610  070623                  .WORD 070623         ;INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
006612  001007                  .WORD 001007
006614  071101                  .WORD 071101         ;INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
006616  001312                  .WORD 001312
006620  100000                  .WORD 100000         ;COPY TEST BUFFER INTO EMULATION BUFFER
006622  111300                  .WORD 111300         ;SETUP EMULATION OPERANDS & EMULATE INST
006624  122000                  .WORD 122000         ;SETUP CC & REGS AND EXECUTE CIS INST.
006626  001300                  .WORD 001300
006630  000000                  .WORD 000000
006632  000170                  .WORD 000170
006634  131370                  .WORD 131370         ;COMPARE RESULTS
006636  001700                  .WORD 001700
006640  140000                  .WORD 140000         ;UPDATE PTRS FOR NEXT TEST CONDITION.
                                                     ;  RETURN TO START EXECUTING NEXT TEST CONDITION.
```

```


006642                  XCMPP:                          ;CMPP FLOW TABLE S1=SRC1, S2=SRC2
006642                  XCMPN:                          ;CMPN FLOW TABLE S1=SRC1, S2=SRC2
006642  151500                  .WORD 151500            ;LOAD SPECIAL HANDLING FROM PTP15
006644  010110                  .WORD 010110            ;LOAD TR0 FROM PTP01
006646  010201                  .WORD 010201            ;LOAD TR1 FROM PTP02
006650  010312                  .WORD 010312            ;LOAD TR2 FROM PTP03
006652  010504                  .WORD 010504            ;LOAD TR4 FROM PTP05
006654  020403                  .WORD 020403            ;GENERATE TR3 FROM PTP04
006656  031001                  .WORD 031001            ;VERIFY THAT S1.ADR-S1.SURR.LEN >=20
006660  031303                  .WORD 031303            ;VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
006662  041001                  .WORD 041001            ;VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLEN
006664  041323                  .WORD 041323            ;VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLEN
006666  051300                  .WORD 051300            ;ADD TEST BUFFER ADDRESS TO TR1 AND TR3
006670  060000                  .WORD 060000            ;INITIALIZE TEST BUFFER
006672  075123                  .WORD 075123            ;INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
006674  074601                  .WORD 074601            ;INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
006676  100000                  .WORD 100000            ;COPY TEST BUFFER INTO EMULATION BUFFER
006700  111300                  .WORD 111300            ;SETUP EMULATION OPERANDS & EMULATE INST
006702  122000                  .WORD 122000            ;SETUP CC & REGS AND EXECUTE CIS INST.
006704  001300                  .WORD 001300
006706  000000                  .WORD 000000
006710  007000                  .WORD 007000
006712  137000                  .WORD 137000            ;COMPARE RESULTS
006714  140000                  .WORD 140000            ;UPDATE PTRS FOR NEXT TEST CONDITION.
                                                        ;  RETURN TO START EXECUTING NEXT TEST CONDITION.
```

```

006716                          XASHP:                                  ;ASHP FLOW TABLE
006716                          XASHN:                                  ;ASHN FLOW TABLE
006716  151500                          .WORD 151500                    ;LOAD SPECIAL HANDLING FROM PTP15
006720  010110                          .WORD 010110                    ;LOAD TR0 FROM PTP01
006722  010201                          .WORD 010201                    ;LOAD TR1 FROM PTP02
006724  010422                          .WORD 010422                    ;LOAD TR2 FROM PTP04
006726  010304                          .WORD 010304                    ;LOAD TR4 FROM PTP03
006730  020503                          .WORD 020503                    ;GENERATE TR3 FROM PTP05
006732  031001                          .WORD 031001                    ;VERIFY THAT SRC.ADR-SRC.SURR.LEN >= 20
006734  031303                          .WORD 031303                    ;VERIFY THAT DST.ADR-DST.SURR.LEN >= 20
006736  041001                          .WORD 041001                    ;VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN <TBLEN
006740  041323                          .WORD 041323                    ;VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN <TBLEN
006742  051300                          .WORD 051300                    ;ADD TEST BUFFER ADDRESS TO TR1 & TR5
006744  060000                          .WORD 060000                    ;INITIALIZE TEST BUFFER
006746  071123                          .WORD 071123                    ;INSERT DST & DST.SURR STRINGS IN TEST BUFFER
006750  001312                          .WORD 001312
006752  074601                          .WORD 074601                    ;INSERT SRC IN TST BUFFER
006754  100000                          .WORD 100000                    ;COPY TEST BUFFER INTO EMULATION BUFFER
006756  111300                          .WORD 111300                    ;SETUP EMULATION OPERANDS & EXECUTE INST
006760  122400                          .WORD 122400                    ;SETUP CC & REGS AND EXECUTE CIS INST
006762  001300                          .WORD 001300
006764  000000                          .WORD 000000
006766  007000                          .WORD 007000
006770  133700                          .WORD 133700                    ;COMPARE RESULTS
006772  007000                          .WORD 007000
006774  140000                          .WORD 140000                    ;UPDATE PTRS FOR NEXT TEST CONDITION
                                                                        ;  AND RETURN TO START EXECUTING NEXT
                                                                        ;  TEST CONDITION
```

```



006776                  XLOCC:                          ;LOCC FLOW TABLE
006776                  XSKPC:                          ;SKPC FLOW TABLE
006776  150700                  .WORD 150700            ;LOAD SPECIAL HANDLING WORD FROM PTP07
007000  010100                  .WORD 010100            ;LOAD TR0 FROM PTP01
007002  010201                  .WORD 010201            ;LOAD TR1 FROM PTP02
007004  010304                  .WORD 010304            ;LOAD TR4 FROM PTP03
007006  030601                  .WORD 030601            ;VERIFY THAT SRC.ADR-SRC.SURR.LEN >=20
007010  040601                  .WORD 040601            ;VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN < TBLEN
007012  051000                  .WORD 051000            ;ADD TEST BUFFER ADDRESS TO TR1
007014  060000                  .WORD 060000            ;INITIALIZE TEST BUFFER
007016  070401                  .WORD 070401            ;INSERT SRC & SRC SURR STRINGS IN BUFFER
007020  000605                  .WORD 000605
007022  100000                  .WORD 100000            ;COPY TEST BUFFER INTO EMULATION BUFFER
007024  111000                  .WORD 111000            ;SETUP EMULATION OPERANDS & EMULATE INST.
007026  121400                  .WORD 121400            ;SETUP CC & REGS AND EXECUTE CIS INST
007030  001000                  .WORD 001000
007032  000000                  .WORD 000000
007034  000170                  .WORD 000170
007036  131700                  .WORD 131700            ;COMPARE RESULTS
007040  001700                  .WORD 001700
007042  140000                  .WORD 140000            ;UPDATE POINTERS AND RETURN FOR NEXT
                                                        ;  TEST CONDITION.

```

```

        007044                  XADDP:                          ;ADDP FLOW TABLE
        007044                  XADDN:                          ;ADDN FLOW TABLE
        007044                  XSUBP:                          ;SUBP FLOW TABLE
        007044                  XSUBN:                          ;SUBN FLOW TABLE
        007044                  XMULP:                          ;MULP FLOW TABLE
        007044                  XDIVP:                          ;DIVP FLOW TABLE
        007044  152100                  .WORD 152100            ;LOAD SPECIAL HANDLING FROM PTP21
        007046  010110                  .WORD 010110            ;LOAD TR0 FROM PTP01
        007050  010201                  .WORD 010201            ;LOAD TR1 FROM PTP02
        007052  010322                  .WORD 010322            ;LOAD TR2 FROM PTP03
        007054  010534                  .WORD 010534            ;LOAD TR4 FROM PTP05
        007056  010605                  .WORD 010605            ;TYPE 0 USE ONLY - LOAD TR5 FROM PTP06
        007060  020403                  .WORD 020403            ;GENERATE TR3 & TR5 FROM PTP04
        007062  031101                  .WORD 031101            ;VERIFY THAT SRC1.ADR-SRC1.SURR.LEN >= 20
        007064  031403                  .WORD 031403            ;VERIFY THAT SRC2.ADR-SRC2.SURR.LEN >= 20
        007066  031705                  .WORD 031705            ;VERIFY THAT DST.ADR-DST.SURR.LEN >=20
        007070  041101                  .WORD 041101            ;VERIFY THAT SRC1.ADR+SRC1.LEN+SRC1.SURR.LEN < TBLEN
        007072  041423                  .WORD 041423            ;VERIFY THAT SRC2.ADR+SRC2.LEN+SRC2.SURR.LEN < TBLEN
        007074  041745                  .WORD 041745            ;VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN < TBLEN
        007076  051350                  .WORD 051350            ;ADD TEST BUFFER ADDRESS TO TR1,TR3, & TR5
        007100  060000                  .WORD 060000            ;INITIALIZE TEST BUFFER
        007102  071545                  .WORD 071545            ;INSERT DST & DST.SURR STRINGS IN TEST BUFFER
        007104  001716                  .WORD 001716
        007106  074701                  .WORD 074701            ;INSERT SRC1 IN TEST BUFFER
        007110  075223                  .WORD 075223            ;INSERT SRC2 IN TEST BUFFFER
        007112  100000                  .WORD 100000            ;COPY TEST BUFFER INTO EMULATION BUFFER
        007114  111350                  .WORD 111350            ;SETUP EMULATION OPERANDS & EMULATE INST
        007116  123000                  .WORD 123000            ;SETUP CC & REGS AND EXECUTE CIS INST.
        007120  001350                  .WORD 001350
        007122  000000                  .WORD 000000
        007124  007000                  .WORD 007000
        007126  135700                  .WORD 135700            ;COMPARE RESULTS
        007130  007000                  .WORD 007000
        007132  140000                  .WORD 140000            ;UPDATE POINTERS FOR NEXT TEST CONDITION
                                                                ;  AND RETURN TO START EXECUTING NEXT
                                                                ;  TEST CONDITION
```

```

007134                         XSCANC:                     ;SCANC FLOW TABLE
007134                         XSPANC:                     ;SPANC FLOW TABLE
007134   151500                        .WORD 151500        ;LOAD SPECIAL HANDLING WORD FROM PTP15
007136   010100                        .WORD 010100        ;LOAD TR0 FROM PTP01
007140   010201                        .WORD 010201        ;LOAD TR1 FROM PTP02
007142   010302                        .WORD 010302        ;LOAD TR2 FROM PTP03
007144   010303                        .WORD 010303        ;LOAD TR3 FROM PTP03 (TR2 & TR3 CONTAIN TABLE LEN)
007146   010404                        .WORD 010404        ;LOAD TR4 FROM PTP04
007150   020505                        .WORD 020505        ;GENERATE TR5 FROM PTP05
007152   031001                        .WORD 031001        ;VERIFY THAT SRC.ADR - SRC.SURR.LEN > = 20.
007154   031305                        .WORD 031305        ;VERIFY THAT TABLE.ADR - TABLE.SURR.LEN > = 20
007156   041001                        .WORD 041001        ;VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN<TBLEN
007160   041325                        .WORD 041325        ;VERIFY THAT TABLE.ADR+256+TABLE SURR LEN<TBLEN
007162   051500                        .WORD 051500        ;ADD TEST BUFFER ADDRESS TO TR1 AND TR5
007164   060000                        .WORD 060000        ;INITIALIZE TEST BUFFER
007166   071125                        .WORD 071125        ;INSERT TABLE & TABLE SURR IN BUFFER
007170   070601                        .WORD 070601        ;INSERT SRC & SRC SURR STRINGS IN BUFFER
007172   001007                        .WORD 001007
007174   100000                        .WORD 100000        ;COPY TEST BUFFER INTO EMULATION BUFFER
007176   111500                        .WORD 111500        ;SETUP EMULATION OPERANDS & EMULATE INST
007200   122000                        .WORD 122000        ;SETUP CC REGS & EXECUTE CIS INST
007202   001500                        .WORD 001500
007204   000000                        .WORD 000000
007206   000170                        .WORD 000170
007210   131570                        .WORD 131570        ;COMPARE RESULTS
007212   001700                        .WORD 001700
007214   140000                        .WORD 140000        ;UPDATE PTRS FROM NEXT TEST CONDITION

```

```
007216                  XCVTPN:                         ;CVTPN FLOW TABLE
007216                  XCVTNP:                         ;CVTNP FLOW TABLE
007216  151400                  .WORD 151400            ;LOAD SPECIAL HANDLING FROM PTP14
007220  010110                  .WORD 010110            ;LOAD TR0 FROM PTP01
007222  010201                  .WORD 010201            ;LOAD TR1 FROM PTP02
007224  010322                  .WORD 010322            ;LOAD TR2 FROM PTP03
007226  020403                  .WORD 020403            ;GENERATE TR3 FROM PTP04
007230  030701                  .WORD 030701            ;VERIFY THAT SRC.ADR-SRC.SURR.LEN>=20
007232  031203                  .WORD 031203            ;VERIFY THAT DST.ADR-DST.SURR.LEN>=20
007234  040701                  .WORD 040701            ;VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN<TBLEN
007236  041223                  .WORD 041223            ;VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN<TBLEN
007240  051300                  .WORD 051300            ;ADD TEST BUFFER ADDRESS TO TR1 & TR3
007242  060000                  .WORD 060000            ;INITIALIZE TEST BUFFER
007244  071023                  .WORD 071023            ;INSERT DST & DST SURR STRINGS IN BUFFER
007246  001211                  .WORD 001211
007250  074501                  .WORD 074501            ;INSERT SRC  STRING IN BUFFER
007252  100000                  .WORD 100000            ;COPY TEST BUFFER INTO EMULATION BUFFER
007254  111300                  .WORD 111300            ;SETUP EMULATION OPERANDS & EMULAT INST.
007256  122000                  .WORD 122000            ;SETUP CC REGS & EXECUTE CIS INST.
007260  001300                  .WORD 001300
007262  000000                  .WORD 000000
007264  007000                  .WORD 007000
007266  133700                  .WORD 133700            ;COMPARE RESULTS
007270  007000                  .WORD 007000
007272  140000                  .WORD 140000            ;UPDATE PTRS FROM NEXT TEST CONDITION
```

```
007274                          XCVTLP:                               ;CVTLP FLOW TABLE
007274                          XCVTLN:                               ;CVTLN FLOW TABLE
007274  151000                          .WORD 151000                  ;LOAD SPECIAL HANDLING FROM PTP10
007276  010102                          .WORD 010102                  ;LOAD TR2 FROM PTP01
007300  010203                          .WORD 010203                  ;LOAD TR3 FROM PTP02
007302  010310                          .WORD 010310                  ;LOAD TR0 FROM PTP03
007304  010401                          .WORD 010401                  ;LOAD TR1 FROM PTP04
007306  030701                          .WORD 030701                  ;VERIFY THAT DST.ADR-DST.SURR.LEN>=20
007310  040701                          .WORD 040701                  ;VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN<TBLEN
007312  051000                          .WORD 051000                  ;ADD TEST BUFFER ADDRESS TO TR1
007314  060000                          .WORD 060000                  ;INITIALIZE TEST BUFFER
007316  070501                          .WORD 070501                  ;INSERT DST & DST SURR STRINGS IN BUFFER
007320  000706                          .WORD 000706
007322  100000                          .WORD 100000                  ;COPY TEST BUFFER INTO EMULATION BUFFER
007324  111000                          .WORD 111000                  ;SETUP EMULATION OPERANDS & EMULATE INST
007326  122000                          .WORD 122000                  ;SETUP CC REGS & EXECUTE CIS INST
007330  001300                          .WORD 001300
007332  000000                          .WORD 000000
007334  007000                          .WORD 007000
007336  131700                          .WORD 131700                  ;COMPARE RESULTS
007340  007000                          .WORD 007000
007342  140000                          .WORD 140000                  ;UPDATE PTRS FOR NEXT TEST CONDITION
```

```
      007344                          XCVTPL:                         ;CVTPL FLOW TABLE
      007344                          XCVTNL:                         ;CVTNL FLOW TABLE
      007344  150700                          .WORD 150700            ;LOAD SPECIAL HANDLING FROM PTP07
      007346  010110                          .WORD 010110            ;LOAD TR0 FROM PTP01
      007350  010201                          .WORD 010201            ;LOAD TR1 FROM PTP02
      007352  010604                          .WORD 010604            ;LOAD TR4 FROM PTP06
      007354  030501                          .WORD 030501            ;VERIFY THAT SRC.ADR-SRC.SURR.LEN.+20
      007356  040501                          .WORD 040501            ;VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN<TBLEN
      007360  051000                          .WORD 051000            ;ADD TEST BUFFER ADDRESS TO TR1
      007362  060000                          .WORD 060000            ;INITIALIZE TEST BUFFER
      007364  074301                          .WORD 074301            ;INSERT SRC  STRING IN TEST BUFFER
      007366  100000                          .WORD 100000            ;COPY TEST BUFFER INTO EMULATION BUFFER
      007370  111000                          .WORD 111000            ;SETUP EMULATION OPERANDS & EMULATE INST.
      007372  122000                          .WORD 122000            ;SETUP CC REGS & EXECUTE CIS INST
      007374  001000                          .WORD 001000
      007376  007300                          .WORD 007300
      007400  007000                          .WORD 007000
      007402  137000                          .WORD 137000            ;COMPARE RESULTS
      007404  140000                          .WORD 140000            ;UPDATE PTRS FOR NEXT TEST CONDITION
```

```
8129 007406                XL2D:                        ;L2DR FLOW TABLE
8130 007406                XL3D:                        ;L3DR FLOW TABLE
8131 007406 010100                 .WORD 010100         ;LOAD TR0 FROM PTP01
8132 007410 010201                 .WORD 010201         ;LOAD TR1 FROM PTP02
8133 007412 010302                 .WORD 010302         ;LOAD TR2 FROM PTP03
8134 007414 010403                 .WORD 010403         ;LOAD TR3 FROM PTP04
8135 007416 010504                 .WORD 010504         ;LOAD TR4 FROM PTP05
8136 007420 010605                 .WORD 010605         ;LOAD TR5 FROM PTP06
8137 007422 060000                 .WORD 060000         ;INITIALIZE TEST BUFFER
8138 007424 020700                 .WORD 020700         ;GENERATE TRN FROM PTP07
8139 007426 100000                 .WORD 100000         ;COPY TEST BUFFER INTO EMUL. BUFFER
8140 007430 110000                 .WORD 110000         ;SETUP EMUL. OPERANDS & EMUL INST.
8141 007432 120000                 .WORD 120000         ;SETUP CC & REGS & EXECUTE CIS INST.
8142 007434 137000                 .WORD 137000         ;COMPARE RESULTS
8143 007436 140000                 .WORD 140000         ;UPDATE PTRS FOR NEXT TEST CONDITION.
```

```
                                        .SBTTL  GLOBAL TEXT SECTION

                                        ; FORMAT STATEMENTS USED IN PRINT CALLS
                                        ;
                                        ;
                                        ;MESSAGES
      007440  040445  046440  053117    AMOVC:  .ASCIZ  /%A MOVC/
      007446  000103
      007450  040445  046440  053117    AMOVRC: .ASCIZ  /%A MOVRC/
      007456  041522     000
      007461     045  020101  047515    AMOVTC: .ASCIZ  /%A MOVTC/
      007466  052126  000103
      007472  040445  046040  041517    ALOCC:  .ASCIZ  /%A LOCC/
      007500  000103
      007502  040445  051440  050113    ASKPC:  .ASCIZ  /%A SKPC/
      007510  000103
      007512  040445  051440  040503    ASCANC: .ASCIZ  /%A SCANC/
      007520  041516     000
      007523     045  020101  050123    ASPANC: .ASCIZ  /%A SPANC/
      007530  047101  000103
      007534  040445  041440  050115    ACMPC:  .ASCIZ  /%A CMPC/
      007542  000103
      007544  040445  046440  052101    AMATCHC:.ASCIZ  /%A MATC/
      007552  000103
      007554  040445  040440  042104    AADDN:  .ASCIZ  /%A ADDN/
      007562  000116
      007564  040445  051440  041125    ASUBN:  .ASCIZ  /%A SUBN/
      007572  000116
      007574  040445  041440  050115    ACMPN:  .ASCIZ  /%A CMPN/
      007602  000116
      007604  040445  041440  052126    ACVTNL: .ASCIZ  /%A CVTNL/
      007612  046116     000
      007615     045  020101  053103    ACVTPN: .ASCIZ  /%A CVTPN/
      007622  050124  000116
      007626  040445  041440  052126    ACVTNP: .ASCIZ  /%A CVTNP/
      007634  050116     000
      007637     045  020101  051501    AASHN:  .ASCIZ  /%A ASHN/
      007644  047110     000
      007647     045  020101  053103    ACVTLN: .ASCIZ  /%A CVTLN/
      007654  046124  000116
      007660  040445  040440  042104    AADDP:  .ASCIZ  /%A ADDP/
      007666  000120
      007670  040445  051440  041125    ASUBP:  .ASCIZ  /%A SUBP/
      007676  000120
      007700  040445  041440  050115    ACMPP:  .ASCIZ  /%A CMPP/
      007706  000120
      007710  040445  041440  052126    ACVTPL: .ASCIZ  /%A CVTPL/
      007716  046120     000
      007721     045  020101  052515    AMULP:  .ASCIZ  /%A MULP/
      007726  050114     000
      007731     045  020101  044504    ADIVP:  .ASCIZ  /%A DIVP/
      007736  050126     000
      007741     045  020101  051501    AASHP:  .ASCIZ  /%A ASHP/
      007746  050110     000
```

```
 8175  007751     045  020101  053103  ACVTLP: .ASCIZ  /%A CVTLP/
       007756  046124  000120
 8176  007762  040445  046040  042062  AL2D:   .ASCIZ  /%A L2D%01/
       007770  047445  000061
 8177  007774  040445  046040  042063  AL3D:   .ASCIZ  /%A L3D%01/
       010002  047445  000061
 8178
 8179  010006  051445  031462  040445  FORM1:  .ASCIZ  /%S23%ASL%S5%ASA%S5%ADL%S5%ADA%S5%AF%S24%ANZVC%N/
       010014  046123  051445  022465
       010022  051501  022501  032523
       010030  040445  046104  051445
       010036  022465  042101  022501
       010044  032523  040445  022506
       010052  031123  022464  047101
       010060  053132  022503  000116
 8180  010066  051445  031462  040445  FORM2:  .ASCIZ  /%S23%ASL%S5%ASA%S5%ADL%S5%ADA%S5%AF%S6%AT%S15%ANZVC%N/
       010074  046123  051445  022465
       010102  051501  022501  032523
       010110  040445  046104  051445
       010116  022465  042101  022501
       010124  032523  040445  022506
       010132  033123  040445  022524
       010140  030523  022465  047101
       010146  053132  022503  000116
 8181  010154  051445  031462  040445  FORM3:  .ASCIZ  /%S23%ASL%S5%ASA%S23%ACHAR%S21%ANZVC%N/
       010162  046123  051445  022465
       010170  051501  022501  031123
       010176  022463  041501  040510
       010204  022522  031123  022461
       010212  047101  053132  022503
       010220  000116
 8182  010222  051445  031462  040445  FORM4:  .ASCIZ  /%S23%ASL%S5%ASA%S23%AMASK%S3%AT%S15%ANZVC%N/
       010230  046123  051445  022465
       010236  051501  022501  031123
       010244  022463  046501  051501
       010252  022513  031523  040445
       010260  022524  030523  022465
       010266  047101  053132  022503
       010274  000116
 8183  010276  051445  031462  040445  FORM5:  .ASCIZ  /%S23%AS1L%S4%AS1A%S4%AS2L%S4%AS2A%S4%AF%S24%ANZVC%N/
       010304  030523  022514  032123
       010312  040445  030523  022501
       010320  032123  040445  031123
       010326  022514  032123  040445
       010334  031123  022501  032123
       010342  040445  022506  031123
       010350  022464  047101  053132
       010356  022503  000116
 8184  010362  051445  031462  040445  FORM6:  .ASCIZ  /%S23%ASL%S5%ASA%S5%AOL%S5%AOA%S32%ANZVC%N/
       010370  046123  051445  022465
       010376  051501  022501  032523
       010404  040445  046117  051445
       010412  022465  047501  022501
       010420  031523  022462  047101
```

```
      010426  053132  022503  000116
 8185 010434  051445  031462  040445  FORM7:  .ASCIZ  /%S23%AS1L%S4%AS1A%S4%AS2L%S4%AS2A%S4%ADL%S5%ADA%S14%ANZVC%N/
      010442  030523  022514  032123
      010450  040445  030523  022501
      010456  032123  040445  031123
      010464  022514  032123  040445
      010472  031123  022501  032123
      010500  040445  046104  051445
      010506  022465  042101  022501
      010514  030523  022464  047101
      010522  053132  022503  000116
 8186 010530  051445  031462  040445  FORM8:  .ASCIZ  /%S23%AS1L%S4%AS1A%S4%AS2L%S4%AS2A%S32%ANZVC%N/
      010536  030523  022514  032123
      010544  040445  030523  022501
      010552  032123  040445  031123
      010560  022514  032123  040445
      010566  031123  022501  031523
      010574  022462  047101  053132
      010602  022503  000116
 8187 010606  051445  031462  040445  FORM9:  .ASCIZ  /%S23%ASL%S5%ASA%S5%AD.H%S4%AD.L%S32%ANZVC%N/
      010614  046123  051445  022465
      010622  051501  022501  032523
      010630  040445  027104  022510
      010636  032123  040445  027104
      010644  022514  031523  022462
      010652  047101  053132  022503
      010660  000116
 8188 010662  051445  031462  040445  FORM10: .ASCIZ  /%S23%ASL%S5%ASA%S5%ADL%S5%ADA%S32%ANZVC%N/
      010670  046123  051445  022465
      010676  051501  022501  032523
      010704  040445  046104  051445
      010712  022465  042101  022501
      010720  031523  022462  047101
      010726  053132  022503  000116
 8189 010734  051445  031462  040445  FORM11: .ASCIZ  /%S23%ASL%S5%ASA%S5%ADL%S5%ADA%S5%AR,S%S22%ANZVC%N/
      010742  046123  051445  022465
      010750  051501  022501  032523
      010756  040445  046104  051445
      010764  022465  042101  022501
      010772  032523  040445  026122
      011000  022523  031123  022462
      011006  047101  053132  022503
      011014  000116
 8190 011016  051445  031462  040445  FORM12: .ASCIZ  /%S23%ADL%S5%ADA%S5%AS.H%S4%AS.L%S32%ANZVC%N/
      011024  046104  051445  022465
      011032  042101  022501  032523
      011040  040445  027123  022510
      011046  032123  040445  027123
      011054  022514  031523  022462
      011062  047101  053132  022503
      011070  000116
 8191 011072  040445  044440  050116  INREG:  .ASCIZ  +%A INPUT   R0-R6,CC/ +
      011100  052125  020040  051040
      011106  026460  033122  041454
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        011114  027503  000040
  8192  011120  040445  044440  050116  INMEM:  .ASCIZ  +%A INPUTS IN MEMORY/ +
        011126  052125  020123  047111
        011134  046440  046505  051117
        011142  027531  000040
  8193  011146  040445  042440  050130  EMOUT:  .ASCIZ  +%A EXP OUT R0-R6,CC/ +
        011154  047440  052125  051040
        011162  026460  033122  041454
        011170  027503  000040
  8194  011174  047445  022466  030523  FORM13: .ASCIZ  /%06%S1%06%S1%06%S1%06%S1%06%S1%06%S1%06%S1%Y4%N/
        011202  047445  022466  030523
        011210  047445  022466  030523
        011216  047445  022466  030523
        011224  047445  022466  030523
        011232  047445  022466  030523
        011240  047445  022466  030523
        011246  054445  022464  000116
  8195  011254  047445  022466  030523  FORM14: .ASCIZ  /%06%S1%06%S1%06%S1%06%S1%06%S1%06%S1%06%S1%Y4%N/
        011262  047445  022466  030523
        011270  047445  022466  030523
        011276  047445  022466  030523
        011304  047445  022466  030523
        011312  047445  022466  030523
        011320  047445  022466  030523
        011326  054445  022464  000116
  8196  011334  040445  040440  052103  ACOUT:  .ASCIZ  +%A ACT OUT R0-R6,CC/ +
        011342  047440  052125  051040
        011350  026460  033122  041454
        011356  027503  000040
  8197  011362  047445  022466  030523  FORM15: .ASCIZ  /%06%S1/
        011370     000
  8198  011371     045  033523     000  FORM16: .ASCIZ  /%S7/
  8199  011375     045  033123  022461  FORM17: .ASCIZ  /%S61%Y4/
        011402  032131     000
  8200  011405     045  032131     000  FORM18: .ASCIZ  /%Y4/
  8201  011411     045  022516  020101  EBUFO:  .ASCIZ  +%N%A EXP BUFFER %06%A/ %03%N+
        011416  054105  020120  052502
        011424  043106  051105  022440
        011432  033117  040445  020057
        011440  047445  022463  000116
  8202  011446  040445  040440  052103  ABUFO:  .ASCIZ  +%A ACT BUFFER %06%A/ %03+
        011454  041040  043125  042506
        011462  020122  047445  022466
        011470  027501  022440  031517
        011476     000
  8203  011477     015  041412  041475  QDISP:  .ASCIZ  <CR><LF>/C=CONT.;R=REPEAT TEST;S=RESTART;D=DISPLAY MEMORY;H=REPEAT & HAL
        011504  047117  027124  051073
        011512  051075  050105  040505
        011520  020124  042524  052123
        011526  051473  051075  051505
        011534  040524  052122  042073
        011542  042075  051511  046120
        011550  054501  046440  046505
        011556  051117  035531  036510
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          011564  042522  042520  052101
          011572  023040  044040  046101
          011600  020124  052101  041440
          011606  051511  044440  051516
          011614  037524     000
  8204    011617     045  022516  041501   STKM1:  .ASCIZ  /%N%ACIS INST EXECUTION USED MORE THAN 64 LOCS ON STACK%N/
          011624  051511  044440  051516
          011632  020124  054105  041505
          011640  052125  047511  020116
          011646  051525  042105  046440
          011654  051117  020105  044124
          011662  047101  033040  020064
          011670  047514  051503  047440
          011676  020116  052123  041501
          011704  022513  000116
  8205    011710  047045  040445  044503   STKM2:  .ASCIZ  /%N%ACIS INST EXECUTION DESTROYED CONTENTS OF WORD AT STACK+2%N/
          011716  020123  047111  052123
          011724  042440  042530  052503
          011732  044524  047117  042040
          011740  051505  051124  054517
          011746  042105  041440  047117
          011754  04252?  052116  020123
          011762  043117  053440  051117
          011770  020104  052101  051440
          011776  040524  045503  031053
          012004  047045     000
  8206    012007     045  022516  052101   CISQ:   .ASCIZ  /%N%ATRAP TO 10 OCCURRED ON CIS INST IN TEST #1. IS CISP PRESENT?%N/
          012014  040522  020120  047524
          012022  030440  020060  041517
          012030  052503  051122  042105
          012036  047440  020116  044503
          012044  020123  047111  052123
          012052  044440  020116  042524
          012060  052123  021440  027061
          012066  044440  020123  044503
          012074  050123  050040  042522
          012102  042523  052116  022477
          012110  000116
  8207    012112  047045  040445  051124   MMVMSG: .ASCIZ  /%N%ATRAP TO 250/
          012120  050101  052040  020117
          012126  032462  000060
  8208    012132  047045  040445  051124   TRAP4:  .ASCIZ  /%N%ATRAP TO 4/
          012140  050101  052040  020117
          012146  000064
  8209    012150  047045  040445  051124   TRAP10: .ASCIZ  /%N%ATRAP TO 10/
          012156  050101  052040  020117
          012164  030061     000
  8210    012167     045  022516  042501   HLTMSG: .ASCIZ  /%N%AERROR HALT/
          012174  051122  051117  044040
          012202  046101  000124
  8211    012206  047045  040445  044503   NOPROG: .ASCIZ  /%N%ACIS INST IS NOT MAKING PROGRESS%N/
          012214  020123  047111  052123
          012222  044440  020123  047516
          012230  020124  040515  044513
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      012236  043516  050040  047522
      012244  051107  051505  022523
      012252  000116
8212  012254  047045  040445  040514   LATEXC: .ASCIZ  /%N%ALATENCY EXCESSIVE%N/
      012262  042524  041516  020131
      012270  054105  042503  051523
      012276  053111  022505  000116
8213  012304  040445  020040  052101   TRPINF: .ASCIZ  /%A  AT:%O6%A  MODE:%O1%A  D-EN:%B1%A  INST:%O6%A  INST CT:%D2%S1%D5%N/
      012312  022472  033117  040445
      012320  020040  047515  042504
      012326  022472  030517  040445
      012334  020040  026504  047105
      012342  022472  030502  040445
      012350  020040  047111  052123
      012356  022472  033117  040445
      012364  020040  047111  052123
      012372  041440  035124  042045
      012400  022462  030523  042045
      012406  022465  000116
8214  012412  047045  040445  047105   ASK:    .ASCIZ  /%N%AENTER INSTRUCTION TO TEST <ALL>   /
      012420  042524  020122  047111
      012426  052123  052522  052103
      012434  047511  020116  047524
      012442  052040  051505  020124
      012450  040474  046114  020076
      012456  020040     000
8215  012461     045  022516  051101   ASKRM:  .ASCIZ  /%N%ARANDOM EXERCISE MODE (Y OR N) ?  /
      012466  047101  047504  020115
      012474  054105  051105  044503
      012502  042523  046440  042117
      012510  020105  054450  047440
      012516  020122  024516  037440
      012524  020040     000
8216  012527     045  022516  050101   ASKMOD: .ASCIZ  /%N%APROCESSOR TEST MODE (K=KERNEL,S=SUPV,U=USER)?  /
      012534  047522  042503  051523
      012542  051117  052040  051505
      012550  020124  047515  042504
      012556  024040  036513  042513
      012564  047122  046105  051454
      012572  051475  050125  026126
      012600  036525  051525  051105
      012606  037451  020040     000
8217  012613     045  022516  046501   ASKMM:  .ASCIZ  /%N%AMEMORY MANAGEMENT (N=OFF,D=D-SPACE ENABLED,H=D-SPACE DISABLED)?  /
      012620  046505  051117  020131
      012626  040515  040516  042507
      012634  042515  052116  024040
      012642  036516  043117  026106
      012650  036504  026504  050123
      012656  041501  020105  047105
      012664  041101  042514  026104
      012672  036510  026504  050123
      012700  041501  020105  044504
      012706  040523  046102  042105
      012714  037451  020040     000
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 8218  012721     045  022516  052101  ASKINT: .ASCIZ  /%N%ATEST INTERRUPTABILITY OF CIS INSTRUCTIONS (KW11-P REQUIRED) (Y OR N
       012726  051505  020124  047111
       012734  042524  051122  050125
       012742  040524  044502  044514
       012750  054524  047440  020106
       012756  044503  020123  047111
       012764  052123  052522  052103
       012772  047511  051516  024040
       013000  053513  030461  050055
       013006  051040  050505  044525
       013014  042522  024504  024040
       013022  020131  051117  047040
       013030  020051  000077
 8219  013034  047045  040445  047105  ASKST:  .ASCIZ  /%N%AENTER STOP TEST NUMBER (DECIMAL):%N/
       013042  042524  020122  052123
       013050  050117  052040  051505
       013056  020124  052516  041115
       013064  051105  024040  042504
       013072  044503  040515  024514
       013100  022472  000116
 8220  013104  047045  040445  047111  ASKSRC: .ASCIZ  /%N%AINTR SOURCE (R=LTC,N=KW11-P @100KHZ,C=KW11-P @10KHZ,Y=KW11-P EXT OS
       013112  051124  051440  052517
       013120  041522  020105  051050
       013126  046075  041524  047054
       013134  045475  030527  026461
       013142  020120  030500  030060
       013150  044113  026132  036503
       013156  053513  030461  050055
       013164  040040  030061  044113
       013172  026132  036531  053513
       013200  030461  050055  042440
       013206  052130  047440  041523
       013214  037451     000
 8221  013217     045  022516  040501  ASKDI:  .ASCIZ  /%N%AALLOW INTERRUPTING THE CIS INST EXECUTED DURING NORMAL INTR SERVICE
       013224  046114  053517  044440
       013232  052116  051105  052522
       013240  052120  047111  020107
       013246  044124  020105  044503
       013254  020123  047111  052123
       013262  042440  042530  052503
       013270  042524  020104  052504
       013276  044522  043516  047040
       013304  051117  040515  020114
       013312  047111  051124  051440
       013320  051105  044526  042503
       013326  000077
 8222  013330  047045  040445  040503  NOLAT:  .ASCIZ  /%N%ACAN'T TEST LATENCY - NEED 2ND KW11-P/
       013336  023516  020124  042524
       013344  052123  046040  052101
       013352  047105  054503  026440
       013360  047040  042505  020104
       013366  047062  020104  053513
       013374  030461  050055     000
 8223  013401     045  022516  041501  NOINT:  .ASCIZ  /%N%ACAN'T TEST INTERRUPTABILITY - NO CLOCK/
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      013406  047101  052047  052040
      013414  051505  020124  047111
      013422  042524  051122  050125
      013430  040524  044502  044514
      013436  054524  026440  047040
      013444  020117  046103  041517
      013452  000113
8224  013454  047045  040445  053523  SWNG:   .ASCIZ  /%N%ASWITCH ON CIS MODULE ACTS LIKE IT IS IN THE INCORRECT POSITION%N/
      013462  052111  044103  047440
      013470  020116  044503  020123
      013476  047515  052504  042514
      013504  040440  052103  020123
      013512  044514  042513  044440
      013520  020124  051511  044440
      013526  020116  044124  020105
      013534  047111  047503  051122
      013542  041505  020124  047520
      013550  044523  044524  047117
      013556  047045     000
8225  013561     045  022516  041501  NOABO:  .ASCIZ  /%N%ACIS INST FAILED TO ABORT%N/
      013566  051511  044440  051516
      013574  020124  040506  046111
      013602  042105  052040  020117
      013610  041101  051117  022524
      013616  000116
8226  013620  047045  040445  044514  KW11L:  .ASCIZ  /%N%ALINE CLOCK WILL BE USED FOR INTERRUPT SOURCE%N/
      013626  042516  041440  047514
      013634  045503  053440  046111
      013642  020114  042502  052440
      013650  042523  020104  047506
      013656  020122  047111  042524
      013664  051122  050125  020124
      013672  047523  051125  042503
      013700  047045     000
8227  013703     015  040412  042104  AST:    .ASCIZ  <CR><LF>/ADDR(S)?/
      013710  024122  024523  000077
8228  013716  047445  022466  027501  FORM19: .ASCIZ  +%06%A/%S3%03%S2%03%S2%03%S2%03+
      013724  051445  022463  031517
      013732  051445  022462  031517
      013740  051445  022462  031517
      013746  051445  022462  031517
      013754     000
8229  013755     045  020101  020040  ADDHDR: .ASCIZ  /%A          0     1     2     3     4     5     6     7%N/
      013762  020040  020040  020040
      013770  020040  020060  020040
      013776  030440  020040  020040
      014004  020062  020040  031440
      014012  020040  020040  020064
      014020  020040  032440  020040
      014026  020040  020066  020040
      014034  033440  047045     000
8230  014041     045  031123  047445  FORM20: .ASCIZ  /%S2%03%S2%03%S2%03%S2%03%N/
      014046  022463  031123  047445
      014054  022463  031123  047445
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      014062  022463  031123  047445
      014070  022463  000116
8231  014074  047045     000            FORM21: .ASCIZ  /%N/
8232  014077     045  022516  020101    FORM22: .ASCIZ  /%N%A SRC%S13/
      014104  051123  022503  030523
      014112  000063
8233  014114  047045  040445  051440    FORM23: .ASCIZ  /%N%A SRC1%S12/
      014122  041522  022461  030523
      014130  000062
8234  014132  047045  040445  051440    FORM24: .ASCIZ  /%N%A SRC2%S12/
      014140  041522  022462  030523
      014146  000062
8235  014150  047045  040445  042440    FORM25: .ASCIZ  /%N%A EXP RESULT%S4/
      014156  050130  051040  051505
      014164  046125  022524  032123
      014172     000
8236  014173     045  022516  020101    FORM26: .ASCIZ  /%N%A ACT RESULT%S4/
      014200  041501  020124  042522
      014206  052523  052114  051445
      014214  000064
8237  014216  040445  000040            FORM27: .ASCIZ  /%A /
8238  014222  051445  022462  044501    FORM30: .ASCIZ  /%S2%AINST CNT:%D2%S1%D5/
      014230  051516  020124  047103
      014236  035124  042045  022462
      014244  030523  042045  000065
8239  014252  040445  000111            FORM31: .ASCIZ  /%AI/
8240  014256  040445  020040  044523    FORM32: .ASCIZ  /%A  SIGN BYTE=(/
      014264  047107  041040  052131
      014272  036505  000050
8241  014276  040445  000051            FORM33: .ASCIZ  /%A)/
8242  014302  040445  025440     000    FORM34: .ASCIZ  /%A +/
8243  014307     045  020101  000055    FORM35: .ASCIZ  /%A -/
8244  014314  047045  047045  040445    FORM36: .ASCIZ  /%N%N%ARANDOM # GENERATOR SEED%S5%06%S2%06%S2%06%N/
      014322  040522  042116  046517
      014330  021440  043440  047105
      014336  051105  052101  051117
      014344  051440  042505  022504
      014352  032523  047445  022466
      014360  031123  047445  022466
      014366  031123  047445  022466
      014374  000116
8245  014376  047045  040445  051105    FORM37: .ASCIZ  /%N%AERROR #%D6/
      014404  047522  020122  022443
      014412  033104     000
8246  014415     045  022516  042501    FORM38: .ASCIZ  /%N%AERROR IN UNUSED REGISTER SET: USED SET:%O1/
      014422  051122  051117  044440
      014430  020116  047125  051525
      014436  042105  051040  043505
      014444  051511  042524  020122
      014452  042523  035124  052440
      014460  042523  020104  042523
      014466  035124  047445  000061
8247  014474  047045  040445  054105    FORM39: .ASCIZ  /%N%AEXP:%O6%A  ACT R0-R5 %O6%S1%O6%S1%O6%S1%O6%S1%O6%S1%O6/
      014502  035120  047445  022466
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        014510  020101  040440  052103
        014516  051040  026460  032522
        014524  022440  033117  051445
        014532  022461  033117  051445
        014540  022461  033117  051445
        014546  022461  033117  051445
        014554  022461  033117  051445
        014562  022461  033117     000
 8248   014567     045  020101  047111   FORM40: .ASCIZ  /%A INTR CNT:%D4%A REG SET:%O1%A MODE:/
        014574  051124  041440  052116
        014602  022472  032104  040445
        014610  051040  043505  051440
        014616  052105  022472  030517
        014624  040445  046440  042117
        014632  035105     000
 8249   014635     045  020101  042040   FRM40A: .ASCIZ  /%A  D-EN:/
        014642  042455  035116     000
 8250   014647     045  031123  022463   FORM41: .ASCIZ  /%S23%AR0%S5%AR1%S5%AR2%S5%AR3%S5%AR4%S5%AR5%S5%AR6%S5%ANZVC%N/
        014654  051101  022460  032523
        014662  040445  030522  051445
        014670  022465  051101  022462
        014676  032523  040445  031522
        014704  051445  022465  051101
        014712  022464  032523  040445
        014720  032522  051445  022465
        014726  051101  022466  032523
        014734  040445  055116  041526
        014742  047045     000
 8251   014745     045  022516  041501   FORM42: .ASCIZ  /%N%ACIS INSTRUCTION WAS SUSPENDED TO SERVICE INTERRUPT/
        014752  051511  044440  051516
        014760  051124  041525  044524
        014766  047117  053440  051501
        014774  051440  051525  042520
        015002  042116  042105  052040
        015010  020117  042523  053122
        015016  041511  020105  047111
        015024  042524  051122  050125
        015032  000124
 8252   015034  047045  040445  051520   FORM43: .ASCIZ  /%N%APSW BIT 8 SHOULD HAVE BEEN SET BUT WAS NOT%N/
        015042  020127  044502  020124
        015050  020070  044123  052517
        015056  042114  044040  053101
        015064  020105  042502  047105
        015072  051440  052105  041040
        015100  052125  053440  051501
        015106  047040  052117  047045
        015114     000
 8253   015115     045  022516  041101   FORM44: .ASCIZ  /%N%ABIT 8 OF PSW SET WITH PC < CIS INST PC/
        015122  052111  034040  047440
        015130  020106  051520  020127
        015136  042523  020124  044527
        015144  044124  050040  020103
        015152  020074  044503  020123
        015160  047111  052123  050040
```

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        015166  000103
8254    015170  047045  040445  052523  FORM45: .ASCIZ  /%N%ASUSPECT THAT CIS INST BACKED UP PC TOO FAR/
        015176  050123  041505  020124
        015204  044124  052101  041440
        015212  051511  044440  051516
        015220  020124  040502  045503
        015226  042105  052440  020120
        015234  041520  052040  047517
        015242  043040  051101     000
8255    015247     045  022516  004501  FORM46: .ASCIZ  /%N%A   WHEN EXITING TO SERVICE INTERRUPT%N/
        015254  044127  047105  042440
        015262  044530  044524  043516
        015270  052040  020117  042523
        015276  053122  041511  020105
        015304  047111  042524  051122
        015312  050125  022524  000116
8256    015320  047045  040445  044503  FORM47: .ASCIZ  /%N%ACIS INST COMPLETED BUT PSW BIT 8 STILL SET%N/
        015326  020123  047111  052123
        015334  041440  046517  046120
        015342  052105  042105  041040
        015350  052125  050040  053523
        015356  041040  052111  034040
        015364  051440  044524  046114
        015372  051440  052105  047045
        015400     000
8257    015401     045  022516  044501  FORM48: .ASCIZ  /%N%AIN-LINE CIS INSTRUCTION COMPLETED WITH PC/
        015406  026516  044514  042516
        015414  041440  051511  044440
        015422  051516  051124  041525
        015430  044524  047117  041440
        015436  046517  046120  052105
        015444  042105  053440  052111
        015452  020110  041520     000
8258    015457     045  022516  020101  FORM49: .ASCIZ  /%N%A   POINTING AT IN-LINE OPERANDS RATHER THAN NEXT INST%N/
        015464  050011  044517  052116
        015472  047111  020107  052101
        015500  044440  026516  044514
        015506  042516  047440  042520
        015514  040522  042116  020123
        015522  040522  044124  051105
        015530  052040  040510  020116
        015536  042516  052130  044440
        015544  051516  022524  000116
8259    015552  006477  051012  042505  QUES:   .ASCIZ  /?/<CR><LF>/REENTER:/
        015560  052116  051105  000072
8260    015566  005015     000          XCRLF:  .ASCIZ  <CR><LF>
8261    015571     057  005015     000  SLCRLF: .ASCIZ  <SL><CR><LF>
8263    015575     015  042412  042116  ENDP:   .ASCIZ  <CR><LF>/END OF PASS (EXECUTION OF TABLED TEST CASES COMPLETE)/
        015602  047440  020106  040520
        015610  051523  024040  054105
        015616  041505  052125  047511
        015624  020116  043117  052040
        015632  041101  042514  020104
        015640  042524  052123  041440
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        015646  051501  051505  041440
        015654  046517  046120  052105
        015662  024505     000
 8268   015665     015  042412  042116  ENDQP:  .ASCIZ  <CR><LF>/END OF QUICK VERIFY PASS/
        015672  047440  020106  052521
        015700  041511  020113  042526
        015706  044522  054506  050040
        015714  051501  000123
 8269   015720  005015  047111  052123  FSHDR:  .ASCIZ  <CR><LF>/INST UNDER TEST WILL BE DISPLAYED AT THE START OF TESTING FOR E
        015726  052440  042116  051105
        015734  052040  051505  020124
        015742  044527  046114  041040
        015750  020105  044504  050123
        015756  040514  042531  020104
        015764  052101  052040  042510
        015772  051440  040524  052122
        016000  047440  020106  042524
        016006  052123  047111  020107
        016014  047506  020122  040505
        016022  044103  044440  051516
        016030  000124
 8270   016032  005015  052521  041511  QVHDR:  .ASCIZ  <CR><LF>/QUICK VERIFY PASS TIME:  LESS THAN 5 MINUTES/
        016040  020113  042526  044522
        016046  054506  050040  051501
        016054  020123  044524  042515
        016062  020072  046040  051505
        016070  020123  044124  047101
        016076  032440  046440  047111
        016104  052125  051505     000
 8271   016111     045  022516  042501  ACCSEED:.ASCIZ  /%N%AENTER 3 RANDOM NUMBER GEN. SEED CONSTANTS:  %N/
        016116  052116  051105  031440
        016124  051040  047101  047504
        016132  020115  052516  041115
        016140  051105  043440  047105
        016146  020056  042523  042105
        016154  041440  047117  052123
        016162  047101  051524  020072
        016170  022440  000116
 8273   016174  005015  040520  051523  FSHDR1: .ASCIZ  <CR><LF>+PASS TIME: APPROX 30 MIN+
        016202  052040  046511  035105
        016210  040440  050120  047522
        016216  020130  030063  046440
        016224  047111     000
 8278   016227     015  042412  052116  FSHDR2: .ASCIZ  <CR><LF>/ENTERING RANDOM TEST MODE/
        016234  051105  047111  020107
        016242  040522  042116  046517
        016250  052040  051505  020124
        016256  047515  042504     000
 8279   016263     015  047012  020117  FSHDR3: .ASCIZ  <CR><LF>/NO FURTHER END OF PASS MESSAGES WILL BE ISSUED/
        016270  052506  052122  042510
        016276  020122  047105  020104
        016304  043117  050040  051501
        016312  020123  042515  051523
        016320  043501  051505  053440
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        016326  046111  020114  042502
        016334  044440  051523  042525
        016342  000104
  8280  016344  005015  040522  042116  FSHDR4: .ASCIZ  <CR><LF>/RANDOM # GENERATOR SEED CONSTANTS WILL BE PRINTED/
        016352  046517  021440  043440
        016360  047105  051105  052101
        016366  051117  051440  042505
        016374  020104  047503  051516
        016402  040524  052116  020123
        016410  044527  046114  041040
        016416  020105  051120  047111
        016424  042524  000104
  8281  016430  005015  020040  020040  FSHDR5: .ASCIZ  <CR><LF>/    EVERY 1024 CIS INSTRUCTION TESTS/
        016436  053105  051105  020131
        016444  030061  032062  041440
        016452  051511  044440  051516
        016460  051124  041525  044524
        016466  047117  052040  051505
        016474  051524     000
  8285  016477     045  026501  026455  DASH:   .ASCIZ  /%A--------------------------------------------------------------%N/
        016504  026455  026455  026455
        016512  026455  026455  026455
        016520  026455  026455  026455
        016526  026455  026455  026455
        016534  026455  026455  026455
        016542  026455  026455  026455
        016550  026455  026455  026455
        016556  026455  026455  026455
        016564  026455  026455  026455
        016572  026455  047045     000
  8286  016577     045  022516  026501  SDASH:  .ASCIZ  /%N%A-------------/
        016604  026455  026455  026455
        016612  026455  026455  026455
        016620     000
  8288  016621     015  041412  045532  PNAME:  .ASCIZ  <CR><LF>/CZKEEBO PDP-11 CIS INSTRUCTION EXERCISER /
        016626  042505  030102  050040
        016634  050104  030455  020061
        016642  044503  020123  047111
        016650  052123  052522  052103
        016656  047511  020116  054105
        016664  051105  044503  042523
        016672  020122     000
  8293  016675     015  046412  046505  MPT34:  .ASCIZ  <CR><LF>+MEM MGMT HARDWARE AVAILABLE ON SYSTEM UNDER TEST+
        016702  046440  046507  020124
        016710  040510  042122  040527
        016716  042522  040440  040526
        016724  046111  041101  042514
        016732  047440  020116  054523
        016740  052123  046505  052440
        016746  042116  051105  052040
        016754  051505  000124
  8294  016760  005015  030461  032057  MPT44:  .ASCIZ  <CR><LF>+11/44 PROCESSOR+
        016766  020064  051120  041517
        016774  051505  047523  000122
```

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017002  005015  030461  033457  MPT74:   .ASCIZ  <CR><LF>+11/74 TYPE PROCESSOR+
017010  020064  054524  042520
017016  050040  047522  042503
017024  051523  051117     000
017031     015  030412  027461  MPT2324:.ASCIZ  <CR><LF>+11/23 OR 11/24 PROCESSOR+
017036  031462  047440  020122
017044  030461  031057  020064
017052  051120  041517  051505
017060  047523  000122
017064  005015  047516  046440  NMM:     .ASCIZ  <CR><LF>+NO MEMORY MGMT HARDWARE ON SYSTEM UNDER TEST+
017072  046505  051117  020131
017100  043515  052115  044040
017106  051101  053504  051101
017114  020105  047117  051440
017122  051531  042524  020115
017130  047125  042504  020122
017136  042524  052123     000
```

```
                                  .SBTTL  GLOBAL SUBROUTINES SECTION

                                  .SBTTL          CIS EMULATOR
                                  ; FUNCTIONAL DESCRIPTION:
                                  ;    CIS EMULATOR        CONTAINS ROUTINES TO EMULATE EACH OF THE
                                  ;                        CIS INSTRUCTIONS USING STANDARD PDP-11 INSTRUCTIONS

                                  ; INPUTS:         CIS INSTRUCTION TO EMULATE
                                  ;                 CIS INSTRUCTION OPERANDS (LENGTHS,ADDRESSES,ETC)
                                  ;                 STARTING ADDRESS FOR REGISTER RESULTS
                                  ;                 ADDRESS FOR CONDITION CODE RESULTS

                                  ; IMPLICIT INPUTS:       CHARACTER OR DECIMAL STRINGS SETUP IN EMULATION BUFFER

                                  ; OUTPUTS:        CONDITION CODES
                                  ;                 GENERAL PURPOSE REGISTERS
                                  ;                 STRINGS IN EMULATION BUFFER

                                  ; IMPLICIT OUTPUTS:

                                  ; SUBORDINATE ROUTINES USED:

                                  ; FUNCTIONAL SIDE EFFECTS:

                                  ; CALLING SEQUENCE:      JSR PC,EMULATE
                                  ;                        XXXXXX              ;OCTAL ENCODING OF CIS INST
                                  ;                        YYYYYY              ;POINTER TO REGISTER OPERANDS
                                  ;                        ZZZZZZ              ;POINTER TO REGISTER RESULTS
                                  ;                        WWWWWW              ;POINTER TO CONDITION CODE RESULTS

         177776                                   EPSW = 177776
         017144                           .EVEN
```

```
                                                .SBTTL                  INSTRUCTION DECODER
017144  010037  017336  EMULAT:                 MOV R0,ESTORE           ;SAVE OLD REGISTER VALUES
017150  010137  017340                          MOV R1,ESTORE+2
017154  010237  017342                          MOV R2,ESTORE+4
017160  010337  017344                          MOV R3,ESTORE+6
017164  010437  017346                          MOV R4,ESTORE+10
017170  010537  017350                          MOV R5,ESTORE+12
017174  005037  036210                          CLR EZDF                ;CLEAR ZERO DIVIDE FLAG
017200  011600                                  MOV (SP),R0             ;GRAB DATA POINTERS
017202  012037  017354                          MOV (R0)+,EINST         ;CIS INSTRUCTION BEING CALLED
017206  012037  017356                          MOV (R0)+,EIRSTK        ;FAKE INPUT GPRS
017212  012037  017360                          MOV (R0)+,EORSTK        ;FAKE OUTPUT GPRS
017216  012037  017362                          MOV (R0)+,EOPSW         ;FAKE PSW
017222  010016                                  MOV R0,(SP)             ;SUB RETURN ADDRESS
017224  012700  017404                          MOV #ELISTA,R0          ;CIS COMMAND LIST POINTER
017230  005710                          1$:     TST (R0)                ;EXIT IF INSTRUCTION CANT DECODE
017232  001001                                  BNE 2$                  ;ELSE CONTINUE SEARCH
017234  000207                                  RTS PC
017236  023720  017354                  2$:     CMP EINST,(R0)+         ;LOOK AT TABLE FOR MATCH
017242  001372                                  BNE 1$                  ;KEEP TRYING
017244  162700  017406                          SUB #ELISTA+2,R0        ;AT LAST, SO FIND HANDLER FOR IT
017250  062700  017530                          ADD #ELISTB,R0          ;HANDLER ADDRESS IN TABLE B
017254  011037  017352                          MOV (R0),EROUT          ;HOLD ADDRESS WHILE I FIND THE DATA
017260  012700  017364                          MOV #E0,R0              ;POINTER TO EMULATE GPRS
017264  013701  017356                          MOV EIRSTK,R1           ;POINTER TO REGISTER DATA
017270  012120                          3$:     MOV (R1)+,(R0)+         ;BEAM OVER THE DATA
017272  022700  017402                          CMP #E6+2,R0            ;EXIT LOOP AFTER R6 LOADED
017276  001374                                  BNE 3$                  ;ELSE LOAD NEXT
017300  004777  000046                          JSR PC,@EROUT           ;EXECUTE EMULATED CIS INSTRUCTION
017304  013700  017336                          MOV ESTORE,R0           ;ON RETURN RESTORE REGISTERS
017310  013701  017340                          MOV ESTORE+2,R1
017314  013702  017342                          MOV ESTORE+4,R2
017320  013703  017344                          MOV ESTORE+6,R3
017324  013704  017346                          MOV ESTORE+10,R4
017330  013705  017350                          MOV ESTORE+12,R5
017334  000207                                  RTS PC                  ;RETURN TO MAIN PROGRAM
```

```
 8371                                   .SBTTL          DATA STORAGE
 8372  017336  000006       ESTORE:     .BLKW 6
 8373  017352  000000       EROUT:      .WORD 0
 8374  017354  000000       EINST:      .WORD 0
 8375  017356  000000       EIRSTK:     .WORD 0
 8376  017360  000000       EORSTK:     .WORD 0
 8377  017362  000000       EOPSW:      .WORD 0
 8378  017364  000000       E0:         .WORD 0
 8379  017366  000000       E1:         .WORD 0
 8380  017370  000000       E2:         .WORD 0
 8381  017372  000000       E3:         .WORD 0
 8382  017374  000000       E4:         .WORD 0
 8383  017376  000000       E5:         .WORD 0
 8384  017400  000000       E6:         .WORD 0
 8385  017402  000000       TEMP:       .WORD 0
 8386  017404  076020       ELISTA:     .WORD 076020
 8387  017406  076021                   .WORD 076021
 8388  017410  076022                   .WORD 076022
 8389  017412  076023                   .WORD 076023
 8390  017414  076024                   .WORD 076024
 8391  017416  076025                   .WORD 076025
 8392  017420  076026                   .WORD 076026
 8393  017422  076027                   .WORD 076027
 8394  017424  076030                   .WORD 76030
 8395  017426  076031                   .WORD 76031
 8396  017430  076032                   .WORD 76032
 8397  017432  076040                   .WORD 76040
 8398  017434  076041                   .WORD 76041
 8399  017436  076042                   .WORD 76042
 8400  017440  076043                   .WORD 76043
 8401  017442  076044                   .WORD 76044
 8402  017444  076045                   .WORD 76045
 8403  017446  076050                   .WORD 76050
 8404  017450  076051                   .WORD 76051
 8405  017452  076052                   .WORD 76052
 8406  017454  076053                   .WORD 76053
 8407  017456  076054                   .WORD 76054
 8408  017460  076055                   .WORD 76055
 8409  017462  076056                   .WORD 76056
 8410  017464  076057                   .WORD 76057
 8411  017466  076060                   .WORD 076060
 8412  017470  076061                   .WORD 076061
 8413  017472  076062                   .WORD 076062
 8414  017474  076063                   .WORD 076063
 8415  017476  076064                   .WORD 076064
 8416  017500  076065                   .WORD 076065
 8417  017502  076066                   .WORD 076066
 8418  017504  076067                   .WORD 076067
 8419  017506  076070                   .WORD 76070
 8420  017510  076071                   .WORD 76071
 8421  017512  076072                   .WORD 76072
 8422  017514  076073                   .WORD 76073
 8423  017516  076074                   .WORD 76074
 8424  017520  076075                   .WORD 76075
```

```
 8425  017522  076076                          .WORD 76076
 8426  017524  076077                          .WORD 76077
 8427  017526  000000                          .WORD 0
 8428  017530  036216          ELISTB:         .WORD EL2D0
 8429  017532  036322                          .WORD EL2D1
 8430  017534  036330                          .WORD EL2D2
 8431  017536  036336                          .WORD EL2D3
 8432  017540  036344                          .WORD EL2D4
 8433  017542  036360                          .WORD EL2D5
 8434  017544  036374                          .WORD EL2D6
 8435  017546  036440                          .WORD EL2D7
 8436  017550  017652                          .WORD EMOVC
 8437  017552  020356                          .WORD EMOVRC
 8438  017554  020074                          .WORD EMOVTC
 8439  017556  021246                          .WORD ELOCC
 8440  017560  021300                          .WORD ESKPC
 8441  017562  021170                          .WORD ESCNC
 8442  017564  021112                          .WORD ESPNC
 8443  017566  020600                          .WORD ECMPC
 8444  017570  021002                          .WORD EMTCHC
 8445  017572  023412                          .WORD EADDN
 8446  017574  023460                          .WORD ESUBN
 8447  017576  032314                          .WORD ECMPN
 8448  017600  026766                          .WORD ECVTNL
 8449  017602  027532                          .WORD ECVTPN
 8450  017604  030144                          .WORD ECVTNP
 8451  017606  030716                          .WORD EASHN
 8452  017610  025170                          .WORD ECVTLN
 8453  017612  036500                          .WORD EL3D0
 8454  017614  036554                          .WORD EL3D1
 8455  017616  036562                          .WORD EL3D2
 8456  017620  036570                          .WORD EL3D3
 8457  017622  036576                          .WORD EL3D4
 8458  017624  036604                          .WORD EL3D5
 8459  017626  036612                          .WORD EL3D6
 8460  017630  036672                          .WORD EL3D7
 8461  017632  023402                          .WORD EADDP
 8462  017634  023420                          .WORD ESUBP
 8463  017636  032240                          .WORD ECMPP
 8464  017640  026774                          .WORD ECVTPL
 8465  017642  033100                          .WORD EMULP
 8466  017644  035142                          .WORD EDIVP
 8467  017646  030642                          .WORD EASHP
 8468  017650  025176                          .WORD ECVTLP
```

```
                                                          .SBTTL          MOVE STRING
      017652  013700  017366           EMOVC:             MOV E1,R0       ;FIND END OF SOURCE STRING
      017656  063700  017364                              ADD E0,R0
      017662  013701  017372                              MOV E3,R1       ;FIND END OF DEST. STRING
      017666  063701  017370                              ADD E2,R1
      017672  023737  017364  017370                      CMP E0,E2       ;WICH STRING IS LONGER
      017700  101003                                      BHI 1$          ;SOURCE
      017702  103416                                      BLO 2$          ;DEST.
      017704  010102                                      MOV R1,R2       ;THEIR THE SAME
      017706  000420                                      BR 3$
      017710  013700  017366                      1$:     MOV E1,R0       ;SHORTEN SOURCE STRING
      017714  063700  017370                              ADD E2,R0
      017720  010102                                      MOV R1,R2       ;DEST USED END = REAL END
      017722  013703  017364                              MOV E0,R3       ;CALCULATE # OF CHARS
      017726  163703  017370                              SUB E2,R3       ; NOT TRANSFERRED.
      017732  010377  177422                              MOV R3,@EORSTK  ;SAVE RESULT
      017736  000406                                      BR 4$
      017740  013702  017372                      2$:     MOV E3,R2       ;USED END < REAL END
      017744  063702  017364                              ADD E0,R2
      017750  005077  177404                      3$:     CLR @EORSTK     ;ALL CHAR. TRANSFERED TO DEST.
      017754  023737  017366  017372              4$:     CMP E1,E3       ;WICH STRING IS IN HIGH CORE
      017762  103410                                      BLO EFORWD      ;DEST STRING IS
      017764  013703  017366           EBACK:             MOV E1,R3       ;START ADDRESS OF SOURCE
      017770  013704  017372                              MOV E3,R4       ;START ADDRESS OF DEST.
      017774  020402                              1$:     CMP R4,R2       ;IS TRANSFER COMPLETE ?
      017776  001410                                      BEQ EFILL       ;YES
      020000  112324                                      MOVB (R3)+,(R4)+        ;XFER CHAR.
      020002  000774                                      BR 1$
      020004  010203                   EFORWD:            MOV R2,R3       ;DEST STRING POINTER
      020006  023700  017366                      1$:     CMP E1,R0       ;IS XFER COMPLETE ?
      020012  001402                                      BEQ EFILL       ;YES
      020014  114043                                      MOVB -(R0),-(R3)        ;XFER CHAR.
      020016  000773                                      BR 1$
      020020  020102                   EFILL:             CMP R1,R2       ;ADD FILL CHARS. TO COMPLETE STRING
      020022  001403                                      BEQ 2$
      020024  113722  017374                              MOVB E4,(R2)+   ;XFER FILL
      020030  000773                                      BR EFILL
      020032  013700  017360                      2$:     MOV EORSTK,R0   ;RETURN CLEAN UP
      020036  005720                                      TST (R0)+       ;R0 = R0
      020040  005020                                      CLR (R0)+       ;R1 = 0
      020042  005020                                      CLR (R0)+       ;R2 = 0
      020044  005020                                      CLR (R0)+       ;R3 = 0
      020046  013720  017374                              MOV E4,(R0)+    ;R4 = R4
      020052  013710  017376                              MOV E5,(R0)     ;R5 = R5
      020056  023737  017364  017370                      CMP E0,E2       ;SET PSW CC BITS
      020064  013777  177776  177270                      MOV EPSW,@EOPSW ;STORE RESULT
      020072  000207                                      RTS PC
```

```
                                                     .SBTTL                MOVE STRING TRANSLATE
020074  013700  017366           EMOVTC:             MOV E1,R0             ;FIND END OF SOURCE
020100  063700  017364                               ADD E0,R0
020104  013701  017372                               MOV E3,R1             ;FIND END OF DEST.
020110  063701  017370                               ADD E2,R1
020114  023737  017364  017370                       CMP E0,E2             ;WHICH STRING IS LONGER
020122  101003                                       BHI 1$                ;SOURCE
020124  103416                                       BLO 2$                ;DEST.
020126  010102                                       MOV R1,R2             ;SAME
020130  000420                                       BR 3$
020132  013700  017366                      1$:      MOV E1,R0             ;SHORTEN SOURCE STRING
020136  063700  017370                               ADD E2,R0
020142  010102                                       MOV R1,R2
020144  013703  017364                               MOV E0,R3             ;CALCULATE NO. OF CHARS.
020150  163703  017370                               SUB E2,R3             ;  NOT TRANSFERRED
020154  010377  177200                               MOV R3,@EORSTK        ;STORE RESULT
020160  000406                                       BR 4$
020162  013702  017372                      2$:      MOV E3,R2             ;MARK REAL END OF DEST
020166  063702  017364                               ADD E0,R2
020172  005077  177162                      3$:      CLR @EORSTK
020176  023737  017366  017372              4$:      CMP E1,E3             ;WHO'S HIGHER IN MEMORY
020204  103420                                       BLO EMTFRD            ;MOVE FORWARD
020206  013703  017366           EMTBCK:             MOV E1,R3             ;START OF SOURCE
020212  013704  017372                               MOV E3,R4             ;START OF DEST.
020216  020402                              1$:      CMP R4,R2             ;XFER COMPLETE YET
020220  001430                                       BEQ EMTFIL            ;YES
020222  112337  017402                               MOVB (R3)+,TEMP       ;CAL. INDEX INTO TABLE
020226  105037  017403                               CLRB TEMP+1
020232  063737  017376  017402                       ADD E5,TEMP
020240  117724  177136                               MOVB @TEMP,(R4)+      ;MOVE TABLE VALUE TO DEST.
020244  000764                                       BR 1$
020246  010203                   EMTFRD:             MOV R2,R3             ;DEST MOVE POINTER
020250  023700  017366                      1$:      CMP E1,R0             ;XFER COMPLETE ?
020254  001412                                       BEQ EMTFIL
020256  114037  017402                               MOVB -(R0),TEMP       ;CAL INDEX INTO TABLE
020262  105037  017403                               CLRB TEMP+1
020266  063737  017376  017402                       ADD E5,TEMP
020274  117743  177102                               MOVB @TEMP,-(R3)      ;MOVE TABLE VALUE INTO DEST.
020300  000763                                       BR 1$
020302  020102                   EMTFIL:             CMP R1,R2             ;COMPLETE
020304  001403                                       BEQ 2$                ;YES
020306  113722  017374                               MOVB E4,(R2)+         ;XFER FILL
020312  000773                                       BR EMTFIL
020314  013700  017360                      2$:      MOV EORSTK,R0         ;RETURN CLEAN UP
020320  005720                                       TST (R0)+             ;R0 = R0
020322  005020                                       CLR (R0)+             ;R1 = 0
020324  005020                                       CLR (R0)+             ;R2 = 0
020326  005020                                       CLR (R0)+             ;R3 = 0
020330  013720  017374                               MOV E4,(R0)+          ;R4 = R4
020334  013710  017376                               MOV E5,(R0)           ;R5 = R5
020340  023737  017364  017370                       CMP E0,E2             ;SET CC BITS
020346  013777  177776  177006                       MOV EPSW,@EOPSW       ;RETURN STATUS
020354  000207                                       RTS PC
```

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                                                       .SBTTL                  MOVE REVERSE STRING
020356  013700  017366          EMOVRC:                MOV E1,R0               ;FIND END OF SOURCE
020362  063700  017364                                 ADD E0,R0
020366  013701  017372                                 MOV E3,R1               ;FIND END OF DEST.
020372  063701  017370                                 ADD E2,R1
020376  023737  017364  017370                         CMP E0,E2               ;WHICH STRING IS LARGER
020404  101004                                         BHI 1$                  ;SOURCE
020406  103421                                         BLO 2$                  ;DEST.
020410  013702  017372                                 MOV E3,R2               ;SAME
020414  000421                                         BR 3$
020416  010037  017366                         1$:     MOV R0,E1               ;SHORTEN SOURCE
020422  163737  017370  017366                         SUB E2,E1
020430  013702  017372                                 MOV E3,R2               ;DEST. REAL START
020434  013703  017364                                 MOV E0,R3               ;CALCULATE NO OF CHARS
020440  163703  017370                                 SUB E2,R3               ;  NOT TRANSFERRED
020444  010377  176710                                 MOV R3,@EORSTK          ;STORE RESULT
020450  000405                                         BR 4$
020452  010102                                 2$:     MOV R1,R2               ;MARK REAL START OF DEST.
020454  163702  017364                                 SUB E0,R2
020460  005077  176674                         3$:     CLR @EORSTK             ;ALL CHARS. TRANSFERED
020464  023702  017366                         4$:     CMP E1,R2               ;WHO'S IN HIGH MEMORY
020470  103407                                         BLO EMRFWD              ;MOVE FORWARD
020472  013703  017366          EMRBKD:                MOV E1,R3               ;SOURCE START POINTER
020476  010204                                         MOV R2,R4               ;DEST. START POINTER
020500  020401                                 1$:     CMP R4,R1               ;XFER COMPLETE
020502  001406                                         BEQ EMRFIL              ;YES
020504  112324                                         MOVB (R3)+,(R4)+        ;XFER CHAR.
020506  000774                                         BR 1$
020510  020102                  EMRFWD:                CMP R1,R2               ;XFER COMPLETE
020512  001402                                         BEQ EMRFIL              ;YES
020514  114041                                         MOVB -(R0),-(R1)                ;XFER CHAR.
020516  000774                                         BR EMRFWD
020520  013703  017372          EMRFIL:                MOV E3,R3               ;ADD FILLER
020524  020302                                 2$:     CMP R3,R2               ;FILL COMPLETE
020526  001403                                         BEQ 1$                  ;YES
020530  113723  017374                                 MOVB E4,(R3)+           ;XFER FILL
020534  000773                                         BR 2$
020536  013700  017360                         1$:     MOV EORSTK,R0           ;RETURN CLEAN UP
020542  005720                                         TST (R0)+               ;R0 = R0
020544  005020                                         CLR (R0)+               ;R1 = 0
020546  005020                                         CLR (R0)+               ;R2 = 0
020550  005020                                         CLR (R0)+               ;R3 = 0
020552  013720  017374                                 MOV E4,(R0)+            ;R4 = R4
020556  013710  017376                                 MOV E5,(R0)             ;R5 = R5
020562  023737  017364  017370                         CMP E0,E2               ;SET CC BITS
020570  013777  177776  176564                         MOV EPSW,@EOPSW         ;RETURN TO USER
020576  000207                                         RTS PC
```

```
                                                .SBTTL                  COMPARE STRING
020600  013700  017364          ECMPC:          MOV E0,R0               ;CAL. END OF SCR1
020604  063700  017366                          ADD E1,R0
020610  013701  017370                          MOV E2,R1               ;CAL. END OF SCR2
020614  063701  017372                          ADD E3,R1
020620  013702  017366                          MOV E1,R2               ;START OF SCR1
020624  013703  017372                          MOV E3,R3               ;START OF SCR2
020630  020002                          1$:     CMP R0,R2               ;END OF SCR1
020632  001427                                  BEQ ENDA                ;YES
020634  020103                                  CMP R1,R3               ;END OF SCR2
020636  001445                                  BEQ ENDB                ;YES
020640  121213                                  CMPB (R2),(R3)          ;SET CC BITS
020642  013777  177776  176512                  MOV EPSW,@EOPSW         ;STORE STATUS
020650  122322                                  CMPB (R3)+,(R2)+                ;FIND NON MATCHING CHARS.
020652  001766                                  BEQ 1$                  ;KEEP TRYING
020654  005303                                  DEC R3                  ;ADJ SCR1 POINTER
020656  005302                                  DEC R2                  ;ADJ SCR2 POINTER
020660  160301                  ECMOUT:         SUB R3,R1               ;NO. OF CHARS. LEFT IN SCR2
020662  160200                                  SUB R2,R0               ;NO. OF CHARS. LEFT IN SCR1
020664  013704  017360          EMATOT:         MOV EORSTK,R4           ;REGISTER DUMP POINTER
020670  010024                                  MOV R0,(R4)+            ;R0 = SCR1 LEN
020672  010224                                  MOV R2,(R4)+            ;R1 = SCR1 START
020674  010124                                  MOV R1,(R4)+            ;R2 = SCR2 LEN
020676  010324                                  MOV R3,(R4)+            ;R3 = SCR2 START
020700  013724  017374                          MOV E4,(R4)+            ;R4 = R4
020704  013724  017376                          MOV E5,(R4)+            ;R5 = R5
020710  000207                                  RTS PC
020712  020103                  ENDA:           CMP R1,R3               ;END SCR2 ?
020714  001004                                  BNE 1$
020716  013777  177776  176436                  MOV EPSW,@EOPSW         ;YES - STORE STATUS
020724  000755                                  BR ECMOUT
020726  123713  017374                  1$:     CMPB E4,(R3)            ;SET CC BITS
020732  013777  177776  176422                  MOV EPSW,@EOPSW         ;STORE RESULT
020740  123723  017374                          CMPB E4,(R3)+           ;FIND NON MATCHING CHARS.
020744  001762                                  BEQ ENDA                ;KEEP TRYING
020746  005303                                  DEC R3                  ;ADJ SCR2 POINTER
020750  000743                                  BR ECMOUT
020752  020002                  ENDB:           CMP R0,R2               ;END SCR1
020754  001741                                  BEQ ECMOUT              ;YES
020756  121237  017374                          CMPB (R2),E4            ;SET CC BITS
020762  013777  177776  176372                  MOV EPSW,@EOPSW         ;SAVE RESULT
020770  123722  017374                          CMPB E4,(R2)+           ;FIND NON MATCHING CHARS.
020774  001766                                  BEQ ENDB                ;KEEP TRYING
020776  005302                                  DEC R2                  ;ADJ POINTER
021000  000727                                  BR ECMOUT
```

```
                                                     .SBTTL               MATCH STRING
021002  013700  017364           EMTCHC:             MOV E0,R0            ;CALCULATE END OF SRC
021006  063700  017366                               ADD E1,R0
021012  013701  017370                               MOV E2,R1            ;CALCULATE END OF OBJ
021016  063701  017372                               ADD E3,R1
021022  013702  017366                               MOV E1,R2            ;START OF SRC
021026  013703  017372                               MOV E3,R3            ;START OF OBJ
021032  010204                               4$:     MOV R2,R4            ;SAVE START OF SRC
021034  020103                               1$:     CMP R1,R3            ;OBJ FOUND IN STRING?
021036  001411                                       BEQ 3$               ;YES
021040  020200                                       CMP R2,R0            ;END OF STRING AND NO MATCH
021042  001410                                       BEQ 2$               ;YES
021044  122322                                       CMPB (R3)+,(R2)+     ;DO CHARS. MATCH
021046  001772                                       BEQ 1$               ;YES
021050  013703  017372                               MOV E3,R3            ;NO , SO RESET OBJ POINTER
021054  005204                                       INC R4               ;ADVANCE SRC POINTER TO ONE CHAR
                                                                          ;  POSITION BEYOND WHERE IT WAS
021056  010402                                       MOV R4,R2
021060  000764                                       BR 4$
021062  010402                               3$:     MOV R4,R2
021064  013703  017372                       2$:     MOV E3,R3            ;RESTORE OBJ.LEN AND OBJ.ADR
021070  013701  017370                               MOV E2,R1
021074  160200                                       SUB R2,R0            ;SET CC BITS
021076  005700                                       TST R0
021100  013777  177776  176254                       MOV EPSW,@EOPSW      ;SAVE RESULT
021106  000137  020664                               JMP EMATOT
```

```
                                         .SBTTL          SEARCH FOR NON GROUP CHARS.
021112  013700  017366          ESPNC:   MOV E1,R0       ;CALCULATE END OF SOURCE
021116  063700  017364                   ADD E0,R0       ;
021122  013701  017366                   MOV E1,R1       ;START OF SOURCE
021126  020100                      1$:  CMP R1,R0       ;COMPLETE
021130  001476                           BEQ ESPND       ;YES
021132  112137  017402                   MOVB (R1)+,TEMP ;TABLE OFFSET
021136  105037  017403                   CLRB TEMP+1     ;LOWER BYTE ONLY
021142  063737  017376  017402           ADD E5,TEMP     ;TABLE DATA
021150  117702  176226                   MOVB @TEMP,R2
021154  133702  017374                   BITB E4,R2      ;AND MASK
021160  001362                           BNE 1$          ;IF = 0 END SEARCH
021162  005301                           DEC R1          ;ADJ POINTER
021164  000137  021326                   JMP ESPND
```

```
                                                        .SBTTL              SEARCH FOR GROUP CHARS.
021170  013700  017366                  ESCNC:          MOV E1,R0           ;CALCULATE END OF SOURCE
021174  063700  017364                                  ADD E0,R0
021200  013701  017366                                  MOV E1,R1           ;START OF SOURCE
021204  020100                                  1$:     CMP R1,R0           ;COMPLETE ?
021206  001447                                          BEQ ESPND           ;YES
021210  112137  017402                                  MOVB (R1)+,TEMP     ;TABLE OFFSET
021214  105037  017403                                  CLRB TEMP+1         ;LOWER BYTE ONLY
021220  063737  017376  017402                          ADD E5,TEMP         ;TABLE DATA
021226  117702  176150                                  MOVB @TEMP,R2
021232  133702  017374                                  BITB E4,R2          ;AND MASK
021236  001762                                          BEQ 1$              ;IF <>0 END SEARCH
021240  005301                                          DEC R1              ;ADJ POINTER
021242  000137  021326                                  JMP ESPND
```

```
                                                .SBTTL          LOCC INSTRUCTION
021246  013700  017366      ELOCC:              MOV E1,R0       ;CALCULATE END ADDRESS
021252  010001                                  MOV R0,R1       ;SEARCH POINTER
021254  063700  017364                          ADD E0,R0
021260  020001                          1$:     CMP R0,R1       ;HAS SEARCH FAILED
021262  001421                                  BEQ ESPND       ;YES
021264  122137  017374                          CMPB (R1)+,E4   ;LOOK FOR CHAR.
021270  001373                                  BNE 1$          ;NOT FOUND YET
021272  005301                                  DEC R1          ;ADJUST POINTER
021274  000137  021326                          JMP ESPND       ;RETURN
```

```
8735                                                   .SBTTL            SKPC INSTRUCTION
8736  021300  013700  017366          ESKPC:           MOV E1,R0         ;CALCULATE END ADDRESS
8737  021304  010001                                   MOV R0,R1         ;START ADDRESS
8738  021306  063700  017364                           ADD E0,R0
8739  021312  020001                           1$:     CMP R0,R1         ;SEARCH FOR PASS
8740  021314  001404                                   BEQ ESPND         ;FOUND IT
8741  021316  122137  017374                           CMPB (R1)+,E4     ;LOOK FOR NOT CHAR.
8742  021322  001773                                   BEQ 1$
8743  021324  005301                                   DEC R1
8744  021326  160100                  ESPND:           SUB R1,R0         ;NO. OF CHARS.
8745  021330  013702  017360                           MOV EORSTK,R2     ;REGISTER DUMP POINTER
8746  021334  010022                                   MOV R0,(R2)+      ;R0 = LEN
8747  021336  010122                                   MOV R1,(R2)+      ;R1 = POS.
8748  021340  013722  017370                           MOV E2,(R2)+      ;R2 = R2
8749  021344  013722  017372                           MOV E3,(R2)+      ;R3 = R3
8750  021350  013722  017374                           MOV E4,(R2)+      ;R4 = R4
8751  021354  013722  017376                           MOV E5,(R2)+      ;R5 = R5
8752  021360  005700                                   TST R0            ;SET CC BITS
8753  021362  013777  177776  175772                   MOV EPSW,@EOPSW   ;STORE RESULTS
8754  021370  000207                                   RTS PC
```

```
                                                .SBTTL          DIGIT (SIGN) RETRIEVER
                                ;*****************************************************************************
                                ;  ROUTINE TO RETREIVE A PACKED OR ZONED DIGIT (OR SIGN) FROM A DECIMAL STRING.
                                ;
                                ;
                                ;       INPUTS: R0 = STRING ADDRESS
                                ;               R1 = TYPE & POSITION OF DIGIT REQUESTED WITHIN STRING
                                ;               ELSD = TYPE & STRING LENGTH
                                ;               EODD = ODD SIZE INDICATOR
                                ;
                                ;       OUTPUT: ERSNEG = SIGN (IS SIGN WAS REQUESTED)
                                ;                      = 0 IF REQUEST IS FOR UNSIGNED STRING SIGN.
                                ;               R2 = REQUESTED DIGIT (0 IF SIGN WAS REQUESTED)
                                ;               SGNBYT = SIGN BYTE IF SIGN WAS REQUESTED
                                ;               R0,R1,ELSD,EODD RETURNED UNDISTURBED
                                ;
                                ;       USAGE:  (MSD=MOST SIGNIFICANT DIGIT;LSD=LEAST SIGNIF DIGIT)
                                ;               TO REQUEST MSD  SET R1 = 0
                                ;               ''     ''   LSD  SET R1 = STRING LENGTH -1
                                ;               ''     ''   SIGN SET R1 = STRING LENGTH
                                ;
                                ;*****************************************************************************

021372  005737  026322          ESNK:           TST EPAK                ;PACKED OR ZONED
021376  100403                                  BMI 1$
021400  004737  021616                          JSR PC,EFNDTZ           ;ZONED
021404  000402                                  BR 2$
021406  004737  021414                  1$:     JSR PC,EFINDT           ;PACKED
021412  000207                          2$:     RTS PC

                                ;PACKED STRING DIGIT RETRIEVER
021414  010037  032130          EFINDT:         MOV R0,ETMPR0           ;SAVE INPUT REGISTERS
021420  010137  032132                          MOV R1,ETMPR1
021424  042701  070000                          BIC #070000,R1          ;CLEAR TYPE FIELD
021430  005737  025112                          TST EODD                ;POSITION CORRECT FOR ODD SIZE NUMBERS
021434  100401                                  BMI 10$
021436  005201                                  INC R1                  ;NUMBER IS EVEN
021440  010137  025074                  10$:    MOV R1,EFINDA           ;FIND WORD TO NIBBLE
021444  006237  025074                          ASR EFINDA
021450  042737  000001  025074                  BIC #1,EFINDA
021456  060037  025074                          ADD R0,EFINDA           ;ADD OFFSET TO POSITION
021462  013700  025074                          MOV EFINDA,R0           ;PLACE IN R0 FOR USE
021466  032701  000002                          BIT #2,R1               ;WHICH BYTE
021472  001403                                  BEQ 1$
021474  116002  000001                          MOVB 1(R0),R2           ;GRAB BYTE
021500  000401                                  BR 2$
021502  111002                          1$:     MOVB (R0),R2            ;GRAB LOWER BYTE
021504  110237  025166                  2$:     MOVB R2,SGNBYT          ;SAVE SIGN BYTE FOR POSSIBLE ERROR PRINT
021510  032701  000001                          BIT #1,R1               ;WHICH NIBBLE
021514  001433                                  BEQ 3$                  ;HIGH
021516  042702  177760                  4$:     BIC #177760,R2          ;LOW
021522  123737  025130  032132                  CMPB ELSD,ETMPR1        ;REQUEST FOR SIGN?
021530  001020                                  BNE 5$                  ;BRANCH IF NO
021532  005037  025062                          CLR ERSNEG
```

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021536  020227  000013                          CMP R2,#13              ;IS RETRIEVED SIGN NEG (1011)?
021542  001403                                  BEQ 7$                  ;BRANCH IF YES
021544  020227  000015                          CMP R2,#15              ;IS RETRIEVED SIGN NEG (1101)?
021550  001007                                  BNE 6$                  ;BRANCH IF NO
021552  122737  000160  032133        7$:       CMPB #160,ETMPR1+1      ;IS INST UNSIGNED PACKED?
021560  001403                                  BEQ 6$                  ;BRANCH IF YES
021562  012737  177777  025062                  MOV #177777,ERSNEG      ;SET NEG FLAG
021570  005002                        6$:       CLR R2
021572  013700  032130                5$:       MOV ETMPR0,R0           ;RESTORE REGISTERS
021576  013701  032132                          MOV ETMPR1,R1
021602  000207                                  RTS PC                  ;RETURN
021604  006202                        3$:       ASR R2                  ;SELECT UPPER NIBBLE
021606  006202                                  ASR R2
021610  006202                                  ASR R2
021612  006202                                  ASR R2
021614  000740                                  BR 4$

                              ;ZONED STRING DIGIT RETRIEVER
021616  010037  032130        EFNDTZ:           MOV R0,ETMPR0           ;SAVE REGISTER
021622  010137  032132                          MOV R1,ETMPR1
021626  013737  025130  025122                  MOV ELSD,ESLSD
021634  042701  070000                          BIC #070000,R1
021640  123737  025130  032132                  CMPB ELSD,ETMPR1        ;REQUEST FOR SIGN?
021646  001442                                  BEQ 1$                  ;BRANCH IF YES
021650  122737  000040  032133        6$:       CMPB #040,ETMPR1+1      ;IS DESC TYPE TRAILING OVERPUNCH?
021656  001405                                  BEQ 4$                  ;BRANCH IF YES
021660  122737  000060  032133                  CMPB #060,ETMPR1+1      ;IS DESC TYPE LEADING OVERPUNCH?
021666  001411                                  BEQ 5$                  ;BRANCH IF YES
021670  000415                                  BR 3$

021672  005337  025130                4$:       DEC ELSD                ;TYPE = TRAILING OVERPUNCH
021676  123701  025130                          CMPB ELSD,R1            ;IS DIGIT REQUESTED PART OF THE
                                                                        ;  ENCODED SIGN DIGIT?
021702  001010                                  BNE 3$                  ;BRANCH IF NO
021704  004737  022230                          JSR PC,DECZO            ;DECODE OVERPUNCH BYTE FOR DIGIT
021710  000407                                  BR 2$

021712                                5$:                               ;TYPE = LEADING OVERPUNCH
021712  005701                                  TST R1                  ;IS DIGIT REQUESTED PART OF ENCODED
                                                                        ;  SIGN DIGIT?
021714  001003                                  BNE 3$                  ;BRANCH IF NO
021716  004737  022230                          JSR PC,DECZO            ;DECODE OVERPUNCH BYTE
021722  000402                                  BR 2$

021724  060100                        3$:       ADD R1,R0               ;BYTE ADDRESS
021726  111002                                  MOVB (R0),R2            ;DATA
021730  042702  177760                2$:       BIC #177760,R2          ;MASK OFF JUNK
021734  013700  032130                          MOV ETMPR0,R0           ;RESTORE REGISTER
021740  013701  032132                          MOV ETMPR1,R1
021744  013737  025122  025130                  MOV ESLSD,ELSD
021752  000207                                  RTS PC
021754                                1$:                               ;SIGN REQUESTED
021754  105737  025130                          TSTB ELSD               ;IS STRING LEN = 0?
021760  001020                                  BNE 10$                 ;BRANCH IF NO
```

```
021762  122737  000100  032133              CMPB #100,ETMPR1+1       ;TYPE = TRAILING SEPARATE?
021770  001002                              BNE 103$                 ;BRANCH IF NO
021772  000137  022154                      JMP 14$                  ;RETURN SIGN AT 'A'
021776  122737  000120  032133      103$:   CMPB #120,ETMPR1+1       ;IS STRING TYPE LEADING SEPARATE?
                                                                     ;NOTE: SEPARATE TYPE ARE THE ONLY
                                                                     ;      0 LEN ZONED STRING THAT
                                                                     ;      THAT OCCUPIES MEMORY.
022004  001002                              BNE 102$                 ;BRANCH IF NO
022006  000137  022202                      JMP 15$                  ;RETURN SIGN AT 'A-1'
022012  005037  025166              102$:   CLR SGNBYT               ;CLEAR SIGN BYTE FOR POSSIBLE ERROR PRINT
022016  000137  022054                      JMP 100$                 ;RETURN + SIGN

022022  122737  000000  032133      10$:    CMPB #000,ETMPR1+1       ;IS TYPE = SIGNED ZONED?
022030  001022                              BNE 11$                  ;BRANCH IF NO
022032  060100                              ADD R1,R0                ;FORM SIGN ADDRESS
022034  114002                              MOVB -(R0),R2
022036  010237  025166                      MOV R2,SGNBYT            ;SAVE SIGN BYTE
022042  042702  177417                      BIC #177417,R2           ;LOOK ONLY AT SIGN
022046  020227  000160                      CMP R2,#160              ;IS IT (0111) NEGATIVE
022052  001404                              BEQ 101$                 ;BRANCH IF YES
022054  005037  025062              100$:   CLR ERSNEG               ;SET SIGN FLAG TO +
022060  005002                              CLR R2
022062  000722                              BR 2$

022064  012737  177777  025062      101$:   MOV #177777,ERSNEG       ;SET SIGN FLAG TO '-'
022072  005002                              CLR R2
022074  000715                              BR 2$
022076  122737  000020  032133      11$:    CMPB #020,ETMPR1+1       ;IS TYPE = UNSIGNED ZONED?
022104  001004                              BNE 12$                  ;BRANCH IF NO
022106  060100                              ADD R1,R0
022110  114037  025166                      MOVB -(R0),SGNBYT        ;SAVE SIGN BYTE
022114  000757                              BR 100$
022116  122737  000040  032133      12$:    CMPB #040,ETMPR1+1       ;IS TYPE = TRAILING OVERPUNCH?
022124  001005                              BNE 13$                  ;BRANCH IF NO
022126  005301                              DEC R1
022130  004737  022230              120$:   JSR PC,DECZO
022134  005002                              CLR R2
022136  000674                              BR 2$

022140  122737  000060  032133      13$:    CMPB #060,ETMPR1+1       ;IS TYPE = LEADING OVERPUNCH?
022146  001002                              BNE 14$                  ;BRANCH IF NO
022150  005001                              CLR R1
022152  000766                              BR 120$
022154  122737  000100  032133      14$:    CMPB #100,ETMPR1+1       ;IS TYPE = TRAILING SEPARATE
022162  001007                              BNE 15$                  ;BRANCH IF NO
022164  060100                              ADD R1,R0                ;FORM ADDRESS OF SIGN
022166  111037  025166                      MOVB (R0),SGNBYT         ;SAVE SIGN BYTE
022172  121027  000055                      CMPB (R0),#55            ;IS SIGN = '-'
022176  001326                              BNE 100$                 ;BRANCH IF NO
022200  000731                              BR 101$
022202  122737  000120  032133      15$:    CMPB #120,ETMPR1+1       ;IS TYPE=LEADING SEPARATE
022210  001401                              BEQ 115$
022212  000000                              HALT                     ;ILLEGAL ZONED DATA TYPE
022214  114037  025166              115$:   MOVB -(R0),SGNBYT
```

```
022220  121027  000055                           CMPB (R0),#55           ;IS SIGN = '-' ?
022224  001313                                   BNE 100$                ;BRANCH IF NO
022226  000716                                   BR 101$



                                ;
                                ;SUBROUTINE TO DECODE ZONED OVERPUNCH SIGN DIGIT BYTE
                                ;
022230  060100                  DECZO:           ADD R1,R0               ;FIND DIGIT BY DECODING
                                                                         ;DIGIT RETURNED IN R2; SIGN IN ERSNEG
022232  111002                                   MOVB (R0),R2            ;GET ENCODED BYTE
022234  010237  025166                           MOV R2,SGNBYT           ;SAVE SIGN BYTE FOR POSSIBLE ERROR PRINTOUT
022240  042702  177417                           BIC #177417,R2          ;LOOK AT HIGH NIBBLE
022244  020227  000160                           CMP R2,#160             ;IS HIGH NIBBLE A 7
022250  001014                                   BNE 1$                  ;BRANCH IF NO
022252  111002                                   MOVB (R0),R2            ;DIGIT = 0
022254  032702  000002                   5$:     BIT #2,R2               ;IS SIGN + OR -
022260  001403                                   BEQ 2$                  ;BRANCH IF -
022262  005037  025062                           CLR ERSNEG
022266  000403                                   BR 3$
022270  012737  177777  025062           2$:     MOV #177777,ERSNEG
022276  005002                           3$:     CLR R2
022300  000207                                   RTS PC
022302  020227  000120                   1$:     CMP R2,#120             ;IS HIGH NIBBLE A 5?
022306  001014                                   BNE 4$                  ;BRANCH IF NO
022310  111002                                   MOVB (R0),R2
022312  032702  000010                           BIT #10,R2              ;IS DIGIT = 0?
022316  001356                                   BNE 5$                  ;BRANCH IF YES
022320  012737  177777  025062                   MOV #177777,ERSNEG      ;DIGIT IS NEG
022326  042702  177760                           BIC #177760,R2
022332  062702  000007                           ADD #7,R2
022336  000207                                   RTS PC
022340  020227  000060                   4$:     CMP R2,#060             ;IS HIGH NIBBLE A 3?
022344  001006                                   BNE 6$                  ;BRANCH IF NO
022346  005037  025062                           CLR ERSNEG              ;SIGN IS POSITIVE
022352  111002                                   MOVB (R0),R2
022354  042702  177760                           BIC #177760,R2          ;DIGIT = LOW NIBBLE OF BYTE
022360  000207                                   RTS PC
022362  020227  000100                   6$:     CMP R2,#100             ;IS HIGH NIBBLE A 4?
022366  001404                                   BEQ 61$
022370  005737  002304                           TST PRTSGN              ;DECIMAL PRINTING IN PROGRESS?
022374  001016                                   BNE 62$                 ;BRANCH IF YES (DONT WANT TO HALT IN
                                                                         ;  MIDDLE OF ERROR PRINTOUT)
022376  000000                                   HALT                    ;ILLEGAL ENCODING OF OVERPUNCH DIGIT
022400  111002                           61$:    MOVB (R0),R2
022402  042702  177760                           BIC #177760,R2
022406  020227  000012                           CMP R2,#12              ;IS DIGIT POSITIVE?
022412  103407                                   BLO 62$                 ;BRANCH IF YES
022414  012737  177777  025062                   MOV #177777,ERSNEG
022422  042702  000010                           BIC #10,R2
022426  005302                                   DEC R2
022430  000207                                   RTS PC
022432  005037  025062                   62$:    CLR ERSNEG
022436  000207                                   RTS PC
```

```
                                          .SBTTL                  DIGIT (SIGN) PUSHER
                                ;*************************************************************************
                                ;
                                ;ROUTINE TO PUSH A PACKED OR ZONED DIGIT (OR SIGN) ONTO A DECIMAL STRING
                                ;
                                ;         INPUTS: R0 = STRING ADDRESS
                                ;                 R1 = TYPE & POSITION OF WHERE TO STORE DIGIT IN STRING
                                ;                 ELSD = TYPE & STRING LEN
                                ;                 EODD = ODD SIZE INDICATOR
                                ;                 ERSNEG = SIGN IF SIGN IS TO BE STORED
                                ;                         (EXCEPT 1111 IS ALWAYS STORED FOR UNSIGNED PACKED STRINGS)
                                ;                 R2 = DIGIT TO PUSH INTO STRING
                                ;
                                ;         OUTPUT: ERSNEG = 0 FOR UNSIGNED STRINGS SIGN
                                ;                 R0,R1,ELSD,EODD,R2 RETURNED UNDISTURBED
                                ;
                                ;         USAGE:  TO PUSH MSD  SET R1 = 0
                                ;                 ''   ''  LSD  SET R1 = STRING LEN - 1
                                ;                 ''   ''  SIGN SET R1 = STRING LEN
                                ;                 IF STRING LEN = 0 THEN STORED BYTE = 0,SIGN
                                ;
                                ;*************************************************************************
                                ;
022440  005737  026322          EPUSH:            TST EPAK                ;ZONED OR PACKED STRING?
022444  100403                                    BMI 1$
022446  004737  022716                            JSR PC,EPUDTZ           ;ZONED
022452  000402                                    BR 2$
022454  004737  022462                  1$:       JSR PC,EPUTDT           ;PACKED
022460  000207                          2$:       RTS PC

                                ;PACKED STRING NIBBLE PUSHER
022462  010037  032130          EPUTDT:           MOV R0,ETMPR0           ;SAVE REGISTERS
022466  010137  032132                            MOV R1,ETMPR1
022472  042701  070000                            BIC #070000,R1          ;CLEAR TYPE FIELD
022476  010237  032134                            MOV R2,ETMPR2
022502  005737  025112                            TST EODD                ;POSITION CORRECT FOR ODD SIZE NUMBERS
022506  100401                                    BMI 10$
022510  005201                                    INC R1
022512  010137  025074                  10$:      MOV R1,EFINDA           ;FIND WORD TO NIBBLE
022516  006237  025074                            ASR EFINDA
022522  063700  025074                            ADD EFINDA,R0
022526  042702  177760                            BIC #177760,R2          ;MASK JUNK FROM DATA
022532  123737  025130  032132                    CMPB ELSD,ETMPR1        ;REQUEST TO INSERT SIGN?
022540  001021                                    BNE 5$                  ;BRANCH IF NO
022542  122737  000160  032133                    CMPB #160,ETMPR1+1      ;UNSIGNED INST?
022550  001005                                    BNE 7$                  ;BRANCH IF NO
022552  112702  000017                            MOVB #17,R2             ;YES - STORE (1111)
022556  005037  025062                            CLR ERSNEG              ;SET SIGN FLAG TO POSITIVE
022562  000410                                    BR 5$
022564  005737  025062                  7$:       TST ERSNEG              ;STORE + SIGN?
022570  001403                                    BEQ 6$                  ;BRANCH IF YES
022572  112702  000015                            MOVB #15,R2             ;STORE MINUS SIGN
022576  000402                                    BR 5$
022600  112702  000014                  6$:       MOVB #14,R2             ;STORE POSITIVE SIGN
```

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022604  010237  017402                  5$:     MOV R2,TEMP             ;HOLD DATA
022610  012737  000017  025106          4$:     MOV #17,EMASK           ;LOW NIBBLE MASK
022616  032701  000001                          BIT #1,R1               ;WHICH NIBBLE
022622  001013                                  BNE 2$                  ;LOW
022624  006337  017402                          ASL TEMP                ;POSITION FOR HIGH NIBBLE
022630  006337  017402                          ASL TEMP
022634  006337  017402                          ASL TEMP
022640  006337  017402                          ASL TEMP
022644  012737  000360  025106                  MOV #360,EMASK          ;NIBBLE MASK
022652  143710  025106                  2$:     BICB EMASK,(R0)         ;CLEAR NIBBLE BEFORE LOAD
022656  153710  017402                          BISB TEMP,(R0)          ;LOAD NIBBLE
022662  005737  025112                          TST EODD                ;IF NUMBER IS EVEN LENGTH
022666  100404                                  BMI 3$
022670  005037  017402                          CLR TEMP                ;AND THIS IS LAST DIGIT
022674  005301                                  DEC R1
022676  001744                                  BEQ 4$                  ;THEN CLEAR UNUSED NIBBLE
022700  013700  032130                  3$:     MOV ETMPR0,R0           ;RESTORE REGISTERS
022704  013701  032132                          MOV ETMPR1,R1
022710  013702  032134                          MOV ETMPR2,R2
022714  000207                                  RTS PC

                                ;ZONED STRING DIGIT PUSHER
022716  010037  032130          EPUDTZ:         MOV R0,ETMPR0           ;SAVE REGISTER
022722  010137  032132                          MOV R1,ETMPR1
022726  042701  070000                          BIC #070000,R1
022732  010237  032134                          MOV R2,ETMPR2
022736  042702  177760                          BIC #177760,R2          ;MASK OFF JUNK
022742  052702  000060                          BIS #60,R2              ;ADD JUNK
022746  123737  025130  032132                  CMPB ELSD,ETMPR1        ;REQUEST TO PUSH SIGN?
022754  001411                                  BEQ 1$                  ;BRANCH IF YES
022756  060100                                  ADD R1,R0               ;WORD ADDRESS
022760  110210                                  MOVB R2,(R0)            ;DEPOSIT DATA
022762  013700  032130                  2$:     MOV ETMPR0,R0           ;RESTORE REGISTER
022766  013701  032132                          MOV ETMPR1,R1
022772  013702  032134                          MOV ETMPR2,R2
022776  000207                                  RTS PC
023000  105737  025130                  1$:     TSTB ELSD               ;IS STRING 0 IN LEN
023004  001015                                  BNE 3$                  ;BRANCH IF NO
023006  122737  000100  032133                  CMPB #100,ETMPR1+1      ;IS SIGN = TRAILING SEPARATE
023014  001001                                  BNE 100$
023016  000472                                  BR 14$                  ;PUSH TRAILING SEP SIGN INTO 'A'
023020  122737  000120  032133          100$:   CMPB #120,ETMPR1+1      ;IS STRING TYPE = LEADING SEPARATE
023026  001001                                  BNE 4$                  ;BRANCH IF NO
023030  000503                                  BR 16$                  ;PUSH LEADING SEPARATE SIGN INTO 'A-1'
023032  005037  025062                  4$:     CLR ERSNEG
023036  000751                                  BR 2$
023040  122737  000000  032133          3$:     CMPB #000,ETMPR1+1      ;IS TYPE=SIGNED ZONED
023046  001021                                  BNE 5$                  ;BRANCH IF NO
023050  005737  025062                          TST ERSNEG              ;WHAT SIGN IS TO BE STORED
023054  001003                                  BNE 6$
023056  112702  000003                          MOVB #3,R2              ;STORE + SIGN
023062  000402                                  BR 7$
023064  112702  000007                  6$:     MOVB #7,R2              ;STORE - SIGN
023070  060100                          7$:     ADD R1,R0               ;FORM SIGN BYTE ADDRESS
```

```
023072  142740  000360                  BICB #360,-(R0)         ;CLEAR POSITION FOR SIGN
023076  006302                          ASL R2                  ;SHIFT SIGN INTO HIGH NIBBLE POSITION
023100  006302                          ASL R2
023102  006302                          ASL R2
023104  006302                          ASL R2
023106  150210                          BISB R2,(R0)            ;INSERT SIGN
023110  000724                          BR 2$
023112  122737  000020  032133  5$:     CMPB #020,ETMPR1+1      ;IS TYPE = UNSIGNED ZONED
023120  001001                          BNE 10$                 ;BRANCH IF NO
023122  000743                          BR 4$                   ;SIGN  = 3
023124  122737  000040  032133  10$:    CMPB #040,ETMPR1+1      ;IS TYPE = TRAILING OVERPUNCHED?
023132  001016                          BNE 11$
023134  060100                          ADD R1,R0
023136  114002                  15$:    MOVB -(R0),R2           ;PICKUP DIGIT TO BE ENCODED WITH SIGN
023140  042702  000060                  BIC #60,R2              ;STRIP JUNK THAT WAS PREVIOUSLY ADDED.
023144  005737  025062                  TST ERSNEG              ;IS SIGN NEGATIVE?
023150  001004                          BNE 12$                 ;BRANCH IF YES
023152  062702  025142                  ADD #OPEPTB,R2          ;ENCODE DIGIT WITH + SIGN
023156  111210                  13$:    MOVB (R2),(R0)          ;STORE ENCODED BYTE IN STRING.
023160  000700                          BR 2$

023162  062702  025154          12$:    ADD #OPENTB,R2          ;ENCODE DIGIT WITH - SIGN
023166  000773                          BR 13$                  ;STORE ENCODED BYTE IN STRING.
023170  122737  000060  032133  11$:    CMPB #060,ETMPR1+1      ;IS TYPE = LEADING OVERPUNCH?
023176  001002                          BNE 14$                 ;BRANCH IF NO
023200  005200                          INC R0                  ;ADJUST R0 TO ENABLE USE
                                                                ;  OF TRAILING OVERPUNCH ROUTINE
023202  000755                          BR 15$

023204  122737  000100  032133  14$:    CMPB #100,ETMPR1+1      ;IS TYPE=TRAILING SEPARATE?
023212  001012                          BNE 16$                 ;BRANCH IF NO
023214  060100                          ADD R1,R0
023216  005737  025062          21$:    TST ERSNEG              ;IS SIGN NEGATIVE?
023222  001003                          BNE 17$                 ;BRANCH IF YES
023224  112710  000053                  MOVB #053,(R0)          ;STORE + SIGN
023230  000654                          BR 2$
023232  112710  000055          17$:    MOVB #055,(R0)          ;STORE - SIGN
023236  000651                          BR 2$

023240  122737  000120  032133  16$:    CMPB #120,ETMPR1+1      ;IS TYPE = LEADING SEPARATE?
023246  001401                          BEQ 20$                 ;BRANCH IF YES
023250  000000                          HALT                    ;ILLEGAL ZONED DATA TYPE
023252  005300                  20$:    DEC R0
023254  000760                          BR 21$
```

```
                                                  .SBTTL               DECIMAL ADDER
023256  063737  025070  025072  EDCAD:            ADD EDCOPA,EDCOPB    ;ADD TWO SOURCE DIGITS
023264  005737  025066                            TST ECARRY           ;ANY CARRY OR BORROW
023270  001410                                    BEQ 1$               ;NO
023272  105737  025067                            TSTB ECARRY+1        ;WHICH ONE
023276  001403                                    BEQ 2$
023300  005337  025072                            DEC EDCOPB           ;BORROW
023304  000402                                    BR 1$
023306  005237  025072                    2$:     INC EDCOPB           ;CARRY
023312  005037  025066                    1$:     CLR ECARRY           ;RESET CARRY/BORROW FLAG
023316  005737  025072                            TST EDCOPB           ;IS RESULT NEGATIVE
023322  100006                                    BPL 3$               ;NO
023324  062737  000012  025072                    ADD #12,EDCOPB       ;MAKE VALUE POSITIVE
023332  112737  000377  025067                    MOVB #377,ECARRY+1   ;SET BORROW FLAG
023340  023727  025072  000011            3$:     CMP EDCOPB,#11       ;IS RESULT > 9
023346  101411                                    BLOS 4$              ;NO
023350  062737  000006  025072                    ADD #6,EDCOPB        ;CONVERT TO DECIMAL
023356  042737  177760  025072                    BIC #177760,EDCOPB
023364  112737  000377  025066                    MOVB #377,ECARRY
023372  053737  025072  025104            4$:     BIS EDCOPB,EADSUM    ;RESULT = 0 INDICATOR
023400  000207                                    RTS PC
```

```
                                                  .SBTTL            ADDP,ADDN,SUBP,SUBN INSTRUCTIONS
023402  012737  177777  026322  EADDP:            MOV #177777,EPAK  ;INDICATE PACKED MODE
023410  000430                                    BR EADSUB
023412  005037  026322          EADDN:            CLR EPAK          ;INDICATE ZONED MODE
023416  000425                                    BR EADSUB
023420  012737  177777  026322  ESUBP:            MOV #177777,EPAK  ;INDICATE PACKED MODE
023426  012737  177777  025124                    MOV #177777,ESUBF ;SET SUBTRACT FLAG
023434  005037  025112                            CLR EODD
023440  032737  000001  017364                    BIT #1,E0         ;IS NUMBER ODD LENGTH
023446  001411                                    BEQ EADSUB        ;NO
023450  012737  177777  025112                    MOV #177777,EODD
023456  000405                                    BR EADSUB
023460  005037  026322          ESUBN:            CLR EPAK          ;INDICATE ZONED MODE
023464  012737  177777  025124                    MOV #177777,ESUBF ;SET SUBTRACT FLAG
023472  005037  025114          EADSUB:           CLR EAODD         ;ODD SIZE INDICATORS
023476  005037  025116                            CLR EBODD
023502  005037  025120                            CLR ECODD
023506  013737  017364  025134                    MOV E0,TE0        ;SAVE STRING LEN WORDS
023514  013737  017370  025136                    MOV E2,TE2
023522  013737  017374  025140                    MOV E4,TE4
023530  032737  000001  017364                    BIT #1,E0         ;IF ODD SIZE SET INDICATOR
023536  001403                                    BEQ 10$           ;EVEN NO. OF DIGITS
023540  012737  177777  025114                    MOV #177777,EAODD ;SHOW ITS ODD
023546  032737  000001  017370          10$:      BIT #1,E2         ;IF ODD SIZE SET INDICATOR
023554  001403                                    BEQ 11$           ;EVEN NO. OF DIGITS
023556  012737  177777  025116                    MOV #177777,EBODD ;SHOW ITS ODD
023564  032737  000001  017374          11$:      BIT #1,E4         ;IS RESULT ODD LENGTH
023572  001403                                    BEQ 12$           ;NO
023574  012737  177777  025120                    MOV #177777,ECODD ;SET ODD INDICATOR
023602  013700  017366                  12$:      MOV E1,R0         ;FIND SIGN OF SRC1
023606  013701  017364                            MOV E0,R1
023612  013737  017364  025130                    MOV E0,ELSD
023620  013737  025114  025112                    MOV EAODD,EODD
023626  004737  021372                            JSR PC,ESNK
023632  005037  025052                            CLR ES1
023636  005737  025124                            TST ESUBF         ;SUBTRACT INST?
023642  001007                                    BNE 1$            ;BRANCH IF YES
023644  005737  025062                            TST ERSNEG        ;IS SIGN NEGATIVE
023650  001407                                    BEQ 2$            ;BRANCH IF NO
023652  012737  177777  025052          3$:       MOV #177777,ES1   ;SET NEGATIVE INDICATOR
023660  000403                                    BR 2$
023662  005737  025062                  1$:       TST ERSNEG        ;SUBT INST  - IS SIGN NEGATIVE
023666  001771                                    BEQ 3$            ;BRANCH IF NO TO SET NEG. INDICATOR
                                                                    ;NOTE: FOR SUBT, THE SIGN OF SRC1
                                                                    ;       IS INVERTED AND THE ADD IS USED.
023670  013700  017372                  2$:       MOV E3,R0         ;FIND SIGN OF SRC2
023674  013701  017370                            MOV E2,R1
023700  013737  017370  025130                    MOV E2,ELSD
023706  013737  025116  025112                    MOV EBODD,EODD
023714  004737  021372                            JSR PC,ESNK
023720  005037  025054                            CLR ES2
023724  005737  025062                            TST ERSNEG        ;IS SIGN NEGATIVE?
023730  001403                                    BEQ EADSB1        ;BRANCH IF NO
023732  012737  177777  025054                    MOV #177777,ES2   ;SET NEGATIVE INDICATOR
```

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023740 005037 026332          EADSB1:          CLR EVTSSV             ;RESET RESULT SIZE INDICATOR
023744 005037 025056                           CLR EANEG              ;RESET SUBTRACT FLAGS
023750 005037 025060                           CLR EBNEG
023754 023737 025052 025054                    CMP ES1,ES2            ;ADD OR SUBTRACT DISPATCH
023762 001527                                  BEQ EADAD              ;LIKE SIGNS ADD
023764 113703 017370                           MOVB E2,R3             ;UNLIKE SIGNS SUBTRACT
023770 123737 017364 017370                    CMPB E0,E2             ;WHO IS LONGER
023776 103402                                  BLO 1$
024000 113703 017364                           MOVB E0,R3             ;MAXIMUM LENGTH
024004 113704 017364                   1$:     MOVB E0,R4             ;POSITION OF SCR1
024010 113705 017370                           MOVB E2,R5             ;POSITION OF SCR2
024014 160304                                  SUB R3,R4              ;START POSITION
024016 160305                                  SUB R3,R5
024020 123704 017364                   6$:     CMPB E0,R4             ;EXIT HERE INDICATES
024024 001470                                  BEQ EAIS               ;RESULT = 0
024026 005037 025046                           CLR EOPA               ;RESET DATA REGS
024032 005037 025050                           CLR EOPB
024036 005704                                  TST R4                 ;IS POSITION OF SCR1 VALID
024040 100424                                  BMI 2$                 ;NO
024042 013700 017366                           MOV E1,R0              ;GIT A OPERAND
024046 010401                                  MOV R4,R1
024050 013737 017364 025130                    MOV E0,ELSD
024056 013737 025114 025112                    MOV EAODD,EODD
024064 013737 017364 025132                    MOV E0,TEMPE           ;SET TYPE FIELD
024072 105037 025132                           CLRB TEMPE
024076 053701 025132                           BIS TEMPE,R1
024102 004737 021372                           JSR PC,ESNK
024106 010237 025046                           MOV R2,EOPA            ;DATA FOR COMPARE
024112 005705                          2$:     TST R5                 ;IS POSITION OF SCR2 VALID
024114 100424                                  BMI 4$       ;NO
024116 013700 017372                           MOV E3,R0              ;GIT B OPERAND
024122 010501                                  MOV R5,R1
024124 013737 017370 025130                    MOV E2,ELSD
024132 013737 025116 025112                    MOV EBODD,EODD
024140 013737 017370 025132                    MOV E2,TEMPE           ;SET TYPE FIELD
024146 105037 025132                           CLRB TEMPE
024152 053701 025132                           BIS TEMPE,R1
024156 004737 021372                           JSR PC,ESNK
024162 010237 025050                           MOV R2,EOPB            ;DATA FOR COMPARE
024166 023737 025046 025050            4$:     CMP EOPA,EOPB          ;WHO IS LARGER
024174 101004                                  BHI EAIS               ;A IS
024176 103412                                  BLO EBIS               ;B  IS
024200 005204                                  INC R4                 ;OH NO THEIR THE SAME
024202 005205                                  INC R5
024204 000705                                  BR 6$
024206 012737 177777 025060   EAIS:            MOV #177777,EBNEG      ;MAKE B NEGATIVE
024214 013737 025052 025062                    MOV ES1,ERSNEG         ;IF A IS NEGATIVE THEN RESULT IS
024222 000412                                  BR EADAD1
024224 012737 177777 025056   EBIS:            MOV #177777,EANEG      ;MAKE A NEGATIVE
024232 013737 025054 025062                    MOV ES2,ERSNEG         ;IF B IS NEGATIVE THEN RESULT IS
024240 000403                                  BR EADAD1
024242 013737 025052 025062   EADAD:           MOV ES1,ERSNEG         ;SIGN OF RESULT
024250 005037 025104          EADAD1:          CLR EADSUM             ;RESULT =0 INDICATOR
```

```
024254  013737  025062  025126                  MOV ERSNEG,SAVSGN          ;SAVE SIGN OF RESULT
024262  012700  026126                          MOV #EVRTAB+^D40,R0        ;CLEAR DATA AREA
024266  005040                          21$:    CLR -(R0)
024270  020027  026056                          CMP R0,#EVRTAB
024274  001374                                  BNE 21$
024276  012703  026126                          MOV #EVRTAB+^D40,R3        ;DEST. POINTER
024302  005037  025066                          CLR ECARRY                 ;RESET CARRY
024306  005037  026326                          CLR EVTPAS                 ;RESET PASS COUNTER
024312  005037  025064                  20$:    CLR ENOA                   ;NO A OPERAND FLAG
024316  105337  017364                          DECB E0                    ;A DIGIT POINTER
024322  100005                                  BPL 1$
024324  005237  025064                          INC ENOA                   ;NO DIGITS LEFT
024330  005037  025070                          CLR EDCOPA                 ;DIGIT = 0
024334  000404                                  BR 2$
024336  004737  024442                  1$:     JSR PC,EGTOPA              ;GIT A OPERAND
024342  010237  025070                          MOV R2,EDCOPA              ;SAVE VALUE
024346  105337  017370                  2$:     DECB E2         ;B DIGIT POINTER
024352  100006                                  BPL 3$
024354  005737  025064                          TST ENOA                   ;NO DIGITS LEFT
024360  001077                                  BNE EXT
024362  005037  025072                          CLR EDCOPB
024366  000404                                  BR 4$
024370  004737  024474                  3$:     JSR PC,EGTOPB              ;GIT B OPERAND
024374  010237  025072                          MOV R2,EDCOPB              ;SAVE VALUE
024400  005737  025056                  4$:     TST EANEG                  ;WANT A COMPLEMENTED
024404  100004                                  BPL 5$                     ;NO
024406  005137  025070                          COM EDCOPA                 ;YES
024412  005237  025070                          INC EDCOPA
024416  005737  025060                  5$:     TST EBNEG                  ;WANT B COMPLEMENTED
024422  100004                                  BPL 6$
024424  005137  025072                          COM EDCOPB                 ;YES
024430  005237  025072                          INC EDCOPB
024434  004737  024526                  6$:     JSR PC,EADIT               ;ADD DIGITS STORE RESULT
024440  000724                                  BR 20$

024442                          EGTOPA:                                    ;SUBROUTINE TO GET 'A' OPERAND
024442  013700  017366                          MOV E1,R0                  ;START ADDRESS OF NUMBER
024446  013701  017364                          MOV E0,R1                  ;DIGIT OF NUMBER
024452  013737  025114  025112                  MOV EAODD,EODD
024460  013737  025134  025130                  MOV TE0,ELSD
024466  004737  021372                          JSR PC,ESNK                ;CALL ROUTINE TO RETRIEVE DIGIT
024472  000207                                  RTS PC

024474                          EGTOPB:                                    ;SUBROUTINE TO GET 'B' OPERAND
024474  013737  025116  025112                  MOV EBODD,EODD
024502  013700  017372                          MOV E3,R0                  ;START ADDRESS OF NUMBER
024506  013701  017370                          MOV E2,R1                  ;DIGIT OF NUMBER
024512  013737  025136  025130                  MOV TE2,ELSD
024520  004737  021372                          JSR PC,ESNK                ;CALL ROUTINE TO RETRIEVE DIGIT
024524  000207                                  RTS PC

024526  004737  023256          EADIT:          JSR PC,EDCAD               ;ADD TWO DECIMAL DIGITS
024532  005237  026326                          INC EVTPAS                 ;BUMP PASS COUNTER
024536  005737  025072                          TST EDCOPB                 ;SAVE POSITION OF LAST VALID DIGIT
```

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024542  001403                                  BEQ 1$
024544  013737  026326  026332                  MOV EVTPAS,EVTSSV           ;SAVE POSITION
024552  113743  025072                  1$:     MOVB EDCOPB,-(R3)           ;SAVE RESULT
024556  000207                                  RTS PC
024560  005037  032146          EXT:            CLR ENZI                    ;INITIALIZE NONZERO DIGIT STORED INDICATOR TO ZE
024564  105737  025066                          TSTB ECARRY                 ;ANY CARRY FROM LAST ADD
024570  100007                                  BPL 1$                      ;NO
024572  112743  000001                          MOVB #1,-(R3)               ;ADD CARRY TO WORD
024576  005237  026326                          INC EVTPAS                  ;BUMP PASS COUNTER
024602  013737  026326  026332                  MOV EVTPAS,EVTSSV           ;STORE POSITION
024610  012703  026126                  1$:     MOV #EVRTAB+^D40,R3         ;ADDRESS OF DATA
024614  105337  017374                  2$:     DECB E4                     ;LAST TRANSFER COMPLETE
024620  100423                                  BMI 3$                      ;YES
024622  013700  017376                          MOV E5,R0                   ;START ADDRESS OF DEST.
024626  013701  017374                          MOV E4,R1                   ;DIGIT POSITION
024632  114302                                  MOVB -(R3),R2               ;DATA TO DEPOSIT
024634  005702                                  TST R2                      ;CHECK DIGIT BEING STORED IN DST
024636  001403                                  BEQ 7$
024640  012737  177777  032146                  MOV #177777,ENZI            ;DIGIT NOT = 0, SET INDICATOR
024646  013737  025120  025112          7$:     MOV ECODD,EODD
024654  013737  025140  025130                  MOV TE4,ELSD
024662  004737  022440                          JSR PC,EPUSH                ;CALL ROUTINE TO PUSH DIGIT ONTO DST STRING
024666  000752                                  BR 2$
024670  013701  025140                  3$:     MOV TE4,R1                  ;POSITION OF SIGN
024674  013737  025126  025062                  MOV SAVSGN,ERSNEG           ;SETUP ERSNEG WITH RESULT SIGN
024702  013737  025140  025130                  MOV TE4,ELSD
024710  005737  026332                          TST EVTSSV                  ;IF ZERO, SIGN = +
024714  001002                                  BNE 10$
024716  005037  025062                          CLR ERSNEG                  ;SET POSITIVE
024722  013700  017376                  10$:    MOV E5,R0                   ;START OF DEST.
024726  013737  025120  025112                  MOV ECODD,EODD
024734  004737  022440                          JSR PC,EPUSH                ;SAVE SIGN
024740  005077  172416          EXT1:           CLR @EOPSW                  ;RESET EMULATE PSW
024744  005737  032146                          TST ENZI                    ;IF = 0 SET Z BIT & SKIP OVER SETTING OF N BIT.
024750  001407                                  BEQ 1$
024752  005737  025062                          TST ERSNEG                  ;IF (-) SET N BIT
024756  100007                                  BPL 2$
024760  052777  000010  172374                  BIS #10,@EOPSW              ;SET N BIT
024766  000403                                  BR 2$
024770  052777  000004  172364          1$:     BIS #4,@EOPSW               ;COMP. LENGTH FOR OVERFLOW
024776  123737  025140  026332          2$:     CMPB TE4,EVTSSV             ;FIND LENGTH OF RESULT
025004  103003                                  BHIS 4$
025006  052777  000002  172346                  BIS #2,@EOPSW               ;SET OVERFLOW
025014  013702  017360                  4$:     MOV EORSTK,R2               ;REGISTER UNLOAD
025020  005022                                  CLR (R2)+                   ;R0 = 0
025022  005022                                  CLR (R2)+                   ;R1 = 0
025024  005022                                  CLR (R2)+                   ;R2 = 0
025026  005022                                  CLR (R2)+                   ;R3 = 0
025030  013722  025140                          MOV TE4,(R2)+               ;R4 = R4
025034  013722  017376                          MOV E5,(R2)+                ;R5 = R5
025040  005037  025124                          CLR ESUBF                   ;CLEAR SUBTRACT FLAG
025044  000207                                  RTS PC
```

```
 9365  025046  000000            EOPA:           .WORD 0
 9366  025050  000000            EOPB:           .WORD 0
 9367  025052  000000            ES1:            .WORD 0
 9368  025054  000000            ES2:            .WORD 0
 9369  025056  000000            EANEG:          .WORD 0
 9370  025060  000000            EBNEG:          .WORD 0
 9371  025062  000000            ERSNEG:         .WORD 0
 9372  025064  000000            ENOA:           .WORD 0
 9373  025066  000000            ECARRY:         .WORD 0
 9374  025070  000000            EDCOPA:         .WORD 0
 9375  025072  000000            EDCOPB:         .WORD 0
 9376  025074  000000            EFINDA:         .WORD 0
 9377  025076  000000            ESGNA:          .WORD 0
 9378  025100  000000            ESGNB:          .WORD 0
 9379  025102  000000            ESGNC:          .WORD 0
 9380  025104  000000            EADSUM:         .WORD 0
 9381  025106  000000            EMASK:          .WORD 0
 9382  025110  000000            TEMP1:          .WORD 0
 9383  025112  000000            EODD:           .WORD 0
 9384  025114  000000            EAODD:          .WORD 0
 9385  025116  000000            EBODD:          .WORD 0
 9386  025120  000000            ECODD:          .WORD 0
 9387  025122  000000            ESLSD:          .WORD 0
 9388  025124  000000            ESUBF:          .WORD 0
 9389  025126  000000            SAVSGN:         .WORD 0  .
 9390  025130  000000            ELSD:   .WORD 0
 9391  025132  000000            TEMPE:  .WORD 0
 9392  025134  000000            TE0:    .WORD 0
 9393  025136  000000            TE2:    .WORD 0
 9394  025140  000000            TE4:    .WORD 0
 9395  025142                    OPEPTB:                         ;OVERPUNCH SIGN DIGIT (PREFERRED ENCODINGS)
 9396  025142     173                    .BYTE 173               ;+0
 9397  025143     101                    .BYTE 101               ;+1
 9398  025144     102                    .BYTE 102               ;+2
 9399  025145     103                    .BYTE 103               ;+3
 9400  025146     104                    .BYTE 104               ;+4
 9401  025147     105                    .BYTE 105               ;+5
 9402  025150     106                    .BYTE 106               ;+6
 9403  025151     107                    .BYTE 107               ;+7
 9404  025152     110                    .BYTE 110               ;+8
 9405  025153     111                    .BYTE 111               ;+9
 9406  025154     175            OPENTB: .BYTE 175               ;-0
 9407  025155     112                    .BYTE 112               ;-1
 9408  025156     113                    .BYTE 113               ;-2
 9409  025157     114                    .BYTE 114               ;-3
 9410  025160     115                    .BYTE 115               ;-4
 9411  025161     116                    .BYTE 116               ;-5
 9412  025162     117                    .BYTE 117               ;-6
 9413  025163     120                    .BYTE 120               ;-7
 9414  025164     121                    .BYTE 121               ;-8
 9415  025165     122                    .BYTE 122               ;-9
 9416  025166  000000            SGNBYT: .WORD 0
```

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                                                        .SBTTL          CVTLP,Z INSTRUCTIONS
                                        ;               CONVERT LONG FORMAT NUMBERS INTO DECIMAL
                                        ;       IN EITHER PACKED OR ZONED FORMAT.
                                        ;------------------------------------------------------------
025170  005037  026322                  ECVTLN:         CLR EPAK                ;ZONED FORMATED OUTPUT
025174  000403                                          BR ECVT
025176  012737  177777  026322          ECVTLP:         MOV #177777,EPAK        ;PACKED FORMAT OUTPUT
025204  005037  025112                  ECVT:           CLR EODD                ;RESET ODD INDICATORS
025210  005037  026332                                  CLR EVTSSV
025214  005037  025070                                  CLR EDCOPA
025220  005037  025072                                  CLR EDCOPB
025224  005037  026330                                  CLR ESCF
025230  032737  000001  017364                          BIT #1,E0               ;IF ODD SET ODD FLAG
025236  001403                                          BEQ 10$                 ;EVEN NO. OF DIGITS
025240  012737  177777  025112                          MOV #177777,EODD        ;SET ODD FLAG
025246  012700  026072                          10$:    MOV #EVRTAB+14,R0       ;CLEAR DATA TABLE
025252  013702  017370                                  MOV E2,R2               ;DATA TO BE CONVERTED
025256  013703  017372                                  MOV E3,R3
025262  005040                                  1$:     CLR -(R0)               ;
025264  022700  026056                                  CMP #EVRTAB,R0          ;CLEAR COMPLETE
025270  001374                                          BNE 1$                  ;NO
025272  005037  026324                                  CLR EVTSGN              ;CLEAR OLD SIGN INFO
025276  005702                                          TST R2                  ;IS DATA NEGATIVE
025300  100026                                          BPL 2$                  ;NO
025302  112737  000377  026324                          MOVB #377,EVTSGN        ;YES , SAVE SIGN
025310  005103                                          COM R3                  ;NEGATE DATA
025312  005102                                          COM R2
025314  022703  177777                                  CMP #177777,R3          ;CHECK FOR SPECIAL CASE - MOST NEG #.
025320  001007                                          BNE 6$                  ;BRANCH IF THIS IS NOT THE SPECIAL CASE
025322  022702  077777                                  CMP #077777,R2          ;FOR MOST NEG # SRC HIGH =100000, SRC LOW = 0.
025326  001004                                          BNE 6$                  ;BRANCH IF NOT THE SPECIAL CASE
025330  012737  177777  026330                          MOV #177777,ESCF        ;SET SPECIAL CASE FLAG
025336  000405                                          BR 3$
025340  000257                                  6$:     CCC
025342  062703  000001                                  ADD #1,R3
025346  103001                                          BCC 3$                  ;BRANCH IF NO CARRY FROM FIRST WORD
025350  005202                                          INC R2                  ;YES
025352  042702  100000                          3$:     BIC #100000,R2          ;CLEAR SIGN BIT
025356  005037  026326                          2$:     CLR EVTPAS              ;RESET PASS COUNTER
025362  023727  026326  000174                  5$:     CMP EVTPAS,#^D124       ;31 PASSES COMPLETE YET
025370  001460                                          BEQ EVTWRP              ;WRAP UP ROUTEEN
025372  000257                                          CCC                     ;CLEAR CC BITS FOR 32 BIT SHIFT
025374  006002                                          ROR R2                  ;SHIFT LOB INTO R3
025376  006003                                          ROR R3                  ;SHIFT LOB FOR VALUE
025400  103002                                          BCC 4$                  ;IF NOT SET BIT HAS NO VALUE
025402  004737  025416                                  JSR PC,EVRTAD           ;ADD BIT VALUE TO DECIMAL NUMBER
025406  062737  000004  026326                  4$:     ADD #4,EVTPAS           ;BUMP PASS COUNTER
025414  000762                                          BR 5$                   ;NEXT PASS
025416  005037  025066                  EVRTAD:         CLR ECARRY              ;RESET CARRY/BORROW FLAGS
025422  012700  026070                                  MOV #EVRTAB+12,R0       ;A OPERAND POINTER
025426  013704  026326                                  MOV EVTPAS,R4           ;TABLE OFFSET
025432  062704  026334                                  ADD #EVTABA,R4          ;TABLE START ADDRESS
025436  012401                                          MOV (R4)+,R1            ;START ADDRESS OF DATA
025440  061401                                          ADD (R4),R1             ;END ADDRESS OF DATA
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025442  011404                               MOV (R4),R4             ;NO. OF DIGITS
025444  010437  026332                       MOV R4,EVTSSV
025450  114037  025070           1$:         MOVB -(R0),EDCOPA       ;FIND A OPERAND
025454  114137  025072                       MOVB -(R1),EDCOPB       ;FIND B OPERAND
025460  004737  023256                       JSR PC,EDCAD            ;ADD
025464  113710  025072                       MOVB EDCOPB,(R0)        ;SAVE RESULT
025470  005304                               DEC R4                  ;IS THIS LAST DIGIT
025472  001366                               BNE 1$                  ;NO
025474  105737  025066           2$:         TSTB ECARRY             ;ANY CARRY
025500  100401                               BMI 3$                  ;YES
025502  000207                               RTS PC
025504  005237  026332           3$:         INC EVTSSV
025510  114037  025070                       MOVB -(R0),EDCOPA       ;A OPERAND
025514  005037  025072                       CLR EDCOPB              ;NO B OPERAND
025520  004737  023256                       JSR PC,EDCAD            ;ADD THE CARRY
025524  113710  025072                       MOVB EDCOPB,(R0)                ;SAVE RESULT
025530  000761                               BR 2$
025532  005037  026316          EVTWRP:      CLR ENULL               ;RESET RESULT = 0 INDICATOR
025536  013737  026324  025062               MOV EVTSGN,ERSNEG       ;SETUP SIGN INDICATOR
025544  012704  026070                       MOV #EVRTAB+12,R4       ;SETUP PCINTER TO CONVERT RESULT
025550  113701  017364                       MOVB E0,R1
025554  160104                               SUB R1,R4
025556  013737  017364  025130               MOV E0,ELSD             ;SETUP POINTER TO LEAST SIGN. DIGIT
025564  113737  017364  026320               MOVB E0,EPOPS
025572  005337  026320                       DEC EPOPS
025576  013701  017364                       MOV E0,R1               ;SETUP POSITION OF # TO INSERT = 0
025602  042701  000377                       BIC #377,R1
025606  013700  017366                       MOV E1,R0               ;SETUP ADDRESS OF # TO LOAD
025612  005002                   2$:         CLR R2                  ;SETUP DATA TO LOAD
025614  020427  026056                       CMP R4,#EVRTAB
025620  103403                               BLO 1$
025622  111402                               MOVB (R4),R2
025624  050237  026316                       BIS R2,ENULL
025630  005204                   1$:         INC R4
025632  004737  022440                       JSR PC,EPUSH            ;CALL ROUTINE TO PUSH DIGIT INTO STRING
025636  120137  026320                       CMPB R1,EPOPS           ;READY TO PUSH SIGN?
025642  001004                               BNE 3$                  ;BRANCH IF NO
025644  005737  026330                       TST ESCF                ;SPECIAL CASE?
025650  001401                               BEQ 3$                  ;BRANCH IF NO
025652  000405                               BR EVTXT                ;WORK WITH SPECIAL CASE BEFORE INSERTING SIGN.
025654  020137  017364           3$:         CMP R1,E0               ;ALL DIGITS PLUS SIGN PUSHED?
025660  001402                               BEQ EVTXT               ;BRANCH IF YES
025662  005201                               INC R1
025664  000752                               BR 2$                   ;RETURN TO PUSH NEXT DIGIT

025666  105737  017364          EVTXT:       TSTB E0                 ;IF DST.LEN=0 ,DON'T BOTHER TESTING
                                                                     ;  FOR SPECIAL CASE.
025672  001425                               BEG 5$
025674  005737  026330                       TST ESCF                ;SPECIAL CASE? (MOST NEG #).
025700  001422                               BEQ 5$                  ;BRANCH IF NO.
025702  013737  017364  025130               MOV E0.ELSD
025710  013701  017364                       MOV E0,R1
025714  005301                               DEC R1                  ;SET R1=DST.LEN-1.
025716  013700  017366                       MOV E1,R0               ;INCREMENT LEAST SIGN DIGIT TO 8.
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025722  012702  000010                          MOV #10,R2
025726  004737  022440                          JSR PC,EPUSH             ;CALL ROUTINE TO PUSH THE 8 INTO DEST.
025732  005201                                  INC R1                   ;INSERT NEGATIVE SIGN
025734  012737  177777  025062                  MOV #177777,ERSNEG
025742  004737  022440            7$:           JSR PC,EPUSH             ;CALL ROUTINE TO PUSH NEG SIGN INTO DEST.
025746  005077  171410            5$:           CLR @EOPSW               ;INIT EMULATE PSW
025752  005737  026316                          TST ENULL                ;IF = 0 SET Z BIT; SKIP SETTING OF N BIT
025756  001407                                  BEQ 1$
025760  105737  025062                          TSTB ERSNEG              ;IF (-) SET N BIT
025764  100007                                  BPL 2$
025766  052777  000010  171366                  BIS #10,@EOPSW           ;SET N BIT
025774  000403                                  BR 2$
025776  052777  000004  171356    1$:           BIS #4,@EOPSW            ;SET Z BIT
026004  123737  017364  026332    2$:           CMPB E0,EVTSSV
026012  103003                                  BHIS 4$
026014  052777  000002  171340                  BIS #2,@EOPSW            ;SET OVERFLOW
026022  013702  017360            4$:           MOV EORSTK,R2            ;REGISTER UNLOAD
026026  013722  017364                          MOV E0,(R2)+             ;R0 =R0
026032  013722  017366                          MOV E1,(R2)+             ;R1 = R1
026036  005022                                  CLR (R2)+                ;R2 = 0
026040  005022                                  CLR (R2)+                ;R3 = 0
026042  013722  017374                          MOV E4,(R2)+             ;R4 = R4
026046  013712  017376                          MOV E5,(R2)              ;R5 = R5
026052  000207                                  RTS PC
026054  000000                                  .WORD 0                  ;MUST PRECEDE EVRTAB!!
026056  000240                    EVRTAB:       .BLKB ^D160
026316  000000                    ENULL:        .WORD 0
026320  000000                    EPOPS:        .WORD 0
026322  000000                    EPAK:         .WORD 0
026324  000000                    EVTSGN:       .WORD 0
026326  000000                    EVTPAS:       .WORD 0
026330  000000                    ESCF:         .WORD 0
026332  000000                    EVTSSV:       .WORD 0
026334  026530  000001            EVTABA:       .WORD E00,1
026340  026531  000001                          .WORD E01,1
026344  026532  000001                          .WORD E02,1
026350  026533  000001                          .WORD E03,1
026354  026534  000002                          .WORD E04,2
026360  026536  000002                          .WORD E05,2
026364  026540  000002                          .WORD E06,2
026370  026542  000003                          .WORD E07,3
026374  026545  000003                          .WORD E08,3
026400  026550  000003                          .WORD E09,3
026404  026553  000004                          .WORD E10,4
026410  026557  000004                          .WORD E11,4
026414  026563  000004                          .WORD E12,4
026420  026567  000004                          .WORD E13,4
026424  026573  000005                          .WORD E14,5
026430  026600  000005                          .WORD E15,5
026434  026605  000005                          .WORD E16,5
026440  026612  000006                          .WORD E17,6
026444  026620  000006                          .WORD E18,6
026450  026626  000006                          .WORD E19,6
026454  026634  000007                          .WORD E20,7
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026460  026643  000007                        .WORD E21,7
026464  026652  000007                        .WORD E22,7
026470  026661  000007                        .WORD E23,7
026474  026670  000010                        .WORD E24,10
026500  026700  000010                        .WORD E25,10
026504  026710  000010                        .WORD E26,10
026510  026720  000011                        .WORD E27,11
026514  026731  000011                        .WORD E28,11
026520  026742  000011                        .WORD E29,11
026524  026753  000012                        .WORD E30,12
026530     001                  E00:          .BYTE ^D1
026531     002                  E01:          .BYTE ^D2
026532     004                  E02:          .BYTE ^D4
026533     010                  E03:          .BYTE ^D8
026534     001     006          E04:          .BYTE ^D1,^D6
026536     003     002          E05:          .BYTE ^D3,^D2
026540     006     004          E06:          .BYTE ^D6,^D4
026542     001     002     010  E07:          .BYTE ^D1,^D2,^D8
026545     002     005     006  E08:          .BYTE ^D2,^D5,^D6
026550     005     001     002  E09:          .BYTE ^D5,^D1,^D2
026553     001     000     002  E10:          .BYTE ^D1,^D0,^D2,^D4
026556     004
026557     002     000     004  E11:          .BYTE ^D2,^D0,^D4,^D8
026562     010
026563     004     000     011  F12:          .BYTE ^D4,^D0,^D9,^D6
026566     006
026567     010     001     011  E13:          .BYTE ^D8,^D1,^D9,^D2
026572     002
026573     001     006     003  E14:          .BYTE ^D1,^D6,^D3,^D8,^D4
026576     010     004
026600     003     002     007  E15:          .BYTE ^D3,^D2,^D7,^D6,^D8
026603     006     010
026605     006     005     005  E16:          .BYTE ^D6,^D5,^D5,^D3,^D6
026610     003     006
026612     001     003     001  E17:          .BYTE ^D1,^D3,^D1,^D0,^D7,^D2
026615     000     007     002
026620     002     006     002  E18:          .BYTE ^D2,^D6,^D2,^D1,^D4,^D4
026623     001     004     004
026626     005     002     004  E19:          .BYTE ^D5,^D2,^D4,^D2,^D8,^D8
026631     002     010     010
026634     001     000     004  E20:          .BYTE ^D1,^D0,^D4,^D8,^D5,^D7,^D6
026637     010     005     007
026642     006
026643     002     000     011  E21:          .BYTE ^D2,^D0,^D9,^D7,^D1,^D5,^D2
026646     007     001     005
026651     002
026652     004     001     011  E22:          .BYTE ^D4,^D1,^D9,^D4,^D3,^D0,^D4
026655     004     003     000
026660     004
026661     010     003     010  E23:          .BYTE ^D8,^D3,^D8,^D8,^D6,^D0,^D8
026664     010     006     000
026667     010
026670     001     006     007  E24:          .BYTE ^D1,^D6,^D7,^D7,^D7,^D2,^D1,^D6
026673     007     007     002
```

```
        026676    001    006
  9615  026700    003    003    005  E25:          .BYTE ^D3,^D3,^D5,^D5,^D4,^D4,^D3,^D2
        026703    005    004    004
        026706    003    002
  9616  026710    006    007    001  E26:          .BYTE ^D6,^D7,^D1,^D0,^D8,^D8,^D6,^D4
        026713    000    010    010
        026716    006    004
  9617  026720    001    003    004  E27:          .BYTE ^D1,^D3,^D4,^D2,^D1,^D7,^D7,^D2,^D8
        026723    002    001    007
        026726    007    002    010
  9618  026731    002    006    010  E28:          .BYTE ^D2,^D6,^D8,^D4,^D3,^D5,^D4,^D5,^D6
        026734    004    003    005
        026737    004    005    006
  9619  026742    005    003    006  E29:          .BYTE ^D5,^D3,^D6,^D8,^D7,^D0,^D9,^D1,^D2
        026745    010    007    000
        026750    011    001    002
  9620  026753    001    000    007  E30:          .BYTE ^D1,^D0,^D7,^D3,^D7,^D4,^D1,^D8,^D2,^D4
        026756    003    007    004
        026761    001    010    002
        026764    004
  9621          026766                             .EVEN
```

```
                                                        .SBTTL          CONVERT PACKED OR ZONED TO LONG
                                        ;               CONVERT A NUMBER THAT IS IN EITHER PACKED OR
                                        ;       ZONED FORMAT INTO LONG FORMAT.          (CVTPL,CVTNL)
                                        ;-------------------------------------------------------------
026766  005037  026322                  ECVTNL:         CLR EPAK                        ;ZONED FORMAT INPUT
026772  000403                                          BR EZL1
026774  012737  177777  026322          ECVTPL:         MOV #177777,EPAK                ;PACKED FORMAT INPUT
027002  005037  027526                  EZL1:           CLR EFLO                        ;RESET OVERFLOW
027006  005037  025112                                  CLR EODD                        ;RESET ODD LENGTH INDICATOR
027012  005003                                          CLR R3                          ;CLEAR RESULT DATA AREA
027014  005004                                          CLR R4
027016  005037  026316                                  CLR ENULL                       ;RESET NULL INDICATOR
027022  032737  000001  017364                          BIT #1,E0                       ;IS SOURCE ODD OR EVEN NO. OF DIGITS
027030  001403                                          BEQ 1$                          ;ITS EVEN
027032  012737  177777  025112                          MOV #177777,EODD                ;ODD
                                        ;
                                        ;               FIND SIGN OF NUMBER
027040  013701  017364                          1$:     MOV E0,R1                       ;SETUP POSITION OF SIGN
027044  013737  017364  025130                          MOV E0,ELSD                     ;SETUP POSITION OF LEAST SIGN DIGIT.
027052  013700  017366                                  MOV E1,R0                       ;SETUP ADDRESS OF STRING
027056  004737  021372                                  JSR PC,ESNK                     ;CALL ROUTINE TO FIND SIGN
027062  005037  025052                                  CLR ES1
027066  005737  025062                                  TST ERSNEG                      ;IS SIGN NEGATIVE?
027072  001403                                          BEQ EZL2                        ;BRANCH IF NO
027074  012737  177777  025052                          MOV #177777,ES1                 ;YES - SET NEGATIVE FLAG
                                        ;
                                        ;               CONVERTER
                                        ;                       CLEAR RESULT
                                        ;                       FOR COUNT = 1 TO LENGTH
                                        ;                       RESULT = (RESULT*10)+DIGIT<MSD+COUNT>
                                        ;                       NEXT COUNT
027102  013737  017364  027530          EZL2:           MOV E0,ECOUN                    ;RESET COUNT(UPPER BYTE OF ECOUN MUST
                                                                                        ;  CONTAIN TYPE)
027110  042737  000377  027530                          BIC #377,ECOUN
027116  013737  017364  025130                          MOV E0,ELSD
027124  123737  027530  017364                  10$:    CMPB ECOUN,E0                   ;CONVERSION COMPLETE YET
027132  001474                                          BEQ EZLE                        ;YES
027134  013701  027530                                  MOV ECOUN,R1                    ;POSITION OF SOURCE
027140  013700  017366                                  MOV E1,R0                       ;START ADDRESS OF SOURCE
027144  004737  021372                                  JSR PC,ESNK                     ;CALL ROUTINE TO FIND DIGIT
027150  005237  027530                          2$:     INC ECOUN                       ;BUMP COUNTER
027154  050237  026316                                  BIS R2,ENULL                    ;DIGIT SUM FOR NULL TEST
027160  000257                                          CCC                             ;MULTIPLY RESULT BY 10
027162  006104                                          ROL R4
027164  006103                                          ROL R3
027166  103003                                          BCC 3$                          ;ANY BIT SHIFTED OUT IS OVERFLOW
027170  012737  177777  027526                          MOV #177777,EFLO
027176  010337  017402                          3$:     MOV R3,TEMP                     ;TEMP DATA HOLD FOR MULTIPLY
027202  010437  025110                                  MOV R4,TEMP1
027206  000257                                          CCC
027210  006104                                          ROL R4
027212  006103                                          ROL R3
027214  103003                                          BCC 4$
027216  012737  177777  027526                          MOV #177777,EFLO
```

```
027224  000257                          4$:     CCC
027226  006104                                  ROL R4
027230  006103                                  ROL R3
027232  103003                                  BCC 5$
027234  012737  177777  027526                  MOV #177777,EFLO
027242  063704  025110                  5$:     ADD TEMP1,R4            ;COMPLETE MULTIPLY
027246  103007                                  BCC 6$
027250  000257                                  CCC
027252  062703  000001                          ADD #1,R3
027256  103003                                  BCC 6$
027260  012737  177777  027526                  MOV #177777,EFLO
027266  063703  017402                  6$:     ADD TEMP,R3
027272  103003                                  BCC 8$
027274  012737  177777  027526                  MOV #177777,EFLO
027302  060204                          8$:     ADD R2,R4               ;ADD NEW DIGIT
027304  103307                                  BCC 10$
027306  062703  000001                          ADD #1,R3
027312  103304                                  BCC 10$
027314  012737  177777  027526                  MOV #177777,EFLO
027322  000700                                  BR 10$
                                ;
                                ;               SET CC BITS , SET RESULT REGISTERS
027324  005703                  EZLE:           TST R3                  ;BIT 32= 1 IS OVERFLOW EXCEPT IF
                                                                        ; ALL OTHER 31 BITS = 0 & SRC WAS NEGATIVE
027326  100013                                  BPL 6$                  ;BRANCH IF OK
027330  005704                                  TST R4                  ;ALL OTHER 31 BITS = 0?
027332  001006                                  BNE 7$                  ;BRANCH IF NO
027334  032703  077777                          BIT #77777,R3
027340  001003                                  BNE 7$                  ;BRANCH IF NO
027342  005737  025052                          TST ES1                 ;WAS SRC NEGATIVE?
027346  100403                                  BMI 6$                  ;BRANCH IF YES
027350  012737  177777  027526          7$:     MOV #177777,EFLO        ;ELSE OVERFLOW
027356  005077  170000                  6$:     CLR @EOPSW              ;RESET PSW
027362  005737  027526                          TST EFLO                ;ANY OVERFLOW
027366  001403                                  BEQ 1$                  ;NO
027370  052777  000002  167764                  BIS #2,@EOPSW           ;SET V BIT
027376  005704                          1$:     TST R4                  ;WAS RESULT = 0
027400  001006                                  BNE 5$                  ;NO
027402  005703                                  TST R3
027404  001004                                  BNE 5$                  ;NO
027406  052777  000004  167746                  BIS #4,@EOPSW           ;SET Z BIT
027414  000412                                  BR 2$
027416  005737  025052                  5$:     TST ES1                 ;WHAT SIGN
027422  100007                                  BPL 2$                  ;POSITIVE
027424  005103                                  COM R3                  ;COMPLEMENT VALUE
027426  005104                                  COM R4
027430  000257                                  CCC
027432  062704  000001                          ADD #1,R4
027436  103001                                  BCC 2$
027440  005203                                  INC R3
027442  005703                          2$:     TST R3                  ;SET N BIT BASED ON SIGN OF RESULT
027444  100003                                  BPL 3$                  ;IF RESULT SIGN =+ BRANCH
027446  052777  000010  167706                  BIS #10,@EOPSW          ;SET N BIT
027454  032777  000004  167700          3$:     BIT #4,@EOPSW           ;WAS DST = 0
```

```
 9731  027462  001006                                    BNE 4$                   ;YES
 9732  027464  005737  025052                            TST ES1                  ;AND WAS SOURCE NEGATIVE
 9733  027470  100003                                    BPL 4$                   ;NO
 9734  027472  052777  000001  167662                    BIS #1,@EOPSW            ;YES , THEN SET C BIT
 9735  027500  013700  017360          4$:               MOV EORSTK,R0            ;REGISTER SAVE
 9736  027504  005020                                    CLR (R0)+                ;R0 =0
 9737  027506  005020                                    CLR (R0)+                ;R1 = 0
 9738  027510  010320                                    MOV R3,(R0)+             ;R2 = DST HIGH
 9739  027512  010420                                    MOV R4,(R0)+             ;R3 =  DST LOW
 9740  027514  013720  017374                            MOV E4,(R0)+             ;R4 = R4
 9741  027520  013720  017376                            MOV E5,(R0)+             ;R5 = R5
 9742  027524  000207                                    RTS PC
 9743  027526  000000                 EFLO:              .WORD 0
 9744  027530  000000                 ECOUN:             .WORD 0
```

```
                                                        .SBTTL          CONVERT PACKED TO ZONED
027532  012737  177777  026322  ECVTPN:                 MOV #177777,EPAK        ;SET PACKED MODE INDICATOR
027540  005037  026332                                  CLR EVTSSV              ;RESET PASS COUNTER
027544  005037  026316                                  CLR ENULL               ;RESET NULL INDICATOR
027550  005077  167606                                  CLR @EOPSW              ;RESET EMULATE PSW
027554  013737  017364  025070                          MOV E0,EDCOPA           ;START POSITION OF SOURCE
027562  013737  017370  025072                          MOV E2,EDCOPB           ;START POSITION OF DEST.
027570  005037  025112                                  CLR EODD                ;IS SOURCE ODD OR EVEN NUMBER
027574  032737  000001  017364                          BIT #1,E0               ;OF DIGITS
027602  001403                                          BEQ EPZ1                ;ITS EVEN
027604  012737  177777  025112                          MOV #177777,EODD        ;ITS ODD
027612  004737  030554          EPZ1:                   JSR PC,EFMSD            ;DETERMINE POSITION OF MOST SIGN SRC DIGIT
027616  005002                                          CLR R2
027620  105337  025070                                  DECB EDCOPA             ;END OF SOURCE YET
027624  100414                                          BMI 1$                  ;YES
027626  042777  000001  167526                          BIC #1,@EOPSW           ;RESET END OF SOURCE FLAG
027634  013700  017366                                  MOV E1,R0               ;START ADDRESS OF SOURCE
027640  013701  025070                                  MOV EDCOPA,R1           ;POSITION OF DIGIT
027644  013737  017364  025130                          MOV E0,ELSD
027652  004737  021414                                  JSR PC,EFINDT           ;GRAB DIGIT
027656  105337  025072                  1$:             DECB EDCOPB             ;END OF DEST. YET
027662  100421                                          BMI EPZE                ;YES
027664  005237  026332                                  INC EVTSSV              ;DIGIT POSITION
027670  005702                                          TST R2                  ;IS DIGIT ZERO
027672  001403                                          BEQ 2$
027674  013737  026332  026316                          MOV EVTSSV,ENULL        ;POSITION OF LAST NON ZERO DIGIT STORED.
027702  013700  017372                  2$:             MOV E3,R0               ;START ADDRESS OF DEST
027706  013701  025072                                  MOV EDCOPB,R1           ;POSITION OF DIGIT
027712  013737  017370  025130                          MOV E2,ELSD
027720  004737  022716                                  JSR PC,EPUDTZ           ;SAVE DIGIT
027724  000732                                          BR EPZ1                 ;LOOP TILL COMPLETE
027726  013700  017366          EPZE:                   MOV E1,R0               ;START ADDRESS OF SOURCE
027732  013701  017364                                  MOV E0,R1               ;POSITION OF SIGN
027736  013737  017364  025130                          MOV E0,ELSD
027744  004737  021414                                  JSR PC,EFINDT           ;GRAB SIGN
027750  005037  025052                                  CLR ES1                 ;RESET SIGN FLAG
027754  005737  025062                                  TST ERSNEG              ;IS SOURCE NEG?
027760  001406                                          BEQ 2$                  ;BRANCH IF NO
027762  005737  030636                                  TST EMSDP               ;IF SRC IS ZERO AND NEG TREAT IT AS POSITIVE
027766  001403                                          BEQ 2$
027770  012737  177777  025052                          MOV #177777,ES1         ;SET NEGATIVE FLAG
027776  005737  026316                  2$:             TST ENULL               ;WAS RESULT STORED ZERO
030002  001004                                          BNE 3$                  ;NO
030004  052777  000004  167350                          BIS #4,@EOPSW           ;SET Z BIT
030012  000406                                          BR 6$                   ;SKIP SETTING OF N BIT
030014  005737  025052                  3$:             TST ES1                 ;SIGN OF RESULT
030020  001403                                          BEQ 6$                  ;POSITIVE
030022  052777  000010  167332                          BIS #10,@EOPSW          ;SET N BIT
030030  013737  025052  025062          6$:             MOV ES1,ERSNEG          ;SETUP SIGN OF RESULT
030036  013701  017370                                  MOV E2,R1               ;POSITION OF SIGN
030042  013737  017370  025130                          MOV E2,ELSD
030050  013700  017372                                  MOV E3,R0               ;START ADDRESS OF DEST.
030054  004737  022716                                  JSR PC,EPUDTZ           ;INSERT SIGN IN DST STRING
030060  005737  025062                                  TST ERSNEG              ;WAS SIGN STORED POSTITIVE?(UNSIGNED)
```

```
 9800  030064  001003                                  BNE 4$                ;BRANCH IF NO
 9801  030066  042777  000010  167266                  BIC #10,@EOPSW        ;CLEAR PSW N BIT
 9802  030074  023737  030636  026316       4$:       CMP EMSDP,ENULL       ;CAN DEST. CONTAIN ALL DIGITS
 9803  030102  101403                                  BLOS 5$               ;YES
 9804  030104  052777  000002  167250                  BIS #2,@EOPSW         ;SET V BIT
 9805  030112  013702  017360                5$:       MOV EORSTK,R2         ;SAVE REGISTERS
 9806  030116  005022                                  CLR (R2)+             ;R0 = 0
 9807  030120  005022                                  CLR (R2)+             ;R1 = 0
 9808  030122  013722  017370                          MOV E2,(R2)+          ;R2 = R2
 9809  030126  013722  017372                          MOV E3,(R2)+          ;R3 = R3
 9810  030132  013722  017374                          MOV E4,(R2)+          ;R4 = R4
 9811  030136  013722  017376                          MOV E5,(R2)+          ;R5 = R5
 9812  030142  000207                                  RTS PC
```

```
                                                .SBTTL              CONVERT ZONED TO PACKED
030144  005037  026332          ECVTNP:         CLR EVTSSV          ;RESET PASS COUNTER
030150  005037  026322                          CLR EPAK            ;MODE = ZONED
030154  005037  026316                          CLR ENULL           ;RESET NULL INDICATOR
030160  005077  167176                          CLR @EOPSW          ;RESET EMULATE PSW
030164  013737  017364  025070                  MOV E0,EDCOPA       ;START POSITION OF SOURCE
030172  013737  017370  025072                  MOV E2,EDCOPB       ;START POSITION OF DEST.
030200  005037  025112                          CLR EODD            ;IS DEST. ODD OR EVEN # OF DIGITS.
030204  032737  000001  017370                  BIT #1,E2
030212  001403                                  BEQ EZP1            ;ITS EVEN
030214  012737  177777  025112                  MOV #177777,EODD    ;ITS ODD
030222  004737  030554          EZP1:           JSR PC,EFMSD        ;FIND POSITION OF MOST SIGNIFICANT SOURCE DIGIT
030226  005002                                  CLR R2
030230  105337  025070                          DECB EDCOPA         ;END OF SOURCE YET
030234  100414                                  BMI 1$
030236  042777  000001  167116                  BIC #1,@EOPSW       ;RESET END OF SOURCE FLAG
030244  013700  017366                          MOV E1,R0           ;START ADDRESS OF SOURCE
030250  013701  025070                          MOV EDCOPA,R1       ;POSITION OF DIGIT
030254  013737  017364  025130                  MOV E0,ELSD
030262  004737  021616                          JSR PC,EFNDTZ       ;GRAB DIGIT
030266  105337  025072                  1$:     DECB EDCOPB         ;END OF DEST. YET
030272  100421                                  BMI EZPE            ;YES
030274  005237  026332                          INC EVTSSV          ;PASS COUNTER
030300  005702                                  TST R2              ;IS DIGIT ZERO
030302  001403                                  BEQ 2$
030304  013737  026332  026316                  MOV EVTSSV,ENULL    ;SAVE POSITION OF LAST NON ZERO DIGIT STORED.
030312  013700  017372                  2$:     MOV E3,R0           ;START ADDRESS OF DEST.
030316  013701  025072                          MOV EDCOPB,R1       ;POSITION OF DIGIT
030322  013737  017370  025130                  MOV E2,ELSD
030330  004737  022462                          JSR PC,EPUTDT       ;SAVE DIGIT
030334  000732                                  BR EZP1             ;LOOP TILL COMPLETE
030336  013700  017366          EZPE:           MOV E1,R0           ;START ADDRESS OF SOURCE
030342  013701  017364                          MOV E0,R1           ;POSITION OF SIGN
030346  013737  017364  025130                  MOV E0,ELSD
030354  004737  021616                          JSR PC,EFNDTZ
030360  005037  025052                          CLR ES1             ;RESET SIGN FLAG
030364  005737  025062                          TST ERSNEG          ;IS SOURCE NEG?
030370  001406                                  BEQ 2$              ;NO
030372  005737  030636                          TST EMSDP           ;IF SOURCE IS ZERO AND NEG TREAT IT AS POSITIVE
030376  001403                                  BEQ 2$
030400  012737  177777  025052                  MOV #177777,ES1     ;SET NEGATIVE FLAG
030406  005737  026316                  2$:     TST ENULL           ;WAS RESULT STORED ZERO
030412  001004                                  BNE 3$              ;NO
030414  052777  000004  166740                  BIS #4,@EOPSW       ;SET Z BIT
030422  000406                                  BR 4$
030424  005737  025052                  3$:     TST ES1             ;SET SIGN OF RESULT
030430  001403                                  BEQ 4$              ;POSITIVE
030432  052777  000010  166722                  BIS #10,@EOPSW      ;SET N BIT
030440  023737  030636  026316          4$:     CMP EMSDP,ENULL     ;CAN DEST. CONTAIN ALL DIGITS
030446  101403                                  BLOS 5$             ;YES
030450  052777  000002  166704                  BIS #2,@EOPSW       ;SET V BIT
030456  013701  017370                  5$:     MOV E2,R1           ;POSITION OF SIGN
030462  013700  017372                          MOV E3,R0           ;START ADDRESS OF NUMBER
030466  013737  025052  025062                  MOV ES1,ERSNEG
```

```
030474  013737  017370  025130          MOV E2,ELSD
030502  004737  022462                  JSR PC,EPUTDT           ;SAVE SIGN
030506  005737  025062                  TST ERSNEG              ;WAS SIGN STORED POSITIVE? (UNSIGNED)
030512  001003                          BNE 1$                  ;BRANCH IF NO
030514  042777  000010  166640          BIC #10,@EOPSW          ;CLEAR PSW N BIT
030522  013702  017360          1$:     MOV EORSTK,R2           ;SAVE REGISTERS
030526  005022                          CLR (R2)+               ;R0 = 0
030530  005022                          CLR (R2)+               ;R1 = 0
030532  013722  017370                  MOV E2,(R2)+            ;R2 = R2
030536  013722  017372                  MOV E3,(R2)+            ;R3 = R3
030542  013722  017374                  MOV E4,(R2)+            ;R4 = R4
030546  013722  017376                  MOV E5,(R2)+            ;R5 = R5
030552  000207                          RTS PC
```

```
030554  005037  030640          EFMSD:          CLR ESDC
030560  005037  030636                          CLR EMSDP
030564  013700  017366                          MOV E1,R0               ;SET R0=SRC.ADR
030570  013701  017364                          MOV E0,R1               ;SET R1=SRC.PTR
030574  013737  017364  025130                  MOV E0,ELSD
030602  005301                          1$:     DEC R1
030604  105701                                  TSTB R1                 ;LOOKED AT ALL SRC DIGITS YET?
030606  100412                                  BMI 2$                  ;BRANCH IF YES
030610  004737  021372                          JSR PC,ESNK             ;GET NEXT SRC DIGIT
030614  005237  030640                          INC ESDC                ;INCREMENT DIGIT COUNTER
030620  005702                                  TST R2                  ;IS DIGIT ZERO (NON-SIGNIFICANT)
030622  001767                                  BEQ 1$                  ;BRANCH IF YES
030624  013737  030640  030636                  MOV ESDC,EMSDP          ;SAVE POSITION OF DIGIT
030632  000763                                  BR 1$
030634  000207                          2$:     RTS PC

030636  000000                  EMSDP:          .WORD 0
030640  000000                  ESDC:           .WORD 0
```

```
                                                        .SBTTL              ASHP,ASHN INSTRUCTIONS
030642  012737  177777  026322  EASHP:                  MOV #177777,EPAK    ;INDICATE PACKED MODE
030650  005037  032136                                  CLR EODDS
030654  005037  032140                                  CLR EODDD
030660  032737  000001  017364                          BIT #1,E0           ;IS SRC  ODD LENGTH?
030666  001403                                          BEQ 1$
030670  012737  177777  032136                          MOV #177777,EODDS   ;YES - SET ODD INDICATOR
030676  032737  000001  017370          1$:             BIT #1,E2           ;IS DST ODD IN LENGTH?
030704  001406                                          BEQ EASH
030706  012737  177777  032140                          MOV #177777,EODDD   ;YES-SET ODD INDICATOR
030714  000402                                          BR EASH
030716  005037  026322          EASHN:                  CLR EPAK            ;INDICATE ZONE MODE
030722  005037  032144          EASH:                   CLR ENCC            ;INIT. N CLEAR INDICATOR
030726  005037  032146                                  CLR ENZI            ;INIT. NON ZERO INDICATOR
030732  005037  032150                                  CLR ETNZI
030736  005037  025066                                  CLR ECARRY          ;INIT. CARRY INDICATOR
030742  013703  017364                                  MOV E0,R3           ;INIT. SCR.PTR TO SRC.LEN-1
030746  105303                                          DECB R3
030750  005737  026322                                  TST EPAK            ;ZONED STRING?
030754  001003                                          BNE 2$              ;BRANCH IF NO
030756  012704  040237                                  MOV #40237,R4       ;MAKE RESULT DATA TYPE = TRAILING SEPARATE
030762  000406                                          BR 3$
030764  013704  017370                  2$:             MOV E2,R4           ;INITIALIZE RESULT PTR TO 127+31+1(MAX SHIFT CT+
030770  042704  000377                                  BIC #377,R4
030774  052704  000237                                  BIS #237,R4
031000  010437  033076                  3$:             MOV R4,ETLSD
031004  105304                                          DECB R4
031006  113705  017374                                  MOVB E4,R5          ;INITIALIZE SHIFT # TO SHIFT COUNT
031012  100424                                          BMI EASHR           ;SHIFT COUNT?
031014  005705                          1$:             TST R5              ;POSITIVE OR ZERO - SHIFT IN DIRECTION OF
                                                                            ;    LEAST TO MOST SIGNIFICANT DIGITS
031016  003476                                          BLE ESISRC          ;IS SHIFT # <=0?
031020  122704  000377                                  CMPB #377,R4        ;SHIFT #>0; IS RESULT.PTR=0?
031024  001555                                          BEQ EDETSN          ;IF RESULT.PTR<0 BRANCH TO COPY RESULT INTO DST.
031026  012700  026056                                  MOV #EVRTAB,R0      ;RESULT.PTR DOES NOT=0. PUSH A ZERO
031032  010401                                          MOV R4,R1           ;    DIGIT INTO THE DESTINATION.
031034  013737  033076  025130                          MOV ETLSD,ELSD
031042  005002                                          CLR R2              ;SET R0=RESULT.ADR, R1=RESULT.PTR, R2=0
031044  012737  177777  025112                          MOV #177777,EODD
031052  004737  022440                                  JSR PC,EPUSH        ;CALL ROUTINE TO PUSH THE 0 DIGIT INTO RESULT.
031056  105304                                          DECB R4
031060  005305                                          DEC R5
031062  000754                                          BR  1$

031064                          EASHR:                                      ;SHIFT COUNT IS NEGATIVE
031064  042703  177400                                  BIC #177400,R3
031070  113700  017374                                  MOVB E4,R0          ;GET SHIFT COUNT
031074  060003                                          ADD R0,R3           ;ADD SHIFT COUNT (NEGATIVE) TO SRC.PTR
031076  042703  177400                                  BIC #177400,R3
031102  013700  017364                                  MOV E0,R0
031106  042700  000377                                  BIC #377,R0
031112  060003                                          ADD R0,R3
031114  122703  000177                                  CMPB #177,R3        ;CHECK FOR SPECIAL CASE WHEN SRC.LEN=0 AND
                                                                            ;  SHIFT CNT=-128(200).
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031120  001515                                    BEQ EFILZ              ;BRANCH IF THIS IS THE SPECIAL CASE.
031122  105703                                    TSTB R3
031124  100003                                    BPL 2$                 ;BRANCH IF SRC PTR IS POSITIVE
031126  122703  177777                            CMPB #-1,R3
031132  001110                                    BNE EFILZ              ;IF SRC PTR IS <-1 FILL DST WITH ZERO
031134  013700  017366                   2$:      MOV E1,R0              ;FIND MOST SIGNIFICANT DIGIT TO BE
031140  010301                                    MOV R3,R1              ;     SHIFTED OUT
031142  013737  017364  025130                    MOV E0,ELSD
031150  105201                                    INCB R1                ;SET R0=SRC.ADR,R1=SRC.PTR+1
031152  013737  032136  025112                    MOV EODDS,EODD
031160  004737  021372                            JSR PC,ESNK            ;CALL ROUTINE TO FIND DIGIT
031164  113700  017375                            MOVB E4+1,R0
031170  060002                                    ADD R0,R2              ;ADD RND.DGT TO DIGIT FOUND IN R2
031172  022702  000012                            CMP #12,R2             ;IS RESULT LESS THAN 10
031176  101004                                    BHI 1$
031200  012737  000001  025066                    MOV #1,ECARRY          ;NO-SET CARRY
031206  000402                                    BR ESISRC
031210  005037  025066                   1$:      CLR ECARRY

031214                          ESISRC:                                  ;SHIFT SRC DIGITS INTO DST.
031214  122704  000377                            CMPB #377,R4           ;IS RESULT.PTR <0?
031220  001457                                    BEQ EDETSN             ;YES - BRANCH TO COPY RESULT INTO DEST
031222  105703                                    TSTB R3                ;NO - IS SRC.PTR <0?
031224  100453                                    BMI EFILZ
031226  013700  017366                            MOV E1,R0              ;NO - FIND SRC DIGIT TO SHIFT INTO RESULT
031232  010301                                    MOV R3,R1              ;SET R0=SRC.ADR, R1=SRC.PTR
031234  013737  017364  025130                    MOV E0,ELSD
031242  013737  032136  025112                    MOV EODDS,EODD
031250  004737  021372                            JSR PC,ESNK            ;CALL ROUTINE TO FIND SRC DIGIT
031254  063702  025066                            ADD ECARRY,R2          ;ADD CARRY TO DIGIT FOUND
031260  022702  000011                            CMP #11,R2             ;DIGIT OVERFLOW?
031264  103005                                    BHIS    2$             ;IF NO BRANCH
031266  005002                                    CLR R2                 ;OVERFLOW - SET CARRY & SET DIGIT=0
031270  012737  000001  025066                    MOV #1,ECARRY
031276  000402                                    BR 3$
031300  005037  025066                   2$:      CLR ECARRY
031304  012700  026056                   3$:      MOV #EVRTAB,R0         ;PUSH DIGIT FOUND INTO RESULT.
031310  010401                                    MOV R4,R1              ;SET R0=RESULT.ADR, R1=RESULT.PTR, R2 CONTAINS D
031312  013737  033076  025130                    MOV ETLSD,ELSD
031320  012737  177777  025112                    MOV #177777,EODD
031326  004737  022440                            JSR PC,EPUSH           ;CALL ROUTINE TO PUSH DIGIT INTO RESULT
031332  042702  177760                            BIC #177760,R2         ;MASK OFF ALL BUT DIGIT PUSHED
031336  001403                                    BEQ 1$                 ;IS DIGIT PUSHED=0?
031340  012737  177777  032150                    MOV #177777,ETNZI      ;NO-SET NON ZERO INDICATOR
031346  105303                           1$:      DECB R3                ;DECREMENT SRC.PTR
031350  105304                                    DECB R4                ;DECREMENT RESULT.PTR
031352  000720                                    BR ESISRC

031354  000137  032152          EFILZ:            JMP EFILLZ
031360                          EDETSN:                       ;DETERMINE SIGN & STORE WITH RESULT
                                                              ;NOTE: THERE EXIST TWO CASES IN WHICH THE DST SIGN
                                                              ;  WILL DIFFER FROM THE SRC SIGN. THESE CASES ARE
                                                              ;  WHEN:
                                                              ;  1)SRC SIGN = -,SHIFT=RIGHT,AND RESULT(ETNZI)=0
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                                                       ;  2)SRC SIGN = -,SHIFT=LEFT,AND SRC MAGNIIUDE=0
031360  013700  017366                  MOV E1,R0            ;SETUP SRC ADR
031364  013701  017364                  MOV E0,R1            ;SETUP PTR TO SIGN
031370  013737  017364  025130          MOV E0,ELSD          ;SETUP PTR TO LEAST SIGN DIGIT
031376  013737  032136  025112          MOV EODDS,EODD
031404  004737  021372                  JSR PC,ESNK          ;CALL ROUTINE TO FIND SRC SIGN
                                                             ;SIGN RETURNED IN ERSNEG
031410  005737  032150                  TST ETNZI            ;NON ZERO INDICATOR SET?
031414  001035                          BNE 1$               ;BRANCH IF YES
031416  032737  000200  017374          BIT #200,E4          ;SHIFT RIGHT?
031424  001403                          BEQ 2$               ;NO
031426  005037  025062                  CLR ERSNEG           ;MAKE SIGN POSITIVE (CASE 1 NOTED ABOVE)
031432  000426                          BR 1$
031434  105737  017364          2$:     TSTB E0              ;SRC MAGNITUDE = 0
031440  001421                          BEQ 4$               ;BRANCH IF YES (SRC.LEN = 0)
031442  013700  017366                  MOV E1,R0            ;SETUP SRC.ADR
031446  013701  017364                  MOV E0,R1            ;SETUP PTR TO SIGN
031452  013737  017364  025130          MOV E0,ELSD          ;SETUP PTR TO LEAST SIGN DIGIT
031460  105301                  3$:     DECB R1
031462  013737  032136  025112          MOV EODDS,EODD       ;FIND SRC DIGIT
031470  004737  021372                  JSR PC,ESNK
031474  005702                          TST R2               ;IS DIGIT = 0?
031476  001004                          BNE 1$               ;BRANCH IF NO
031500  105701                          TSTB R1              ;ALL DIGITS IN SRC TESTED?
031502  001366                          BNE 3$               ;BRANCH IF NO
031504  005037  025062          4$:     CLR ERSNEG           ;CASE 2 NOTED ABOVE
031510                          1$:                          ;STORE SIGN WITH RESULT
031510  012700  026056                  MOV #EVRTAB,R0
031514  013701  033076                  MOV ETLSD,R1
031520  013737  033076  025130          MOV ETLSD,ELSD
031526  012737  177777  025112          MOV #177777,EODD
031534  004737  022440                  JSR PC,EPUSH

031540                  ECRID:                               ;COPY RESULT INTO DESTINATION
031540  005037  032146                  CLR ENZI             ;CLEAR NON ZERO INDICATOR
031544  113701  017370                  MOVB E2,R1           ;  OF RESULT TO COPY.
031550  005737  026322                  TST EPAK             ;PACKED INST?
031554  001405                          BEQ 1$               ;BRANCH IF NO
031556  012704  026176                  MOV #EVRTAB+120,R4
031562  006201                          ASR R1               ;CALCULATE # OF BYTES OCCUPIED BY DST
031564  005201                          INC R1               ;    # OF BYTES=# OF DIGITS/2 +1
031566  000402                          BR 4$
031570  012704  026315          1$:     MOV #EVRTAB+237,R4
031574  160104                  4$:     SUB R1,R4
031576  013701  017370                  MOV E2,R1            ;SETUP POSITION POINTER TO ZERO
031602  042701  000377                  BIC #377,R1
031606  010103                          MOV R1,R3            ;SAVE DATA TYPE FIELD
031610  010400                  2$:     MOV R4,R0            ;SETUP 'FROM' ADDRESS
031612  013737  017370  025130          MOV E2,ELSD          ;SETUP POINTER TO LEAST SIGN DIGIT
031620  013737  032140  025112          MOV EODDD,EODD
031626  005737  026322                  TST EPAK             ;ZONED RESULT?
031632  001007                          BNE 5$               ;BRANCH IN NO
031634  042701  177400                  BIC #177400,R1       ;ZONED RESULT DATA TYPE = TRAILING SEPARATE
031640  052701  040000                  BIS #40000,R1
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031644  112737  000100  025131                    MOVB #100,ELSD+1
031652  004737  021372                   5$:      JSR PC,ESNK            ;CALL ROUTINE TO GET RESULT DIGIT
031656  013700  017372                            MOV E3,R0              ;SETUP 'TO' ADDRESS (I.E. DST)
031662  105037  025131                            CLRB ELSD+1
031666  050337  025130                            BIS R3,ELSD
031672  042701  177400                            BIC #177400,R1
031676  050301                                    BIS R3,R1
031700  004737  022440                            JSR PC,EPUSH           ;CALL ROUTINE TO PUSH RESULT DIGIT INTO DST
031704  005702                                    TST R2                 ;WAS DIGIT PUSHED NON ZERO?
031706  001403                                    BEQ 3$                 ;BRANCH IF NO
031710  012737  177777  032146                    MOV #177777,ENZI       ;SET NON ZERO INDICATOR
031716  020137  017370                   3$:      CMP R1,E2              ;COPY DONE?
031722  001402                                    BEQ ESCC               ;BRANCH IF YES
031724  005201                                    INC R1                 ;UPDATE PTR AND RETURN TO COPY NXT DIGIT
031726  000730                                    BR 2$

031730                          ESCC:                                    ;SET CONDITION CODES
031730  005077  165426                            CLR @EOPSW             ;RESET EMULATION PSW
031734  005737  032146                            TST ENZI               ;SET Z BIT IF NON ZERO INDICATOR=0.
031740  001004                                    BNE 1$
031742  052777  000004  165412                    BIS #4,@EOPSW
031750  000406                                    BR 2$
031752  005737  025062                   1$:      TST ERSNEG             ;IS SIGN NEGATIVE?
031756  001403                                    BEQ 2$                 ;BRANCH IF NO
031760  052777  000010  165374                    BIS #10,@EOPSW         ;SET N BIT
031766                                   2$:                             ;DETERMINE V BIT
031766  113700  017370                            MOVB E2,R0             ;CALCULATE # OF DIGITS OF RESULT
031772  012704  000237                            MOV #237,R4            ;  THAT WOULD NOT FIT IN DEST.
031776  160004                                    SUB R0,R4
032000  001437                                    BEQ 6$
032002  005304                                    DEC R4
032004  012700  026056                            MOV #EVRTAB,R0         ;YES - WERE ANY SIGNIFICANT DIGITS
032010  013701  017370                            MOV E2,R1              ;     NOT STORED?
032014  042701  000377                            BIC #377,R1
032020  005737  026322                            TST EPAK               ;ZONED RESULT?
032024  001004                                    BNE 3$                 ;BRANCH IF NO
032026  042701  177400                            BIC #177400,R1         ;ZONED RESULT DATA TYPE =TRAILING SEPARATE
032032  052701  040000                            BIS #40000,R1
032036  012737  177777  025112           3$:      MOV #177777,EODD
032044  013737  033076  025130                    MOV ETLSD,ELSD
032052  004737  021372                   5$:      JSR PC,ESNK            ;     CALL ROUTINE TO FIND RESULT DIGIT
032056  005702                                    TST R2                 ;     NOT STORED.
032060  001004                                    BNE 4$                 ;GO SET OVERFLOW - V BIT
032062  120104                                    CMPB R1,R4
032064  001405                                    BEQ 6$
032066  005201                                    INC R1
032070  000770                                    BR 5$
032072  052777  000002  165262           4$:      BIS #2,@EOPSW          ;SET V BIT
032100  013702  017360                   6$:      MOV EORSTK,R2          ;REGISTER UNLOAD
032104  005022                                    CLR (R2)+              ;R0=0
032106  005022                                    CLR (R2)+              ;R1=0
032110  013722  017370                            MOV E2,(R2)+           ;R2=R2
032114  013722  017372                            MOV E3,(R2)+           ;R3=R3
032120  005022                                    CLR (R2)+              ;R4=0
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032122  013722  017376                       MOV E5,(R2)+             ;R5=R5
032126  000207                               RTS PC

032130  000000           ETMPR0:             .WORD 0
032132  000000           ETMPR1:             .WORD 0
032134  000000           ETMPR2:             .WORD 0
032136  000000           EODDS:              .WORD 0
032140  000000           EODDD:              .WORD 0
032142  000000           ESGN:               .WORD 0
032144  000000           ENCC:               .WORD 0
032146  000000           ENZI:               .WORD 0
032150  000000           ETNZI:              .WORD 0

032152                   EFILLZ:                                      ;PAD REMAINING RESULT WITH ZERO DIGITS
032152  122704  000377                       CMPB #377,R4             ;IS RESULT.PTR <0?
032156  001426                               BEQ 1$                   ;IF YES BRANCH
032160  012700  026056                       MOV #EVRTAB,R0           ;PUSH A ZERO DIGIT INTO RESULT.
032164  010401                               MOV R4,R1                ;SET R0=RESULT.ADR, R1-RESULT.PTR, R2=0
032166  013702  025066                       MOV ECARRY,R2
032172  013737  033076  025130               MOV ETLSD,ELSD
032200  012737  177777  025112               MOV #177777,EODD
032206  004737  022440                       JSR PC,EPUSH             ;CALL ROUTINE TO PUSH ZERO + CARRY
                                                                      ;    DIGIT INTO RESULT.
032212  005702                               TST R2                   ;WAS DIGIT PUSHED = 0?
032214  001403                               BEQ 2$                   ;BRANCH IF YES
032216  012737  177777  032150               MOV #177777,ETNZI        ;DIGIT PUSHED NOT = 0;SET NONZERO INDICATOR
032224  105304                       2$:     DECB R4
032226  005037  025066                       CLR ECARRY
032232  000747                               BR EFILLZ
032234  000137  031360               1$:     JMP EDETSN
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                                                   .SBTTL          CMPP,CMPN INSTRUCTIONS
032240 012737 177777 026322 ECMPP:         MOV #177777,EPAK       ;INDICATE PACKED MODE
032246 005037 033066                       CLR EODDS1
032252 005037 033070                       CLR EODDS2
032256 032737 000001 017364                BIT #1,E0              ;IS SRC NUMBER ODD LENGTH?
032264 001403                              BEQ 1$
032266 012737 177777 033066                MOV #177777,EODDS1     ;YES - SET ODD INDICATOR
032274 032737 000001 017370        1$:     BIT #1,E2              ;IS SRC2 ODD LENGTH?
032302 001406                              BEQ ECMP
032304 012737 177777 033070                MOV #177777,EODDS2     ;YES SET ODD INDICATOR
032312 000402                              BR ECMP
032314 005037 026322        ECMPN:         CLR EPAK               ;INDICATE ZONED MODE

032320 013703 017364        ECMP:          MOV E0,R3              ;INITIALIZE SRC.PTY TO 0
032324 042703 000377                       BIC #377,R3
032330 013704 017370                       MOV E2,R4              ;INITIALIZE DST.PTR TO 0
032334 042704 000377                       BIC #377,R4
032340 010337 033072                       MOV R3,ELS1M
032344 010437 033074                       MOV R4,ELS2M
032350 013700 017366               1$:     MOV E1,R0              ;FIND MOST SIGNIFICANT DIGIT IN SRC1
032354 010301                              MOV R3,R1              ;SET R0=SRC1.ADR, R1=SRC1.PTR
032356 120337 017364                       CMPB R3,E0             ;REACH END OF SRC1 STRING?
032362 001416                              BEQ 2$                 ;IF YES BRANCH
032364 013737 017364 025130                MOV E0,ELSD
032372 013737 033066 025112                MOV EODDS1,EODD
032400 004737 021372                       JSR PC,ESNK            ;CALL ROUTINE TO FIND SRC DIGIT
032404 005702                              TST R2                 ;IS SRC1 DIGIT=0?
032406 001004                              BNE 2$                 ;IF NO BRANCH
032410 005203                              INC R3                 ;UPDATE SRC1.PTR TO NEXT DIGIT
032412 010337 033072                       MOV R3,ELS1M           ;SAVE SRC1.PTR
032416 000754                              BR 1$
032420 013705 017364               2$:     MOV E0,R5
032424 160305                              SUB R3,R5              ;CALCULATE # OF SIGN DIGITS IN SRC1
032426 010537 033062                       MOV R5,ES1NSD          ;SAVE # OF SIGN DIGITS IN ES1NSD
032432 013700 017372               3$:     MOV E3,R0              ;FIND MOST SIGNIFICANT DIGIT IN SRC2
032436 010401                              MOV R4,R1              ;SET R0=SRC2.ADR, R1=SRC2.PTR
032440 120437 017370                       CMPB R4,E2             ;REACH END OF SRC2 STRING?
032444 001416                              BEQ 4$                 ;IF YES BRANCH
032446 013737 017370 025130                MOV E2,ELSD
032454 013737 033070 025112                MOV EODDS2,EODD
032462 004737 021372                       JSR PC,ESNK            ;CALL ROUTINE TO FIND SRC DIGIT
032466 005702                              TST R2                 ;IS SRC2 DIGIT=0
032470 001004                              BNE 4$                 ;IF NO BRANCH
032472 005204                              INC R4                 ;UPDATE SRC2.PTR TO NEXT DIGIT
032474 010437 033074                       MOV R4,ELS2M           ;SAVE SRC2.PTR
032500 000754                              BR 3$
032502 013705 017370               4$:     MOV E2,R5
032506 160405                              SUB R4,R5              ;CALCULATE # OF SIGN DIGITS IN SRC2
032510 010537 033064                       MOV R5,ES2NSD          ;SAVE # OF SIGN DIGITS IN ES2NSD

032514                      ECNSD:                                ;COMPARE # OF SIGN DIGITS IN SRC1
032514 005077 164642                       CLR @EOPSW             ;      VERSUS SRC2
032520 023737 033062 033064                CMP ES1NSD,ES2NSD
032526 101052                              BHI 5$                 ;BRANCH IF SRC1 HAS MORE SIGN DIGITS
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032530  103457                                  BLO 6$                  ;BRANCH IF SRC2 HAS MORE SIGN DIGITS
032532  005737  033062                          TST ES1NSD                      ;SRC1 & SRC2 CONTAIN THE SAME #
                                                                        ;    OF SIGNIFICANT DIGITS
032536  001500                                  BEQ 3$                  ;BOTH SRC'S CONTAIN NO SIGNIFICANT DIGITS
032540  013703  033072                          MOV ELS1M,R3            ;SETUP SRC1.PTR
032544  013704  033074                          MOV ELS2M,R4            ;SETUP SRC2.PTR
032550  013700  017366                  4$:     MOV E1,R0               ;GET A SRC1 DIGIT
032554  010301                                  MOV R3,R1
032556  013737  017364  025130                  MOV E0,ELSD
032564  013737  033066  025112                  MOV EODDS1,EODD
032572  004737  021372                          JSR PC,ESNK
032576  010237  033060                          MOV R2,ES1D             ;SAVE SRC1 DIGIT
032602  013700  017372                          MOV E3,R0               ;GET A SRC2 DIGIT
032606  010401                                  MOV R4,R1
032610  013737  017370  025130                  MOV E2,ELSD
032616  013737  033070  025112                  MOV EODDS2,EODD
032624  004737  021372                          JSR PC,ESNK
032630  023702  033060                          CMP ES1D,R2             ;COMPARE DIGITS
032634  101007                                  BHI 5$                  ;BRANCH IF SRC1 DIGIT IS BIGGER
032636  103414                                  BLO 6$                  ;BRANCH IF SRC2 DIGIT IS BIGGER
032640  005203                                  INC R3                  ;DIGITS EQUAL - ALL DIGITS CHECKED?
032642  120337  033062                          CMPB R3,ES1NSD
032646  001416                                  BEQ 7$                  ;BRANCH IF ALL CHECKED - I.E. ALL
                                                                        ;     DIGITS ARE EQUAL
032650  005204                                  INC R4
032652  000736                                  BR 4$
032654  004737  032774                  5$:     JSR PC,EGS1S            ;CHECK SIGN OF SRC1
032660  005737  025062                          TST ERSNEG              ;IS SRC1 NEG?
032664  001021                                  BNE 2$                  ;BRANCH IF YES
032666  000427                                  BR 1$                   ;SRC1 IS POSITIVE

032670  004737  033026                  6$:     JSR PC,EGS2S            ;CHECK SIGN OF SRC2
032674  005737  025062                          TST ERSNEG              ;IS SRC2 NEGATIVE?
032700  001022                                  BNE 1$                  ;BRANCH IF YES
032702  000412                                  BR 2$                   ;SRC2 IS POSITIVE

032704                                  7$:                             ;COMPARE SIGNS
032704  004737  032774                          JSR PC,EGS1S            ;GET SRC1 SIGN
032710  013705  025062                          MOV ERSNEG,R5           ;SAVE IT IN R5
032714  004737  033026                          JSR PC,EGS2S            ;GET SRC2 SIGN
032720  023705  025062                          CMP ERSNEG,R5           ;SIGNS =?
032724  001405                                  BEQ 3$                  ;BRANCH IF YES
032726  000752                                  BR 5$                   ;SIGNS NOT EQUAL

032730  052777  000010  164424          2$:     BIS #10,@EOPSW          ;SRC2>SRC1 SET N BIT.
032736  000403                                  BR 1$
032740  052777  000004  164414          3$:     BIS #4,@EOPSW           ;SRC2=SRC1 SET Z BIT
032746  013702  017360                  1$:     MOV EORSTK,R2           ;REGISTER UNLOAD
032752  005022                                  CLR (R2)+               ;R0=0
032754  005022                                  CLR (R2)+               ;R1=0
032756  005022                                  CLR (R2)+               ;R2=0
032760  005022                                  CLR (R2)+               ;R3=0
032762  013722  017374                          MOV E4,(R2)+            ;R4=R4
032766  013722  017376                          MOV E5,(R2)+            ;R5=R5
```

```
032772  000207                                        RTS PC

032774  013700  017366          EGS1S:          MOV E1,R0               ;ROUTINE TO GET SRC1 SIGN
033000  013701  017364                          MOV E0,R1               ;SET R0=SRC1.ADR,R1=SRC1.PTR
033004  013737  017364  025130                  MOV E0,ELSD
033012  013737  033066  025112                  MOV EODDS1,EODD
033020  004737  021372                          JSR PC,ESNK             ;CALL ROUTINE TO FIND SRC1 SIGN
033024  000207                                  RTS PC

033026  013700  017372          EGS2S:          MOV E3,R0               ;ROUTINE TO GET SRC2 SIGN
033032  013701  017370                          MOV E2,R1               ;SET R0=SRC2.ADR,R1=SRC2.PTR
033036  013737  017370  025130                  MOV E2,ELSD
033044  013737  033070  025112                  MOV EODDS2,EODD
033052  004737  021372                          JSR PC,ESNK             ;CALL ROUTINE TO FIND SRC2 SIGN
033056  000207                                  RTS PC

033060  000000                  ES1D:           .WORD 0
033062  000000                  ES1NSD:         .WORD 0
033064  000000                  ES2NSD:         .WORD 0
033066  000000                  EODDS1:         .WORD 0
033070  000000                  EODDS2:         .WORD 0
033072  000000                  ELS1M:          .WORD 0
033074  000000                  ELS2M:          .WORD 0
033076  000000                  ETLSD:          .WORD 0
```

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                                                  .SBTTL                  MULP INSTRUCTION

 033100  004737  034142           EMULP:          JSR PC,ERSAV            ;SAVE MULP CALL PARAMETERS
 033104  005037  035130                           CLR EMVBR               ;INITIALIZE MULP V-BIT RESULT
 033110  004737  034224                           JSR PC,EIRT2            ;INITIALIZE TEMPORARY RESULT BUFFER (ERT2) TO 0+
 033114  004737  034300                           JSR PC,ETSTS1           ;IS MULP SRC1=0?
 033120  032737  000004  034610                   BIT #4,ETOPSW
 033126  001147                                   BNE EPMID
 033130  004737  034350                           JSR PC,ETSTS2           ;IS MULP SRC2=0?
 033134  032737  000004  034610                   BIT #4,ETOPSW
 033142  001141                                   BNE EPMID

 033144  005037  017370                           CLR E2                  ;FORM 1X,2X,3X, ETC TABLE
 033150  012737  034552  017372                   MOV #EZDSC,E3           ;  USE ADDP - SRC1=MULT.SRC1
 033156  012737  035060  035126                   MOV #EXTBP,EVXTBP       ;             SRC2=PREVIOUS ADDP DST
 033164  012737  035102  035124                   MOV #EXTVB,EVXTVB       ;             DST=E(N)XT TABLE
 033172  013737  034574  017364                   MOV ESR0,E0
 033200  013737  034576  017366                   MOV ESR1,E1
 033206  012737  000040  017374           1$:     MOV #40,E4
 033214  017737  001706  017376                   MOV @EVXTBP,E5
 033222  012737  034554  017360                   MOV #ETRSTK,EORSTK
 033230  012737  034610  017362                   MOV #ETOPSW,EOPSW
 033236  004737  023402                           JSR PC,EADDP
 033242  042737  177775  034610                   BIC #177775,ETOPSW      ;CLEAR ALL BUT V BIT FROM ADDP
 033250  013777  034610  001646                   MOV ETOPSW,@EVXTVB      ;  RESULT PSW; SAVE V BITS IN TABLE.
 033256  027727  001644  034612                   CMP @EVXTBP,#E1XT       ;FIRST TABLE ENTRY FORMATION?
 033264  001041                                   BNE 2$                  ;BRANCH IF NO
 033266  032737  000001  034600                   BIT #1,ESR2             ;WORK ON TABLE ENTRY SIGNS
 033274  001404                                   BEQ 31$
 033276  012737  177777  025112                   MOV #177777,EODD
 033304  000402                                   BR 3$
 033306  005037  025112                   31$:    CLR EODD
 033312  013700  034602                   3$:     MOV ESR3,R0
 033316  013701  034600                           MOV ESR2,R1
 033322  013737  034600  025130                   MOV ESR2,ELSD
 033330  004737  021372                           JSR PC,ESNK             ;CALL ROUTINE TO GET MULP.SRC2 SIGN
 033334  005737  025062                           TST ERSNEG              ;IF THIS SIGN IS POSITIVE THEN
 033340  001413                                   BEQ 2$                  ;  LEAVE TABLE SIGNS = MULP.SRC1 SIGN
 033342  132737  000001  034632                   BITB #1,E1XT+20         ;MULP.SRC2 SIGN = NEG; MAKE TABLE
 033350  001404                                   BEQ 4$                  ;  SIGNS = COMPLEMENT OF MULP.SRC1 SIGN
 033352  142737  000001  034632                   BICB #1,E1XT+20
 033360  000403                                   BR 2$
 033362  152737  000001  034632           4$:     BISB #1,E1XT+20
 033370  027727  001532  035032           2$:     CMP @EVXTBP,#E9XT       ;ALL TABLE ENTRIES FORMED?
 033376  001424                                   BEQ EISP                ;BRANCH IF YES
 033400  012737  000040  017364                   MOV #40,E0
 033406  012737  034612  017366                   MOV #E1XT,E1
 033414  012737  000040  017370                   MOV #40,E2              ;UPDATE ADDP SRC2 TO CURRENT
 033422  017737  001500  017372                   MOV @EVXTBP,E3          ;  DST POINTER
 033430  062737  000002  035126                   ADD #2,EVXTBP           ;UPDATE TABLE POINTERS
 033436  062737  000002  035124                   ADD #2,EVXTVB
 033444  000660                                   BR 1$                   ;RETURN TO FORM NEXT ENTRY.

 033446  000565                   EPMID:          BR EMID
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033450  005037  035054          EISP:                   CLR ESPOS               ;INITIALIZE SHIFT POSITION TO ZERO
033454  032737  000001  034600                          BIT #1,ESR2
033462  001404                                          BEQ 10$
033464  012737  177777  025112                          MOV #177777,EODD
033472  000402                                          BR 11$
033474  005037  025112                          10$:    CLR EODD
033500  013737  025112  035132                  11$:    MOV EODD,SEODD          ;SAVE EODD
033506  013737  034600  035056                          MOV ESR2,EMS2D          ;INITIALIZE MULP.SRC2 POINTER
033514  013737  035132  025112                  1$:     MOV SEODD,EODD          ;RESTORE EODD
033522  105337  035056                                  DECB EMS2D
033526  100535                                          BMI EMID                ;BRANCH IF NO MORE MULP.SRC2 DIGITS TO WORK ON
033530  013700  034602                                  MOV ESR3,R0
033534  013737  034600  025130                          MOV ESR2,ELSD
033542  013701  035056                                  MOV EMS2D,R1
033546  004737  021372                                  JSR PC,ESNK             ;CALL ROUTINE TO GET NEXT SRC2 DIGIT
033552  005702                                          TST R2
033554  001517                                          BEQ 2$                  ;BRANCH IF DIGIT = 0
033556  005302                                          DEC R2
033560  010237  035124                                  MOV R2,EVXTVB
033564  006337  035124                                  ASL EVXTVB
033570  062737  035102  035124                          ADD #EXTVB,EVXTVB       ;SETUP POINTER INTO V-BIT TABLE
033576  010237  035126                                  MOV R2,EVXTBP           ;INDEX INTO 1X,2X,ETC TABLE USING
033602  006337  035126                                  ASL EVXTBP              ;  NEXT SRC2 DIGIT
033606  062737  035060  035126                          ADD #EXTBP,EVXTBP
033614  012737  000040  017364                          MOV #40,E0              ;MULTIPLY TABLE VALUE BY PROPER
033622  017737  001300  017366                          MOV @EVXTBP,E1          ; POWER OF TEN INDICATOR BY SHIFT
033630  013737  035054  017374                          MOV ESPOS,E4            ; POSITION
033636  012737  000037  017370                          MOV #37,E2              ; USE ASHP - SRC=TABLE VALUE
033644  012737  034420  017372                          MOV #ERT1,E3            ;              SHFT.CT=SHFT.POSITION
033652  012737  034554  017360                          MOV #ETRSTK,EORSTK      ;              DST=ERT1
033660  012737  034610  017362                          MOV #ETOPSW,EOPSW
033666  004737  030642                                  JSR PC,EASHP
033672  042737  177775  034610                          BIC #177775,ETOPSW      ;WORK ON V BIT
033700  053737  034610  035130                          BIS ETOPSW,EMVBR        ; 'OR' ASHP V BIT WITH RESULT V BIT.
033706  057737  001212  035130                          BIS @EVXTVB,EMVBR       ; 'OR' TABLE V BIT WITH RESULT V BIT
033714  012737  000037  017364                          MOV #37,E0              ;ADD SHIFTED VALUE TO RESULT
033722  012737  034442  017366                          MOV #ERT2,E1            ; USE ADDP - SRC1=ERT2
033730  012737  000037  017370                          MOV #37,E2              ;              SRC2=ERT1
033736  012737  034420  017372                          MOV #ERT1,E3            ;              DST= ERT2
033744  012737  000037  017374                          MOV #37,E4
033752  012737  034442  017376                          MOV #ERT2,E5
033760  012737  034554  017360                          MOV #ETRSTK,EORSTK
033766  012737  034610  017362                          MOV #ETOPSW,EOPSW
033774  004737  023402                                  JSR PC,EADDP
034000  042737  177775  034610                          BIC #177775,ETOPSW      ;WORK ON V BIT
034006  053737  034610  035130                          BIS ETOPSW,EMVBR        ;'OR' ADDP V BIT WITH RESULT

034014  005237  035054                          2$:     INC ESPOS               ;INCREMENT SHIFT POSITION FOR NEXT
034020  000635                                          BR 1$                   ; MULP SRC2 DIGIT.

034022  012737  000037  017364  EMID:                   MOV #37,E0              ;MOVE RESULT INTO MULP DST
034030  012737  034442  017366                          MOV #ERT2,E1            ; USE ASHP - SRC=ERT2
034036  005037  017374                                  CLR E4                  ;              DST=MULP.DST
```

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10389 034042 005037 017376                      CLR E5
10390 034046 013737 034604 017370               MOV ESR4,E2             ;               SHFT.CT=0
10391 034054 013737 034606 017372               MOV ESR5,E3
10392 034062 013737 034570 017360               MOV ESOSTK,EORSTK
10393 034070 013737 034572 017362               MOV ESOPSW,EOPSW
10394 034076 004737 030642                      JSR PC,EASHP
10395 034102 053777 035130 163252               BIS EMVBR,@EOPSW        ;MULP CONDITION CODE RESULTS:
10396                                                                   ; N,Z, AND C FROM LAST ASHP
10397                                                                   ; V = 'OR' OF ALL PREVIOUS V'S
10398 034110 013702 017360               EXMD:  MOV EORSTK,R2           ;REGISTER UNLOAD - NEEDED BECAUSE REGISTER
10399                                                                   ;OUTPUTS FOR ASHP ARE R2 AND R3
10400                                                                   ;WHEREAS THOSE FOR MULP AND DIVP ARE R4 AND R5.
10401 034114 016262 000004 000010               MOV 4(R2),10(R2)        ;R4=R2
10402 034122 016262 000006 000012               MOV 6(R2),12(R2)        ;R5=R3
10403 034130 005062 000004                      CLR 4(R2)               ;R2=0
10404 034134 005062 000006                      CLR 6(R2)               ;R3=0
10405 034140 000207                             RTS PC                  ;EXIT MULP EMULATION ROUTINE
```

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                                                .SBTTL                  MULP/DIVP SUBROUTINES
034142  013737  017360  034570  ERSAV:          MOV EORSTK,ESOSTK       ;SAVE MULP/DIVP CALL PARAMETERS
034150  013737  017362  034572                  MOV EOPSW,ESOPSW        ;THIS PERMITS CALLING OTHER
034156  013737  017364  034574                  MOV E0,ESR0             ;  EMULATION ROUTINES WHILE
034164  013737  017366  034576                  MOV E1,ESR1             ;  IN THE MULP/DIVP EMULATION.
034172  013737  017370  034600                  MOV E2,ESR2
034200  013737  017372  034602                  MOV E3,ESR3
034206  013737  017374  034604                  MOV E4,ESR4
034214  013737  017376  034606                  MOV E5,ESR5
034222  000207                                  RTS PC

034224  005037  017364          EIRT2:          CLR E0                  ;INITIALIZE ERT2 BUFFER TO 0+
034230  012737  034552  017366                  MOV #EZDSC,E1           ;  USE ASHP - SRC.LEN=0
034236  005037  017374                          CLR E4                  ;             SHFT.CT=0
034242  012737  000037  017370                  MOV #37,E2              ;             DST.LEN=31
034250  012737  034442  017372                  MOV #ERT2,E3            ;             DST.ADR=ERT2
034256  012737  034554  017360                  MOV #ETRSTK,EORSTK
034264  012737  034610  017362                  MOV #ETOPSW,EOPSW
034272  004737  030642                          JSR PC,EASHP
034276  000207                                  RTS PC

034300  005037  017370          ETSTS1:         CLR E2                  ;COMPARE MULP/DIVP SRC1 WITH 0.
034304  012737  034552  017372                  MOV #EZDSC,E3           ;  USE CMPP - SRC2.LEN=0
034312  013737  034574  017364                  MOV ESR0,E0             ;             SRC1.LEN=MULT.SRC1.LEN
034320  013737  034576  017366                  MOV ESR1,E1             ;             SRC1.ADR=MULP.SRC1.ADR
034326  012737  034554  017360                  MOV #ETRSTK,EORSTK
034334  012737  034610  017362                  MOV #ETOPSW,EOPSW
034342  004737  032240                          JSR PC,ECMPP
034346  000207                                  RTS PC

034350  005037  017370          ETSTS2:         CLR E2                  ;COMPARE MULP/DIVP SRC2 WITH 0.
034354  012737  034552  017372                  MOV #EZDSC,E3           ;  USE CMPP - SRC2.LEN=0
034362  013737  034600  017364                  MOV ESR2,E0             ;             SRC1.LEN=MULP.SRC2.LEN
034370  013737  034602  017366                  MOV ESR3,E1             ;             SRC1.ADR=MULP.SRC2.ADR
034376  012737  034554  017360                  MOV #ETRSTK,EORSTK
034404  012737  034610  017362                  MOV #ETOPSW,EOPSW
034412  004737  032240                          JSR PC,ECMPP
034416  000207                                  RTS PC
```

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                                   .SBTTL          MULP/DIVP VARIABLES AND BUFFERS

034420  000011         ERT1:       .BLKW 11
034442  000011         ERT2:       .BLKW 11
034464  000011         ERT3:       .BLKW 11
034506  000011         ERT4:       .BLKW 11
034530  000011         ERT5:       .BLKW 11
034552  000000         EZDSC:      .WORD 0
034554  000006         ETRSTK:     .BLKW 6
034570  000000         ESOSTK:     .WORD 0
034572  000000         ESOPSW:     .WORD 0
034574  000000         ESR0:       .WORD 0         ;MULP/DIVP SRC1.LEN
034576  000000         ESR1:       .WORD 0         ;MULP/DIVP SRC1.ADR
034600  000000         ESR2:       .WORD 0         ;MULP/DIVP SRC2.LEN
034602  000000         ESR3:       .WORD 0         ;MULP/DIVP SRC2.ADR
034604  000000         ESR4:       .WORD 0         ;MULP/DIVP DST.LEN
034606  000000         ESR5:       .WORD 0         ;MULP/DIVP DST.ADR
034610  000000         ETOPSW:     .WORD 0
034612  000011         E1XT:       .BLKW 11        ; 1 X SRC1
034634  000011         E2XT:       .BLKW 11        ; 2 X SRC1
034656  000011         E3XT:       .BLKW 11        ; 3 X SRC1
034700  000011         E4XT:       .BLKW 11        ; 4 X SRC1
034722  000011         E5XT:       .BLKW 11        ; 5 X SRC1
034744  000011         E6XT:       .BLKW 11        ; 6 X SRC1
034766  000011         E7XT:       .BLKW 11        ; 7 X SRC1
035010  000011         E8XT:       .BLKW 11        ; 8 X SRC1
035032  000011         E9XT:       .BLKW 11        ; 9 X SRC1
035054  000000         ESPOS:      .WORD 0
035056  000000         EMS2D:      .WORD 0
035060  034612         EXTBP:      .WORD E1XT
035062  034634                     .WORD E2XT
035064  034656                     .WORD E3XT
035066  034700                     .WORD E4XT
035070  034722                     .WORD E5XT
035072  034744                     .WORD E6XT
035074  034766                     .WORD E7XT
035076  035010                     .WORD E8XT
035100  035032                     .WORD E9XT
035102  000011         EXTVB:      .BLKW 11        ;V-BIT TABLE
035124  000000         EVXTVB:     .WORD 0
035126  000000         EVXTBP:     .WORD 0
035130  000000         EMVBR:      .WORD 0
035132  000000         SEODD:      .WORD 0
035134  000000         ESS2SN:     .WORD 0
035136  000000         ESS1SN:     .WORD 0
035140  000000         ESUBCT:     .WORD 0
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                                                       .SBTTL                  DIVP INSTRUCTION

035142  004737  034142            EDIVP:     JSR PC,ERSAV            ;SAVE DIVP CALL PARAMETERS
035146  005037  036210                       CLR EZDF                ;CLEAR ZERO DIVIDE FLAG
035152  005037  035054                       CLR ESPOS               ;CLEAR SHIFT POSITION
035156  004737  034224                       JSR PC,EIRT2            ;INITIALIZE TEMPORARY RESULT BUFFER (ERT2) TO 0+
035162  004737  034300                       JSR PC,ETSTS1           ;IS DIVP SRC1 = 0?
035166  032737  000004  034610               BIT #4,ETOPSW           ;
035174  001152                               BNE E1XZD               ;BRANCH IF YES
035176  042737  177767  034610               BIC #177767,ETOPSW
035204  013737  034610  035136               MOV ETOPSW,ESS1SN       ;SAVE SRC1 SIGN
035212  004737  034350                       JSR PC,ETSTS2           ;IS DIVP SRC2=0?
035216  032737  000004  034610               BIT #4,ETOPSW
035224  001134                               BNE E1DID               ;BRANCH IF YES
035226  042737  177767  034610               BIC #177767,ETOPSW
035234  013737  034610  035134               MOV ETOPSW,ESS2SN       ;SAVE SRC2 SIGN

035242  013737  034574  017364               MOV ESR0,E0             ;MOVE DIVP SRC1 INTO ERT3
035250  013737  034576  017366               MOV ESR1,E1             ; USE ASHP - SRC = DIVP.SRC1
035256  005037  017374                       CLR E4                  ;              DST = ERT3
035262  005037  017376                       CLR E5                  ;              SHFT.CT=0
035266  012737  000040  017370               MOV #40,E2
035274  012737  034464  017372               MOV #ERT3,E3
035302  004737  030642                       JSR PC,EASHP
035306  142737  000001  034504               BICB #1,@#ERT3+20              ;MAKE ERT3 SIGN = +

035314  013737  034600  017364               MOV ESR2,E0             ;MOVE DIVP SRC2 INTO ERT4
035322  013737  034602  017366               MOV ESR3,E1             ; USE ASHP - SRC = DIVP SRC2
035330  005037  017374                       CLR E4                  ;              DST = ERT4
035334  005037  017376                       CLR E5                  ;              SHFT.CT = 0
035340  012737  000037  017370               MOV #37,E2
035346  012737  034506  017372               MOV #ERT4,E3
035354  004737  030642                       JSR PC,EASHP
035360  142737  000001  034525               BICB #1,@#ERT4+17              ;MAKE ERT4 SIGN +

035366  012737  000040  017364    EPOSS1:    MOV #40,E0              ;SHIFT DIVP SRC1 LEFT UNTIL SRC2 - SRC1(SHIFTED)
035374  012737  034464  017366               MOV #ERT3,E1            ;  IS NEGATIVE. NOTE: LEN=40 IS LEGAL FOR EMUL.
035402  012737  000037  017370               MOV #37,E2              ;SUBTRACT ERT3 FROM ERT4
035410  012737  034506  017372               MOV #ERT4,E3            ; USE SUBP - SRC1 = ERT3
035416  012737  000037  017374               MOV #37,E4              ;              SRC2 = ERT4
035424  012737  034420  017376               MOV #ERT1,E5            ;              DST =  ERT1
035432  004737  023420                       JSR PC,ESUBP
035436  032777  000010  161716               BIT #10,@EOPSW          ;IS RESULT NEGATIVE?
035444  001030                               BNE EPOSD               ;BRANCH IF YES
035446  012737  000040  017364               MOV #40,E0              ;SHIFT DIVP SRC1 LEFT 1 PLACE
035454  012737  034464  017366               MOV #ERT3,E1            ; USE ASHP - SRC = ERT3
035462  012737  000001  017374               MOV #1,E4               ;              DST = ERT3
035470  012737  000040  017370               MOV #40,E2              ;              SHFT.CT = 1
035476  012737  034464  017372               MOV #ERT3,E3            ;NOTE - LEGAL FOR EMULATOR.
035504  004737  030642                       JSR PC,EASHP
035510  005237  035054                       INC ESPOS               ;INCREMENT SHIFT POSITION
035514  000724                               BR EPOSS1
035516  000137  036054            E1DID:     JMP EDID
035522  000137  036140            E1XZD:     JMP EXZD
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035526  005737  035054          EPOSD:          TST ESPOS               ;SHIFT POSITION = 0?
035532  001550                                  BEQ EDID                ;BRANCH IF YES
035534  012737  000040  017364  EDIVL:          MOV #40,E0              ;REPOSITION ERT3 BACK 1 PLACE(RIGHT)
035542  012737  034464  017366                  MOV #ERT3,E1            ; USE ASHP - SRC = ERT3
035550  012737  000377  017374                  MOV #377,E4             ;            DST = ERT3
035556  012737  000040  017370                  MOV #40,E2              ;            SHFT.CT=-1
035564  012737  034464  017372                  MOV #ERT3,E3            ;NOTE - THIS IS LEGAL FOR EMULATOR
035572  004737  030642                          JSR PC,EASHP
035576  005037  035140                          CLR ESUBCT              ;CLEAR SUBTRACT COUNTER
035602  012737  000040  017364          1$:     MOV #40,E0              ;SUBTRACT DIVP SRC1(SHIFTED) FROM DIVP SRC2
035610  012737  034464  017366                  MOV #ERT3,E1            ; USE SUBP - SRC1 = ERT3
035616  012737  000037  017370                  MOV #37,E2              ;            SRC2 = ERT4
035624  012737  034506  017372                  MOV #ERT4,E3            ;            DST =  ERT4
035632  012737  000037  017374                  MOV #37,E4
035640  012737  034506  017376                  MOV #ERT4,E5
035646  004737  023420                          JSR PC,ESUBP
035652  032777  000010  161502                  BIT #10,@EOPSW          ;IS RESULT OF SUBP POSITIVE?
035660  001003                                  BNE ESBTD               ;BRANCH IF NO
035662  005237  035140                          INC ESUBCT              ;INCREMENT SUBTRACT COUNTER
035666  000745                                  BR 1$
035670  012737  000040  017364  ESBTD:          MOV #40,E0              ;BACKUP TO LAST POSITIVE RESULT FROM SUBP
035676  012737  034464  017366                  MOV #ERT3,E1            ; USE ADDP - SRC1 = ERT3
035704  012737  000037  017370                  MOV #37,E2              ;            SRC2 = ERT4
035712  012737  034506  017372                  MOV #ERT4,E3            ;            DST = ERT4
035720  012737  000037  017374                  MOV #37,E4
035726  012737  034506  017376                  MOV #ERT4,E5
035734  004737  023402                          JSR PC,EADDP
035740  012737  000037  017364                  MOV #37,E0              ;STORE SUBTRACT COUNTER IN RESULT(ERT2)
035746  012737  034442  017366                  MOV #ERT2,E1            ;SHIFT RESULT, THEN ENTER DIGIT
035754  012737  000001  017374                  MOV #1,E4               ; USE ASHP - SRC = ERT2
035762  012737  000037  017370                  MOV #37,E2              ;              DST=ERT2
035770  012737  034442  017372                  MOV #ERT2,E3            ;            SHFT.CT=1
035776  004737  030642                          JSR PC,EASHP
036002  006337  035140                          ASL ESUBCT              ;INSERT SUBTRACT COUNTER IN RESULT
036006  006337  035140                          ASL ESUBCT
036012  006337  035140                          ASL ESUBCT
036016  006337  035140                          ASL ESUBCT
036022  153737  035140  034461                  BISB ESUBCT,@#ERT2+17
036030  005337  035054                          DEC ESPOS               ;DECREMENT SHIFT POSITION
036034  001237                                  BNE EDIVL               ;IS SHIFT POSITION=0? BRANCH IF NO
036036  023737  035134  035136                  CMP ESS2SN,ESS1SN       ;DIVP SRC1 SIGN = DIVP SRC2 SIGN?
036044  001403                                  BEQ EDID                ;BRANCH IF YES
036046  152737  000001  034461                  BISB #1,@#ERT2+17               ;NO - MAKE SIGN IN ERT2 NEGATIVE
036054  012737  000037  017364  EDID:           MOV #37,E0              ;MOVE RESULT INTO DST
036062  012737  034442  017366                  MOV #ERT2,E1            ; USE ASHP - SRC = ERT2
036070  005037  017374                          CLR E4                  ;            DST = DIVP.DST
036074  005037  017376                          CLR E5                  ;            SHFT.CT = 0
```

```
036100 013737 034604 017370                MOV ESR4,E2
036106 013737 034606 017372                MOV ESR5,E3
036114 013737 034570 017360                MOV ESOSTK,EORSTK
036122 013737 034572 017362                MOV ESOPSW,EOPSW
036130 004737 030642                       JSR PC,EASHP
036134 000137 034110                       JMP EXMD                 ;EXIT DIVP

036140 013737 034572 017362  EXZD:         MOV ESOPSW,EOPSW
036146 052777 000003 161206                BIS #3,@EOPSW            ;EXIT FROM DIVIDE BY ZERO
                                                                    ;SET V & C COND. CODES
036154 012737 177777 036210                MOV #177777,EZDF         ;SET ZERO DIVIDE FLAG TO SIGNAL
                                                                    ;  TABLE DRIVER NOT TO COMPARE
                                                                    ;  ANYTHING EXCEPT V & C COND. CODE
036162 013737 034576 036212                MOV ESR1,EZDBEG          ;SAVE POINTER TO START & # OF BYTES
                                                                    ;  OF DST STRING
036170 013737 034574 036214                MOV ESR0,EZDEND          ;CONTENTS OF DST STRING UNPREDICTABLE
036176 006237 036214                       ASR EZDEND               ;  AFTER ZERO DIVP
036202 005237 036214                       INC EZDEND
036206 000207                              RTS PC                   ;RESULTS

036210 000000                EZDF:         .WORD 0
036212 000000                EZDBEG:       .WORD 0
036214 000000                EZDEND:       .WORD 0
```

```
                                                .SBTTL          LOAD DESCRIPTORS
036216  013701  017364          EL2D0:          MOV E0,R1       ;GET REGISTER POINTER
036222  012102                  EL2:            MOV (R1)+,R2    ;GET ADDRESS OF DESCRIPTOR
036224  011237  017364                          MOV (R2),E0     ;LOAD 1ST WORD OF DESC INTO E0
036230  016237  000002  017366                  MOV 2(R2),E1    ;LOAD 2ND WORD OF DESC INTO E1
036236  011102                                  MOV (R1),R2     ;GET ADDRESS OF NEXT DESC
036240  011237  017370                          MOV (R2),E2     ;LOAD 1ST WORD OF DESC INTO E2
036244  016237  000002  017372                  MOV 2(R2),E3    ;LOAD 2ND WORD OF DESC INTO E3
036252  013700  017360          EXL2:           MOV EORSTK,R0   ;RETURN CLEAN UP
036256  013720  017364                          MOV E0,(R0)+    ;R0=R0
036262  013720  017366                          MOV E1,(R0)+    ;R1=R1
036266  013720  017370                          MOV E2,(R0)+    ;R2=R2
036272  013720  017372                          MOV E3,(R0)+    ;R3=R3
036276  013720  017374                          MOV E4,(R0)+    ;R4=R4
036302  013720  017376                          MOV E5,(R0)+    ;R5=R5
036306  013720  017400                          MOV E6,(R0)+    ;R6=R6
036312  012777  000017  161042                  MOV #17,@EOPSW  ;SET ALL COND. CODE BITS.
036320  000207                                  RTS PC

036322                          EL2D1:
036322  013701  017366                          MOV E1,R1
036326  000735                                  BR EL2

036330                          EL2D2:
036330  013701  017370                          MOV E2,R1
036334  000732                                  BR EL2

036336                          EL2D3:
036336  013701  017372                          MOV E3,R1
036342  000727                                  BR EL2

036344                          EL2D4:
036344  013701  017374                          MOV E4,R1
036350  062737  000004  017374                  ADD #4,E4
036356  000721                                  BR EL2

036360                          EL2D5:
036360  013701  017376                          MOV E5,R1
036364  062737  000004  017376                  ADD #4,E5
036372  000713                                  BR EL2

036374                          EL2D6:
036374  013701  017400                          MOV E6,R1
036400  012102                                  MOV (R1)+,R2
036402  011237  017364                          MOV (R2),E0
036406  016237  000002  017366                  MOV 2(R2),E1
036414  012102                                  MOV (R1)+,R2
036416  011237  017370                          MOV (R2),E2
036422  016237  000002  017372                  MOV 2(R2),E3
036430  010137  017400                          MOV R1,E6       ;NOTE:L2D6 UPDATES R6 (POPS STACK)
036434  000137  036252                          JMP EXL2

036440                          EL2D7:
036440  013701  050014                          MOV TINST+2,R1
```

```
036444  011137  017364                          MOV (R1),E0
036450  016137  000002  017366                  MOV 2(R1),E1
036456  013701  050016                          MOV TINST+4,R1
036462  011137  017370                          MOV (R1),E2
036466  016137  000002  017372                  MOV 2(R1),E3
036474  000137  036252                          JMP EXL2
```

```
036500  013701  017364          EL3D0:  MOV E0,R1           ;GET REGISTER POINTER
036504  012102                  EL3:    MOV (R1)+,R2        ;GET ADDRESS OF DESCRIPTOR
036506  011237  017364                  MOV (R2),E0         ;LOAD 1ST WORD OF DESC INTO E0
036512  016237  000002  017366          MOV 2(R2),E1        ;LOAD 2ND WORD OF DESC INTO E1
036520  012102                          MOV (R1)+,R2        ;GET ADDRESS OF NEXT DESC
036522  011237  017370                  MOV (R2),E2         ;LOAD 1ST WORD OF DESC INTO E2
036526  016237  000002  017372          MOV 2(R2),E3        ;LOAD 2ND WORD OF DESC INTO E3
036534  011102                          MOV (R1),R2         ;GET ADDRESS OF NEXT DESC
036536  011237  017374                  MOV (R2),E4         ;LOAD 1ST WORD OF DESC INTO E4
036542  016237  000002  017376          MOV 2(R2),E5        ;LOAD 2ND WORD OF DESC INTO E5
036550  000137  036252                  JMP EXL2

036554                          EL3D1:
036554  013701  017366                  MOV E1,R1
036560  000751                          BR EL3

036562                          EL3D2:
036562  013701  017370                  MOV E2,R1
036566  000746                          BR EL3

036570                          EL3D3:
036570  013701  017372                  MOV E3,R1
036574  000743                          BR EL3

036576                          FL3D4:
036576  013701  017374                  MOV E4,R1
036602  000740                          BR EL3

036604                          EL3D5:
036604  013701  017376                  MOV E5,R1
036610  000735                          BR EL3

036612                          EL3D6:
036612  013701  017400                  MOV E6,R1
036616  012102                          MOV (R1)+,R2
036620  011237  017364                  MOV (R2),E0
036624  016237  000002  017366          MOV 2(R2),E1
036632  012102                          MOV (R1)+,R2
036634  011237  017370                  MOV (R2),E2
036640  016237  000002  017372          MOV 2(R2),E3
036646  012102                          MOV (R1)+,R2
036650  011237  017374                  MOV (R2),E4
036654  016237  000002  017376          MOV 2(R2),E5
036662  010137  017400                  MOV R1,E6           ;NOTE:L2D6 UPDATES R6 (POPS STACK)
036666  000137  036252                  JMP EXL2

036672                          EL3D7:
036672  013701  050014                  MOV TINST+2,R1
036676  011137  017364                  MOV (R1),E0
036702  016137  000002  017366          MOV 2(R1),E1
036710  013701  050016                  MOV TINST+4,R1
036714  011137  017370                  MOV (R1),E2
036720  016137  000002  017372          MOV 2(R1),E3
036726  013701  050020                  MOV TINST+6,R1
```

```
 10744  036732  011137  017374                           MOV (R1),E4
 10745  036736  016137  000002  017376                   MOV 2(R1),E5
 10746  036744  000137  036252                           JMP EXL2
 10747
```

```
 10749                                          .SBTTL  CIS INSTRUCTION TEST LOOP
 10750
 10751  036750  012737  177777  001744  SEEDST: MOV #177777,ESEED          ;SET ENTER RNG SEED FLAG
 10752  036756  000476                          BR DVTST
 10754  036760  012737  177777  001750  START:  MOV #177777,N200M          ;SET FLAG TO INDICATE THAT PROG WAS
 10755                                                                     ;STARTED AT LOC 200
 10757  036766  012737  177777  002206  QVST:   MOV #177777,QVMODE         ;SET QVMODE FLAG
 10763  036774  005037  001746          NST:    CLR DENS                   ;CLEAR DON'T ENTER NORMAL RNG SEED FLAG.
 10764  037000  005037  001120                  CLR $TESTN                 ;CLEAR TEST COUNT
 10765  037004  012706  001100                  MOV     #STACK,SP          ;;SETUP THE STACK POINTER
   (1)  037010  012737  111214  000034          MOV     #$TRAP,@#TRAPVEC   ;;TRAP VECTOR FOR TRAP CALLS
   (1)  037016  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
   (1)  037024  012737  111246  000024          MOV     #$PWRDN,@#PWRVEC   ;;POWER FAILURE VECTOR
   (1)  037032  012737  000340  000026          MOV     #340,@#PWRVEC+2    ;;LEVEL 7
   (2)  037040  013746  000004                  MOV     @#4,-(SP)          ;;SAVE ERROR VECTOR
   (2)  037044  013746  000006                  MOV     @#6,-(SP)
   (2)  037050  012737  037064  000004          MOV     #64$,4             ;;SET UP TIME OUT VECTOR
   (2)  037056  005777  142654                  TST     @SWR               ;;TRY TO REFERENCE HARDWARE SWR
   (2)  037062  000407                          BR      65$                ;;BRANCH IF NO TIMEOUT TRAP OCCURS
   (2)  037064  012737  000176  001736  64$:    MOV     #SWREG,SWR         ;;POINT TO SOFTWARE SWR
   (2)  037072  012737  000174  001740          MOV     #DISPREG,DISPLAY   ;;POINT TO SOFTWARE DISPLAY REG
   (2)  037100  022626                          CMP     (SP)+,(SP)+        ;;RESTORE STACK
   (2)  037102  012637  000006          65$:    MOV     (SP)+,@#6          ;;RESTORE ERROR VECTOR
   (2)  037106  012637  000004                  MOV     (SP)+,@#4
   (1)  037112  005037  001122                  CLR     $PASS              ;;CLEAR PASS COUNT
   (1)  037116  132737  000200  001135          BITB    #APTSIZE,$ENVM     ;;TEST USER SIZE UNDER APT
   (1)  037124  001403                          BEQ     3$                 ;;YES,USE NON-APT SWITCH
   (1)  037126  012737  001136  001736          MOV     #$SWREG,SWR        ;;NO,USE APT SWITCH REGISTER
   (1)  037134                          3$:
 10766                                                                     ;  NO QUESTIONS ASKED - EXERCISES FIXED TABLE TEST
 10767                                                                     ;  CONDITIONS FIRST THEN ENTERS RANDOM MODE TESTING
 10768  037134  012737  177777  002074          MOV #177777,FSRUN
 10769  037142  005037  001660                  CLR INCSQ1                 ;PRIOR TO EACH TEST, BUFFERS WILL BE INITIALIZED TO ZERO
 10770  037146  005037  001662                  CLR INCSQ2
 10771  037152  000462                          BR COMST
 10772  037154  005037  002206          DVTST:  CLR QVMODE
 10773  037160  005037  001746                  CLR DENS                   ;CLEAR DON'T ENTER NORMAL RNG SEED FLAG
 10774  037164  012706  001100                  MOV     #STACK,SP          ;;SETUP THE STACK POINTER
   (1)  037170  012737  111214  000034          MOV     #$TRAP,@#TRAPVEC   ;;TRAP VECTOR FOR TRAP CALLS
   (1)  037176  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
   (1)  037204  012737  111246  000024          MOV     #$PWRDN,@#PWRVEC   ;;POWER FAILURE VECTOR
   (1)  037212  012737  000340  000026          MOV     #340,@#PWRVEC+2    ;;LEVEL 7
   (2)  037220  013746  000004                  MOV     @#4,-(SP)          ;;SAVE ERROR VECTOR
   (2)  037224  013746  000006                  MOV     @#6,-(SP)
   (2)  037230  012737  037244  000004          MOV     #64$,4             ;;SET UP TIME OUT VECTOR
   (2)  037236  005777  142474                  TST     @SWR               ;;TRY TO REFERENCE HARDWARE SWR
   (2)  037242  000407                          BR      65$                ;;BRANCH IF NO TIMEOUT TRAP OCCURS
   (2)  037244  012737  000176  001736  64$:    MOV     #SWREG,SWR         ;;POINT TO SOFTWARE SWR
   (2)  037252  012737  000174  001740          MOV     #DISPREG,DISPLAY   ;;POINT TO SOFTWARE DISPLAY REG
   (2)  037260  022626                          CMP     (SP)+,(SP)+        ;;RESTORE STACK
   (2)  037262  012637  000006          65$:    MOV     (SP)+,@#6          ;;RESTORE ERROR VECTOR
   (2)  037266  012637  000004                  MOV     (SP)+,@#4
   (1)  037272  005037  001122                  CLR     $PASS              ;;CLEAR PASS COUNT
   (1)  037276  132737  000200  001135          BITB    #APTSIZE,$ENVM     ;;TEST USER SIZE UNDER APT
```

```
   (1)  037304  001403                               BEQ     3$               ;;YES,USE NON-APT SWITCH
   (1)  037306  012737  001136  001736               MOV     #$SWREG,SWR      ;;NO,USE APT SWITCH REGISTER
   (1)  037314                                3$:
 10775                                                                        ;  RESULTS IN DIALOG WITH USER TO DETERMINE
 10776                                                                        ;  EXACT RUN MODE DESIRED.
 10781  037314  005037  002074                       CLR FSRUN
 10782  037320                                COMST:
 10783  037320  005077  142340                       CLR @TPSW                ;SET PROCESSOR PRIORITY TO ZERO
 10784  037324  012737  037356  000010               MOV #22$,@#RESVEC        ;CHECK FOR SWITCH ON CIS MODULE TO BE IN CORRECT POSITIO
 10785  037332  005037  000012                       CLR @#RESVEC+2
 10786  037336  076001                               76001                    ;THIS INST SHOULD TRAP TO LOC 10 IF
 10787                                                                        ;  SWITCH POSITION IS OK; OTHERWISE
 10788                                                                        ;  IT WILL ACT LIKE A 'NOP'.
 10789  037340                                       PRINTB #SWNG             ;INDICATE THAT SWITCH POSITION IS INCORECT
   (6)  037340  012746  013454                       MOV     #SWNG,-(SP)
   (3)  037344  010600                               MOV     SP,R0
   (4)  037346  004737  065410                       JSR PC,FPRINT
 10790  037352  000000                               HALT
 10791  037354  000761                               BR COMST
 10798  037356  005726                        22$:   TST (SP)+        ;FIX UP STACK
 10799  037360  005726                               TST (SP)+
 10800  037362  005737  001744                       TST ESEED        ;GET NEW SEED CONSTANTS?
 10801  037366  001437                               BEQ 2$           ;BRANCH IF NO
 10802  037370                                111$:  PRINTB #ACCSEED  ;PRINT MESSAGE: ENTER RNG SEED CONSTANTS
   (6)  037370  012746  016111                       MOV     #ACCSEED,-(SP)
   (3)  037374  010600                               MOV     SP,R0
   (4)  037376  004737  065410                       JSR PC,FPRINT
 10803  037402  004737  065102                       JSR PC,ACCOCT    ;GET OCTAL SEED
 10804  037406  000770                               BR 111$          ;<CR> RETURN
 10805  037410  000240                               NOP              ;XXXXXX<CR> RETURN
 10806  037412  000240                               NOP              ;XXXXXX<-> RETURN
 10807  037414  012637  063612                       MOV (SP)+,RNCON  ;INSERT FIRST SEED CONSTANT
 10808  037420  004737  065102                       JSR PC,ACCOCT    ;GET SECOND SEED
 10809  037424  000761                               BR 111$
 10810  037426  000240                               NOP
 10811  037430  000240                               NOP
 10812  037432  012637  063614                       MOV (SP)+,RP1    ;INSERT SECOND SEED CONSTANT
 10813  037436  004737  065102                       JSR PC,ACCOCT    ;GET THIRD SEED
 10814  037442  000752                               BR 111$
 10815  037444  000240                               NOP
 10816  037446  000240                               NOP
 10817  037450  012637  063616                       MOV (SP)+,RP2    ;INSERT THIRD SEED CONSTANT
 10818  037454  012737  177777  001746               MOV #177777,DENS;SET DON'T ENTER NORMAL SEED FLAG
 10819  037462  005037  001744                       CLR ESEED
 10820  037466  012737  057202  000010       2$:    MOV #ILLSER,@#RESVEC     ;SETUP ILLEGAL INST TRAP CATCHER
 10822  037474  005037  000012                       CLR @#RESVEC+2
 10823  037500  012737  057364  000250               MOV #MMVIOL,@#MMVEC      ;SETUP MEMORY MANAGEMENT TRAP CATCHER
 10824  037506  005037  000252                       CLR @#MMVEC+2
 10825  037512  012737  057062  000004               MOV #HLTSER,@#ERRVEC     ;SETUP TIMEOUT INST. TRAP VECTOR
 10826  037520  005037  000006                       CLR @#ERRVEC+2
 10827  037524  004737  054252                       JSR PC,SIZEPT            ;SETUP PROCESSOR DEPENDENT CONSTANTS
 10828  037530  023727  000042  053424       1$:    CMP @#42,#ENDAD          ;IF IN ACT CHAIN MODE SKIP PRINTING OF PROG TITLE
 10829  037536  001405                               BEQ 14$
 10830  037540  005737  001122                       TST $PASS        ;IDENTIFY PROGRAM ON 1ST PASS ONLY
```

```
      037544  001002                            BNE 14$
      037546  104400                            TYPE
      037550  016621                            PNAME                   ;TYPE PROGRAM NAME
      037552  005037  002470            14$:    CLR ONEINS              ;CLEAR SINGLE INST TEST FLAG
      037556  012737  000207  061174            MOV #207,DI             ;INHIBIT INTERRUPT DURING INTR SERVICE DIVPI
      037564  012737  000414  047720            MOV #414,TOLTC          ;INHIBIT LTC TURN ON
      037572  012737  000403  047752            MOV #403,TOPC2          ;INHIBIT LATENCY & INTERRUPTABILITY TURN ON
      037600  012737  000403  047762            MOV #403,TOPC1
      037606  005037  002054                    CLR ERRCT               ;CLEAR ERROR COUNT
      037612  005037  002162                    CLR DEN                 ;CLEAR D-SPACE ENABLE FLAG
      037616  005037  003030                    CLR LCNT                ;CLEAR LTC COUNT
      037622  005037  002544                    CLR LATEN               ;CLEAR LATENCY TESTING FLAG
      037626  005037  002216                    CLR STOPTF              ;CLEAR FLAG WHICH WHEN CLR WILL TRIGGER
                                                                        ;  PROGRAM TO REQUEST STOP TEST NUMBER
      037632  005037  002132                    CLR FATAL               ;CLEAR FATAL ERROR INDICATOR
      037636  005037  001760                    CLR RANDOM              ;CLEAR RANDOM EXERCISE MODE FLAG
      037642  005037  002042                    CLR NOERDS              ;CLEAR 'NO-ERROR DISPLAY' SWITCH
      037646  004737  055446            66$:    JSR PC,SETPAR           ;SETUP PAR'S (MEM MGMT)
      037652  013700  001654                    MOV PSEED,R0            ;FORM RNG PRINT SEED MASK
      037656  005100                            COM R0
      037660  005200                            INC R0
      037662  010037  002076                    MOV R0,MSEED
      037666  005737  001746                    TST DENS                ;ENTER NORMAL SEED?
      037672  001011                            BNE 61$                 ;BRANCH IF NO
      037674  013737  063620  063612            MOV KRNCON,RNCON        ;INITIALIZE RANDOM # GENERATOR
      037702  013737  063622  063614            MOV KRP1,RP1
      037710  013737  063624  063616            MOV KRP2,RP2
      037716  012737  072222  072220    61$:    MOV #IL2D,INPTBL        ;INITIALIZE INPUT TABLE POINTER
      037724  005737  002074                    TST FSRUN               ;FIELD SERVICE TYPE RUN
      037730  001431                            BEQ 13$                 ;BRANCH IF NO TO ENTER DIALOG WITH USER
                                                                        ;DETERMINE IF LINE CLOCK IS AVAILABLE FOR
                                                                        ; FIELD SERVICE TYPE RUN
      037732  004737  062366            31$:    JSR PC,LTCP             ;IS LTC ON SYSTEM?
      037736  000137  037776                    JMP 32$                 ;NO - CANT TEST INTERRUPTABILITY
      037742  005737  001122                    TST SPASS               ;IDENTIFY INTR SOURCE ON 1ST PASS
      037746  001005                            BNE 103$
      037750                                    PRINTB #KW11L           ;INDICATE THAT LINE CLOCK WILL BE USED
  (6) 037750  012746  013620                    MOV     #KW11L,-(SP)
  (3) 037754  010600                            MOV     SP,R0
  (4) 037756  004737  065410                    JSR PC,FPRINT
                                                                        ;FOR INTERRUPT SOURCE.
      037762  004737  062250            103$:   JSR PC,LTCSUP           ;SYNC UP TO LTC
      037766  004737  062312                    JSR PC,LTCCNT           ;DETERMINE COUNT PER CLOCK TICK
      037772  000137  040546                    JMP FDIALG              ;SKIP OVER DIALOG WITH USER
      037776                            32$:    PRINTB #NOINT           ;PRINT   CANT TEST INTR MESSAGE
  (6) 037776  012746  013401                    MOV     #NOINT,-(SP)
  (3) 040002  010600                            MOV     SP,R0
  (4) 040004  004737  065410                    JSR PC,FPRINT
      040010  000137  040546                    JMP FDIALG
      040014                            13$:    PRINTB #ASKINT          ;ASK IF INTERRUPTABILITY MODE IS DESIRED?
  (6) 040014  012746  012721                    MOV     #ASKINT,-(SP)
  (3) 040020  010600                            MOV     SP,R0
  (4) 040022  004737  065410                    JSR PC,FPRINT
      040026  004737  064546                    JSR PC,YORN             ;ACCEPT ASCIZ FROM TTY
```

```
      040032  000137  040336                      JMP ARMQ                  ;N RESPONSE
      040036  000137  040052                      JMP 5$                    ;Y RESPONSE
      040042  000137  040336                      JMP ARMQ                  ;R OR H RESPONSE (ILLEGAL HERE)
      040046  000137  040336                      JMP ARMQ                  ;C RESPONSE (ILLEGAL HERE)

      040052                              5$:     PRINTB #ASKSRC            ;ASK FOR INTERRUPT SOURCE
 (6)  040052  012746  013104                      MOV     #ASKSRC,-(SP)
 (3)  040056  010600                              MOV        SP,R0
 (4)  040060  004737  065410                      JSR PC,FPRINT
      040064  004737  064546                      JSR PC,YORN               ;ACCEPT ASCIZ
      040070  000137  040110                      JMP 52$                   ;(N) KW11-P @100KHZ
      040074  000137  040134                      JMP 53$                   ;(Y) KW11-P EXT OSC
      040100  000137  040174                      JMP 54$                   ;(R) LINE TIME CLOCK
      040104  000137  040220                      JMP 55$                   ;(C) KW11-P @10KHZ

      040110                              52$:                              ;MAKE KW11-P @100KHZ THE INTERRUPT SOURCE
      040110  004737  061602                      JSR PC,PC1CK              ;CHECK FOR (& SETUP) P-CLK 1
      040114  000137  040242                      JMP MNOPC1                ;NOT PRESENT ON SYSTEM RETURN
      040120  004737  061716                      JSR PC,PC2CK              ;P-CLK EXISTS RETURN - CHECK FOR (& SETUP) 2ND PCLK
                                                                            ;  FOR LATENCY TESTING
      040124  000137  040260                      JMP MNOPC2                ;NOT PRESENT ON SYSTEM RETURN
      040130  000137  040272                      JMP ADIQ                  ;2ND PCLK EXISTS

      040134                              53$:                              ;MAKE KW11-P WITH EXTERNAL OSCILLATOR THE
                                                                            ;  INTERRUPT SOURCE
      040134  004737  061602                      JSR PC,PC1CK              ;CHECK FOR (& SETUP) P-CLK ON SYSTEM
      040140  000137  040242                      JMP MNOPC1                ;NOT PRESENT ON SYSTEM RETURN
      040144  052777  000006  142346              BIS #6,@PC1CSR            ;SET PCLK 1 FOR EXTERNAL OSCILLATOR
      040152  004737  061716                      JSR PC,PC2CK              ;CHECK FOR 2ND P-CLK FOR LATENCY TESTING
      040156  000137  040260                      JMP MNOPC2                ;NOT PRESENT RETURN
      040162  052777  000006  142340              BIS #6,@PC2CSR            ;SET PCLK2 FOR EXTERNAL OSC
      040170  000137  040272                      JMP ADIQ

      040174                              54$:                              ;MAKE LINE TIME CLOCK THE INTR SOURCE
      040174  004737  062366                      JSR PC,LTCP               ;CHECK FOR LTC ON SYSTEM
      040200  000137  040242                      JMP MNOLTC                ;NOT PRESENT RETURN
      040204  004737  062250                      JSR PC,LTCSUP             ;SYNC UP TO LTC
      040210  004737  062312                      JSR PC,LTCCNT             ;DETERMINE COUNT PER CLOCK TICK
      040214  000137  040336                      JMP ARMQ

      040220                              55$:                              ;MAKE KW11-P @10KHZ THE INTERRUPT SOURCE
      040220  004737  061602                      JSR PC,PC1CK              ;CHECK FOR P-CLK ON SYSTEM
      040224  000137  040242                      JMP MNOPC1                ;NOT PRESENT RETURN
      040230  052777  000002  142262              BIS #2,@PC1CSR            ;SET PCLK FOR 10KHZ (NO LATENCY TESTING)
      040236  000137  040336                      JMP ARMQ

      040242                              MNOLTC:
      040242                              MNOPC1: PRINTB #NOINT             ;PRINT CANT TEST INTERRUPTABILITY MESSAGE
 (6)  040242  012746  013401                      MOV     #NOINT,-(SP)
 (3)  040246  010600                              MOV        SP,R0
 (4)  040250  004737  065410                      JSR PC,FPRINT
      040254  000137  040336                      JMP ARMQ
      040260                              MNOPC2: PRINTB #NOLAT             ;PRINT CANT TEST LATENCY MESSAGE
 (6)  040260  012746  013330                      MOV     #NOLAT,-(SP)
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  (3)  040264  010600                                MOV     SP,RO
  (4)  040266  004737  065410                        JSR PC,FPRINT
 10933 040272                          ADIQ:         PRINTB #ASKDI              ;ASK IF USER ALLOWS AN INTERRUPT DURING CIS
  (6)  040272  012746  013217                        MOV     #ASKDI,-(SP)
  (3)  040276  010600                                MOV     SP,RO
  (4)  040300  004737  065410                        JSR PC,FPRINT
 10934                                                                          ;  INST EXECUTED ON NORMAL INTR SERVICE ROUTINE
 10935 040304  004737  064546                        JSR PC,YORN                ;ACCEPT ASCIZ FROM TTY
 10936 040310  000137  040336                        JMP ARMQ                   ;N RESPONSE
 10937 040314  000137  040330                        JMP 1$                     ;Y RESPONSE
 10938 040320  000137  040336                        JMP ARMQ                   ;ILLEGAL RESPONSE
 10939 040324  000137  040336                        JMP ARMQ                   ;ILLEGAL RESPONSE
 10940 040330  013737  001670  061174  1$:           MOV KNOP,DI                ;OVERWRITE 'RTS PC' TO ALLOW P-CLK
 10941                                                                          ;  INTERRUPT DURING CIS INST EXECUTED
 10942                                                                          ;  WITHIN NORMAL P-CLK INTERRUPT SERVICE ROUTINE.
 10943
 10944
 10945
 10946 040336                          ARMQ:         PRINTB #ASKRM              ;ASK IF RANDOM EXERCISE MODE IS DESIRED?
  (6)  040336  012746  012461                        MOV     #ASKRM,-(SP)
  (3)  040342  010600                                MOV     SP,RO
  (4)  040344  004737  065410                        JSR PC,FPRINT
 10947 040350  004737  064546                        JSR PC,YORN                ;ACCEPT ASCIZ FROM TTY
 10948 040354  000137  040412                        JMP 2$                     ;N RESPONSE
 10949 040360  000137  040374                        JMP 3$                     ;Y RESPONSE
 10950 040364  000137  040506                        JMP 1$                     ;R OR H RESPONSE  (ILLEGAL HERE)
 10951 040370  000137  040506                        JMP 1$                     ;C RESPONSE       (ILLEGAL HERE)
 10952 040374  012737  177777  001760  3$:           MOV #177777,RANDOM         ;SET RANDOM FLAG
 10953 040402  012737  072144  072220                MOV #IDUM,INPTBL           ;SET INPUT TABLE POINTER TO DUMMY INPUT TABLE
 10954 040410  000436                                BR 1$
 10955 040412                          2$:           PRINTB #ASKMOD             ;ASK FOR PROCESSOR TEST MODE
  (6)  040412  012746  012527                        MOV     #ASKMOD,-(SP)
  (3)  040416  010600                                MOV     SP,RO
  (4)  040420  004737  065410                        JSR PC,FPRINT
 10956 040424  004737  057462                        JSR PC,KSORU               ;ACCEPT ASCIZ FROM TTY AND SETUP MODE WORD
 10957 040430  000770                                BR 2$                      ;ILLEGAL CHAR RETURN - ASK AGAIN
 10958 040432                          20$:          PRINTB #ASKMM              ;ASK FOR MEM MGMT TEST MODE
  (6)  040432  012746  012613                        MOV     #ASKMM,-(SP)
  (3)  040436  010600                                MOV     SP,RO
  (4)  040440  004737  065410                        JSR PC,FPRINT
 10959 040444  004737  064546                        JSR PC,YORN
 10960 040450  000137  040502                        JMP 23$                    ;N RESPONSE - MEM MGMT OFF
 10961 040454  000137  040472                        JMP 22$                    ;D RESPONSE - D SPACE ENABLED
 10962 040460  000137  040506                        JMP 1$                     ;H RESPONSE - D SPACE DISABLED
 10963 040464  000137  040432                        JMP 20$                    ;ILLEGAL RESPONSE - ASK AGAIN
 10964 040470  000406                                BR 1$
 10965 040472  012737  177777  002162  22$:          MOV #177777,DEN            ;SET D ENABLED FLAG
 10966 040500  000402                                BR 1$
 10967 040502  005037  002156          23$:          CLR MMFLG                  ;SET NO MEM MGMT FLAG
 10968 040506                          1$:           PRINTB  #ASK               ;ASK FOR SPECIFIC INST TO TEST
  (6)  040506  012746  012412                        MOV     #ASK,-(SP)
  (3)  040512  010600                                MOV     SP,RO
  (4)  040514  004737  065410                        JSR PC,FPRINT
 10969 040520  004737  067664                        JSR PC,ACASZ               ;ACCEPT ASCIZ FROM TTY
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040524  005737  002462                   TST ACINST              ;DEFAULTED TO ALL INSTRUCTIONS?
040530  001406                           BEQ FDIALG              ;BRANCH IF YES
040532  004737  067562                   JSR PC,SFCI             ;LOOK FOR MATCH BETWEEN INST ENTERED
                                                                 ;AND LIST OF CIS INST ASCII.
040536  000763                           BR 1$                   ;NO MATCH RETURN
040540  012737  177777  002470           MOV #177777,ONEINS      ;MATCH - SET SINGLE INST TESTING FLAG
040546  013737  072220  002134  FDIALG:  MOV INPTBL,INPTP        ;INITIALIZATION
040554  005037  001420                   CLR TOTTC               ;ZERO COUNT OF TOTAL TESTS EXECUTED
040560  005037  001416                   CLR TOTTCH
040564  005037  001422                   CLR INVTC               ;ZERO COUNT OF INVALID TESTS - TESTS ABORTED
040570  005037  001424                   CLR REDTC               ;ZERO COUNT OF REDUNDANT TESTS - TESTS ABORTED.
040574  005002                           CLR R2
040576  013737  001670  047772           MOV KNOP,PREINS         ;INSERT NOP BEFORE INST UNDER TEST.
040604  012700  120606                   MOV #XLTBL1,R0          ;INITIALIZE MOVTC TRANSLATION TABLES
040610  012701  121206                   MOV #ELTBL,R1           ;  AS FOLLOWS; 1 IN LOC 0, 2 IN LOC 1, ETC.
040614  005202                  11$:     INC R2
040616  110220                           MOVB R2,(R0)+
040620  020001                           CMP R0,R1
040622  103774                           BLO 11$
040624  005737  002074                   TST FSRUN               ;NORMAL FIELD SERVICE TYPE RUN?
040630  001426                           BEQ NITE                ;BRANCH IF NO
040632  023727  000042  053424           CMP @#42,#ENDAD         ;IF IN ACT CHAIN MODE SKIP OVER PRINTING OF HEADER
040640  001412                           BEQ 15$
040642  005737  002206                   TST QVMODE              ;IF IN QVMODE PRINT QV MODE
040646  001403                           BEQ 1$
040650  104400                           TYPE
040652  016032                           QVHDR
040654  000404                           BR 15$
040656  104400                  1$:      TYPE
040660  015720                           FSHDR                   ;PRINT FIELD SERVICE HEADER INFO
040662  104400                  10$:     TYPE                    ;PRINT PASS TIME MESSAGE
040664  016174                           FSHDR1
040666  012737  071576  002142  15$:     MOV #YL2D,EMPTR
040674  042737  000007  050012           BIC #7,TINST            ;CLEAR REGISTER FIELD (FOR L2D DISPLAY ONLY)
040702  004737  063436                   JSR PC,IDINST           ;IDENTIFY INST UNDER TEST

040706  005037  042032          NITE:    CLR MTYPE               ;CONTROL IS PASSED TO THIS POINT WHENEVER
                                                                 ;        ALL TEST CONDITIONS FOR A GIVEN INPUT
                                                                 ;        TABLE HAVE BEEN EXHAUSTED.  PRIOR
                                                                 ;        TO ENTRY TO THIS POINT, THE INPUT
                                                                 ;        TABLE POINTER (INPTP) HAS BEEN UPDATED
                                                                 ;        TO POINT TO THE NEXT INPUT TABLE
                                                                 ;        OF TEST CONDITIONS. IN RANDOM MODE
                                                                 ;        CONTROL IS PASSED HERE FOLLOWING EACH TEST.
040712  005037  002472                   CLR PZCODE
040716  005037  002454                   CLR PKPTW
040722  005037  002440                   CLR DECINS
040726  005037  002456                   CLR NDESC
040732  005737  001760                   TST RANDOM              ;RUNNING IN RANDOM EXERCISE MODE?
040736  001436                           BEQ 2$                  ;BRANCH IF NO
040740  004737  062452                   JSR PC,SRNGST           ;SAVE RANDOM # GENERATOR STATE AT START OF EACH TEST
040744  013700  001420                   MOV TOTTC,R0            ;PRINT RANDOM # GEN SEED?
040750  043700  002076                   BIC MSEED,R0
040754  001016                           BNE 3$                  ;BRANCH IF NO
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040756  005737  002044                    TST PROGD                ;PROGRESS DISPLAY?
040762  001013                            BNE 3$                   ;BRANCH IF NO
040764                                    PRINTB #FORM36,RNCON,RP1,RP2     ;PRINT 3 SEED CONSTANTS
040764  013746  063616                    MOV      RP2,-(SP)
040770  013746  063614                    MOV      RP1,-(SP)
040774  013746  063612                    MOV      RNCON,-(SP)
041000  012746  014314                    MOV      #FORM36,-(SP)
041004  010600                            MOV      SP,R0
041006  004737  065410                    JSR PC,FPRINT
                                                                   ;NOTE: TO USE SEED, LOAD 3 CONSTANTS INTO
                                                                   ;   KRNCON,KRP1,KRP2 THEN RESTART AT LOC 204.
041012  005737  002470            3$:     TST ONEINS               ;SINGLE INST TESTING?
041016  001002                            BNE 1$                   ;BRANCH IF YES
041020  004737  062736                    JSR PC,GENRI             ;GENERATE NEXT RANDOM CIS INST TO TEST
041024  004737  062776            1$:     JSR PC,LDINPT            ;LOAD UP DUMMY INPUT TABLE USING RANDOM # GEN.
041030  004737  063210                    JSR PC,LDCON             ;LOAD MISCELLANEOUS CONSTANTS USING RANDOM # GEN.
041034  013700  002134            2$:     MOV INPTP,R0             ;R0 POINTS TO ENTRY IN INPUT TABLE
041040  016001  000002                    MOV 2(R0),R1
041044  042701  177776                    BIC #177776,R1           ;CLEAR OUT ALL BUT TYPE BIT IN ENTRY TYPE WORD
041050  006301                            ASL R1
041052  062701  001426                    ADD #ITYPE,R1
041056  000171  000000                    JMP @(R1)                ;DISPATCH ON INPUT TABLE ENTRY TYPE

041062                            TYPE0:                           ;INPUT PARAMETERS FULLY SPECIFIED IN INPUT TABLE ENTRY
041062  012737  177777  042032            MOV #177777,MTYPE        ;SET TYPE FLAG TO INDICATE TYPE 0 ENTRY
041070  010001                            MOV R0,R1                ;SETUP PARAMETER TABLE POINTERS
041072  062701  000004                    ADD #4,R1                ;R1 POINTS TO IP1
041076  012702  001570                    MOV #PTP01,R2            ;R2 POINTS TO TOP OF PARAMETER TABLE POINTER LIST
041102  010122                    1$:     MOV R1,(R2)+             ;LOAD PTP
041104  062701  000002                    ADD #2,R1
041110  022702  001636                    CMP #PTP24,R2            ;ALL PTP'S LOADED
041114  103372                            BHIS 1$                  ;BRANCH IF NO

041116  005037  042034            2$:     CLR ID1
041122  005037  042036                    CLR ID2
041126  011001                            MOV (R0),R1              ;UPDATE PTP CONTENTS FOR INDIRECTLY
041130  006301                            ASL R1                   ;  SPECIFIED DATA DESCRIPTORS.
041132  062701  004364                    ADD #INSTID,R1
041136  111137  042034                    MOVB (R1),ID1
041142  005201                            INC R1
041144  111137  042036                    MOVB (R1),ID2            ;ID1 AND ID2 CONTAIN OFFSETS INTO PTP TABLE
041150  005737  042034                    TST ID1
041154  001445                            BEQ LDCOD                ;BRANCH IF OFFSET = 0. NO UPDATE REQUIRED
041156  006337  042034                    ASL ID1
041162  062737  001566  042034            ADD #PTP,ID1             ;USE OFFSET TO GET PTP ENTRY
041170  017701  000640                    MOV @ID1,R1              ;USE ENTRY TO GET ADDRESS OF DATA DESCRIPTOR
041174  011177  000634                    MOV (R1),@ID1
041200  005737  042036                    TST ID2
041204  001431                            BEQ LDCOD                ;BRANCH IF SECOND OFFSET = 0
041206  006337  042036                    ASL ID2
041212  062737  001566  042036            ADD #PTP,ID2             ;HANDLE SECOND OFFSET SAME AS FIRST
041220  017701  000612                    MOV @ID2,R1
041224  011177  000606                    MOV (R1),@ID2
041230  000417                            BR LDCOD
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041232                               TYPE1:                        ;INPUT PARAMETERS SPECIFIED IN TABLES
041232  010001                               MOV R0,R1             ;SETUP PARAMETER TABLE POINTERS
041234  062701  000004                       ADD #4,R1             ;R1 POINTS TO IP1
041240  012702  001570                       MOV #PTP01,R2         ;R2 POINTS TO TOP OF PARAMETER TABLE POINTER (PTP) LIST.
041244  012112                       1$:     MOV (R1)+,(R2)        ;LOAD PTP FROM IP
041246  005712                               TST (R2)              ;PTP=0 ?
041250  001402                               BEQ 2$                ;YES - DON'T ADVANCE IT
041252  062712  000002                       ADD #2,(R2)           ;ADVANCE PTP TO FIRST ENTRY
041256  062702  000002               2$:     ADD #2,R2             ;UPDATE POINTER
041262  020227  001640                       CMP R2,#PTP24+2       ;ALL PTP'S LOADED?
041266  002766                               BLT 1$                ;NO

041270  011001                       LDCOD:  MOV (R0),R1           ;LOAD OCTAL CODING FOR CIS INST
041272  010137  002276                       MOV R1,OCTIC          ;  UNDER TEST INTO EINST & TINST
041276  010137  002132                       MOV R1,FATAL          ;LOAD CODING FOR INST UNDER TEST INTO FATAL
                                                                   ;  ERROR INDICATOR WORD
041302  006301                               ASL R1
041304  062701  003726                       ADD #OINST,R1
041310  011137  046136                       MOV (R1),EINSTR
041314  011137  050012                       MOV (R1),TINST
041320  004737  062616                       JSR PC,SRNGSW         ;SAVE STATE OF RANDOM # GEN. AS STATE W

041324  004737  062642               NTC:    JSR PC,RRNGSW         ;CONTROL IS PASSED TO THIS POINT TO EXECUTE
                                                                   ;       NEXT TEST CONDITION FOR GIVEN INPUT
                                                                   ;       TABLE. PARAMETER TABLE POINTERS
                                                                   ;       HAVE BEEN UPDATED TO POINT TO NEXT
                                                                   ;       TEST CONDITION PRIOR TO ENTRY
                                                                   ;       TO THIS POINT.
                                                                   ;RESTORE RANDOM # GEN  TO STATE W.
041330  013701  002276                       MOV OCTIC,R1          ;LOAD # OF INST DESC INTO NDESC
041334  006301                               ASL R1                ;LOAD DATA TYPE CONTROL WORDS
041336  006301                               ASL R1                ;   PKPTW,ZPM,SXTYPE
041340  063701  004262                       ADD DECTYP,R1
041344  012137  002300                       MOV (R1)+,TW1
041350  113737  002300  002454               MOVB TW1,PKPTW        ;PKPTW IDENTIFIES STARTING DATA TYPE FOR EACH INST TESTI
041356  113737  002301  002456               MOVB TW1+1,NDESC
041364  011137  002302                       MOV (R1),TW2
041370  113701  002302                       MOVB TW2,R1
041374  042701  177770                       BIC #177770,R1
041400  010137  002442                       MOV R1,S1TYPE         ;S1TYPE IDENTIFIES 1ST STRING DESC DATA TYPE
041404  113701  002302                       MOVB TW2,R1
041410  042701  177707                       BIC #177707,R1
041414  006201                               ASR R1
041416  006201                               ASR R1
041420  006201                               ASR R1
041422  010137  002444                       MOV R1,S2TYPE
041426  113701  002302                       MOVB TW2,R1
041432  006301                               ASL R1
041434  006301                               ASL R1
041436  000301                               SWAB R1
041440  010137  002446                       MOV R1,S3TYPE
041444  113701  002303                       MOVB TW2+1,R1
041450  006201                               ASR R1
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041452  010137  002460                          MOV R1,ZPM
041456  005737  001760                          TST RANDOM              ;IN RANDOM EXERCISE MODE?
041462  001447                                  BEQ NTCTS               ;BRANCH IF NO
041464  023727  002442  000006                  CMP S1TYPE,#6           ;RANDOMIZE STRING DATA TYPES
041472  103405                                  BLO 1$
041474  004737  063464                          JSR PC,RPTYPE           ;GET A RANDOM PACKED DATA TYPE
041500  010037  002442                          MOV R0,S1TYPE           ;STORE IT IN S1TYPE
041504  000404                                  BR 2$
041506  004737  063512          1$:             JSR PC,RZTYPE           ;GET A RANDOM ZONED DATA TYPE
041512  010037  002442                          MOV R0,S1TYPE           ;STORE IT IN S1TYPE
041516  023727  002444  000006  2$:             CMP S2TYPE,#6
041524  103405                                  BLO 3$
041526  004737  063464                          JSR PC,RPTYPE
041532  010037  002444                          MOV R0,S2TYPE
041536  000404                                  BR 4$
041540  004737  063512          3$:             JSR PC,RZTYPE
041544  010037  002444                          MOV R0,S2TYPE
041550  023727  002446  000006  4$:             CMP S3TYPE,#6
041556  103405                                  BLO 5$
041560  004737  063464                          JSR PC,RPTYPE
041564  010037  002446                          MOV R0,S3TYPE
041570  000404                                  BR NTCTS
041572  004737  063512          5$:             JSR PC,RZTYPE
041576  010037  002446                          MOV R0,S3TYPE

041602                          NTCTS:                                  ;CONTROL IS PASSED TO THIS POINT TO EXECUTE
                                                                        ;       THE GIVEN TEST CONDITION USING
                                                                        ;       THE NEXT DATA TYPE.
041602  005237  001120                          INC $TESTN              ;INCREMENT TEST # IN APT MAILBOX
041606  005737  001760                          TST RANDOM              ;RUNNING IN RANDOM MODE?
041612  001410                                  BEQ 2$                  ;BRANCH IF NO
041614  023737  001120  001652                  CMP $TESTN,TPERP        ;HAS TEST # REACHED MAX PER APT PASS?
041622  101404                                  BLOS 2$                 ;BRANCH IF NO
041624  005237  001122                          INC $PASS               ;INCREMENT APT PASS COUNTER
041630  005037  001120                          CLR $TESTN
041634  005237  001420          2$:             INC TOTTC               ;UPDATE TESTS EXECUTED COUNTER
041640  001002                                  BNE 1$                  ;BRANCH IF TEST COUNT NOT = ZERO
041642  005237  001416                          INC TOTTCH              ;INCREMENT TEST COUNT OVERFLOW EVERY TIME
                                                                        ;  TEST COUNT (TOTTC) EXCEEDS 177777 OCTAL.
041646  013777  001420  140064  1$:             MOV TOTTC,@DISPLAY      ;SET TEST # INTO DISPLAY LIGHTS
041654  004737  062546                          JSR PC,SRNGSY           ;SAVE STATE OF RANDOM # GEN AS STATE Y.

041660                          RTC:                                    ;CONTROL IS PASSED TO THIS  POINT TO REPEAT
                                                                        ;       THE PREVIOUS TEST USING THE SAME
                                                                        ;       TEST CONDITION & DATA TYPES.
                                                                        ;SETUP MICRO BREAK REG (11/74)
041660  000240                                  NOP                     ;(11/74 MICROBREAK - REPLACE WITH 013737)
041662  000240                                  NOP                     ;(   ''        ''           ''     '' 177570)
041664  000240                                  NOP                     ;(   ''        ''           ''     '' 177770)
041666  004737  062572                          JSR PC,RRNGSY           ;RESTORE RANDOM # GEN TO STATE Y.
041672  005037  002140                          CLR SPHAND              ;CLEAR SPECIAL HANDLING REQUESTS
041676  005037  002274                          CLR FILLS2
041702  012737  111111  120400                  MOV #111111,PRECSK      ;INITIALIZE STACK OVERFLOW CONSTANTS
041710  012737  111111  120602                  MOV #111111,PSTCSK
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041716  005037  002152                          CLR ERRSTK              ;CLEAR STACK ERROR FLAG.
041722  012700  120402                          MOV #PRECSK+2,R0        ;INITIALIZE  STACK CONTENTS BEFORE EACH TEST
041726  020027  120602                  1$:     CMP R0,#PSTCSK
041732  001403                                  BEQ 2$
041734  012720  055555                          MOV #055555,(R0)+
041740  000772                                  BR 1$
041742  013700  002134                  2$:     MOV INPTP,R0            ;R0 POINTS TO ENTRY IN INPUT TABLE
041746  011001                                  MOV (R0),R1             ;SETUP POINTER TO PROPER CIS
041750  006301                                  ASL R1                  ;  INSTRUCTION FLOW TABLE
041752  062701  001436                          ADD #IN0,R1
041756  011137  001742                          MOV (R1),FLOPTR
041762  011001                                  MOV(R0),R1              ;SETUP POINTER TO PROPER ERROR
041764  006301                                  ASL R1                  ; MESSAGE HEADER
041766  062701  070052                          ADD #INEM,R1
041772  011137  002142                          MOV (R1),EMPTR

041776                                  XINST:
041776  017701  137740                          MOV @FLOPTR,R1          ;GET NEXT ENTRY FROM INST. FLOW TABLE
042002  006101                                  ROL R1
042004  006101                                  ROL R1
042006  006101                                  ROL R1
042010  006101                                  ROL R1
042012  006101                                  ROL R1
042014  042701  177760                          BIC #177760,R1          ;LOOK ONLY AT FLOW TABLE ENTRY COMMAND
042020  006301                                  ASL R1                  ;  FORM INDEX INTO FLOW DISPATCH TABLE
042022  062701  001526                          ADD #FLODIS,R1
042026  000171  000000                          JMP @(R1)               ;DISPATCH ON FLOW COMMAND
042032  000000                          MTYPE:  .WORD 0
042034  000000                          ID1:    .WORD 0
042036  000000                          ID2:    .WORD 0

042040  005737  002074                  CTLC:   TST FSRUN               ;DVT TYPE RUN?
042044  001006                                  BNE NOCTC               ;BRANCH IF NO
042046  000137  037154                          JMP DVTST               ;RESTART DVT TYPE RUN


042052                                  FC01:                           ;FLOW COMMAND = 01 - COPY TEST OPERAND
                                                                        ;  FROM PARAMETER TABLE INTO TRN.
042052  004737  063232                          JSR PC,EXTBK            ;HANDLE OPERATOR REQUESTS
042056  000137  042040                          JMP CTLC                        ;CNTL C RETURN FROM SUBROUTIINE.
042062  032737  000100  050012          NOCTC:  BIT #100,TINST          ;THE IN-LINE TEST CASE ALWAYS FOLLOWS THE SAME
042070  001067                                  BNE FCRTN               ;REG TEST CASE - THEREFORE DO NOT REFILL THE TRNS
                                                                        ; BECAUSE SXTYPES ARE ALREADY UPDATED FOR NEXT REG
                                                                        ; TEST CONDITION.
042072  004737  053570                          JSR PC,PF1              ;FORM PARAMETER TABLE POINTER FROM
                                                                        ;  PF1 FIELD OF FLOW TABLE ENTRY
042076  004737  054004                          JSR PC,RF4              ;FORM TEST OPERAND POINTER FROM RF4 FIELD
                                                                        ;  OF FLOW TABLE ENTRY.
042102  017711  140030                          MOV @PTPTR,(R1)         ;COPY TEST OPERAND FROM PARAMETER TABLE
042106  010102                                  MOV R1,R2
042110  004737  053766                          JSR PC,RF3X             ;LOAD R1 WITH TWICE CONTENTS OF RF3 FIELD OF
042114  005701                                  TST R1                  ;  FLOW TABLE ENTRY
042116  001454                                  BEQ FCRTN               ;BRANCH IF FIELD CONTAINS ZERO
042120  012737  177777  002440                  MOV #177777,DECINS      ;SET FLAG TO INDICATE THAT INST IS A DECIMAL INST.
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042126  020127  000002                   CMP R1,#2            ;IS TEST OPERAND PART OF 1ST DECIMAL DESC
                                                              ;  OPERAND FOR INST?
042132  001013                           BNE 1$               ;BRANCH IF NO
042134  013704  002442                   MOV S1TYPE,R4
042140  006304                           ASL R4
042142  006304                           ASL R4
042144  006304                           ASL R4
042146  006304                           ASL R4
042150  000304                           SWAB R4
042152  042704  107777                   BIC #107777,R4
042156  050412                           BIS R4,(R2)          ;'OR' SRC1 TYPE FIELD INTO TEST OPERAND
042160  000433                           BR FCRTN
042162  020127  000004          1$:      CMP R1,#4            ;IS TEST OPERAND PART OF 2ND DECIMAL DESC
                                                              ;  OPERAND FOR INST?
042166  001013                           BNE 2$               ;BRANCH IF NO
042170  013704  002444                   MOV S2TYPE,R4
042174  006304                           ASL R4
042176  006304                           ASL R4
042200  006304                           ASL R4
042202  006304                           ASL R4
042204  000304                           SWAB R4
042206  042704  107777                   BIC #107777,R4
042212  050412                           BIS R4,(R2)          ;'OR' SRC2 TYPE FIELD INTO TEST OPERAND
042214  000415                           BR FCRTN
042216  020127  000006          2$:      CMP R1,#6            ;IS TEST OPERAND PART OF 3RD DECIMAL DESC
                                                              ;  OPERAND FOR INST?
042222  001012                           BNE FCRTN            ;BRANCH IF NO
042224  013704  002446                   MOV S3TYPE,R4
042230  006304                           ASL R4
042232  006304                           ASL R4
042234  006304                           ASL R4
042236  006304                           ASL R4
042240  000304                           SWAB R4
042242  042704  107777                   BIC #107777,R4       ;'OR' DST TYPE FIELD INTO TEST OPERAND
042246  050412                           BIS R4,(R2)

042250  062737  000002  001742  FCRTN:   ADD #2,FLOPTR        ;UPDATE FLOW TABLE POINTER TO NEXT COMMAND
042256  000137  041776                   JMP XINST

042262                          FC02:                         ;FLOW COMMAND = 02 - GENERATE TEST OPERAND
                                                              ;  FROM PARAMETER TABLE ENTRY.
042262  032737  000100  050012           BIT #100,TINST       ;SKIP THIS FLOW COMMAND FOR INLINE CASE
042270  001367                           BNE FCRTN
042272  005737  042032                   TST MTYPE
042276  001410                           BEQ 1$               ;BRANCH IF NOT TYPE 0 ENTRY
042300  004737  053570                   JSR PC,PF1           ;FORM PARAMETER TABLE POINTER FROM
                                                              ;  PF1 FIELD OF FLOW TABLE ENTRY.
042304  004737  054004                   JSR PC,RF4           ;FORM TEST OPERAND POINTER FROM
                                                              ;  RF4 FIELD OF FLOW TABLE ENTRY
042310  017711  137622                   MOV @PTPTR,(R1)      ;COPY TEST OPERAND FROM PARAMETER TABLE
042314  000137  042250                   JMP FCRTN
042320  004737  053570          1$:      JSR PC,PF1           ;FORM PARAMETER TABLE POINTER FROM PF1
                                                              ;  FIELD OF FLOW TABLE ENTRY.
042324  004777  137606                   JSR PC,@PTPTR        ;EXECUTE PARAMETER TABLE ENTRY TO
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                                                        ;  GENERATE TEST OPERAND.
042330  000137  042250                   JMP FCRTN

042334  005237  001424          REDNTC:  INC REDTC      ;TEST CONDITION REDUNDANT - ABORT TEST.
042340  005737  001420                   TST TOTTC      ;DID TEST COUNT OVERFLOW ON LAST INCREMENT?
042344  001002                           BNE 1$         ;BRANCH IF NO
042346  005337  001416                   DEC TOTTCH
042352  005337  001420          1$:      DEC TOTTC
042356  000137  052654                   JMP NXTTC

042362                          FC03:                   ;FLOW COMMAND = 03 - VERIFY THAT STRING'S
                                                        ;  LOWER ADDRESS LIMIT FALLS WITHIN TEST BUFFER.
042362  032737  000100  050012           BIT #100,TINST ;SKIP THIS FLOW COMMAND FOR INLINE CASE
042370  001327                           BNE FCRTN
042372  032737  000010  002140           BIT #10,SPHAND ;SPECIAL HANDLING REQUEST?
042400  001323                           BNE FCRTN      ;SKIP THIS FLOW COMMAND IF YES.
042402  004737  053570                   JSR PC,PF1     ;FORM PARAMETER TABLE POINTER TO STRING
                                                        ;  SURROUND LENGTH FROM PF1 FIELD OF FLOW
                                                        ;  TABLE ENTRY.
042406  004737  054004                   JSR PC,RF4     ;FORM TEST OPERAND POINTER TO STRING.ADR FROM
                                                        ;  RF4 FIELD OF FLOW TABLE ENTRY
042412  011101                           MOV (R1),R1
042414  167701  137516                   SUB @PTPTR,R1  ;SUBTRACT STRING.SURR.LEN FROM STRING.ADR
                                                        ;  TO GET STRING.SURR.ADR.
042420  020127  000020                   CMP R1,#20
042424  002475                           BLT [illegible]XTC ;STRING.SURR.ADR < 20  -SKIP THIS TEST CONDITION
                                                        ;  (20 ALLOWS SPACE FOR IN-LINE DESCRIPTORS AT BEGINNING
042426  000137  042250                   JMP FCRTN

042432                          FC04:                   ;FLOW COMMAND = 04 - VERIFY THAT STRINGS
                                                        ;  UPPER ADDRESS LIMIT FALLS WITHIN TEST
                                                        ;  BUFFER.
042432  032737  000100  050012           BIT #100,TINST ;SKIP THIS FLOW COMMAND FOR INLINE CASE
042440  001035                           BNE 1$
042442  032737  000001  002140           BIT #1,SPHAND  ;SPECIAL HANDLING REQUEST
042450  001031                           BNE 1$         ;SKIP VERIFICATION IF YES
042452  004737  053570                   JSR PC,PF1     ;FORM PARAMETER TABLE POINTER TO STRING.SURR.LEN
                                                        ;  FROM PF1 FIELD OF FLOW TABLE ENTRY
042456  004737  053754                   JSR PC,RF3     ;FORM TEST OPERAND POINTER TO STRING.LEN
                                                        ;  FROM RF3 FIELD OF FLOW TABLE ENTRY
042462  011101                           MOV (R1),R1
042464  005737  002440                   TST DECINS     ;IS INST A DECIMAL INST?
042470  001402                           BEQ 2$         ;BRANCH IF NO
042472  043701  002450                   BIC TYPFLD,R1  ;CLEAR TYPE FIELD SO AS NOT TO
                                                        ;  DISTORT UPPER ADDRESS CALCULATION.
042476  017702  137434          2$:      MOV @PTPTR,R2
042502  060102                           ADD R1,R2      ;R2 NOW CONTAINS SUM OF STRING.SURR.LEN
                                                        ;  AND STRING.LEN
042504  004737  054004                   JSR PC,RF4     ;FORM TEST OPERAND POINTER TO STRING.ADR
                                                        ;  FROM RF4 FIELD OF FLOW TABLE ENTRY.
042510  061102                           ADD (R1),R2    ;R2 NOW CONTAINS STRING.ADR + STRING.LEN
                                                        ;  + STRING.SURR.ADR
042512  005737  001760                   TST RANDOM     ;RANDOM EXERCISE MODE?
042516  001403                           BEQ 3$         ;BRANCH IF NO.
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042520  020237  001644                   CMP R2,RTBLEN          ;COMPARE ADDRESS WITH END OF RANDOM TEST BUFFER
042524  000402                           BR 4$
042526  020237  001642           3$:     CMP R2,TBLEN           ;DOES THIS ADDRESS EXCEED TEST BUFFER
                                                                ;  LENGTH ?
042532  003032                   4$:     BGT NXTC               ;YES - SKIP THIS TES1 CONDITION
042534  000137  042250           1$:     JMP FCRTN

042540                           FC05:                          ;FLOW COMMAND = 05 - ADJUST TEST OPERANDS
                                                                ;  TO INCLUDE BASE ADDRESS OF TEST BUFFER.
042540  032737  000100  050012           BIT #100,TINST         ;SKIP THIS FLOW COMMAND FOR INLINE CASE
042546  001022                           BNE EC05
042550  004737  053666                   JSR PC,RF1             ;FORM 1ST TEST OPERAND POINTER FROM RF1
                                                                ;  FIELD OF FLOW TABLE ENTRY
042554  063711  001640                   ADD TBADR,(R1)         ;ADD TEST BUFFER BASE ADDRESS TO OPERAND
042560  004737  053720                   JSR PC,RF2             ;FORM 2ND TEST OPERAND POINTER FROM RF2
                                                                ;  FIELD OF FLOW TABLE ENTRY
042564  020127  003630                   CMP R1,#TRN            ;IF R1 STILL POINTS TO #TRN THEN THERE WAS
                                                                ;  ONLY ONE TEST OPERAND TO BE UPDATED
042570  001411                           BEQ EC05               ;UPDATING COMPLETE
042572  063711  001640                   ADD TBADR,(R1)         ;ADD TEST BUFFER BASE ADDRESS TO OPERAND
042576  004737  053754                   JSR PC,RF3             ;FORM 3RD TEST OPERAND POINTER FROM RF3
                                                                ;  FIELD OF FLOW TABLE ENTRY.
042602  020127  003630                   CMP R1,#TRN            ;WAS THERE A THIRD ENTRY?
042606  001402                           BEQ EC05               ;NO - UPDATING COMPLETE
042610  063711  001640                   ADD TBADR,(R1)         ;ADD TEST BUFFER BASE ADDRESS TO OPERAND
042614  000137  042250           EC05:   JMP FCRTN

042620  005237  001422           NXTC:   INC INVTC              ;TEST CONDITION INVALID - ABORT TEST
042624  005737  001420                   TST TOTTC              ;DID TEST COUNT OVERFLOW ON LAST INCREMENT?
042630  001002                           BNE 1$                 ;BRANCH IF NO
042632  005337  001416                   DEC TOTTCH
042636  005337  001420           1$:     DEC TOTTC
042642  000137  052654                   JMP NXTTC

042646                           FC06:                          ;FLOW COMMAND = 06 - INITIALIZE TEST BUFFER
                                                                ;  TO AND INCREMENTING SEQUENCE.
042646  032737  000100  050012           BIT #100,TINST
042654  001402                           BEQ 4$
042656  004737  062712                   JSR PC,RRNGSV          ;RESTORE RANDOM # GEN TO STATE V
042662  004737  062666           4$:     JSR PC,SRNGSV          ;SAVE RANDOM # GENERATOR STATE AS STATE V
042666  013737  001640  001754           MOV TBADR,TBEND
042674  005737  001760                   TST RANDOM             ;RANDOM EXERCISE MODE?
042700  001404                           BEQ 2$                 ;BRANCH IF NO
042702  063737  001644  001754           ADD RTBLEN,TBEND       ;THE BUFFER SIZE FOR RANDOM EXERCISE MODE
                                                                ;  IS FIXED
042710  000403                           BR 3$
042712  063737  001642  001754   2$:     ADD TBLEN,TBEND        ;SETUP A POINTER TO END OF BUFFER
042720  013701  001640           3$:     MOV TBADR,R1
042724  013702  001640                   MOV TBADR,R2           ;POINT R1 & R2 TO START OF BUFFER
042730  013721  001660                   MOV INCSQ1,(R1)+
042734  013721  001662                   MOV INCSQ2,(R1)+       ;LOAD THE FIRST TWO BUFFER LOCATIONS
042740  012211                   1$:     MOV (R2)+,(R1)
042742  061221                           ADD (R2),(R1)+         ;CONTENTS OF NEXT LOC = SUM OF CONTENTS
                                                                ;  OF PREVIOUS 2 LOCATIONS.
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 11434  042744  023701  001754                  CMP TBEND,R1
 11435  042750  003373                          BGT 1$
 11436  042752  000137  042250                  JMP FCRTN
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042756                          FC07:                           ;FLOW COMMAND = 07 - INSERT STRING IN
                                                                ;  TEST BUFFER.
042756  005037  002476                  CLR SAVSRF
042762  005737  001760                  TST RANDOM              ;RANDOM EXERCISE MODE?
042766  001406                          BEQ 1$                  ;BRANCH IF NO
042770  023727  002276  000011          CMP OCTIC,#11           ;IS INST A CHAR STRING INST?
042776  101002                          BHI 1$                  ;BRANCH IF NO
043000  000137  042250          2$:     JMP FCRTN               ;IN RANDOM MODE, NO CHAR STRINGS NEED TO BE
                                                                ;  INSERTED FOR CHAR TYPE INSTRUCTIONS.
                                                                ;  RANDOM CHAR BYTES ARE DERIVED BY
                                                                ;  RANDOMIZING THE 'SEED' CONSTANTS USED
                                                                ;  TO INITIALIZE THE ENTIRE BUFFER.
043004  032737  000020  002140  1$:     BIT #20,SPHAND          ;SPECIAL HANDLING REQUEST?
043012  001372                          BNE 2$                  ;SKIP INSERTING STRINGS IF YES
043014  004737  053570                  JSR PC,PF1              ;FORM PARAMETER TABLE POINTER TO STRING
                                                                ;  DESCRIPTOR FROM PF1 FIELD OF FLOW TABLE ENTRY
043020  004737  053754                  JSR PC,RF3              ;FORM TEST OPERAND POINTER TO STRING.LEN
                                                                ;  FROM RF3 FIELD OF FLOW TABLE ENTRY
043024  010137  002104                  MOV R1,TRL              ;SAVE POINTER
043030  004737  054004                  JSR PC,RF4              ;FORM TEST OPERAND POINTER TO STRING.ADR
                                                                ;  FROM RF4 FIELD OF FLOW
                                                                ;  TABLE ENTRY.
043034  010137  002102                  MOV R1,TRA              ;SAVE POINTER
043040  004737  062476                  JSR PC,SRNGSX           ;SAVE RANDOM NUMBER GEN. STATE X
043044  004537  043332                  JSR R5,ISTG             ;INSERT STRING IN TEST BUFFER
043050  002136                          PTPTR                   ;POINTER TO STRING DESCRIPTOR
043052  002104                          TRL                     ;POINTER TO STRING.LEN
043054  002102                          TRA                     ;POINTER TO STRING.ADR

043056  005737  002476                  TST SAVSRF              ;SAVE STRING FOR ERROR PRINTOUT?
043062  001436                          BEQ A3X
043064  004737  053570                  JSR PC,PF1              ;YES - RESTORE POINTER TO STRING DESCRIPTOR
043070  004737  053754                  JSR PC,RF3              ;RESTORE POINTER TO STRING LENGTH
043074  010137  002104                  MOV R1,TRL
043100  005737  002274                  TST FILLS2              ;WHERE SHOULD STRING BE STORED?
043104  001406                          BEQ 4$
043106  012737  002506  002474          MOV #INSRC2+2,SAVPTR    ;STORE STRING IN BUFSR2
043114  011137  002504                  MOV (R1),INSRC2         ;SAVE STRING LEN IN BUFFER DESCRIPTOR
043120  000410                          BR 5$
043122  012737  002502  002474  4$:     MOV #INSRC1+2,SAVPTR    ;SAVE STRING IN BUFSR1
043130  012737  177777  002274          MOV #177777,FILLS2      ;SIGNAL THAT BUFSR1 IS OCCUPIED.
043136  011137  002500                  MOV (R1),INSRC1         ;SAVE STRING LEN IN BUFFER DESCRIPTOR
043142  004737  062522          5$:     JSR PC,RRNGSX           ;RESTORE RANDOM NUMBER GEN TO STATE X.
043146  004537  043332                  JSR R5,ISTG             ;INSERT STRING IN SAVE BUFFER
043152  002136                          PTPTR                   ;POINTER TO STRING DESCRIPTOR
043154  002104                          TRL                     ;POINTER TO STRING LEN
043156  002474                          SAVPTR                  ;POINTER TO STRING ADDRESS (EITHER BUFSR1 OR BUFSR2)

043160  062737  000002  001742  A3X:    ADD #2,FLOPTR           ;LOOK AT NEXT FLOW COMMAND?
043166  017701  136550                  MOV @FLOPTR,R1
043172  042701  017777                  BIC #017777,R1
043176  005701                          TST R1                  ;IS IT = 0 - A CONTINUATION OF THE 07
                                                                ;  COMMAND?
043200  001050                          BNE 2$                  ;NO - DON'T INSERT SURROUND STRINGS
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043202  004737  053570                  JSR PC,PF1              ;YES - FORM PARAMETER TABLE POINTER
                                                                ;  TO STRING.SURR.LEN
043206  013737  002136  002046          MOV PTPTR,SURLEN
043214  004737  053642                  JSR PC,PF2              ;FORM PARAMETER TABLE POINTER TO SURR DATA
                                                                ;  DESCRIPTOR
043220  017737  136660  002104          MOV @TRL,TRL            ;FORM SURR.ADR (UPPER PORTION)
043226  005737  002440                  TST DECINS              ;INST = DECIMAL?
043232  001403                          BEQ 3$                  ;BRANCH IF NO
043234  042737  070000  002104          BIC #070000,TRL         ;CLEAR TYPE FIELD FROM STRING LENGTH
043242  067737  136634  002104  3$:     ADD @TRA,TRL            ;SURR.ADR = STRING.ADR + STRING.LEN
043250  012737  002104  002050          MOV #TRL,SURADR
043256  004537  043332                  JSR R5,ISTG             ;INSERT UPPER HALF OF SURR STRING
043262  002136                          PTPTR                   ;POINTER TO SURR.DATA DESCRIPTOR
043264  002046                          SURLEN                  ;POINTER TO SURR.LEN
043266  002050                          SURADR                  ;POINTER TO SURR.ADR
043270  017737  136606  002104          MOV @TRA,TRL            ;FORM SURR STRING ADDRESS (LOWER PORTION)
043276  167737  136544  002104          SUB @SURLEN,TRL         ;SURR.ADR = STRING.ADR - SURR.LEN
043304  004537  043332                  JSR R5,ISTG             ;INSERT LOWER HALF OF SURR STRING
043310  002136                          PTPTR
043312  002046                          SURLEN
043314  002050                          SURADR
043316  000137  042250          1$:     JMP FCRTN
043322  162737  000002  001742  2$:     SUB #2,FLOPTR           ;RESTORE FLOW COMMAND POINTER
043330  000772                          BR 1$

043332                          ISTG:                           ;SUBROUTINE TO INSERT STRING IN TEST BUFFER.
043332  013501                          MOV @(R5)+,R1
043334  012137  002106                  MOV (R1)+,STGDS1        ;GET STRING DATA DESCRIPTOR
043340  011137  002110                  MOV (R1),STGDS2
043344  013501                          MOV @(R5)+,R1           ;GET STRING.LEN
043346  011137  002112                  MOV (R1),STGLN
043352  032737  000002  002140          BIT #2,SPHAND           ;SPECIAL HANDLING REQUEST?
043360  001403                          BEQ 1$                  ;BRANCH IF NO
043362  042737  100000  002112          BIC #100000,STGLN       ;YES - STRIP BIT 15 FROM LENGTH
043370  013501                  1$:     MOV @(R5)+,R1           ;SETUP STRING STARTING ADDRESS
043372  011137  002114                  MOV (R1),STGAD
043376  013701  002106                  MOV STGDS1,R1
043402  042737  160000  002106          BIC #160000,STGDS1      ;STRIP OFF 'TYPE' FROM 1ST WORD OF DATA DESCRIPTOR
043410  042701  017777                  BIC #17777,R1           ;LOOK ONLY AT DESCRIPTOR TYPE
043414  005701                          TST R1
043416  001426                          BEQ DSTYP0              ;DATA DESCRIPTOR IS TYPE 0.
043420  022701  020000                  CMP #020000,R1
043424  001445                          BEQ DSTYP1              ;DATA DESCRIPTOR IS TYPE 1
043426  022701  040000                  CMP #040000,R1
043432  001461                          BEQ DSTYP2              ;DATA DESCRIPTOR IS TYPE 2
043434  022701  060000                  CMP #060000,R1
043440  001516                          BEQ DSTYP3              ;DATA DESCRIPTOR IS TYPE 3
043442  022701  100000                  CMP #100000,R1          ;
043446  001404                          BEQ 2$                  ;DATA DESCRIPTOR IS TYPE 4
043450  022701  120000                  CMP #120000,R1
043454  001405                          BEQ 3$                  ;DATA DESCRIPTOR IS TYPE 5
043456  000000                          HALT                    ;**DATA DESCRIPTOR NOT TYPE 0 .1,2.3.4. OR 5.
043460  005037  001770          2$:     CLR RANDTA
043464  000137  044574                  JMP DSTYP4
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043470  000137  045642          3$:     JMP DSTYP5

043474                          DSTYP0:                                 ;ALL BYTES OF STRING ARE IDENTICAL
043474  005737  002440                  TST DECINS                      ;INST = DECIMAL?
043500  001403                          BEQ 3$                          ;BRANCH IF NO
043502  042737  070000  002112          BIC #070000,STGLN               ;CLEAR TYPE FIELD STRING LENGTH WORD
043510  013701  002114          3$:     MOV STGAD,R1                    ;R1 CONTAINS STRING STARTING ADDRESS
043514  005737  002112          1$:     TST STGLN                       ;ENTIRE STRING BEEN INSERTED?
043520  001405                          BEQ 2$                          ;YES
043522  113721  002106                  MOVB STGDS1,(R1)+               ;NO - MOVE STRING DATA BYTE INTO NEXT
                                                                        ;  TEST BUFFER LOCATION
043526  005337  002112                  DEC STGLN
043532  000770                          BR 1$
043534  000137  045740          2$:     JMP EISTG

043540                          DSTYP1:                                 ;STRING BYTE N = STRING BYTE N-1 + INC.
043540  013701  002114                  MOV STGAD,R1                    ;R1 CONTAINS STRING STARTING ADDRESS
043544  005737  002112          1$:     TST STGLN                       ;ENTIRE STRING BEEN INSERTED?
043550  001410                          BEQ 2$                          ;YES
043552  113721  002110                  MOVB STGDS2,(R1)+
043556  063737  002106  002110          ADD STGDS1,STGDS2               ;NO FORM AND INSERT NEXT STRING BYTE
043564  005337  002112                  DEC STGLN
043570  000765                          BR 1$
043572  000137  045740          2$:     JMP EISTG

043576                          DSTYP2:                                 ;INSERT BYTES FROM GIVEN STRING
043576  013701  002114                  MOV STGAD,R1                    ;SET R1 TO STARTING ADDRESS OF STRING TO BE
                                                                        ;  FORMED IN TEST BUFFER.
043602  005737  002106                  TST STGDS1                      ;IS GIVEN STRING LENGTH = 0?
043606  001431                          BEQ 3$                          ;YES - DON'T DO ANY INSERTING
043610  013737  002106  002116          MOV STGDS1,SAVSL                ;NO - SAVE STRING LENGTH IN CASE STRING
043616  013737  002110  002120          MOV STGDS2,SAVSA                ;  TO BE FORMED IS LONGER THAN GIVEN STRING.
043624  005737  002112          1$:     TST STGLN                       ;ENTIRE STRING BEEN INSERTED?
043630  001420                          BEQ 3$          ;YES
043632  117721  136252                  MOVB @STGDS2,(R1)+              ;NO - INSERT STRING BYTE FROM GIVEN STRING
043636  005237  002110                  INC STGDS2                      ;UPDATE GIVEN STRING ADDRESS TO NEXT BYTE
043642  005337  002106                  DEC STGDS1
043646  001006                          BNE 2$                          ;ALL BYTES IN GIVEN STRING USED?
043650  013737  002116  002106          MOV SAVSL,STGDS1                ;YES - STRING BEING FORMED IS LONGER THAN
043656  013737  002120  002110          MOV SAVSA,STGDS2                ;  GIVEN STRING. RESET STRING ADDRESS
                                                                        ;  BACK TO BEGINNING OF GIVEN STRING.
043664  005337  002112          2$:     DEC STGLN                       ;DECREMENT COUNT OF # OF CHARACTERS YET
                                                                        ;  TO BE INSERTED.
043670  000755                          BR 1$
043672  000137  045740          3$:     JMP EISTG

043676                          DSTYP3:                                 ;DECIMAL STRING - ALL DIGITS IDENTICAL
043676  022737  010000  002106          CMP #10000,STGDS1               ;IS FORMED STRING TO BE PACKED OR ZONED DECIMAL?
043704  101070                          BHI PTYP3P
043706                          TYP3Z:                                  ;ZONED
043706  013701  002112                  MOV STGLN,R1                    ;GET STRING DESC. TYPE FIELD
043712  000301                          SWAB R1
043714  006201                          ASR R1
043716  006201                          ASR R1
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043720  006201                                  ASR R1
043722  006201                                  ASR R1
043724  042701  177770                          BIC #177770,R1
043730  010137  002310                          MOV R1,STGTYP           ;SAVE TYPE
043734  042737  177740  002112                  BIC #177740,STGLN       ;STRIP TYPE OFF STRING LENGTH WORD
043742  013737  002106  002124                  MOV STGDS1,SIGN         ;STRIP OFF SIGN FROM DATA DESCRIPTOR WORD 1
043750  042737  177760  002124                  BIC #177760,SIGN
043756  006237  002106                          ASR STGDS1              ;GET AND RIGHT ADJUST ZONED DATA BYTE
043762  006237  002106                          ASR STGDS1
043766  006237  002106                          ASR STGDS1
043772  006237  002106                          ASR STGDS1
043776  042737  177400  002106                  BIC #177400,STGDS1      ;GOT ZONED DATA BYTE (HIGH NIBBLE & DIGIT)
                                                                        ;  RIGHT ADJUSTED IN STGDS1.
044004  013702  002106                          MOV STGDS1,R2
044010  042702  177760                          BIC #177760,R2
044014  010237  002306                          MOV R2,STGDIG           ;SAVE JUST THE DIGIT IN STGDIG
044020  005737  002112                          TST STGLN               ;STRING TO BE FORMED HAVE 0 LENGTH?
044024  001535                                  BEQ TFS                 ;YES - NOTE: A ZERO LENGTH ZONED
                                                                        ;  STRING OCCUPIES NO MEMORY (ESCEPT SEPARATE TYPES).
044026  013701  002114                          MOV STGAD,R1            ;SET R1 TO STARTING ADDRESS OF STRING
                                                                        ;  TO BE FORMED IN TEST BUFFER.
044032  113721  002106                  1$:     MOVB STGDS1,(R1)+       ;NO - INSERT NEXT ZONED DATA BYTE.
044036  005337  002112                          DEC STGLN
044042  005737  002112                          TST STGLN               ;ENTIRE STRING BEEN INSERTED?
044046  001371                                  BNE 1$                  ;NO
044050  013702  002310                          MOV STGTYP,R2           ;YES - INSERT SIGN BYTE
044054  006302                                  ASL R2
044056  062702  002312                          ADD #TYPTAB,R2
044062  000172  000000                          JMP @(R2)               ;VECTOR TO APPROPRIATE STRING TYPE ROUTINE
                                                                        ;   TO ENTER SIGN BYTE.

044066  000137  044354                  PTYP3P: JMP TYP3P

044072  142741  000360                  TYPSZ:  BICB #360,-(R1)         ;SIGNED ZONED
                                                                        ;CLEAR OUT THE HIGH NIBBLE OF LEAST
                                                                        ;  SIGNIFICANT STRING BYTE.
044076  006337  002124                          ASL SIGN
044102  006337  002124                          ASL SIGN
044106  006337  002124                          ASL SIGN
044112  006337  002124                          ASL SIGN
044116  153711  002124                          BISB SIGN,(R1)          ;'OR' IN SIGN
044122  000512                                  BR EXTYP
044124  000511                          TYPUZ:  BR EXTYP                ;UNSIGNED ZONED - NO ACTION REQUIRED

044126                                  TYPTO:                          ;TRAILING OVERPUNCHED
044126  022737  000003  002124                  CMP #3,SIGN             ;IS SIGN = +?
044134  001416                                  BEQ 1$                  ;BRANCH IF YES
044136  004737  063532                          JSR PC,RN               ;RANDOMLY SELECT FROM 2 NEGATIVE SIGN TABLES
044142  032700  000001                          BIT #1,R0
044146  001403                                  BEQ 3$
044150  012702  002346                          MOV #NEGTB1,R2
044154  000402                                  BR 2$
044156  012702  002334                  3$:     MOV #NEGTAB,R2          ;SIGN IS NEGATIVE
044162  063702  002306                  2$:     ADD STGDIG,R2
```

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044166  111241                           MOVB (R2),-(R1)          ;COPY ENCODED SIGN FROM TABLE INTO STRING
044170  000467                           BR EXTYP
044172  004737  063532          1$:      JSR PC,RN                ;RANDOMLY SELECT FROM 3 POSITIVE SIGN TABLES.
044176  032700  000001                   BIT #1,R0
044202  001403                           BEQ 4$
044204  012702  002372                   MOV #POSTB1,R2
044210  000764                           BR 2$
044212  032700  000002          4$:      BIT #2,R0
044216  001403                           BEQ 5$
044220  012702  002404                   MOV #POSTB2,R2
044224  000756                           BR 2$
044226  012702  002360          5$:      MOV #POSTAB,R2
044232  000753                           BR 2$
044234                          TYPLO:                            ;LEADING OVERPUNCHED
044234  013701  002114                   MOV STGAD,R1             ;SETUP POINTER TO MOST SIGN. BYTE OF STRING
044240  005201                           INC R1
044242  000731                           BR TYPTO
044244                          TYPTS:                            ;TRAILING SEPARATE
044244  022737  000003  002124           CMP #3,SIGN              ;IS SIGN +
044252  001403                           BEQ 1$                   ;BRANCH IF YES
044254  112711  000055                   MOVB #055,(R1)           ;SIGN = -; COPY SIGN BYTE INTO STRING
044260  000433                           BR EXTYP
044262  004737  063532          1$:      JSR PC,RN                ;RANDOMLY SELECT BETWEEN 2 POSITIVE SEPARATE SIGNS.
044266  032700  000001                   BIT #1,R0
044272  001403                           BEQ 2$
044274  112711  000040                   MOVB #040,(R1)
044300  000423                           BR EXTYP
044302  112711  000053          2$:      MOVB #053,(R1)           ;SIGN = +; COPY SIGN BYTE INTO BYTE STRING
044306  000420                           BR EXTYP
044310                          TYPLS:                            ;LEADING SEPARATE
044310  013701  002114                   MOV STGAD,R1             ;SETUP POINTER TO BYTE BEFORE MOST SIGN.
                                                                  ;  DIGIT OF STRING.
044314  005301                           DEC R1
044316  000752                           BR TYPTS
044320                          TFS:                              ;0 LENGTH STRING
044320  022737  000005  002310           CMP #5,STGTYP            ;IS STRING TYPE = LEADING SEPARATE?
044326  001001                           BNE 1$                   ;BRANCH IF NO
044330  000767                           BR TYPLS                 ;INSERT SIGN AT 'A-1'
044332  022737  000004  002310  1$:      CMP #4,STGTYP            ;IS STRING TYPE = TRAILING SEPARATE
044340  001003                           BNE EXTYP                ;BRANCH IF NO
044342  013701  002114                   MOV STGAD,R1             ;INSERT SIGN AT  'A'
044346  000736                           BR TYPTS
044350  000137  045740          EXTYP:   JMP EISTG
044354                          TYP3P:                            ;PACKED
044354  013701  002112                   MOV STGLN,R1             ;GET STRING DESC. TYPE FIELD
044360  000301                           SWAB R1
044362  006201                           ASR R1
044364  006201                           ASR R1
044366  006201                           ASR R1
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044370  006201                                 ASR R1
044372  042701  177770                         BIC #177770,R1
044376  010137  002310                         MOV R1,STGTYP           ;SAVE TYPE
044402  042737  177740  002112                 BIC #177740,STGLN       ;STRIP TYPE OFF STRING LENGTH WORD
044410  113737  002106  002124                 MOVB STGDS1,SIGN        ;LOAD SIGN WITH DIGIT-SIGN BYTE
044416  113701  002106                         MOVB STGDS1,R1          ;FORM DIGIT-DIGIT BYTE
044422  006201                                 ASR R1                  ;RIGHT ADJUST DIGIT
044424  006201                                 ASR R1
044426  006201                                 ASR R1
044430  006201                                 ASR R1
044432  042701  177760                         BIC #177760,R1          ;CLEAR OUT ALL BUT DIGIT
044436  042737  177417  002106                 BIC #177417,STGDS1      ;CLEAR OUT ALL BUT DIGIT IN DATA DESCRIPTOR WORD 1
044444  050137  002106                         BIS R1,STGDS1           ;STGDS1 NOW CONTAINS DIGIT-DIGIT BYTE
044450  110137  002110                         MOVB R1,STGDS2          ;SAVE 0000-DIGIT BYTE IN CASE STRING LENGTH
                                                                       ;  IS EVEN - I.E. MOST SIGNIF DIGIT BYTE CONTAINS
                                                                       ;  ONLY A SINGLE DIGIT.
044454  013701  002114                         MOV STGAD,R1            ;SET R1 TO STARTING ADDRESS OF STRING
                                                                       ;  TO BE FORMED IN TEST BUFFER.
044460  005737  002112                         TST STGLN               ;STRING TO BE FORMED HAVE ZERO LENGTH?
044464  001004                                 BNE 3$                  ;NO
044466  042737  177760  002124                 BIC #177760,SIGN        ;YES - INSERT SIGN. NOTE: A ZERO LENGTH
044474  000424                                 BR INSIGN               ;  PACKED STRING OCCUPIES 1 BYTE.
044476  013737  002112  002116  3$:            MOV STGLN,SAVSL         ;STRING TO BE FORMED HAVE EVEN LENGTH?
044504  042737  177776  002116                 BIC #177776,SAVSL
044512  001003                                 BNE 1$
044514  113721  002110                         MOVB STGDS2,(R1)+       ;YES - INSERT 0000-DIGIT BYTE
044520  000404                                 BR 2$
044522  113721  002106          1$:            MOVB STGDS1,(R1)+       ;INSERT NEXT PACKED DATA BYTE
044526  005337  002112                         DEC STGLN
044532  005337  002112          2$:            DEC STGLN
044536  005737  002112                         TST STGLN               ;ENTIRE STRING BEEN INSERTED?
044542  003367                                 BGT 1$                  ;NO - CONTINUE INSERTING
044544  005301                                 DEC R1                  ;YES - BACKUP
044546  022737  000007  002310  INSIGN:        CMP #7,STGTYP           ;IS STRING TYPE UNSIGNED?
044554  001003                                 BNE 1$                  ;BRANCH IF NO
044556  052737  000017  002124                 BIS #17,SIGN            ;UNSIGNED PACKED STRING SIGN MUST = (1111)
044564  113711  002124          1$:            MOVB SIGN,(R1)          ;INSERT SIGN
044570  000137  045740                         JMP EISTG

044574                          DSTYP4:                                ;DECIMAL STRING - USER DEFINED DIGIT STRING
044574  032737  000002  002460                 BIT #2,ZPM              ;IS FORMED STRING TO BE PACKED OR ZONED
044602  001002                                 BNE TYP4Z               ;BRANCH IF ZONED
044604  000137  045314                         JMP TYP4P

044610                          TYP4Z:                                 ;ZONED
044610  013701  002112                         MOV STGLN,R1            ;GET STRING DESC. TYPE FIELD
044614  000301                                 SWAB R1
044616  006201                                 ASR R1
044620  006201                                 ASR R1
044622  006201                                 ASR R1
044624  006201                                 ASR R1
044626  042701  177770                         BIC #177770,R1
044632  010137  002310                         MOV R1,STGTYP           ;SAVE TYPE
044636  042737  177740  002112                 BIC #177740,STGLN       ;STRIP TYPE OFF STRING LENGTH WORD
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044644  042737  010000  002106           BIC #10000,STGDS1       ;STRIP OFF ALL BUT LENGTH
044652  013701  002114                   MOV STGAD,R1            ;INSERTION IS DONE FROM LS TO MS DIGIT
044656  063701  002112                   ADD STGLN,R1            ;FORM IN R1 ADDRESS WHERE FIRST BYTE IS TO BE INSERTED
044662  010137  002436                   MOV R1,ONEBEY           ;SAVE PTR TO 1 BYTE BEYOND LS END OF STRING
044666  013737  002110  002120           MOV STGDS2,SAVSA        ;SAVE GIVEN STRING DESCRIPTOR WORDS
044674  013737  002106  002116           MOV STGDS1,SAVSL        ;
044702  063737  002106  002110           ADD STGDS1,STGDS2       ;FORM IN STGDS2 ADDRESS WHERE FIRST BYTE IS TO BE
                                                                 ;  TAKEN FROM
044710  005337  002110                   DEC STGDS2
044714  005737  001770                   TST RANDTA              ;USE RANDOM SIGN?
044720  001403                           BEQ 4$
044722  004737  045154                   JSR PC,GETSGN           ;YES
044726  000416                           BR 5$
044730  117737  135154  002124  4$:      MOVB @STGDS2,SIGN
044736  006237  002124                   ASR SIGN
044742  006237  002124                   ASR SIGN
044746  006237  002124                   ASR SIGN
044752  006237  002124                   ASR SIGN
044756  042737  177760  002124           BIC #177760,SIGN
044764  005737  002112          5$:      TST STGLN               ;STRING TO BE FORMED HAVE 0 LENGTH?
044770  001002                           BNE 1$                  ;BRANCH IF NO
044772  000137  044320                   JMP TFS
044776  005737  002112          1$:      TST STGLN               ;ENTIRE STRING BEEN INSERTED?
045002  001432                           BEQ WONSGN              ;BRANCH IF YES
045004  005737  001770                   TST RANDTA              ;USE RANDOM DATA?
045010  001404                           BEQ 3$                  ;BRANCH IF NO
045012  004737  045654                   JSR PC,GRZDB            ;GENERATE IN R0 A RANDOM ZONED DATA BYTE
045016  110041                           MOVB R0,-(R1)           ;INSERT BYTE
045020  000420                           BR 2$
045022  117741  135062          3$:      MOVB @STGDS2,-(R1)      ;INSERT NEXT BYTE
045026  005337  002110                   DEC STGDS2              ;UPDATE POINTERS
045032  005337  002106                   DEC STGDS1
045036  001011                           BNE 2$                  ;GIVEN STRING EXHAUSTED? BRANCH IF NO
045040  013737  002116  002106           MOV SAVSL,STGDS1        ;RESET POINTERS BACK TO BEGINNING OF GIVEN STRING
045046  013737  002120  002110           MOV SAVSA,STGDS2
045054  063737  002106  002110           ADD STGDS1,STGDS2
045062  005337  002112          2$:      DEC STGLN               ;DECREMENT COUNT OF # OF DIGITS TO BE INSERTED
045066  000743                           BR 1$                   ;RETURN
045070  013702  002310          WONSGN:  MOV STGTYP,R2           ;WORK ON INSERTING SIGN BYTE
045074  006302                           ASL R2
045076  062702  002416                   ADD #PTYPTA,R2
045102  000172  000000                   JMP @(R2)

045106                          PTYPTO:                          ;FIX UP POINTERS TO ENABLE USE OF
                                                                 ;  TYP3Z ROUTINES.
045106  013701  002436                   MOV ONEBEY,R1           ;GET LEAST SIGN DIGIT
045112  114101                           MOVB -(R1),R1
045114  042701  177760          PTO:     BIC #177760,R1
045120  010137  002306                   MOV R1,STGDIG           ;SAVE IN STGDIG
045124  004737  045154                   JSR PC,GETSGN
045130  013701  002436                   MOV ONEBEY,R1           ;SETUP R1 TO ONE BYTE BEYOND STRING
045134  023727  002310  000002           CMP STGTYP,#2
045142  001402                           BEQ 1$
045144  000137  044234                   JMP TYPLO
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045150  000137  044126           1$:      JMP TYPTO
045154  005737  001770           GETSGN:  TST RANDTA                  ;USE RANDOM SIGN?
045160  001415                            BEQ 1$                      ;BRANCH IF NO
045162  004737  063532                    JSR PC,RN                   ;GET A RANDOM #
045166  032700  000001                    BIT #1,R0                   ;USE LEAST SIGN BIT TO  PICK A SIGN
045172  001404                            BEQ 2$
045174  012737  000007  002124            MOV #7,SIGN                 ;LS BIT = 1; MAKE SIGN NEG.
045202  000417                            BR 3$
045204  012737  000003  002124   2$:      MOV #3,SIGN                 ;LS BIT = 0;MAKE SIGN POS.
045212  000413                            BR 3$
045214  013701  002436           1$:      MOV ONEBEY,R1               ;SUBROUTINE TO GET SIGN FROM INSERTED STRING
045220  114101                            MOVB -(R1),R1
045222  042701  177417                    BIC #177417,R1
045226  006201                            ASR R1
045230  006201                            ASR R1                      ;RIGHT ADJUST
045232  006201                            ASR R1
045234  006201                            ASR R1
045236  010137  002124                    MOV R1,SIGN                 ;SAVE SIGN IN 'SIGN'
045242  000207                   3$:      RTS PC
045244                           PTYPSZ:                              ;INSERT SIGN TYPE SIGN
045244  013701  002436                    MOV ONEBEY,R1
045250  000137  044072                    JMP TYPSZ
045254                           PTYPLO:                              ;INSERT LEADING OVERPUNCH SIGN
045254  117701  134634                    MOVB @STGAD,R1              ;GET MOST SIGN. DIGIT
045260  000137  045114                    JMP PTO
045264                           PTYPTS:                              ;INSERT TRAILING SEPARATE SIGN
045264  004737  045154                    JSR PC,GETSGN               ;GET SIGN TO INSERT
045270  013701  002436                    MOV ONEBEY,R1
045274  000137  044244                    JMP TYPTS
045300                           PTYPLS:                              ;INSERT LEADING SEPARATE SIGN
045300  004737  045154                    JSR PC,GETSGN
045304  013701  002436                    MOV ONEBEY,R1
045310  000137  044310                    JMP TYPLS
045314  013701  002112           TYP4P:   MOV STGLN,R1                ;GET STRING DESC. TYPE FIELD
045320  000301                            SWAB R1
045322  006201                            ASR R1
045324  006201                            ASR R1
045326  006201                            ASR R1
045330  006201                            ASR R1
045332  042701  177770                    BIC #177770,R1
045336  010137  002310                    MOV R1,STGTYP               ;SAVE TYPE
045342  042737  177740  002112            BIC #177740,STGLN           ;STRIP TYPE OFF STRING LENGTH WORD
045350  013737  002112  002122            MOV STGLN,SAVSGL            ;PACKED - SAVE STRING LENGTH
045356  006237  002112                    ASR STGLN                   ;INSERTION IS DONE FROM LS TO MS DIGIT
045362  013701  002112                    MOV STGLN,R1                ;FORM IN R1 ADDRESS WHERE 1ST BYTE IS TO BE INSERTED
045366  063701  002114                    ADD STGAD,R1
045372  006237  002106                    ASR STGDS1
045376  013737  002106  002116            MOV STGDS1,SAVSL
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045404  013737  002110  002120          MOV STGDS2,SAVSA        ;SAVE GIVEN STRING DESCRIPTOR WORDS
045412  063737  002106  002110          ADD STGDS1,STGDS2       ;FORM IN STGDS2 ADDRESS WHERE 1ST BYTE
045420  005201                          INC R1                  ;IS TO BE TAKEN FROM
045422  005737  002112          1$:     TST STGLN               ;ENTIRE STRING BEEN INSERTED?
045426  100432                          BMI 3$                  ;BRANCH IF YES
045430  005737  001770                  TST RANDTA              ;USE RANDOM DATA?
045434  001404                          BEQ 5$                  ;BRANCH IF NO
045436  004737  045720                  JSR PC,GRPDB            ;GENERATE IN RO A RANDOM PACKED DATA BYTE
045442  110041                          MOVB RO,-(R1)           ;INSERT BYTE
045444  000420                          BR 2$
045446  117741  134436          5$:     MOVB @STGDS2,-(R1)      ;INSERT NEXT BYTE
045452  005337  002110                  DEC STGDS2
045456  005337  002106                  DEC STGDS1              ;UPDATE  POINTERS
045462  002011                          BGE 2$                  ;GIVEN STRING EXHAUSTED? BRANCH IF NO
045464  013737  002116  002106          MOV SAVSL,STGDS1        ;RESET POINTERS BACK TO BEGINNING OF GIVEN STRING
045472  013737  002120  002110          MOV SAVSA,STGDS2
045500  063737  002106  002110          ADD STGDS1,STGDS2
045506  005337  002112          2$:     DEC STGLN               ;DECREMENT COUNT OF # OF BYTES TO BE IBSERTED
045512  000743                          BR 1$
045514  032737  000001  002122  3$:     BIT #1,SAVSGL           ;IS STRING LENGTH ODD?
045522  001002                          BNE 4$                  ;BRANCH IF YES - DONE
045524  142721  000360                  BICB #360,(R1)+         ;ZERO NIBBLE IN MOST SIGN BYTE
045530  013701  002122          4$:     MOV SAVSGL,R1           ;CALCULATE SIGN ADDRESS
045534  006201                          ASR R1
045536  063701  002114                  ADD STGAD,R1
045542  022737  000007  002310          CMP #7,STGTYP           ;IS STRING TYPE UNSIGNED?
045550  001431                          BEQ 6$                  ;BRANCH IF YES
045552  005737  001770                  TST RANDTA              ;USE RANDOM SIGN?
045556  001470                          BEQ EISTG               ;BRANCH IF NO
045560  142711  000017                  BICB #17,(R1)           ;CLEAR OUT FOR SIGN
045564  004737  063532                  JSR PC,RN
045570  032700  000001                  BIT #1,RO
045574  001403                          BEQ 7$
045576  152711  000013                  BISB #13,(R1)           ;MAKE SIGN NEGATIVE
045602  000456                          BR EISTG
045604  032700  000002          7$:     BIT #2,RO
045610  001403                          BEQ 10$
045612  152711  000016                  BISB #16,(R1)           ;MAKE SIGN +
045616  000450                          BR EISTG
045620  032700  000004          10$:    BIT #4,RO
045624  001403                          BEQ 6$
045626  152711  000012                  BISB #12,(R1)           ;MAKE SIGN +
045632  000442                          BR EISTG
045634  152711  000017          6$:     BISB #17,(R1)           ;OVERWRITE SIGN TO (1111)
045640  000437                          BR EISTG

045642                          DSTYP5:                         ;DECIMAL STRING - RANDOM DATA & SIGN
045642  012737  177777  001770          MOV #177777,RANDTA      ;SET RANDOM DATA FLAG
045650  000137  044574                  JMP DSTYP4              ;USE DSTYP4 ROUTINES.

045654                          GRZDB:                          ;SUBROUTINE TO GENERATE A RANDOM ZONED
                                                                ;DATA BYTE IN RO.
045654  004737  063532                  JSR PC,RN               ;GET A RANDOM #.
045660  042700  177740                  BIC #BS128,RO           ;STRIP OFF ALL BUT LS NIBBLE
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11924  045664  020027  000011              CMP R0,#11          ;VALID NIBBLE = 0 TO 11.
11925  045670  101402                      BLOS    1$          ;BRANCH IF NIBBLE IS VALID
11926  045672  042700  000010              BIC #10,R0          ;CONVERT INVALID NIBBLE TO A VALID ONE
11927  045676  010037  001774      1$:     MOV R0,RNIB         ;SAVE NIBBLE
11928  045702  004737  063532              JSR PC,RN           ;GET ANOTHER RANDOM #
11929  045706  043700  001766              BIC ZMSK,R0         ;MASK OFF ALL BUT ZONE FIELD
11930  045712  053700  001774              BIS RNIB,R0         ;OR - IN THE DECIMAL NIBBLE
11931  045716  000207                      RTS PC              ;RETURN WITH ZONED DATA BYTE IN R0
11932
11933  045720                      GRPDB:                      ;SUBROUTINE TO GENERATE A RANDOM PACKED
11934                                                          ;DATA BYTE IN R0.
11935  045720  004737  045654              JSR PC,GRZDB        ;GET A RANDOM ZONED DATA BYTE
11936  045724  020027  000231              CMP R0,#231         ;HIGH NIBBLE MUST BE <=9
11937  045730  101402                      BLOS    1$          ;BRANCH IF VALID
11938  045732  042700  000200              BIC #200,R0         ;CONVERT TO VALID
11939  045736  000207                  1$: RTS PC
11940  045740  000205                  EISTG: RTS R5
11941
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045742                              FC10:                                   ;FLOW COMMAND = 10 - COPY TEST BUFFER INTO
                                                                            ;  EMULATION BUFFER
045742  032737  000100  050012              BIT #100,TINST                  ;THE IN-LINE TEST CASE ALWAYS FOLLOWS
                                                                            ; THE SAME REGISTER TEST CASE - THEREFORE
                                                                            ; THEIR IS NO NEED TO REEMULATE.
045750  001010                              BNE 2$
045752  013701  001640                      MOV TBADR,R1                    ;R1 POINTS TO START OF TEST BUFFER
045756  013702  001646                      MOV EBADR,R2                    ;R2 POINTS TO START OF EMULATION BUFFER
045762  012122                      1$:     MOV (R1)+,(R2)+                 ;COPY NEXT WORD
045764  023701  001754                      CMP TBEND,R1                    ;COPY COMPLETE ?
045770  003374                              BGT 1$                          ;NO
045772  000137  042250              2$:     JMP FCRTN                       ;YES

045776                              FC11:                                   ;FLOW COMMAND = 11 - SETUP EMULATION
                                                                            ;  OPERANDS IN ER0 - ER5 AND EMULATE
                                                                            ;  THE CIS INSTRUCTION UNDER TEST.
045776  032737  000100  050012              BIT #100,TINST                  ;THE IN-LINE TEST CASE ALWAYS FOLLOWS THE SAME
                                                                            ; REGISTER TEST CASE - THEREFORE THEIR IS NO
                                                                            ; NEED TO REEMULATE.
046004  001060                              BNE FINEM
046006  013737  003630  003670              MOV TR0,ER0                     ;COPY ERN DIRECTLY FROM TRN
046014  013737  003632  003672              MOV TR1,ER1
046022  013737  003634  003674              MOV TR2,ER2
046030  013737  003636  003676              MOV TR3,ER3
046036  013737  003640  003700              MOV TR4,ER4
046044  013737  003642  003702              MOV TR5,ER5
046052  013737  003644  003704              MOV TR6,ER6

                                                                            ;ADJUST ERN SPECIFIED IN FLOW TABLE ENTRY
                                                                            ;  TO ACCOUNT FOR EMULATION VERSUS TEST
                                                                            ;  BUFFER STARTING ADDRESS
046060  004737  053666                      JSR PC,RF1                      ;FORM POINTER TO FIRST TEST OPERAND TO
                                                                            ;  BE ADJUSTED.
046064  020127  003630                      CMP R1,#TRN                     ;ANY OPERANDS TO BE ADJUSTED?
046070  001420                              BEQ EC11                        ;BRANCH IF NO.
046072  004737  046152                      JSR PC,ADJEOP                   ;ADJUST OPERAND
046076  004737  053720                      JSR PC,RF2                      ;FORM POINTER TO SECOND TEST OPERAND TO
                                                                            ;  BE ADJUSTED.
046102  020127  003630                      CMP R1,#TRN                     ;IF R1 STILL POINTS TO #TRN THEN THERE
                                                                            ;  WAS ONLY ONE OPERAND TO BE ADJUSTED.
046106  001411                              BEQ EC11                        ;ADJUSTING COMPLETE
046110  004737  046152                      JSR PC,ADJEOP                   ;ADJUST NEXT EMULATION OPERAND
046114  004737  053754                      JSR PC,RF3                      ;FORM POINTER TO THIRD TEST OPERAND TO
                                                                            ;  BE ADJUSTED.
046120  020127  003630                      CMP R1,#TRN                     ;WAS THERE A THIRD OPERAND TO BE ADJUSTED?
046124  001402                              BEQ EC11                        ;NO - ADJUSTING COMPLETE
046126  004737  046152                      JSR PC,ADJEOP                   ;YES - ADJUST IT.

046132                              EC11:                                   ;EMULATION OPERANDS ALL SET.
                                                                            ;EMULATE CIS INST.
046132  004737  017144                      JSR PC,EMULATE                  ;CALL EMULATOR
046136  000000                      EINSTR: 0                               ;INSTRUCTION
046140  003670                              ERN                             ;POINTER TO REGISTER OPERANDS
046142  003706                              ERNR                            ;POINTER TO REGISTER RESULTS
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046144  003724                          ECCR                    ;POINTER TO COND. CODE RESULTS
046146  000137  042250          FINEM:  JMP FCRTN

046152                          ADJEOP:                         ;SUBROUTINE TO UPDATE EMULATION OPERANDS
                                                                ;  TO REFLECT EMULATION BUFFER STARTING ADDRESS.
046152  162701  003630                  SUB #TRN,R1
046156  062701  003670                  ADD #ERN,R1             ;POINT R1 TO EMULATION OPERAND RATHER THAN
                                                                ;  TEST OPERAND.
046162  163711  001640                  SUB TBADR,(R1)          ;SUBTRACT OUT TEST BUFFER STARTING ADDRESS
046166  063711  001646                  ADD EBADR,(R1)          ;ADD IN EMULATION BUFFER STARTING ADDRESS
046172  000207                          RTS PC

046174                          FC12:                           ;FLOW COMMAND = 12 - SETUP REGISTERS (OR INLINE POINTERS
                                                                ;  AND COND CODES AND EXECUTE CIS INSTRUCTION.
                                                                ;  SAVE RESULTS.
046174  013737  003630  002234          MOV TR0,TTR0            ;SAVE TRNS IN TEMPORARY STORAGE
046202  013737  003632  002236          MOV TR1,TTR1
046210  013737  003634  002240          MOV TR2,TTR2
046216  013737  003636  002242          MOV TR3,TTR3
046224  013737  003640  002244          MOV TR4,TTR4
046232  013737  003642  002246          MOV TR5,TTR5
046240  032737  000100  050012          BIT #100,TINST          ;INST TYPE (REG OR IN-LINE)?
046246  001014                          BNE INLINE              ;BRANCH IF INLINE TYPE
046250  023727  050012  076027          CMP TINST,#76027
046256  001406                          BEQ NONOP
046260  023727  050012  076067          CMP TINST,#76067
046266  001402                          BEQ NONOP
046270  000137  047124                  JMP REGOP
046274  000137  047170          NONOP:  JMP LTSTOP
046300  004737  053700          INLINE: JSR PC,RF1X             ;GET # OF IN-LINE DESCRIPTOR POINTERS
046304  006201                          ASR R1
046306  012702  000005                  MOV #5,R2               ;CALCULATE BRANCH TO INSERT IMMEDIATELY
                                                                ; FOLLOWING IN LINE DESCRIPTORS.
046312  160102                          SUB R1,R2
046314  062702  000400                  ADD #400,R2
046320  010237  001756                  MOV R2,SBR              ;SAVE BRANCH INST
046324  005002                          CLR R2
046326  013703  001640                  MOV TBADR,R3
046332  005701                  2$:     TST R1
046334  001410                          BEQ 1$                  ;BRANCH IF ALL IN-LINE PTRS HAVE BEEN INSERTED.
046336  010362  050014                  MOV R3,TINST+2(R2)      ;INSERT DESCRIPTOR POINTERS IN-LINE
046342  005301                          DEC R1                  ;UPDATE FOR NEXT IN-LINE PTR
046344  062702  000002                  ADD #2,R2
046350  062703  000004                  ADD #4,R3
046354  000766                          BR 2$                   ;RETURN TO WORK ON NEXT IN-LINE PTR.
046356  012737  000001  002232  1$:     MOV #1,NXFLD            ;INITIALIZE FIELD PTR TO SECOND FIELD
046364  004737  054132          11$:    JSR PC,RFN              ;GET NEXT FIELD CONTENTS.
046370  020127  003630                  CMP R1,#TRN             ;ALL OPERANDS INSERTED IN-LINE?
046374  001407                          BEQ 3$                  ;BRANCH IF YES
046376  005337  001756                  DEC SBR
046402  011162  050014                  MOV (R1),TINST+2(R2)    ;MOVE REGISTER OPERAND INTO IN-LINE LOC
046406  062702  000002                  ADD #2,R2               ;UPDATE TO NEXT IN-LINE LOC
046412  000764                          BR 11$                  ;RETURN TO WORK ON NEXT IN-LINE OPERAND
046414  013762  001756  050014  3$:     MOV SBR,TINST+2(R2)     ;INSERT BRANCH
```

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046422  012737  050014  002214          MOV #TINST+2,ICOMPC     ;SAVE BRANCH LOCATION FOR PC
046430  060237  002214                  ADD R2,ICOMPC           ;       CHECK ON IN-LINE INSTRUCTION COMPLETION
046434  062702  000002          12$:    ADD #2,R2               ;INSERT HALTS FOLLOWING BRANCH
046440  022702  000014                  CMP #14,R2
046444  001404                          BEQ 4$
046446  013762  001672  050014          MOV KHALT,TINST+2(R2)
046454  000767                          BR 12$

046456  062737  000002  001742  4$:     ADD #2,FLOPTR           ;LOOK AT NEXT FLOW COMMAND (=00)
046464  013702  001640                  MOV TBADR,R2            ;INITIALIZE POINTERS TO TEST & EMULATION BUFFERS
046470  013703  001646                  MOV EBADR,R3
046474  005037  002232                  CLR NXFLD               ;INITIALIZE FIELD PTR TO 1ST FIELD
046500  004737  054132          41$:    JSR PC,RFN              ;GET NEXT FIELD CONTENTS
046504  020127  003630                  CMP R1,#TRN             ;ALL BUFFER DESCRIPTORS FILLED?
046510  001441                          BEQ 5$                  ;BRANCH IF YES
046512  020127  003636                  CMP R1,#TR3             ;FOR CVTLN & CVTLP THE MEMORY ORDER
046516  001021                          BNE 42$                 ;  OF THE LONG INTEGER LOW & HIGH
046520  023727  050012  076157          CMP TINST,#76157        ;  IS REVERSED FROM THE REGISTER ORDER
046526  001404                          BEQ 43$
046530  023727  050012  076177          CMP TINST,#76177
046536  001011                          BNE 42$
046540  011112                  43$:    MOV (R1),(R2)
046542  011113                          MOV (R1),(R3)
046544  162701  000002                  SUB #2,R1
046550  011162  000002                  MOV (R1),2(R2)
046554  011163  000002                  MOV (R1),2(R3)
046560  000410                          BR 44$
046562  011162  000002          42$:    MOV (R1),2(R2)          ;COPY BUFFER DESCRIPTORS FROM REGISTER
046566  011163  000002                  MOV (R1),2(R3)          ; DESCRIPTORS.
046572  162701  000002                  SUB #2,R1
046576  011112                          MOV (R1),(R2)
046600  011113                          MOV (R1),(R3)
046602  062702  000004          44$:    ADD #4,R2               ;UPDATE BUFFER DESCRIPTOR POINTERS
046606  062703  000004                  ADD #4,R3
046612  000732                          BR 41$                  ;RETURN TO FILL NEXT DESCRIPTOR WORDS.
046614  062737  000002  001742  5$:     ADD #2,FLOPTR           ;LOOK AT NEXT FLOW COMMAND (=00)
046622  005737  002272                  TST RPTFLG              ;IS TEST BEING REPEATED??
046626  001025                          BNE 6$                  ;BRANCH IF YES  (DONT UPDATE EMUL BUFFER
                                                                ;  DESCRIPTORS - THEY ARE ALREADY UP-TO-DATE).
046630  013703  001646                  MOV EBADR,R3            ;INITIALIZE POINTER TO EMULATION BUFFER.
046634  005037  002232                  CLR NXFLD               ;INITIALIZE FIELD PTR TO 1ST FIELD
046640  004737  054032          51$:    JSR PC,RFNX             ;GET NEXT FIELD CONTENTS
046644  005701                          TST R1                  ;ALL RESULT EMULATOR BUFFER DESCRIPTORS UPDATED?
046646  001415                          BEQ 6$                  ;BRANCH IF YES
046650  020127  000016                  CMP R1,#16              ;DESCRIPTOR TO BE UPDATED?
046654  001407                          BEQ 52$                 ;BRANCH IF NO
046656  062701  003706                  ADD #ERNR,R1            ;FORM POINTER INTO EMUL. RESULT STACK
046662  011113                          MOV (R1),(R3)           ;COPY EMUL. RESULT INTO BUFFER
046664  162701  000002                  SUB #2,R1
046670  011163  000002                  MOV (R1),2(R3)
046674  062703  000004          52$:    ADD #4,R3               ;UPDATE EMUL. BUFFER POINTER
046700  000757                          BR 51$                  ;RETURN TO WORK ON NEXT EMUL. RESULT.
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046702  013737  001720  003630  6$:     MOV PAT0,TR0            ;INITIALIZE TRX'S TO #PATTERN
046710  013737  001722  003632          MOV PAT1,TR1
046716  013737  001724  003634          MOV PAT2,TR2
046724  013737  001726  003636          MOV PAT3,TR3
046732  013737  001730  003640          MOV PAT4,TR4
046740  013737  001732  003642          MOV PAT5,TR5

046746  062737  000002  001742  7$:     ADD #2,FLOPTR           ;OVERWRITE WITH #PATTERN ALL ERNRS EXCEPT
                                                                ; THOSE THAT CONTAIN A REGISTER RESULT.
                                                                ;LOOK AT NEXT FLOW COMMAND (=00)
046754  013737  003706  002252          MOV ER0R,TER0R          ;COPY ERNRS INTO TEMP SPACE AT TERNR
046762  013737  003710  002254          MOV ER1R,TER1R
046770  013737  003712  002256          MOV ER2R,TER2R
046776  013737  003714  002260          MOV ER3R,TER3R
047004  013737  003716  002262          MOV ER4R,TER4R
047012  013737  003720  002264          MOV ER5R,TER5R

047020  013737  001720  003706  8$:     MOV PAT0,ER0R           ;OVERWRITE ERNR STACK WITH # PATTERN
047026  013737  001722  003710          MOV PAT1,ER1R
047034  013737  001724  003712          MOV PAT2,ER2R
047042  013737  001726  003714          MOV PAT3,ER3R
047050  013737  001730  003716          MOV PAT4,ER4R
047056  013737  001732  003720          MOV PAT5,ER5R

047064  005037  002232          9$:     CLR NXFLD               ;INITIALIZE FIELD PTR TO 1ST FIELD
047070  004737  054032          91$:    JSR PC,RFNX             ;GET NEXT FIELD CONTENTS
047074  020127  000016                  CMP R1,#16              ;END OF REGISTER RESULT LIST?
047100  001407                          BEQ 10$                 ;BRANCH IF YES
047102  010102                          MOV R1,R2
047104  062701  003706                  ADD #ERNR,R1
047110  062702  002252                  ADD #TER0R,R2
047114  011211                          MOV (R2),(R1)           ;COPY REGISTER RESULT BACK INTO ERNR STACK
                                                                ; FOR TEMPORARY STORAGE.
047116  000764                          BR 91$                  ;RETURN TO WORK ON NEXT REGISTER RESULT.
047120  000137  047170          10$:    JMP LTSTOP

047124  013737  001674  050014  REGOP:  MOV KBR5,TINST+2
047132  013737  001672  050016          MOV KHALT,TINST+4
047140  013737  001672  050020          MOV KHALT,TINST+6
047146  013737  001672  050022          MOV KHALT,TINST+10
047154  013737  001672  050024          MOV KHALT,TINST+12
047162  013737  001672  050026          MOV KHALT,TINST+14

047170  010637  002230          LTSTOP: MOV SP,TSP              ;SAVE STACK POINTER
047174  022737  076026  050012          CMP #076026,TINST       ;IS INST A L2D6?
047202  001003                          BNE 2$                  ;BRANCH IF NO
047204  013706  003644          3$:     MOV TR6,SP              ;LOAD DESC 6 INST - USE TR6 CONTENTS AS SP
047210  000411                          BR 1$
047212  022737  076066  050012  2$:     CMP #076066,TINST       ;IS INST A L3D6?
047220  001771                          BEQ 3$                  ;BRANCH IF YES
047222  012737  120602  003722          MOV #CSTACK,ER6R
047230  012706  120602                  MOV #CSTACK,SP
047234  010637  003644          1$:     MOV SP,TR6              ;LOAD TR6 FOR INPUT REG DISPLAY
047240  013737  003724  003646          MOV ECCR,TCC            ;SETUP CONDITION CODES
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047246  013701  050012                   MOV TINST,R1             ;IS INST A L2D OR L3D?
047252  042701  000007                   BIC #7,R1
047256  022701  076020                   CMP #076020,R1           ;IF YES SETUP CONDITION CODES=EXPECTED CODES.
047262  001405                           BEQ 4$
047264  022701  076060                   CMP #076060,R1
047270  001402                           BEQ 4$
047272  005137  003646                   COM TCC                  ;OTHERWISE SETUP CC=COMPLEMENT OF EXPECTED CC.
047276  004737  054746          4$:      JSR PC,SELREG            ;SELECT REGISTER SET AND SETUP CONTENTS OF
                                                                  ;  REGISTER SET NOT SELECTED.
047302  012737  000240  050030           MOV #NOP,TINRET          ;RESTORE NOP TO CIS INST RETURN POINT
047310  004737  056134                   JSR PC,SELMD             ;SELECT MODE & I/D ENABLES; LOAD MMR3 TO
                                                                  ;  REFLECT D-SPACE ENABLE/DIS SELECTION
047314  005737  002160                   TST MODE                 ;TEST MODE = KERNEL?
047320  001403                           BEQ 17$                  ;BRANCH IF YES
047322  012737  000000  050030           MOV #HALT,TINRET         ;LOAD HALT AT INST UNDER TEST RETURN ADDRESS
                                                                  ;  (ALLOWS TRAPPING BACK TO KERNEL MODE
                                                                  ;  AFTER CIS INST EXECUTION).
047330  005737  002156          17$:     TST MMFLG                ;IS MEMORY MGMT AVAILABLE?
047334  001411                           BEQ 8$                   ;BRANCH IF NO
047336  004737  056360                   JSR PC,SETPDR            ;SETUP MEM MGMT PDR'S
                                                                  ;NOTE: PAR'S ARE SETUP AT BEGINNING OF PROG
                                                                  ; KERNEL,USER & SUPV SPACES ARE ALWAYS MAPPED
                                                                  ; TO SAME PHYSICAL MEMORY)
047342  012737  000240  047774           MOV #NOP,TOMM            ;ALLOW MEMORY MANAGEMENT TURN ON
047350  012737  000240  050040           MOV #NOP,TOFMM           ;ALLOW MEMORY MANAGEMENT TURN OFF
047356  000406                           BR 9$
047360  012737  000403  047774  8$:      MOV #403,TOMM            ;INHIBIT MEM MGMT TURN ON
047366  012737  000402  050040           MOV #402,TOFMM
047374  013700  003630          9$:      MOV TR0,R0               ;LOAD TEST OPERANDS INTO REGISTERS
047400  010037  002566                   MOV R0,STATR0            ;SAVE STATE OF CISP
047404  013701  003632                   MOV TR1,R1
047410  010137  002570                   MOV R1,STATR1
047414  013702  003634                   MOV TR2,R2
047420  010237  002572                   MOV R2,STATR2
047424  013703  003636                   MOV TR3,R3
047430  010337  002574                   MOV R3,STATR3
047434  013704  003640                   MOV TR4,R4
047440  010437  002576                   MOV R4,STATR4
047444  013705  003642                   MOV TR5,R5
047450  010537  002600                   MOV R5,STATR5
047454  010637  002602                   MOV SP,STATR6
047460  005737  002160                   TST MODE                 ;IS MODE = KERNEL?
047464  001003                           BNE 5$                   ;BRANCH IF NO
047466  162737  000006  002602           SUB #6,STATR6            ;ADJUST SAVED STACK POINTER TO ACCOUNT FOR
                                                                  ;  INTERRUPT STACK PUSH (KERNEL = CIS INST STACK)
047474  042737  177760  003646  5$:      BIC #177760,TCC          ;FORM PSW TO BE USED UPON ENTRY TO CIS INST
047502  017737  132156  001752           MOV @TPSW,TSTPSW
047510  042737  170017  001752           BIC #170017,TSTPSW
047516  053737  003646  001752           BIS TCC,TSTPSW
047524  022737  000001  002160           CMP #1,MODE              ;TEST MODE = SUPERVISOR?
047532  001004                           BNE 6$                   ;BRANCH IF NO
047534  052737  040000  001752           BIS #040000,TSTPSW       ;SET CURRENT MODE = SUPV IN TSTPSW
047542  000407                           BR 7$
047544  022737  000003  002160  6$:      CMP #3,MODE              ;TEST MODE = USER?
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      047552 001015                            BNE 10$                  ;BRANCH IF NO
      047554 052737 140000 001752              BIS #140000,TSTPSW       ;SET CURR MODE = USER IN TSTPSW
      047562 013777 001752 132074    7$:       MOV TSTPSW,@TPSW         ;MODE = USER + SUPV; SWITCH TO TEST MODE
      047570 013706 002602                     MOV STATR6,SP            ;SETUP TEST MODE R6
      047574 042777 140000 132062              BIC #140000,@TPSW        ;SWITCH BACK TO KERNEL
      047602 013706 002230                     MOV TSP,SP               ;SETUP KERNEL MODE R6
      047606 013737 001752 002564    10$:      MOV TSTPSW,STATPS
      047614 005037 002546                     CLR INTCT                ;CLEAR INTERRUPT COUNT
      047620 042737 040000 002132              BIC #40000,FATAL         ;CLEAR INTERRUPT INDICATOR IN FATAL ERROR WORD
      047626 005037 002540                     CLR PROGCT               ;CLEAR PROGRESS COUNT
      047632 022777 000001 132076              CMP #1,@SWR              ;CHECK FOR REQUEST TO STOP ON A TEST
      047640 001027                            BNE TOLTC                ;DON'T STOP
      047642 005737 002216                     TST STOPTF               ;HAS TEST BEEN ENTERED?
      047646 001015                            BNE 11$                  ;BRANCH IF YES
      047650 012737 177777 002216              MOV #177777,STOPTF       ;SET FLAG TO INDICATE THAT TEST HAS BEEN ENTERED
      047656 010046                            MOV R0,-(SP)             ;SAVE  R0 - PRINT CALL DESTROYS IT
      047660                                   PRINTB #ASKST            ;ASK USER FOR TEST # TO STOP ON
  (6) 047660 012746 013034                     MOV     #ASKST,-(SP)
  (3) 047664 010600                            MOV     SP,R0
  (4) 047666 004737 065410                     JSR PC,FPRINT
      047672 012600                            MOV (SP)+,R0             ;RESTORE R0
      047674 104403                            RDDEC                    ;READ DECIMAL #
      047676 012637 002220                     MOV (SP)+,STOPT          ;SAVE STOP TEST #
      047702 023737 002220 001420    11$:      CMP STOPT,TOTTC          ;IS CURRENT TEST = STOP TEST
      047710 001003                            BNE TOLTC                ;BRANCH IF NO
      047712 012737 177777 002042              MOV #177777,NOERDS       ;SET FLAGS TO CAUSE CURRENT TEST TO BE
                                                                        ;DISPLAYED AND USER TO BE QUERIED FOR FURTHER ACTION.
      047720 000414                  TOLTC:    BR TOPC2                 ;OVERWRITTEN WITH A NOP IF LTC IS USED FOR
                                                                        ;  INTERRRUPT TESTING
      047722 013737 003030 003032              MOV LCNT,VLCNT           ;RESET LTC COUNTER
      047730 004737 062250                     JSR PC,LTCSUP            ;SYNC UP TO LTC
      047734 052777 000100 133064              BIS #100,@LKS            ;ENABLE LTC INTR
      047742 005337 003032           1$:       DEC VLCNT                ;KILL MOST OF TIME BEFORE EXPECTED
                                                                        ;  INTERRUPT
      047746 001375                            BNE 1$
      047750 000410                            BR PREINS
      047752 000403                  TOPC2:    BR TOPC1                 ;OVERWRITTEN WITH A NOP IF LATENCY IS BEING TESTED
      047754 052777 000001 132546              BIS #001,@PC2CSR                 ;TURN ON P-CLK2
      047762 000403                  TOPC1:    BR PREINS                        ;OVERWRITTEN WITH A NOP IF INTERRUPTABILITY IS B
      047764 052777 000101 132526              BIS #101,@PC1CSR                 ;TURN ON P-CLK1
      047772 000240                  PREINS:   NOP                      ;REPLACED WITH A HALT IF OPERATOR REQUESTED
                                                                        ; 'HALT AT CIS INST'.
      047774 000403                  TOMM:     BR GO                    ;OVERWRITTEN WITH A NOP IF MEM MGMT TEST STATE = ON
      047776 052737 000001 177572              BIS #1,@#MMR0            ;TURN ON MEMORY MGMT
      050004 013777 001752 131652    GO:       MOV TSTPSW,@TPSW         ;SET PSW TO DESIRED STATE (PRIOR TO THIS MODE=KERNEL)
      050012 000000                  TINST:    .WORD 0                  ;EXECUTE CIS INST UNDER TEST.
      050014 000405                            BR TINRET
      050016 000000                            HALT
      050020 000000                            HALT                     ;IF PROGRAM STOPS AT ANY ONE OF THESE HALTS,
      050022 000000                            HALT                     ;  THEN THE CIS INSTRUCTION EXECUTION
      050024 000000                            HALT                     ;  RETURNED WITH INCORRECT PC.
      050026 000000                            HALT
      050030 000240                  TINRET:   NOP                      ;OVERWRITTEN WITH A HALT IF MODE = USER OR SUPV
                                                                        ;NOTE: HALT IS USED TO TRAP BACK TO KERNEL MODE
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     050032  017737  131626  120604            MOV @TPSW,SAVKCC          ;SAVE CC RESULTS
     050040  000402                    TOFMM:  BR CSCC                   ;OVERWRITTEN WITH A NOP IF MEM MGMT IS AVAILABLE
     050042  005037  177572                    CLR @#MMRO                ;TURN OFF MEMORY MGMT
     050046  013737  120604  003666    CSCC:   MOV SAVKCC,TCCR
     050054  042737  177760  003666    SUHRET: BIC #177760,TCCR
     050062  010037  003650                    MOV R0,TR0R               ;SAVE REGISTER RESULTS
     050066  010137  003652                    MOV R1,TR1R
     050072  010237  003654                    MOV R2,TR2R
     050076  010337  003656                    MOV R3,TR3R
     050102  010437  003660                    MOV R4,TR4R
     050106  010537  003662                    MOV R5,TR5R
     050112  032737  030000  177776            BIT #30000,@#PSW          ;WAS PREVIOUS MODE USER OR SUPV?
     050120  001404                            BEQ 4$                    ;BRANCH IF NO
     050122  006506                            MFPI SP                   ;GET PREVIOUS MODE SP
     050124  012637  003664                    MOV (SP)+,TR6R            ;STORE PREVIOUS SP
     050130  000402                            BR 5$
     050132  010637  003664            4$:     MOV SP,TR6R
     050136  013706  002230            5$:     MOV TSP,SP
     050142  004737  055172                    JSR PC,CKUREG             ;VERIFY THAT REG SET WHICH WAS NOT
                                                                         ;  SELECTED DID NOT GET CHANGED AND SWITCH TO
                                                                         ;  REGISTER SET 0.
     050146  022737  111111  120400            CMP #111111,PRECSK        ;DID CIS INST EXECUTION USE MORE THAN 64 STACK WORDS
     050154  001012                            BNE 2$                    ;BRANCH IF YES
     050156  022737  111111  120602            CMP #111111,PSTCSK        ;DID CIS INST DESTROY LOC AT STACK + 2
     050164  001416                            BEQ 3$                    ;BRANCH IF NO
     050166                                    PRINTB #STKM2
 (6) 050166  012746  011710                    MOV     #STKM2,-(SP)
 (3) 050172  010600                            MOV     SP,R0
 (4) 050174  004737  065410                    JSR PC,FPRINT
     050200  000405                            BR 1$
     050202                            2$:     PRINTB #STKM1
 (6) 050202  012746  011617                    MOV     #STKM1,-(SP)
 (3) 050206  010600                            MOV     SP,R0
 (4) 050210  004737  065410                    JSR PC,FPRINT
     050214  012737  177777  002152    1$:     MOV #177777,ERRSTK        ;SET STACK ERROR FLAG
     050222  000137  042250            3$:     JMP FCRTN


     050226                            FC13:                             ;FLOW COMMAND = 13 - COMPARE TEST RESULTS
                                                                         ;  TO EMULATION RESULTS - INDICATE
                                                                         ;  ANY ERRORS.
     050226  005037  002144                    CLR ERRCC
     050232  005037  002146                    CLR ERRREG
     050236  005037  002150                    CLR ERRBUF
     050242  004737  053666                    JSR PC,RF1                ;FORM POINTER TO FIRST TEST OPERAND
                                                                         ;  TO BE ADJUSTED.
     050246  022701  003646                    CMP #TRN+16,R1            ;IF OPERAND = 7 THEN ALL REQUIRED ADJUSTMENTS
                                                                         ;  HAVE BEEN COMPLETED
     050252  001446                            BEQ CCCK                  ;DONE?
     050254  032737  000100  050012            BIT #100,TINST            ;INST TYPE (REG OR INLINE)?
     050262  001030                            BNE ADJI
     050264  004737  051264                    JSR PC,ADJR               ;NO - ADJUST SPECIFIED OPERANDS
     050270  004737  053720                    JSR PC,RF2                ;FORM POINTER TO 2ND TEST OPERAND
                                                                         ;  TO BE ADJUSTED.
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050274  022701  003646                          CMP #TRN+16,R1
050300  001433                                  BEQ CCCK                 ;DONE?
050302  004737  051264                          JSR PC,ADJR              ;NO - ADJUST AGAIN
050306  004737  053754                          JSR PC,RF3               ;FORM POINTER TO 3RD TEST OPERAND TO BE ADJUSTED
050312  022701  003646                          CMP #TRN+16,R1
050316  001424                                  BEQ CCCK                       ;DONE?
050320  004737  051264                          JSR PC,ADJR              ;NO - ADJUST
050324  004737  054004                          JSR PC,RF4               ;FORM POINTER TO 4TH TEST OPERAND TO BE ADJUSTED
050330  022701  003646                          CMP #TRN+16,R1
050334  001415                                  BEQ CCCK                       ;DONE?
050336  004737  051264                          JSR PC,ADJR              ;NO - ADJUST
050342  000412                                  BR CCCK
050344  062737  000002  001742  ADJI:           ADD #2,FLOPTR            ;LOOK AT NEXT FLOW COMMAND (=00)
050352  004737  053666                          JSR PC,RF1               ;FORM PTR TO INLINE TYPE INST REG OPERAND
                                                                         ; TO BE ADJUSTED.
050356  022701  003646                          CMP #TRN+16,R1           ;IF OPERAND = 7 THEN NO REG OPERANDS TO ADJUST.
050362  001402                                  BEQ CCCK                 ;DONE?
050364  004737  051264                          JSR PC,ADJR              ;NO ADJUST SPECIFIED OPERAND.
                                                                         ;NOTE: INLINE TYPE INST NEVER REQUIRE
                                                                         ;  THAT MORE THAN 1 OPERAND BE ADJUSTED.
050370  042737  177760  003724  CCCK:           BIC #177760,ECCR         ;CLEAR OUT ALL BUT CONDITION CODES
050376  005737  036210                          TST EZDF                 ;CONDITION UNDER TEST = DIVP BY 0?
050402  001406                                  BEQ 1$                   ;BRANCH IF NO
050404  042737  000014  003666                  BIC #14,TCCR             ;MASK OUT ALL BUT C & V COND. CODES
050412  042737  000014  003724                  BIC #14,ECCR
050420  004737  070006          1$:             JSR PC,RECCC             ;RECORD CONDITION CODE USAGE
050424  023737  003724  003666                  CMP ECCR,TCCR            ;CHECK CONDITION CODE RESULTS
050432  001403                                  BEQ REGCK
050434  012737  177777  002144                  MOV #177777,ERRCC        ;SET CONDITION CODE ERROR FLAG
050442  005737  036210          REGCK:          TST EZDF                 ;CONDITION UNDER TEST = DIVP BY 0?
050446  001104                                  BNE EZDBCK               ;BRANCH IF YES
050450  023737  003706  003650                  CMP EROR,TROR            ;CHECK REGISTER RESULTS
050456  001030                                  BNE REGERR
050460  023737  003710  003652                  CMP ER1R,TR1R
050466  001024                                  BNE REGERR
050470  023737  003712  003654                  CMP ER2R,TR2R
050476  001020                                  BNE REGERR
050500  023737  003714  003656                  CMP ER3R,TR3R
050506  001014                                  BNE REGERR
050510  023737  003716  003660                  CMP ER4R,TR4R
050516  001010                                  BNE REGERR
050520  023737  003720  003662                  CMP ER5R,TR5R
050526  001004                                  BNE REGERR
050530  023737  003722  003664                  CMP ER6R,TR6R
050536  001403                                  BEQ BUFCK
050540  012737  177777  002146  REGERR:         MOV #177777,ERRREG       ;REGISTER ERROR - SET REGISTER ERROR FLAG
050546  032737  000004  002140  BUFCK:          BIT #4,SPHAND            ;SPECIAL HANDLING?
050554  001077                                  BNE TFORE                ;IF YES SKIP BUFFER CHECK
050556  013701  001640                          MOV TBADR,R1             ;CHECK BUFFER RESULTS
050562  013702  001646                          MOV EBADR,R2
050566  005737  002160                          TST MODE                 ;IS MODE = KERNEL?
050572  001024                                  BNE 1$                   ;BRANCH IF NO
050574  023727  047762  000240                  CMP TOPC1,#NOP           ;INTERRUPTABILITY BEING TESTED?
050602  001404                                  BEQ 3$                   ;BRANCH IF YES
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050604  023727  047720  000240            CMP TOLTC,#NOP
050612  001014                            BNE 1$                   ;BRANCH IF NO
050614  023727  050012  076026  3$:       CMP TINST,#76026         ;IS INST UNDER TEST A L2D6 OR L3D6
050622  001404                            BEQ 2$
050624  023727  050012  076066            CMP TINST,#76066
050632  001004                            BNE 1$
050634  062701  000006          2$:       ADD #6,R1                ;YES - SPECIAL CASE
050640  062702  000006                    ADD #6,R2                ;L2D6 OR L3D6 WITH INTERRUPTABILITY TEST.MODE=KERNEL.
                                                                   ;DUE TO THE INTERRUPT OCCURRING IMMEDIATELY
                                                                   ;AFTER THE L2D6 OR L3D6 INST WHEN R6 POINTS
                                                                   ;TO TBADR (TEST BUFFER), THE FIRST 2 TO 3 WORDS OF
                                                                   ;TBADR WILL GET DESTROYED.  DONT COMPARE
                                                                   ;FIRST 3 WORDS OF BUFFERS.
050644  023701  001754          1$:       CMP TBEND,R1             ;REACH END OF BUFFER YET?
050650  101441                            BLOS TFORE               ;YES
050652  122122                            CMPB (R1)+,(R2)+         ;NO - COMPARE NEXT WORD
050654  001773                            BEQ 1$
050656  000421                            BR BUFERR

050660  013701  001640          EZDBCK:   MOV TBADR,R1             ;CHECK BUFFER RESULTS - ZERO DIVP CASE
050664  013702  001646                    MOV EBADR,R2             ;DON'T COMPARE ON DST STRING
050670  023701  001754          2$:       CMP TBEND,R1             ;REACH END OF BUFFER YET?
050674  101427                            BLOS TFORE               ;YES
050676  020237  036212                    CMP R2,EZDBEG            ;AT BEGINNING OF DST STRING?
050702  001005                            BNE 1$                   ;BRANCH IF NO
050704  063702  036214                    ADD EZDEND,R2            ;ADJUST POINTERS TO END OF DST STRING
050710  063701  036214                    ADD EZDEND,R1
050714  000765                            BR 2$
050716  122122                  1$:       CMPB (R1)+,(R2)+         ;COMPARE NEXT BYTE
050720  001763                            BEQ 2$
050722  012737  177777  002150  BUFERR:   MOV #177777,ERRBUF       ;BUFFER ERROR - SET BUFFER ERROR FLAG
050730  005301                            DEC R1
050732  005302                            DEC R2
050734  010137  002174                    MOV R1,AEADR
050740  010237  002200                    MOV R2,EMADR
050744  111137  002176                    MOVB (R1),AEDTA
050750  111237  002202                    MOVB (R2),EMDTA
050754  005037  002056          TFORE:    CLR ERRS                 ;CLEAR ERROR INDICATOR
050760  005737  002144                    TST ERRCC                ;IF COMPARISON HAS TURNED UP ERRORS
                                                                   ;  ENTER ERROR DISPLAY ROUTINE.
050764  001020                            BNE CISERR
050766  005737  002146                    TST ERRREG
050772  001015                            BNE CISERR
050774  005737  002150                    TST ERRBUF
051000  001012                            BNE CISERR
051002  005737  002152                    TST ERRSTK
051006  001007                            BNE CISERR
051010  005037  002272                    CLR RPTFLG               ;CLEAR THE REPEAT TEST FLAG
051014  005737  002042                    TST NOERDS               ;DISPLAY EVEN THOUGH THERE WAS NO ERROR?
051020  001017                            BNE NOER                 ;BRANCH IF YES
051022  000137  051326                    JMP SWOPC

051026                          CISERR:
051026  005237  002054                    INC ERRCT                ;INCREMENT ERROR COUNT
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12420  051032  005037  002204                   CLR QRYFLG                  ;ASSURE PRINTOUT ON ERROR
12421  051036  012737  000001  001114           MOV #1,$MSGTY               ;SET APT MESSAGE TYPE TO 1
12422  051044  013737  002132  001116           MOV FATAL,$FATAL            ;SET APT FATAL ERROR WORD
12423  051052  012737  177777  002056           MOV #177777,ERRS            ;SET ERROR INDICATOR
12424  051060                           NOER:
12426  051060  005737  001760                   TST RANDOM                  ;IN RANDOM MODE ?
12427  051064  001413                           BEQ 40$                     ;BRANCH IF NO
12428  051066                                   PRINTB #FORM36,STRNC,STRP1,STRP2        ;PRINT 3 SEED CONSTANTS
  (9)  051066  013746  002002                   MOV     STRP2,-(SP)
  (8)  051072  013746  002000                   MOV     STRP1,-(SP)
  (7)  051076  013746  001776                   MOV     STRNC,-(SP)
  (6)  051102  012746  014314                   MOV     #FORM36,-(SP)
  (3)  051106  010600                           MOV     SP,R0
  (4)  051110  004737  065410                   JSR PC,FPRINT
12430  051114  013737  002234  003630   40$:    MOV TTR0,TR0                ;RESTORE TRN'S - NECESSARY IN CASE OPERATOR
12431  051122  013737  002236  003632           MOV TTR1,TR1                ;  REQUESTS THE REPEAT OF AN IN-LINE TEST CONDITION.
12432  051130  013737  002240  003634           MOV TTR2,TR2
12433  051136  013737  002242  003636           MOV TTR3,TR3
12434  051144  013737  002244  003640           MOV TTR4,TR4
12435  051152  013737  002246  003642           MOV TTR5,TR5
12436  051160  005737  002056                   TST ERRS                    ;ERROR INDICATOR SET?
12437  051164  001410                           BEQ 1$                      ;BRANCH IF NO
12438  051166                                   PRINTB  #FORM37,ERRCT       ;PRINT 'ERROR # XXXXXX'
  (7)  051166  013746  002054                   MOV     ERRCT,-(SP)
  (6)  051172  012746  014376                   MOV     #FORM37,-(SP)
  (3)  051176  010600                           MOV     SP,R0
  (4)  051200  004737  065410                   JSR PC,FPRINT
12439  051204  000405                           BR 2$
12440  051206                           1$:     PRINTB #SDASH               ;PRINT DASHES
  (6)  051206  012746  016577                   MOV     #SDASH,-(SP)
  (3)  051212  010600                           MOV     SP,R0
  (4)  051214  004737  065410                   JSR PC,FPRINT
12441  051220                           2$:     PRINTB  #DASH
  (6)  051220  012746  016477                   MOV     #DASH,-(SP)
  (3)  051224  010600                           MOV     SP,R0
  (4)  051226  004737  065410                   JSR PC,FPRINT
12442  051232  004737  063626                   JSR PC,INSERR
12443  051236  000137  041660                   JMP RTC                     ;REPEAT TEST RETURN
12444  051242  000137  051326                   JMP SWOPC                   ;NORMAL RETURN
12445  051246  005737  002074                   TST FSRUN                   ;RESTART RETURN
12446                                                                       ;FIELD SERVICE OR DESIGN VERIF TYPE RUN?
12447  051252  001402                           BEQ 3$                      ;BRANCH IF DESIGN VERIF TYPE RUN
12449  051254  000137  036760                   JMP START                   ;RESTART FIELD SERVICE TYPE RUN
12454  051260  000137  037154           3$:     JMP DVTST                   ;RESTART DESIGN VERIF TYPE RUN
12455
12456
12457                                           .EVEN
12458  051264                           ADJR:                               ;SUBROUTINE TO SUBTRACT OUT BUFFER STARTING
12459                                                                       ;  ADDRESSES FROM SPECIFIED TEST AND EMULATION
12460                                                                       ;  RESULTS.
12461  051264  162701  003630                   SUB #TRN,R1
12462  051270  062701  003650                   ADD #TRNR,R1
12463  051274  163711  001640                   SUB TBADR,(R1)              ;SUBTRACT OUT TEST BUFFER STARTING ADDRESS
12464                                                                       ;  FROM TEST OPERAND
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051300  032737  000100  050012              BIT #100,TINST          ;NOTE: FOR INLINE CASE THE EMULATION STEP WAS
                                                                     ;       SKIPPED. THEREFORE DONT 'RE' ADJUST
                                                                     ;       EMULATION OPERANDS.
051306  001006                              BNE 1$
051310  162701  003650                      SUB #TRNR,R1            ;POINT R1 TO EMULATION OPERAND RATHER THAT
051314  062701  003706                      ADD #ERNR,R1            ;  TEST OPERAND.
051320  163711  001646                      SUB EBADR,(R1)          ;SUBTRACT OUT EMULATION BUFFER STARTING
                                                                     ;  ADDRESS FROM EMULATION OPERAND.
051324  000207                      1$:     RTS PC



051326                              FC14:                           ;FLOW COMMAND = 14 - UPDATE POINTERS
                                                                     ;  FOR NEXT TEST CONDITION.
051326                              SWOPC:
051326  013701  050012                      MOV TINST,R1            ;IS INST = L2D OR L3D ??
051332  042701  000007                      BIC #7,R1
051336  022701  076020                      CMP #076020,R1
051342  001437                              BEQ 1$                  ;BRANCH IF YES (NO INLINE CASE)
051344  022701  076060                      CMP #076060,R1
051350  001434                              BEQ 1$
051352  032737  140000  002140              BIT #140000,SPHAND      ;SKIP INLINE AND ADDITIONAL DATA TYPE TESTING
051360  001030                              BNE 1$                  ;BRANCH IF YES
051362  005737  001760                      TST RANDOM              ;RANDOM EXERCISE MODE?
051366  001027                              BNE 2$                  ;BRANCH IF YES
                                                                     ; NOTE: IN RANDOM  EXERCISE MODE DATA TYPES ARE
                                                                     ;       SELECTED RANDOMLY FOR EACH TEST CONDITION.
051370  005737  002440                      TST DECINS              ;DECIMAL INST?
051374  001424                              BEQ 2$                  ;BRANCH IF NO
051376  032737  000100  050012              BIT #100,TINST          ;INLINE INST JUST TESTED
051404  001020                              BNE 2$                  ;BRANCH IF YES
051406  023727  002460  000001              CMP ZPM,#1              ;IS INST ZONED ,PACKED, OR MIXED?
051414  001420                              BEQ PACKED              ;BRANCH IF PACKED
051416  023727  002460  000002              CMP ZPM,#2
051424  001533                              BEQ ZONED               ;BRANCH IF ZONED
051426  023727  002460  000003              CMP ZPM,#3
051434  001406                              BEQ 3$                  ;BRANCH IF MIXED ZONED PACKED
051436  000137  052262                      JMP MIXDPZ              ;MIXED PACKED ZONED
051442  000137  052654              1$:     JMP NXTTC
051446  000137  052600              2$:     JMP CFINL
051452  000137  052426              3$:     JMP MIXDZP

051456  032737  000001  002454      PACKED: BIT #1,PKPTW            ;SET STRING 1 DESC TYPE BASED ON BIT 0
051464  001004                              BNE 1$                  ;  CONTENTS OF PKPTW
051466  012737  000006  002442              MOV #6,S1TYPE
051474  000403                              BR 2$
051476  012737  000007  002442      1$:     MOV #7,S1TYPE

051504  032737  000002  002454      2$:     BIT #2,PKPTW            ;SET STRING 2 DESC TYPE BASED ON
051512  001004                              BNE 3$                  ;  BIT 1 CONTENTS OF PKPTW
051514  012737  000006  002444              MOV #6,S2TYPE
051522  000403                              BR 4$
051524  012737  000007  002444      3$:     MOV #7,S2TYPE

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051532  032737  000004  002454  4$:     BIT #4,PKPTW            ;SET STRING 3 DESC TYPE BASED
051540  001004                          BNE 5$                  ;  BIT 2 CONTENTS OF PKPTW
051542  012737  000006  002446          MOV #6,S3TYPE
051550  000403                          BR 6$
051552  012737  000007  002446  5$:     MOV #7,S3TYPE

051560  005737  002452          6$:     TST MIXTYP              ;MIX TYPES WITHIN INSTRUCTION?
051564  001011                          BNE 61$                 ;BRANCH IF YES
051566  005137  002454                  COM PKPTW               ;NO-SWITCH ALL DESC FROM SIGNED
                                                                ;  TO UNSIGNED (OR VICE VERSA)
051572  005737  002454                  TST PKPTW               ;ALL TYPES TESTED?
051576  001002                          BNE 60$                 ;BRANCH IF NO
051600  000137  052600                  JMP CFINL               ;EXIT TO IN LINE TESTING
051604  000137  051710          60$:    JMP TYPSET
051610  005237  002454          61$:    INC PKPTW               ;CHANGE TO NEXT MIXED CASE
051614  023727  002456  000001          CMP NDESC,#1            ;IS THERE ONLY 1 DESC FOR THIS INST?
051622  001010                          BNE 7$                  ;BRANCH IF NO
051624  032737  000002  002454          BIT #2,PKPTW            ;ALL TYPE MIXTURES TESTED?
051632  001426                  62$:    BEQ TYPSET              ;BRANCH IF NO
051634  005037  002454                  CLR PKPTW               ;CLEANUP FOR NEXT TEST CONDITION
051640  000137  052600                  JMP CFINL               ;EXIT TO TEST IN-LINE INST.

051644  023727  002456  000002  7$:     CMP NDESC,#2            ;ARE THERE 2 DESC. FOR THIS INST?
051652  001004                          BNE 8$                  ;BRANCH IF NO
051654  032737  000004  002454          BIT #4,PKPTW            ;ALL TYPE MIXTURES TESTED?
051662  000763                          BR 62$

051664  023727  002456  000003  8$:     CMP NDESC,#3            ;ARE THERE 3 DESC FOR THIS INST?
051672  001401                          BEQ 81$
051674  000000                          HALT                    ;# OF DESCRIPTORS FOR INST UNDER TEST
                                                                ;  DOES NOT MAKE SENSE.
051676  032737  000010  002454  81$:    BIT #10,PKPTW
051704  000137  051632                  JMP 62$

051710  000137  041602          TYPSET: JMP NTCTS               ;REPEAT TEST CONDITION WITH A DIFFERENT
                                                                ;  DATA TYPE.



051714  005737  002452          ZONED:  TST MIXTYP              ;MIX DATA TYPES WITHIN INST??
051720  001003                          BNE 1$                  ;BRANCH IF YES
051722  062737  000110  002454          ADD #110,PKPTW
051730  005237  002454          1$:     INC PKPTW
051734  013701  002454          11$:    MOV PKPTW,R1            ;SET STRING 1 DESC TYPE FROM
051740  042701  177770                  BIC #177770,R1          ;  BITS 0,1,2 OF PKPTW
051744  010137  002442                  MOV R1,S1TYPE

051750  013701  002454                  MOV PKPTW,R1            ;SET STRING 2 DESC TYPE FROM
051754  042701  177707                  BIC #177707,R1          ;  BITS 3,4,5 OF PKPTW.
051760  006201                          ASR R1
051762  006201                          ASR R1
051764  006201                          ASR R1
051766  010137  002444                  MOV R1,S2TYPE

051772  013701  002454                  MOV PKPTW,R1            ;SET STRING 3 DESC TYPE FROM
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051776  042701  177077                  BIC #177077,R1          ;  BITS 6,7,8 OF PKPTW.
052002  006301                          ASL R1
052004  006301                          ASL R1
052006  000301                          SWAB R1
052010  010137  002446                  MOV R1,S3TYPE

052014  005737  002452                  TST MIXTYP              ;MIX TYPES WITHIN INST?
052020  001016                          BNE 61$                 ;BRANCH IF YES
052022  023727  002454  000666          CMP PKPTW,#666          ;ALL TYPES TESTED?
052030  001327                  2$:     BNE TYPSET              ;BRANCH IF NO
052032  005037  002454          12$:    CLR PKPTW
052036  005037  002442                  CLR S1TYPE
052042  005037  002444                  CLR S2TYPE
052046  005037  002446                  CLR S3TYPE
052052  000137  052600                  JMP CFINL               ;EXIT TO TEST IN-LINE INST

052056  023727  002456  000001  61$:    CMP NDESC,#1            ;IS THERE ONLY 1 DESC FOR THIS INST
052064  001007                          BNE 7$                  ;BRANCH IF NO
052066  013701  002454                  MOV PKPTW,R1
052072  042701  177770                  BIC #177770,R1
052076  020127  000006                  CMP R1,#6               ;ALL TYPES TESTED?
052102  000752                          BR 2$

052104  023727  002456  000002  7$:     CMP NDESC,#2            ;ARE THERE 2 DESC FOR THIS INST?
052112  001022                          BNE 8$                  ;BRANCH IF NO
052114  013701  002454                  MOV PKPTW,R1
052120  042701  177770                  BIC #177770,R1
052124  020127  000006                  CMP R1,#6
052130  001267                          BNE TYPSET
052132  062737  000002  002454          ADD #2,PKPTW
052140  013701  002454                  MOV PKPTW,R1
052144  042701  177707                  BIC #177707,R1
052150  020127  000060                  CMP R1,#60              ;ALL TYPE MIXTURES TESTED?
052154  001267                          BNE 11$
052156  000725                          BR 12$

052160  023727  002456  000003  8$:     CMP NDESC,#3            ;ARE THERE 3 DESC FOR THIS INST?
052166  001401                          BEQ 81$                 ;BRANCH IF YES
052170  000000                          HALT                    ;# OF DESC FOR INST UNDER TEST DOES
                                                                ;  NOT MAKE SENSE.
052172  013701  002454          81$:    MOV PKPTW,R1
052176  042701  177770                  BIC #177770,R1
052202  020127  000006                  CMP R1,#6
052206  001240                          BNE TYPSET
052210  062737  000002  002454          ADD #2,PKPTW
052216  013701  002454                  MOV PKPTW,R1
052222  042701  177707                  BIC #177707,R1
052226  020127  000060                  CMP R1,#60
052232  001240                          BNE 11$
052234  062737  000020  002454          ADD #20,PKPTW
052242  013701  002454                  MOV PKPTW,R1
052246  042701  177077                  BIC #177077,R1
052252  020127  000600                  CMP R1,#600             ;ALL TYPE MIXTURES TESTED?
052256  001226                          BNE 11$
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052260  000664                            BR 12$

052262  005237  002454           MIXDPZ:  INC PKPTW
052266  005737  002452                    TST MIXTYP              ;MIX TYPES WITHIN INST?
052272  001407                            BEQ 1$                  ;BRANCH IF NO
052274  032737  000007  002454            BIT #7,PKPTW            ;YES - IF PACK DATA TYPE=0,CHANGE IT TO 6.
052302  001003                            BNE 1$
052304  052737  000006  002454            BIS #6,PKPTW
052312  013701  002454           1$:      MOV PKPTW,R1            ;SET STRING 1 DESC TYPE FROM
052316  042701  177770                    BIC #177770,R1          ;   BITS 0,1,2 OF PKPTW
052322  010137  002442                    MOV R1,S1TYPE

052326  013701  002454                    MOV PKPTW,R1            ;SET STRING 2 DESC TYPE FROM
052332  042701  177707                    BIC #177707,R1          ;   BITS 3,4,5 OF PKPTW
052336  006201                            ASR R1
052340  006201                            ASR R1
052342  006201                            ASR R1
052344  010137  002444                    MOV R1,S2TYPE

052350  005737  002452                    TST MIXTYP              ;MIX TYPES WITHIN INST?
052354  001016                            BNE 61$                 ;BRANCH IF YES
052356  023727  002454  000010            CMP PKPTW,#10           ;ALL TYPES TESTED?
052364  001016                   60$:     BNE 62$                 ;BRANCH IF NO
052366  012737  000006  002454            MOV #06,PKPTW
052374  012737  000006  002442            MOV #6,S1TYPE           ;INITIALIZE S1TYPE & S2TYPE FOR NEXT TEST CONDITION
052402  005037  002444                    CLR S2TYPE
052406  000137  052600                    JMP CFINL               ;EXIT TO TEST IN-LINE INST

052412  023727  002454  000066   61$:     CMP PKPTW,#66
052420  000761                            BR 60$
052422  000137  051710           62$:     JMP TYPSET

052426  005237  002454           MIXDZP:  INC PKPTW
052432  005737  002452                    TST MIXTYP              ;MIX TYPES WITHIN INST??
052436  001412                            BEQ 1$                  ;BRANCH IF NO
052440  013701  002454                    MOV PKPTW,R1            ;YES - IF ZONED DATA TYPE=6,CHANGE IT TO 0.
052444  042701  177770                    BIC #177770,R1
052450  020127  000006                    CMP R1,#6
052454  001003                            BNE 1$
052456  062737  000002  002454            ADD #2,PKPTW
052464  013701  002454           1$:      MOV PKPTW,R1            ;SET STRING 1 DESC TYPE FROM
052470  042701  177770                    BIC #177770,R1          ;  BITS 0,1,2 OF PKPTW
052474  010137  002442                    MOV R1,S1TYPE

052500  013701  002454                    MOV PKPTW,R1            ;SET STRING 2 DESC TYPE FROM
052504  042701  177707                    BIC #177707,R1          ;  BITS 3,4,5 OF PKPTW
052510  006201                            ASR R1
052512  006201                            ASR R1
052514  006201                            ASR R1
052516  010137  002444                    MOV R1,S2TYPE
052522  005737  002452                    TST MIXTYP              ;MIX TYPES WITHIN INST?
052526  001016                            BNE 61$                 ;BRANCH IF YES
052530  023727  002454  000066            CMP PKPTW,#66           ;ALL TYPES TESTED?
052536  001016                   60$:     BNE 62$                 ;BRANCH IF NO
```

```
052540  012737  000060  002454          MOV #60,PKPTW
052546  005037  002442                  CLR S1TYPE
052552  012737  000006  002444          MOV #6,S2TYPE
052560  000137  052600                  JMP CFINL               ;EXIT TO TEST IN-LINE INST

052564  022737  000100  002454  61$:    CMP #100,PKPTW
052572  000761                          BR 60$
052574  000137  051710          62$:    JMP TYPSET

052600  032737  000100  050012  CFINL:  BIT #100,TINST          ;INST TYPE (REG OR IN-LINE)?
052606  001022                          BNE NXTTC               ;BRANCH IF IN-LINE TYPE
052610  005737  001760                  TST RANDOM              ;RANDOM EXERCISE MODE?
052614  001407                          BEQ 1$                  ;BRANCH IF NO
052616  004737  063532                  JSR PC,RN               ;GET A RANDOM #
052622  042700  177770                  BIC #177770,R0          ;LOOK AT 3 LEAST SIGN BITS
052626  020027  000003                  CMP R0,#3               ;IF THEY ARE = TO 3 (ARBITRARY CONSTANT) THEN DO IN-LINE
052632  001010                          BNE NXTTC
052634  052737  000100  050012  1$:     BIS #100,TINST          ;SWITCH REG OP-CODE AT TINST TO IN-LINE OP-CODE.
052642  052737  000100  002132          BIS #100,FATAL          ;SET IN-LINE FIELD IN FATAL ERROR INDICATOR WORD
052650  000137  041324                  JMP NTC                 ;REPEAT TEST CONDITION WITH IN-LINE OPCODE.
052654  042737  000100  050012  NXTTC:  BIC #100,TINST
052662  042737  000100  002132          BIC #100,FATAL          ;CLR IN-LINE FIELD IN FATAL ERROR INDICATOR
052670  005737  042032                  TST MTYPE               ;IF TYPE = 0 THEN READY FOR NEXT INPUT TABLE ENTRY
052674  001402                          BEQ 1$                  ;BRANCH IF TYPE NOT = 0
052676  000137  053174                  JMP RFNITE
052702  013737  001656  002126  1$:     MOV IPNU,VIP            ;SETUP A POINTER TO LAST PARAMETER IN
052710  063737  001656  002126          ADD IPNU,VIP            ;  INPUT TABLE ENTRY.
052716  013703  002126          UPTP:   MOV VIP,R3
052722  062703  001566                  ADD #PTP,R3             ;R3 POINTS TO PARAMETER TABLE POINTER
052726  013701  002134                  MOV INPTP,R1
052732  063701  002126                  ADD VIP,R1
052736  062701  000002                  ADD #2,R1
052742  005711                          TST (R1)                ;(R1) POINTS TO 1ST ENTRY IN PARAMTERE TABLE
052744  001464                          BEQ TNXP
052746  017137  000000  002130          MOV @(R1),PTW1          ;PTW1 CONTAINS TYPE,SIZE, AND # OF ENTRIES
                                                                ;  IN PARAMETER TABLE
052754  042737  177400  002130          BIC #177400,PTW1        ;STRIP OFF TYPE AND ENTRY SIZE
052762  122737  000001  002130          CMPB #1,PTW1            ;# OF ENTRIES = 1?
052770  001452                          BEQ TNXP                ;YES - NO UPDATING. TRY NEXT PARAMETER
052772  005737  002130                  TST PTW1                ;# OF ENTRIES = 0?
052776  001447                          BEQ TNXP                ;YES - NO UPDATING. TRY NEXT PARAMETER
053000  017102  000000                  MOV @(R1),R2            ;PARAMETER TABLE CONTAINS MORE THAN 1 ENTRY.
053004  042702  037777                  BIC #037777,R2          ;LOOK AT ENTRY TYPE
053010  005702                          TST R2
053012  001401                          BEQ FLE                 ;FIXED LENGTH ENTRIES
053014  000447                          BR VLE                  ;VARIABLE LENGTH ENTRIES

053016                          FLE:                            ;PARAMETER TABLE CONTAINS FIXED
                                                                ;  LENGTH ENTRIES.
053016  017137  000000  002130          MOV @(R1),PTW1
053024  000337  002130                  SWAB PTW1
053030  113704  002130                  MOVB PTW1,R4            ;LOAD R4 WITH ENTRY SIZE IN WORDS
053034  006304                          ASL R4                  ;CONVERT SIZE IN WORDS TO BYTES
053036  005002                          CLR R2
```

```
053040  000337  002130                  SWAB PTW1
053044  042737  177400  002130          BIC #177400,PTW1        ;PTW1 CONTAINS # OF ENTRIES IN
                                                                ;  PARAMETER TABLE.
053052  005337  002130          1$:     DEC PTW1                ;CALCULATE SIZE OF PARAMETER TABLE
053056  005737  002130                  TST PTW1                ; SIZE = ENTRY SIZE X # OF ENTRIES
053062  001402                          BEQ GPTESZ              ;CALCULATION COMPLETE - R2 CONTAINS SIZE
                                                                ;  OF PARAMETER TABLE (MINUS 1 ENTRY)
053064  060402                          ADD R4,R2
053066  000771                          BR 1$
053070                          GPTESZ:
053070  061102                          ADD (R1),R2             ;UPDATE R2 TO CONTAIN ADDRESS OF
053072  062702  000002                  ADD #2,R2               ;  LAST ENTRY IN PARAMETER TABLE
053076  021302                          CMP (R3),R2
053100  001403                          BEQ RESPTP              ;CURRENT PTP POINTS TO LAST ENTRY IN
                                                                ;  PARAMETER TABLE.  RESET TO 1ST ENTRY
053102  060413                          ADD R4,(R3)             ;STILL MORE ENTRIES TO TRY IN PARAMETER
                                                                ;  TABLE. UPDATE PTP TO NEXT ENTRY.
053104  000137  041324                  JMP NTC                 ;TRY NEXT TEST CONDITON FOR SAME CIS INST.
053110                          RESPTP:                         ;RESET PTP BACK TO 1ST ENTRY IN TABLE
053110  011113                          MOV (R1),(R3)
053112  062713  000002                  ADD #2,(R3)
053116  162737  000002  002126  TNXP:   SUB #2,VIP              ;BACKUP TO NEXT PARAMETER TABLE POINTER
                                                                ;  AND UPDATE IT.
053124  005737  002126                  TST VIP
053130  001421                          BEQ RFNITE              ;ALL TEST CONDITIONS ASSOCIATED WITH CURRENT
                                                                ;  INPUT TABLE ENTRY EXERCISED.
053132  000671                          BR UPTP
053134                          VLE:                            ;PARAMETER TABLE CONTAINS VARIABLE LENGTH ENTRIES
053134  113704  002130                  MOVB PTW1,R4            ;R4 CONTAINS # OF ENTRIES IN PARAMETER TABLE
053140  005304                          DEC R4                  ;DETERMINE ADDRESS OF LAST ENTRY IN PARAMETER TABLE
053142  011102                          MOV (R1),R2             ;R2 POINTS TO 1ST WORD IN PARAMETER TABLE
053144  005722                  1$:     TST (R2)+               ;SEARCH FOR 0 WORDS
053146  001376                          BNE 1$
053150  005304                          DEC R4                  ;AT LAST ENTRY YET?
053152  001374                          BNE 1$                  ;NO
053154  021302                          CMP (R3),R2             ;YES - IS CURRENT PTP POINTING TO LAST ENTRY?
053156  001754                          BEQ RESPTP              ;YES - RESET PTP TO 1ST ENTRY
053160  011304                          MOV (R3),R4             ;NO - UPDATE PTP TO NEXT ENTRY.
053162  005724                  2$:     TST (R4)+
053164  001376                          BNE 2$
053166  010413                          MOV R4,(R3)
053170  000137  041324                  JMP NTC                 ;TRY NEXT TEST CONDITION FOR SAME INPUT
                                                                ;  TABLE ENTRY.
```

```
053174                                  RFNITE:                         ;READY FOR NEXT INPUT TABLE ENTRY.
053174  005737  001760                          TST RANDOM              ;RANDOM EXERCISE MODE?
053200  001402                                  BEQ 2$                  ;BRANCH IF NO
053202  000137  040706                          JMP NITE
053206  013701  002134                  2$:     MOV INPTP,R1            ;SAVE INPUT TABLE POINTER
053212  063737  001656  002134          3$:     ADD IPNU,INPTP
053220  063737  001656  002134                  ADD IPNU,INPTP          ;UPDATE INPTP TO 1ST WORD OF NEXT ENTRY.
053226  062737  000004  002134                  ADD #4,INPTP
053234  005777  126674                          TST @INPTP              ;NOTE: TO ELIMINATE AN INPUT TABLE FROM
                                                                        ; A TEST RUN SET THE FIRST WORD IN THE
                                                                        ; INPUT TABLE TO 177777
053240  100764                                  BMI 3$                  ;IF MINUS SKIP THIS TABLE
053242  005777  126666                          TST @INPTP
053246  001440                                  BEQ 5$                  ;GO ON TO PROBEAHEAD ABORT TESTS
053250  005737  002206                          TST QVMODE              ;RUNNING IN QV MODE?
053254  001406                                  BEQ 4$                  ;BRANCH IF NO
053256  013700  002134                          MOV INPTP,R0            ;LOOK AT ENTRY TYPE WORD
053262  033760  002212  000002                  BIT PTQV,2(R0)          ;IS QV MODE BIT ASSOCIATED WITH PROCESSOR
                                                                        ;   TYPE UNDER TEST SET IN ENTRY TYPE WORD?
053270  001750                                  BEQ 3$                  ;BRANCH IF NO (SKIP TABLE)
053272  021177  126636                  4$:     CMP (R1),@INPTP         ;NEXT INST FOR TESTING = CURRENT INST?
053276  001422                                  BEQ 1$                  ;BRANCH IF YES
053300  005737  002470                          TST ONEINS              ;SINGLE INSTRUCTION TESTING?
053304  001023                                  BNE DONE                ;BRANCH IF YES
053306  005737  002044                          TST PROGD               ;PROGRESS DISPLAY?
053312  001014                                  BNE 1$                  ;BRANCH IF NO
053314  017701  126614                          MOV @INPTP,R1           ;SETUP PTR TO PROPER MESSAGE HEADER
053320  006301                                  ASL R1
053322  062701  070052                          ADD #INEM,R1
053326  011137  002142                          MOV (R1),EMPTR
053332  042737  000007  050012                  BIC #7,TINST            ;CLEAR REGISTER FIELD OF L3D INST OP CODE
                                                                        ;  (FOR PROGRESS DISPLAY ONLY)
053340  004737  063436                          JSR PC,IDINST           ;IDENTIFY NEXT INSTRUCTION TO BE TESTED
053344  000137  040706                  1$:     JMP NITE
053350  000137  111406                  5$:     JMP PROBAH
053354                                  DONE:
053354  005037  001420                          CLR TOTTC
053360  005037  001416                          CLR TOTTCH
053364  005237  001122                          INC $PASS               ;INCREMENT PASS COUNTER IN APT MAILBOX
053370  005037  001120                          CLR $TESTN
053374  005737  002206                          TST QVMODE              ;IF IN QV MODE TYPE END OF QV PASS INDICATOR
053400  001403                                  BEQ 1$
053402  104400                                  TYPE
053404  015665                                  ENDQP
053406  000402                                  BR 2$
053410  104400                          1$:     TYPE
053412  015575                                  ENDP                    ;TYPE NORMAL END OF PASS INDICATOR
053414  013700  000042                  2$:     MOV @#42,R0
053420  001407                                  BEQ HERE
053422  000005                                  RESET
053424  004710                          ENDAD:  JSR PC,(R0)
053426  000240                                  NOP
053430  000240                                  NOP
053432  000240                                  NOP
```

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053434  000137  036760                  JMP START
053440                          HERE:
053440  005737  002074                  TST FSRUN               ;NORMAL FIELD SERVICE RUN?
053444  001445                          BEQ NFS                 ;BRANCH IF NO
053446  005737  002206                  TST QVMODE              ;RUNNING IN QV MODE
053452  001411                          BEQ 1$                  ;BRANCH IF NO
053454  005737  001750                  TST N200M               ;PROG STARTED AT LOC 200?
053460  001404                          BEQ 2$                  ;BRANCH IF NO
053462  005037  002206                  CLR QVMODE
053466  000137  037320                  JMP COMST
053472  000137  036766          2$:     JMP QVST
053476  104400                  1$:     TYPE
053500  016227                          FSHDR2                  ;PRINT ENTERING RANDOM MODE HEADER
053502  104400                          TYPE
053504  016263                          FSHDR3
053506  104400                          TYPE
053510  016344                          FSHDR4
053512  104400                          TYPE
053514  016430                          FSHDR5
053516  012737  000001  001660          MOV #1,INCSQ1           ;INITIALIZE BUFFER INITIALIZATION CONSTANTS
053524  012737  000002  001662          MOV #2,INCSQ2
053532  012737  177777  001760          MOV #177777,RANDOM      ;SET RANDOM MODE FLAG
053540  012737  072144  072220          MOV #IDUM,INPTBL        ;POINT TO DUMMY INPUT TABLE
053546  013737  072220  002134          MOV INPTBL,INPTP
053554  000137  040706                  JMP NITE
053560  000137  037154          NFS:    JMP DVTST

053564                          FC00:                           ;FLOW COMMAND = 00 -IGNORE ENTRY.
053564  000137  042250                  JMP FCRTN


                                ;SUBROUTINES TO EXTRACT VARIOUS DATA FIELDS FROM FLOW TABLE ENTRY.

053570                          PF1:                            ;LOAD PTPTR WITH CONTANTS OF PTP
                                                                ;  SPECIFIED IN THE PF1 FIELD OF FLOW
                                                                ;  TABLE ENTRY.
053570  017701  126146                  MOV @FLOPTR,R1          ;FLOPTR POINTS TO FLOW TABLE ENTRY
053574  032701  004000                  BIT #004000,R1          ;SAVE STRING INSERTED FOR POSSIBLE ERROR PRINTOUT?
053600  001405                          BEQ 1$
053602  042701  004000                  BIC #004000,R1          ;YES
053606  012737  177777  002476          MOV #177777,SAVSRF      ;SET SAVE STRING FLAG
053614  042701  170077          1$:     BIC #170077,R1          ;STRIP OFF ALL BUT DESIRED FIELD
053620  006301                          ASL R1
053622  006301                          ASL R1
053624  000301                          SWAB R1                 ;ADJUST DESIRED FIELD TO BIT 0
053626  006301                          ASL R1
053630  062701  001566                  ADD #PTP,R1             ;ADD # IN FIELD TO TOP OF PTP TABLE
053634  011137  002136                  MOV (R1),PTPTR          ;SAVE CONTENTS OF DESIRED PTP IN PTPTR
053640  000207                          RTS PC

053642                          PF2:                            ;SAME AS PF1 SUBROUTINE EXCEPT FOR FIELD.
053642  017701  126074                  MOV @FLOPTR,R1
053646  042701  177700                  BIC #177700,R1
053652  006301                          ASL R1
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053654  062701  001566                  ADD #PTP,R1
053660  011137  002136                  MOV (R1),PTPTR
053664  000207                          RTS PC

053666                          RF1:                            ;LOAD R1 WITH ADDRESS OF TEST
                                                                ;  OPERAND SPECIFIED.
053666  004737  053700                  JSR PC,RF1X             ;GET FIELD ONE CONTENTS
053672  062701  003630                  ADD #TRN,R1             ;ADD IN ADDRESS OF TEST OPERAND TABLE
053676  000207                          RTS PC

053700                          RF1X:                           ;GET FIELD ONE CONTENTS FROM FLOW TABLE ENTRY
053700  017701  126036                  MOV @FLOPTR,R1          ;FLOPTR POINTS TO FLOW TABLE ENTRY
053704  042701  170777                  BIC #170777,R1          ;STRIP OFF ALL BUT DESIRED FIELD
053710  006201                          ASR R1
053712  000301                          SWAB R1                 ;RIGHT ADJUST FIELD
053714  006301                          ASL R1
053716  000207                          RTS PC

053720                          RF2:                            ;SAME AS RF1 SUBROUTINE EXCEPT FOR FIELD.
053720  004737  053732                  JSR PC,RF2X
053724  062701  003630                  ADD #TRN,R1
053730  000207                          RTS PC

053732                          RF2X:                           ;SAME AS RF2X SUBROUTINE EXCEPT FOR FIELD.
053732  017701  126004                  MOV @FLOPTR,R1
053736  042701  177077                  BIC #177077,R1
053742  006301                          ASL R1
053744  006301                          ASL R1
053746  000301                          SWAB R1
053750  006301                          ASL R1
053752  000207                          RTS PC

053754                          RF3:                            ;SAME AS RF1 SUBROUTINE EXCEPT FOR FIELD
053754  004737  053766                  JSR PC,RF3X
053760  062701  003630                  ADD #TRN,R1
053764  000207                          RTS PC

053766                          RF3X:                           ;SAME AS RF1X SUBROUTINE EXCEPT FOR FIELD
053766  017701  125750                  MOV @FLOPTR,R1
053772  042701  177707                  BIC #177707,R1
053776  006201                          ASR R1
054000  006201                          ASR R1
054002  000207                          RTS PC

054004                          RF4:                            ;SAME AS RF1 SUBROUTINE EXCEPT FOR FIELD
054004  004737  054016                  JSR PC,RF4X
054010  062701  003630                  ADD #TRN,R1
054014  000207                          RTS PC

054016                          RF4X:                           ;SAME AS RF1X SUBROUTINE EXCEPT FOR FIELD
054016  017701  125720                  MOV @FLOPTR,R1
054022  042701  177770                  BIC #177770,R1
054026  006301                          ASL R1
054030  000207                          RTS PC
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054032                          RFNX:                           ;SUBROUTINE TO RETURN CONTENTS OF FLOW
                                                                ; TABLE ENTRY FIELD POINTED TO BY THE
                                                                ; CONTENTS OF NXFLD+1.
054032  005237  002232                  INC NXFLD
054036  022737  000001  002232          CMP #1,NXFLD            ;FIELD REQUESTED = 1?
054044  001003                          BNE 1$                  ;BRANCH IF NO
054046  004737  053700                  JSR PC,RF1X             ;GET CONTENTS OF FIELD ONE.
054052  000426                          BR 10$                  ;EXIT
054054  022737  000002  002232  1$:     CMP #2,NXFLD            ;FIELD REQUESTED=2?
054062  001003                          BNE 2$                  ;BRANCH IF NO
054064  004737  053732                  JSR PC,RF2X             ;GET CONTENTS OF FIELD 2
054070  000417                          BR 10$                  ;EXIT
054072  022737  000003  002232  2$:     CMP #3,NXFLD            ;FIELD REQUESTED = 3?
054100  001003                          BNE 3$                  ;BRANCH IF NO
054102  004737  053766                  JSR PC,RF3X             ;GET CONTENTS OF FIELD 3
054106  000410                          BR 10$                  ;EXIT
054110  022737  000004  002232  3$:     CMP #4,NXFLD            ;FIELD REQUESTED = 4?
054116  001003                          BNE 9$                  ;BRANCH IF NO
054120  004737  054016                  JSR PC,RF4X             ;GET CONTENTS OF FIELD 4
054124  000401                          BR 10$                  ;EXIT
054126  005001                  9$:     CLR R1                  ;FIELD REQUESTED INVALID - RETURN 0.
054130  000207                  10$:    RTS PC

054132                          RFN:                            ;SUBROUTINE TO RETURN CONTENTS OF FLOW
                                                                ; TABLE ENTRY FIELD PLUS TEST OPERAND TABLE
                                                                ; OFFSET POINTED TO BY THE
                                                                ; CONTENTS OF NXFLD+1.
054132  005237  002232                  INC NXFLD
054136  022737  000001  002232          CMP #1,NXFLD            ;FIELD REQUESTED = 1?
054144  001003                          BNE 1$                  ;BRANCH IF NO
054146  004737  053666                  JSR PC,RF1              ;GET CONTENTS OF FIELD ONE PLUS TRN OFFSET.
054152  000427                          BR 10$                  ;EXIT
054154  022737  000002  002232  1$:     CMP #2,NXFLD            ;FIELD REQUESTED=2?
054162  001003                          BNE 2$                  ;BRANCH IF NO
054164  004737  053720                  JSR PC,RF2              ;GET CONTENTS OF FIELD 2 PLUS TRN OFFSET.
054170  000420                          BR 10$                  ;EXIT
054172  022737  000003  002232  2$:     CMP #3,NXFLD            ;FIELD REQUESTED = 3?
054200  001003                          BNE 3$                  ;BRANCH IF NO
054202  004737  053754                  JSR PC,RF3              ;GET CONTENTS OF FIELD 3 PLUS TRN OFFSET.
054206  000411                          BR 10$                  ;EXIT
054210  022737  000004  002232  3$:     CMP #4,NXFLD            ;FIELD REQUESTED = 4?
054216  001003                          BNE 9$                  ;BRANCH IF NO
054220  004737  054004                  JSR PC,RF4              ;GET CONTENTS OF FIELD 4 PLUS TRN OFFSET.
054224  000402                          BR 10$                  ;EXIT
054226  012701  003630          9$:     MOV #TRN,R1                     ;FIELD REQUESTED INVALID - RETURN #TRN.
054232  000207                  10$:    RTS PC

054234                          FC15:                           ;FLOW COMMAND = 15 - SETUP SPECIAL HANDLING WORD
                                                                ;  BIT 0 = 1 MEANS SKIP 04 FLOW COMMANDS
                                                                ;  BIT 1 = 1 MEANS 07 FLOW COMMAND IGNORE BIT 15
                                                                ;       OF STRING LENGTH
                                                                ;  BIT 2 = 1 MEANS DON'T CHECK BUFFER RESULTS
054234  004737  053570                  JSR PC,PF1              ;FORM PARAMETER TABLE POINTER TO SPECIAL HANDLING REQUES
```

```
13026  054240  017737  125672  002140          MOV @PTPTR,SPHAND        ;COPY SPECIAL HANDLING REQUEST INTO SPECIAL HANDLING WOR
13027  054246  000137  042250                  JMP FCRTN
13028
```

```
                                        .SBTTL          SETUP MACHINE DEPENDENT CONSTANTS
                                        ;
                                        ;SIZE FOR PROCESSOR TYPE - SETUP MACHINE DEPENDENT CONSTANTS BASED UPON RESULT.
                                        ;
054252                                  SIZEPT:
054252  012737  054562  000010                  MOV #3$,@#RESVEC        ;SETUP RESERVED INST TRAP VECTOR
                                                                        ; IN CASE MACHINE UNDER TEST DOES NOT HAVE MFPT
054260  005037  000012                          CLR @#RESVEC+2
054264  000007                                  MFPT                    ;WHAT IS THE PROCESSOR TYPE?
054266  123700  001710                          CMPB EL2324,R0
054272  001525                                  BEQ 6$                  ;BRANCH IF PROCESSOR = 11/23 OR 11/24
054274  123700  001704                          CMPB EL74,R0
054300  001025                                  BNE 1$                  ;BRANCH IF NOT AN 11/74 TYPE PROCESSOR
054302  005737  001122                          TST $PASS
054306  001002                                  BNE 10$
054310  104400                                  TYPE                    ;TYPE 11/74 TYPE PROCESSOR (1ST PASS ONLY)
054312  017002                                  MPT74
054314  012737  177777  002156  10$:            MOV #177777,MMFLG       ;SET MEM MANAGEMENT FLAG SIGNALING THAT SYS
                                                                        ; UNDER TEST HAS 11/70 TYPE MEM MGMT
054322  012737  000003  002164                  MOV #3,NMODES           ;PROC UNDER TEST HAS 3 MODES (K,S,U)
054330  012737  177777  002060                  MOV #177777,TWOSET      ;PROCESSOR UNDER TEST HAS 2 REGISTER SETS
054336  012737  000002  002212                  MOV #2,PTQV             ;INPUT TABLE ENTRY TYPE WORD BIT 1
                                                                        ;  IDENTIFIES TABLE RUN IN QV MODE FOR 11/74
                                                                        ;  (1=RUN,0=SKIP)
054344  012737  000003  003036                  MOV #3,LTCDLY           ;INITIALIZE COUNTER USED BY LINE TIME CLOCK
                                                                        ;  ROUTINES - COUNT IS A MEASURE OF
                                                                        ;  TIME REMAINING BEFORE INTERRUPT FROM
                                                                        ;  LTC WHEN STARTING EXECUTION OF CIS
                                                                        ;  INSTRUCTION UNDER TEST.
054352  000566                                  BR 4$
054354  123700  001706          1$:             CMPB EL44,R0            ;IS THIS AN 11/44?
054360  001024                                  BNE 2$                  ;BRANCH IF NO
054362  005737  001122                          TST $PASS
054366  001002                                  BNE 12$
054370  104400                                  TYPE                    ;TYPE 11/44 PROCESSOR (1ST PASS ONLY)
054372  016760                                  MPT44
054374  012737  177777  002156  12$:            MOV #177777,MMFLG       ;SET MEM MGMT FLAG
054402  012737  000003  002164                  MOV #3,NMODES           ;PROC UNDER TEST HAS 3 MODES
054410  005037  002060          11$:            CLR TWOSET              ;INITIALIZE FOR SINGLE REGISTER SET
054414  012737  000002  002212                  MOV #2,PTQV             ;INPUT TABLE ENTRY TYPE WORD BIT 2
                                                                        ; IDENTIFIES TABLE RUN IN QV MODE FOR 11/44
054422  012737  000013  003036                  MOV #13,LTCDLY          ;INITIALIZE COUNTER USED FOR LTC
054430  000537                                  BR 4$
054432  005037  002156          2$:             CLR MMFLG
054436  005737  001122                          TST $PASS
054442  001002                                  BNE 13$
054444  104400                                  TYPE                    ;TYPE NO MEM MGMT AVAILABLE (1ST PASS ONLY)
054446  017064                                  NMM
054450  012737  000240  060110  13$:            MOV #NOP,PCIS2          ;OVERWRITE ACCESS TO MEM MGMT REGISTERS
054456  012737  000240  060112                  MOV #NOP,PCIS2+2
054464  012737  000240  060134                  MOV #NOP,PCIS1
054472  012737  000240  060136                  MOV #NOP,PCIS1+2
054500  012737  000405  062044                  MOV #405,LTCIS
054506  012737  000240  057202                  MOV #NOP,ILLSER
```

```
054514  012737  000240  057204          MOV #NOP,ILLSER+2
054522  012737  000240  057062          MOV #NOP,HLTSER
054530  012737  000240  057064          MOV #NOP,HLTSER+2
054536  012737  000002  002164          MOV #2,NMODES
054544  000721                          BR 11$                  ;MACHINE TYPE UNKNOWN - DEFUAULT TO SINGLE
                                                                ;  REG SET ,NO MEM MGMT, 2 PROC MODES (K & U)
                                                                ; AND A LTC DELAY OF 13
                                                                ;(NEW MACHINES MAY REQUIRE CHANGES HERE)
054546  005737  001122          6$:     TST $PASS
054552  001005                          BNE 7$
054554  104400                          TYPE                    ;TYPE 11/23 OR 11/24 PROCESSOR (1ST PASS ONLY)
054556  017031                          MPT2324
054560  000402                          BR 7$
054562  005726                  3$:     TST (SP)+               ;FIX UP STACK
054564  005726                          TST (SP)+
054566  012737  054634  000004  7$:     MOV #33$,@#ERRVEC       ;DOES MACHINE UNDER TEST HAVE (11/34 TYPE) MEM MGMT?
054574  005737  172340                  TST @#KIPAR0            ;IF SO NO TRAP HERE
054600  005737  177640                  TST @#UIPAR0            ;IF SO NO TRAP HERE
054604  012737  054642  000004          MOV #34$,@#ERRVEC
054612  005737  172240                  TST @#SIPAR0            ;IF SO, TRAP HERE
054616  000705                          BR 2$
054620  012737  054650  000004  5$:     MOV #35$,@#ERRVEC       ;IF SO, TRAP HERE
054626  005737  172360                  TST @#KDPAR0
054632  000677                          BR 2$
054634  005726                  33$:    TST (SP)+               ;FIX UP STACK
054636  005726                          TST (SP)+
054640  000674                          BR 2$
054642  005726                  34$:    TST (SP)+               ;FIX UP STACK
054644  005726                          TST (SP)+
054646  000764                          BR 5$
054650  005726                  35$:    TST (SP)+               ;FIX UP STACK
054652  005726                          TST (SP)+
054654  005737  001122                  TST $PASS
054660  001002                          BNE 14$
054662  104400                          TYPE                    ;TYPE "MEMORY MANAGEMENT ON SYS UNDER TEST"(1ST PASS ONL
054664  016675                          MPT34
054666  012737  000002  002164  14$:    MOV #2,NMODES           ;PROC = 11/23 OR 11/24 OR 11/34
054674  012737  177777  002156          MOV #177777,MMFLG
054702  005037  002060                  CLR TWOSET
054706  012737  000002  002212          MOV #2,PTQV
054714  012737  177777  002154          MOV #177777,PT34
054722  012737  000013  003036          MOV #13,LTCDLY
054730  012737  057202  000010  4$:     MOV #ILLSER,@#RESVEC    ;RESTORE RESERVED INST TRAP CATCHER
054736  012737  057062  000004          MOV #HLTSER,@#ERRVEC    ;RESTORE HALT SERVICE TRAP CATCHER
054744  000207                          RTS PC
```

```
                                        .SBTTL          REGISTER SET SELECTION ROUTINES

                                        ;
                                        ;IF PROCESSOR UNDER TEST HAS 2 REGISTER SETS
                                        ;SELECT REGISTER SET TO BE USED BASED ON LEAST SIGNIFICANT BIT OF
                                        ;TEST # (TOTTC), AND LOAD REGISTER SET WHICH WAS NOT
                                        ;SELECTED WITH A FIXED PATTERN <NOTREG>.
                                        ;

054746                                  SELREG:
054746  005737  002060                          TST TWOSET              ;DOES MACHINE UNDER TEST HAVE 2 REG SETS?
054752  001506                                  BEQ 1$                  ;BRANCH IF NO
054754  032737  000001  001420                  BIT #1,TOTTC            ;PROCESSOR IS AN 11/74 - HAS 2 REG SETS;USE
                                                                        ;  LEAST SIGNIF. BIT OF TEST COUNT TO LOAD
                                                                        ;  PSW BIT 11 (REG SET BIT).
054762  001041                                  BNE 2$                  ;BRANCH TO USE REGISTER SET 1.
054764  052777  004000  124672                  BIS #4000,@TPSW         ;CIS INST WILL BE TESTED USING GPR SET 0.
054772  042737  001000  002132                  BIC #1000,FATAL         ;INDICATE GPR SET 0 IN FATAL ERROR WORD
                                                                        ;LOAD SET 1 WITH PATTERN IN NOTREG.
055000  013700  001702                          MOV NOTREG,R0
055004  013701  001702                          MOV NOTREG,R1
055010  013702  001702                          MOV NOTREG,R2
055014  013703  001702                          MOV NOTREG,R3
055020  013704  001702                          MOV NOTREG,R4
055024  013705  001702                          MOV NOTREG,R5
055030  042777  004000  124626                  BIC #4000,@TPSW         ;SET REGISTER SET TO 0
055036  042777  004000  125452                  BIC #4000,@PCLK1P       ;ASSURE CORRECT REGISTER USAGE ON INTERRUPT
055044  042777  004000  125752                  BIC #4000,@LTCIP
055052  042737  004000  000006                  BIC #4000,@#6
055060  005037  002052                          CLR REGSET              ;SET REG SET INDICATOR TO 0
055064  000441                                  BR 1$                   ;BRANCH TO RETURN
055066  042777  004000  124570  2$:             BIC #4000,@TPSW         ;CIS INST WILL BE TESTED USING GPR SET 1.
055074  052737  001000  002132                  BIS #1000,FATAL         ;INDICATE GPR SET 1 IN FATAL ERROR WORD
                                                                        ;LOAD SET 0 WITH PATTERN IN NOTREG.
055102  013700  001702                          MOV NOTREG,R0
055106  013701  001702                          MOV NOTREG,R1
055112  013702  001702                          MOV NOTREG,R2
055116  013703  001702                          MOV NOTREG,R3
055122  013704  001702                          MOV NOTREG,R4
055126  013705  001702                          MOV NOTREG,R5
055132  052777  004000  124524                  BIS #4000,@TPSW         ;SET REGISTER SET TO 1
055140  052777  004000  125350                  BIS #4000,@PCLK1P       ;ASSURE CORRECT REGISTER USAGE ON INTERRUPT
055146  052777  004000  125650                  BIS #4000,@LTCIP
055154  052737  004000  000006                  BIS #4000,@#6
055162  012737  000001  002052                  MOV #1,REGSET           ;SET REG SET INDICATOR TO 1
055170  000207                          1$:     RTS PC

                                        ;
                                        ;ROUTINE TO VERIFY THAT REGISTER SET WHICH WAS NOT SELECTED
                                        ;(PROVIDED PROCESSOR UNDER TEST HAS 2) DID NOT GET CHANGED, AND
                                        ;SWITCH TO REGISTER SET 0.
                                        ;

055172                                  CKUREG:
```

```
13184 055172 005737 002060                     TST TWOSET              ;PROCESSOR UNDER TEST HAVE TWO REGISTER SETS?
13185 055176 001435                            BEQ 1$                  ;BRANCH IF NO
13186 055200 005737 002052                     TST REGSET              ;DETERMINE WHICH REG SET WAS IN USE
13187 055204 001426                            BEQ 2$                  ;BRANCH IF REG SET 0 WAS USED
13188 055206 042777 004000 124450             BIC #4000,@TPSW         ;VERIFY CONTENTS OF REG SET 0
13189 055214 020037 001702        3$:          CMP R0,NOTREG
13190 055220 001030                            BNE 4$
13191 055222 020137 001702                     CMP R1,NOTREG
13192 055226 001025                            BNE 4$
13193 055230 020237 001702                     CMP R2,NOTREG
13194 055234 001022                            BNE 4$
13195 055236 020337 001702                     CMP R3,NOTREG
13196 055242 001017                            BNE 4$
13197 055244 020437 001702                     CMP R4,NOTREG
13198 055250 001014                            BNE 4$
13199 055252 020537 001702                     CMP R5,NOTREG
13200 055256 001011                            BNE 4$
13201 055260 000404                            BR 1$
13202 055262 052777 004000 124374 2$:          BIS #4000,@TPSW         ;VERIFY CONTENTS OF REG SET 1
13203 055270 000751                            BR 3$
13204 055272 042777 004000 124364 1$:          BIC #4000,@TPSW         ;SET REG SET TO ZERO
13205 055300 000207                            RTS PC                  ;RETURN
13206 055302                          4$:      PRINTB #HLTMSG
  (6) 055302 012746 012167                     MOV     #HLTMSG,-(SP)
  (3) 055306 010600                            MOV     SP,R0
  (4) 055310 004737 065410                     JSR PC,FPRINT
13207 055314 012737 055376 002170              MOV #100$,HLTLOC
13208 055322 004737 055402                     JSR PC,IDINFO           ;IDENTIFY FAILING INST
13209 055326                                   PRINTB #FORM38,REGSET
  (7) 055326 013746 002052                     MOV     REGSET,-(SP)
  (6) 055332 012746 014415                     MOV     #FORM38,-(SP)
  (3) 055336 010600                            MOV     SP,R0
  (4) 055340 004737 065410                     JSR PC,FPRINT
13210 055344                                   PRINTB #FORM39,NOTREG,R0,R1,R2,R3,R4,R5
 (13) 055344 010546                            MOV     R5,-(SP)
 (12) 055346 010446                            MOV     R4,-(SP)
 (11) 055350 010346                            MOV     R3,-(SP)
 (10) 055352 010246                            MOV     R2,-(SP)
  (9) 055354 010146                            MOV     R1,-(SP)
  (8) 055356 010046                            MOV     R0,-(SP)
  (7) 055360 013746 001702                     MOV     NOTREG,-(SP)
  (6) 055364 012746 014474                     MOV     #FORM39,-(SP)
  (3) 055370 010600                            MOV     SP,R0
  (4) 055372 004737 065410                     JSR PC,FPRINT
13211 055376 000000                   100$:    HALT                    ;REGISTER SET ERROR;PRESS CONTINUE SWITCH TO CONTINUE
13212                                                                  ;  TESTING
13213 055400 000734                            BR 1$
13214
13215 055402                          IDINFO:  PRINTB #TRPINF,HLTLOC,MODE,DEN,TINST,TOTTCH,TOTTC
 (12) 055402 013746 001420                     MOV     TOTTC,-(SP)
 (11) 055406 013746 001416                     MOV     TOTTCH,-(SP)
 (10) 055412 013746 050012                     MOV     TINST,-(SP)
  (9) 055416 013746 002162                     MOV     DEN,-(SP)
  (8) 055422 013746 002160                     MOV     MODE,-(SP)
```

```
  (7)  055426  013746  002170                    MOV     HLTLOC,-(SP)
  (6)  055432  012746  012304                    MOV     #TRPINF,-(SP)
  (3)  055436  010600                            MOV     SP,R0
  (4)  055440  004737  065410                    JSR PC,FPRINT
       055444  000207                            RTS PC
```

```
                                         .SBTTL          MEMORY MANAGEMENT SUBROUTINES
                                         ;
                                         ;MEMORY MANAGEMENT SUBROUTINES
                                         ;
                                         ;
                                         ;
                                         ;
                                         ;SETUP PAR'S
 055446                                  SETPAR:                                 ;SETUP PAR'S FOR USER,SUPV, AND KERNEL I & D SPACES
 055446  005737  002156                          TST MMFLG                       ;DOES SYSTEM UNDER TEST HAVE MEMORY MANAGEMENT?
 055452  001002                                  BNE 2$                          ;BRANCH IF YES
 055454  000137  056132                          JMP 1$
 055460  005737  002154                  2$:     TST PT34                        ;IS THIS AN 11/34 TYPE PROCESSOR
                                                                                 ;  (I.E. K, U MODES AND 18 BIT MEM MGMT)
 055464  001142                                  BNE 3$                          ;BRANCH IF YES
 055466  005037  172516                          CLR @#MMR3                      ;CLEAR OUT D-SPACE ENABLES
 055472  012737  000000  177660                  MOV #0,@#UDPAR0                 ;SETUP USER D PAR'S
 055500  012737  000200  177662                  MOV #200,@#UDPAR1
 055506  012737  000400  177664                  MOV #400,@#UDPAR2
 055514  012737  000600  177666                  MOV #600,@#UDPAR3
 055522  012737  001000  177670                  MOV #1000,@#UDPAR4
 055530  012737  001200  177672                  MOV #1200,@#UDPAR5
 055536  012737  001400  177674                  MOV #1400,@#UDPAR6
 055544  012737  177600  177676                  MOV #177600,@#UDPAR7

 055552  012737  000000  172240                  MOV #0,@#SIPAR0                 ;SETUP SUPERVISOR I PAR'S
 055560  012737  000200  172242                  MOV #200,@#SIPAR1
 055566  012737  000400  172244                  MOV #400,@#SIPAR2
 055574  012737  000600  172246                  MOV #600,@#SIPAR3
 055602  012737  001000  172250                  MOV #1000,@#SIPAR4
 055610  012737  001200  172252                  MOV #1200,@#SIPAR5
 055616  012737  001400  172254                  MOV #1400,@#SIPAR6
 055624  012737  177600  172256                  MOV #177600,@#SIPAR7

 055632  012737  000000  172260                  MOV #0,@#SDPAR0                 ;SETUP SUPERVISOR D PAR'S
 055640  012737  000200  172262                  MOV #200,@#SDPAR1
 055646  012737  000400  172264                  MOV #400,@#SDPAR2
 055654  012737  000600  172266                  MOV #600,@#SDPAR3
 055662  012737  001000  172270                  MOV #1000,@#SDPAR4
 055670  012737  001200  172272                  MOV #1200,@#SDPAR5
 055676  012737  001400  172274                  MOV #1400,@#SDPAR6
 055704  012737  177600  172276                  MOV #177600,@#SDPAR7

 055712  012737  000000  172360                  MOV #0,@#KDPAR0                 ;SETUP KERNEL D PAR'S
 055720  012737  000200  172362                  MOV #200,@#KDPAR1
 055726  012737  000400  172364                  MOV #400,@#KDPAR2
 055734  012737  000600  172366                  MOV #600,@#KDPAR3
 055742  012737  001000  172370                  MOV #1000,@#KDPAR4
 055750  012737  001200  172372                  MOV #1200,@#KDPAR5
 055756  012737  001400  172374                  MOV #1400,@#KDPAR6
 055764  012737  177600  172376                  MOV #177600,@#KDPAR7

 055772  012737  000000  177640          3$:     MOV #0,@#UIPAR0                 ;SETUP USER I PAGE ADDRESS REGISTERS
 056000  012737  000200  177642                  MOV #200,@#UIPAR1
```

```
056006  012737  000400  177644          MOV #400,@#UIPAR2
056014  012737  000600  177646          MOV #600,@#UIPAR3
056022  012737  001000  177650          MOV #1000,@#UIPAR4
056030  012737  001200  177652          MOV #1200,@#UIPAR5
056036  012737  001400  177654          MOV #1400,@#UIPAR6
056044  012737  177600  177656          MOV #177600,@#UIPAR7

056052  012737  000000  172340          MOV #0,@#KIPAR0             ;SETUP KERNEL I PAR'S
056060  012737  000200  172342          MOV #200,@#KIPAR1
056066  012737  000400  172344          MOV #400,@#KIPAR2
056074  012737  000600  172346          MOV #600,@#KIPAR3
056102  012737  001000  172350          MOV #1000,@#KIPAR4
056110  012737  001200  172352          MOV #1200,@#KIPAR5
056116  012737  001400  172354          MOV #1400,@#KIPAR6
056124  012737  177600  172356          MOV #177600,@#KIPAR7

056132  000207                  1$:     RTS PC


                                ;
                                ;SELECT MODE AND D-SPACE ENABLE/DISABLE
                                ;
                                ;BOTH MODE AND D-SPACE ENABLE ARE SELECTED RANDOMLY FOR EACH TEST
                                ;IF EXECUTING IN RANDOM MODE OR IN A NORMAL FIELD SERVICE TYPE RUN.
                                ;IF IN A DESIGN VERIFCATION TYPE RUN (ST @ 204) AND NOT RANDOM MODE
                                ;THEN THESE VARIABLES WERE SET VIA OPERATOR DIAGLOG ABOVE.
                                ;REGARDLESS OF THE RUN TYPE, IF MEMORY MANAGEMENT IS AVAILABLE
                                ;(MMFLG=NONZERO) THEN MMR3 IS LOADED TO PROPER D-SPACE STATE.
                                ;
056134                          SELMD:
056134  005737  002074                  TST FSRUN                   ;NORMAL FFIELD SERVICE TYPE RUN?
056140  001003                          BNE 10$                     ;BRANCH IF YES
056142  005737  001760                  TST RANDOM                  ;RANDOM TESTING?
056146  001443                          BEQ 11$                     ;BRANCH IF NO
056150  022737  000001  002164  10$:    CMP #1,NMODES               ;DOES SYSTEM UNDER TEST HAVE MORE THAN  ONE
                                                                    ;  PROCESSOR MODE?
056156  001003                          BNE 2$                      ;BRANCH IF YES
056160  005037  002160                  CLR MODE
056164  000422                          BR 4$
056166  004737  063532          2$:     JSR PC,RN                   ;GENERATE A RANDOM #
056172  042700  177774                  BIC #177774,R0              ;USE BITS 1 & 0 TO SELECT MODE
                                                                    ; (I.E 00=KERNEL,01=SUPV,11=USER)
056176  022700  000002                  CMP #2,R0                   ;ILLEGAL MODE (10)?
056202  001771                          BEQ 2$                      ;YES - TRY AGAIN
056204  022737  000002  002164          CMP #2,NMODES               ;DOES SYSTEM UNDER TEST HAVE ONLY 2 PROC MODES?
056212  001005                          BNE 6$                      ;BRANCH IF NO
056214  022700  000001                  CMP #1,R0                   ;ON 2 MODE MACHINE MODES ASSUMED TO BE
                                                                    ;  KERNEL & USER
056220  001002                          BNE 6$                      ;BRANCH IF MODE IS LEGAL
056222  052700  000002                  BIS #2,R0                   ;IF RANDOM MODE = SUPV THEN SWITCH IT TO USER
056226  010037  002160          6$:     MOV R0,MODE                 ;MODE VALID - SET INTO MODE WORD
056232  005037  002162          4$:     CLR DEN
056236  004737  063532                  JSR PC,RN                   ;GENERATE A RANDOM #
056242  032700  000001                  BIT #1,R0                   ;USE BIT 0 OF RANDOM NUMBER TO SELECT D ENABLE
056246  001403                          BEQ 11$                     ;BRANCH TO DISABLE D SPACE
```

```
056250  012737  177777  002162          MOV #177777,DEN         ;SET D ENABLE FLAG
056256  005737  002156          11$:    TST MMFLG               ;MEMORY MGMT AVAILABLE?
056262  001435                          BEQ 1$                  ;NO - EXIT
056264  005737  002154                  TST PT34                ;11/34 TYPE MEM MGMT?
056270  001403                          BEQ 7$                  ;BRANCH IF NO
056272  005037  002162                  CLR DEN
056276  000427                          BR 1$
056300  005037  172516          7$:     CLR @#MMR3              ;DISABLE ALL D-SPACES
056304  005737  002162                  TST DEN                 ;ENABLE D SPACE IN MMR3?
056310  001422                          BEQ 1$                  ;BRANCH IF NO
056312  005737  002160          13$:    TST MODE                ;MODE SELECTED = KERNEL?
056316  001004                          BNE 3$                  ;BRANCH IF NO
056320  052737  000004  172516          BIS #4,@#MMR3           ;ENABLE KERNEL D SPACE
056326  000413                          BR 1$
056330  022737  000003  002160  3$:     CMP #3,MODE             ;MODE SELECTED = USER
056336  001004                          BNE 5$                  ;BRANCH IF NO
056340  052737  000001  172516          BIS #1,@#MMR3           ;ENABLE USER D SPACE
056346  000403                          BR 1$                   ;MODE SLECTED = SUPERVISOR
056350  052737  000002  172516  5$:     BIS #2,@#MMR3           ;ENABLE SUPERVISOR D SPACE
056356  000207                  1$:     RTS PC

                                ;
                                ;SETUP PDR'S
                                ;
056360                          SETPDR:
056360  005737  002154                  TST PT34                ;11/34 TYPE MEM MGMT?
056364  001022                          BNE 8$                  ;BRANCH IF YES
                                                                ;FIRST CLEAR ALL PDR'S (ABORT ALL ACCESSES)

056366  012700  172200                  MOV #SIPDR0,R0
056372  005020                  2$:     CLR (R0)+               ;CLEAR SUPERVISOR PDR'S
056374  020027  172236                  CMP R0,#SDPDR7
056400  101774                          BLOS 2$

056402  012700  177620                  MOV #UDPDR0,R0          ;CLEAR USER D-PDR'S
056406  005020                  1$:     CLR (R0)+
056410  020027  177636                  CMP R0,#UDPDR7
056414  101774                          BLOS 1$

056416  012700  172320                  MOV #KDPDR0,R0          ;CLEAR KERNEL D-PDR'S
056422  005020                  99$:    CLR (R0)+
056424  020027  172336                  CMP R0,#KDPDR7
056430  101774                          BLOS 99$

056432  012700  177600          8$:     MOV #UIPDR0,R0          ;CLEAR USER I-PDR'S
056436  005020                  9$:     CLR (R0)+
056440  020027  177616                  CMP R0,#UIPDR7
056444  101774                          BLOS 9$

056446  012700  172300                  MOV #KIPDR0,R0
056452  005020                  3$:     CLR (R0)+               ;CLEAR KERNEL PDR'S
056454  020027  172316                  CMP R0,#KIPDR7
056460  101774                          BLOS 3$
```

```
13381                                          ;SETUP KERNEL MODE PDR'S
13382
13383  056462  012737  077406  172316          MOV #77406,@#KIPDR7      ;ALLOW R/W ACCESS OF I/O PAGE
13385  056470  012737  077402  172310          MOV #77402,@#KIPDR4      ;  AND R ONLY ACCESS OF PHYSICAL ADDRESS
13386  056476  012737  077402  172306          MOV #77402,@#KIPDR3      ;  20 TO 120K
13388  056504  012737  077402  172304          MOV #77402,@#KIPDR2
13389  056512  012737  077402  172302          MOV #77402,@#KIPDR1
13390  056520  005737  002160                  TST MODE                 ;IS MODE = KERNEL?
13391  056524  001404                          BEQ 31$                  ;BRANCH IF YES
13392  056526  012737  077406  172300          MOV #77406,@#KIPDR0
13393  056534  000403                          BR 32$
13394  056536  012737  077402  172300  31$:    MOV #77402,@#KIPDR0
13395  056544  005737  002160          32$:    TST MODE                 ;IF MODE= KERNEL & D-SPACE IS DISABLED
13396  056550  001021                          BNE 5$                   ;  THEN ALLOW R/W OF STACK & TEST BUFFER AREA
13397  056552  005737  002162                  TST DEN
13398  056556  001004                          BNE 4$
13400  056560  012737  077406  172312          MOV #77406,@#KIPDR5
13405  056566  000455                          BR 11$
13406  056570  012737  077406  172336  4$:     MOV #77406,@#KDPDR7      ;IF MODE IS KERNEL & D-SPACE IS ENABLED
13408  056576  012737  077406  172332          MOV #77406,@#KDPDR5      ;  THEN SETUP KERNEL D-SPACE PDRS
13413  056604  012737  077402  172320          MOV #77402,@#KDPDR0      ;ALLOW R/W ACCESS OF I/O PAGE AND TEST BUFFER
13414                                                                   ;  AREA; R-ONLY ACCESS OF PHYS 0-20K
13418  056612  000443                          BR 11$
13419  056614  022737  000001  002160  5$:     CMP #1,MODE              ;SETUP SUPERVISOR MODE PDR'S
13420  056622  001016                          BNE 7$                   ;BRANCH IF TEST MODE IS NOT SUPERVISOR
13421  056624  012737  077402  172204          MOV #77402,@#SIPDR2      ;ALLOW R ONLY ACCESS OF SPACE INCLUDING
13422                                                                   ; CIS INST TO BE EXECUTED
13426  056632  005737  002162                  TST DEN                  ;IF D-SPACE IS NOT ENABLED ALLOW
13427  056636  001004                          BNE 6$                   ;  R/W ACCESS OF TEST BUFFER AREA IN SUPERVISOR
13428                                                                   ;  I-SPACE
13430  056640  012737  077406  172212          MOV #77406,@#SIPDR5
13435  056646  000425                          BR 11$
13437  056650  012737  077406  172232  6$:     MOV #77406,@#SDPDR5      ;D-SPACE IS ENABLED; ALLOW R/W ACCESS
13442  056656  000421                          BR 11$                   ;  TO TEST BUFFER AREA IN SUPERVISOR D-SPACE
13443  056660  022737  000003  002160  7$:     CMP #3,MODE              ;SETUP USER MODE PDR'S
13444  056666  001015                          BNE 11$                  ;BRANCH IF TEST MODE IS NOT USER
13445  056670  012737  077402  177604          MOV #77402,@#UIPDR2      ;ALLOW R ONLY ACCESS OF SPACE INCLUDING
13446                                                                   ;  CIS INST TO BE EXECUTED
13450  056676  005737  002162                  TST DEN                  ;IF D-SPACE IS NOT ENABLED ALLOW R/W
13451  056702  001004                          BNE 10$                  ;  ACCESS OF TEST BUFFER AREA IN USER
13453  056704  012737  077406  177612          MOV #77406,@#UIPDR5      ;  I SPACE
13458  056712  000403                          BR 11$
13460  056714  012737  077406  177632  10$:    MOV #77406,@#UDPDR5      ;D-SPACE IS ENABLED; ALLOW R/W ACCESS
13465                                                                   ;  TO TEST BUFFER AREA IN USER D-SPACE
13466  056722  005737  001760          11$:    TST RANDOM               ;ASSURE THAT XLATION BUFFER (MOVTC) IS IN READABLE SPACE
13467                                                                   ;IN RANDOM MODE?
13468  056726  001454                          BEQ 12$                  ;BRANCH IF NO
13469  056730  022737  076032  050012          CMP #76032,TINST         ;IS INST UNDER TEST = MOVTC?
13470  056736  001404                          BEQ 20$                  ;BRANCH IF YES
13471  056740  022737  076132  050012          CMP #76132,TINST
13472  056746  001044                          BNE 12$
13473  056750  005737  002162          20$:    TST DEN                  ;IS D-SPACE ENABLED?
13474  056754  001017                          BNE 13$                  ;BRANCH IF YES
13475  056756  005737  002160                  TST MODE                 ;IS MODE = KERNEL?
```

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      056762  001436                                BEQ 12$                     ;BRANCH IF YES - NO PDR CHANGE REQUIRED FOR XLATION BUFF
      056764  022737  000001  002160                CMP #1,MODE                 ;IS MODE = SUPERVISOR?
      056772  001004                                BNE 14$                     ;BRANCH IF NO
      056774  012737  077402  172202                MOV #77402,@#SIPDR1         ;ALLOW R-ONLY ACCESS TO XLATION BUFFER
      057002  000426                                BR 12$
      057004  012737  077402  177602        14$:    MOV #77402,@#UIPDR1         ;USER MODE- ALLOW R-ONLY ACCESS TO XLATION BUFFER
      057012  000422                                BR 12$
      057014  005737  002160                13$:    TST MODE
      057020  001004                                BNE 15$
      057022  012737  077402  172322                MOV #77402,@#KDPDR1                 ;KERNEL MODE,D-EN - ALLOW R-ONLY ACCESS TO XLATI
      057030  000413                                BR 12$
      057032  022737  000001  002160        15$:    CMP #1,MODE
      057040  001004                                BNE 16$
      057042  012737  077402  172222                MOV #77402,@#SDPDR1                 ;SUPERVISOR MODE,D-EN - ALLOW READ OF XLATION BU
      057050  000403                                BR 12$
      057052  012737  077402  177622        16$:    MOV #77402,@#UDPDR1                 ;USER MODE,D-EN - ALLOW R-ONLY ACCESS OF XLATION
      057060  000207                        12$:    RTS PC

                                            ;
                                            ;HALT SERVICE ROUTINE  (USED FOR TRAPS CAUSED BY HALTS IN SUPERVISOR OR USER MODE
                                            ;
      057062  005037  177572                HLTSER: CLR @#MMRO                  ;TURN OFF MEM MGMT - OVERWRITTEN WITH NOPS
                                                                                ; IF NO MEM MGMT ON SYSTEM (REF SIZEPT ROUTINE)
      057066  021627  050032                        CMP (SP),#TINRET+2          ;WAS HALT AT CIS INST RETURN LOC?
      057072  001434                                BEQ 1$                      ;BRANCH IF YES
      057074  011637  002166                        MOV (SP),TRPLOC             ;GET TRAP LOCATION
      057100  162737  000002  002166                SUB #2,TRPLOC
      057106                                        PRINTB #TRAP4               ;PRINT - TRAP TO LOC 4
  (6) 057106  012746  012132                        MOV     #TRAP4,-(SP)
  (3) 057112  010600                                MOV     SP,RO
  (4) 057114  004737  065410                        JSR PC,FPRINT
      057120                                        PRINTB #TRPINF,TRPLOC,MODE,DEN,TINST,TOTTCH,TOTTC       ;PRINT - ADDITIONAL TRAP
 (12) 057120  013746  001420                        MOV     TOTTC,-(SP)
 (11) 057124  013746  001416                        MOV     TOTTCH,-(SP)
 (10) 057130  013746  050012                        MOV     TINST,-(SP)
  (9) 057134  013746  002162                        MOV     DEN,-(SP)
  (8) 057140  013746  002160                        MOV     MODE,-(SP)
  (7) 057144  013746  002166                        MOV     TRPLOC,-(SP)
  (6) 057150  012746  012304                        MOV     #TRPINF,-(SP)
  (3) 057154  010600                                MOV     SP,RO
  (4) 057156  004737  065410                        JSR PC,FPRINT
      057162  000000                                HALT
      057164  016637  000002  003666        1$:     MOV 2(SP),TCCR              ;SAVE CIS INST RETURN CONDITION CODES
      057172  005726                                TST (SP)+
      057174  005726                                TST (SP)+
      057176  000137  050054                        JMP SUHRET

                                            ;
                                            ;ILLEGAL INSTRUCTION TRAP SERVICE ROUTINE
                                            ;
      057202  005037  177572                ILLSER: CLR @#MMRO                  ;TURN OFF MEM MGMT - OVERWRITTEN WITH NOPS
```

```
                                                      ; IF NO MEM MGMT ON SYSTEM (REF SIZEPT ROUTINE)
      057206  005737  002154                TST PT34              ;11/34 TYPE PROCESSOR?
      057212  001403                        BEQ 2$                ;BRANCH IF NO
                                                                  ;NOTE:ON 11/34 HALT IN USER MODE TRAPS TO 10 (NOT 4)
      057214  021627  050032                CMP (SP),#TINRET+2    ;WAS HALT AT CIS INST RETURN LOC?
      057220  001452                        BEQ 3$                ;BRANCH IF YES
      057222  022737  000001  001420  2$:   CMP #1,TOTTC          ;WAS ILLEGAL INST TRAP DURING TEST #1 ?
      057230  001011                        BNE 1$                ;BRANCH IF NO
      057232  021627  050014                CMP (SP),#TINST+2     ;WAS ILLEGAL INST THE CIS INST?
      057236  001006                        BNE 1$                ;BRANCH IF NO
      057240                                PRINTB #CISQ          ;PRINT CISP PRESENT? WARNING
  (6) 057240  012746  012007                MOV     #CISQ,-(SP)
  (3) 057244  010600                        MOV     SP,R0
  (4) 057246  004737  065410                JSR PC,FPRINT
      057252  000000                        HALT
      057254  011637  002166          1$:   MOV (SP),TRPLOC       ;GET LOCATION THAT CAUSED TRAP
      057260  162737  000002  002166        SUB #2,TRPLOC
      057266                                PRINTB #TRAP10        ;PRINT TRAP TO 10
  (6) 057266  012746  012150                MOV     #TRAP10,-(SP)
  (3) 057272  010600                        MOV     SP,R0
  (4) 057274  004737  065410                JSR PC,FPRINT
      057300                                PRINTB #TRPINF,TRPLOC,MODE,DEN,TINST,TOTTCH,TOTTC       ;PRINT ADDITIONAL TRAP I
 (12) 057300  013746  001420                MOV     TOTTC,-(SP)
 (11) 057304  013746  001416                MOV     TOTTCH,-(SP)
 (10) 057310  013746  050012                MOV     TINST,-(SP)
  (9) 057314  013746  002162                MOV     DEN,-(SP)
  (8) 057320  013746  002160                MOV     MODE,-(SP)
  (7) 057324  013746  002166                MOV     TRPLOC,-(SP)
  (6) 057330  012746  012304                MOV     #TRPINF,-(SP)
  (3) 057334  010600                        MOV     SP,R0
  (4) 057336  004737  065410                JSR PC,FPRINT
      057342  000000                        HALT
      057344  000002                        RTI
      057346  016637  000002  003666  3$:   MOV 2(SP),TCCR        ;SAVE CIS INST RETURN CONDITON CODES
      057354  005726                        TST (SP)+
      057356  005726                        TST (SP)+
      057360  000137  050054                JMP SUHRET



                                      ;
                                      ;MEMORY MANAGEMENT VIOLATION TRAP SERVICE ROUTINE
                                      ;
      057364  005037  177572          MMVIOL: CLR @#MMR0          ;TURN OFF MEM MGMT
      057370  011637  002166                MOV (SP),TRPLOC       ;GET LOCATION WHICH CAUSED TRAP
      057374  162737  000002  002166        SUB #2,TRPLOC
      057402                                PRINTB #MMVMSG        ;PRINT MEMORY MANAGEMENT VIOL
  (6) 057402  012746  012112                MOV     #MMVMSG,-(SP)
  (3) 057406  010600                        MOV     SP,R0
  (4) 057410  004737  065410                JSR PC,FPRINT
      057414                                PRINTB #TRPINF,TRPLOC,MODE,DEN,TINST,TOTTCH,TOTTC
 (12) 057414  013746  001420                MOV     TOTTC,-(SP)
 (11) 057420  013746  001416                MOV     TOTTCH,-(SP)
 (10) 057424  013746  050012                MOV     TINST,-(SP)
  (9) 057430  013746  002162                MOV     DEN,-(SP)
```

```
(8)  057434  013746  002160                    MOV     MODE,-(SP)
(7)  057440  013746  002166                    MOV     TRPLOC,-(SP)
(6)  057444  012746  012304                    MOV     #TRPINF,-(SP)
(3)  057450  010600                            MOV     SP,R0
(4)  057452  004737  065410                    JSR PC,FPRINT
     057456  000000                            HALT
     057460  000002                            RTI

                                       ;
                                       ;ACCEPT ASCII (K,S, OR U) FROM TTY AND SETUP MODE WORD
                                       ;
     057462                            KSORU:
     057462  105777  122200            1$:     TSTB @TKS               ;WAIT FOR A CHARACTER
     057466  100375                            BPL 1$
     057470  117737  122216  064776            MOVB @TKB,RCHAR         ;READ & SAVE CHAR
     057476  042737  177600  064776            BIC #^C177,RCHAR        ;GET RID OF JUNK IF ANY
     057504  004737  064760                    JSR PC,ECHAR            ;ECHO CHARACTER
     057510  123727  064776  000113            CMPB RCHAR,#113         ;IS CHAR A 'K'
     057516  001411                            BEQ 6$                  ;BRANCH IF YES
     057520  123727  064776  000123            CMPB RCHAR,#123         ;IS CHAR AN 'S'
     057526  001410                            BEQ 3$                  ;BRANCH IF YES
     057530  123727  064776  000125            CMPB RCHAR,#125         ;IS CHAR A 'U' ?
     057536  001410                            BEQ 4$                  ;BRANCH IF YES
     057540  000414                            BR 5$                   ;CHAR IS ILLEGAL :RETURN TO CALL +2
     057542  005037  002160            6$:     CLR MODE                ;SET MODE TO KERNEL (0)
     057546  000407                            BR 2$
     057550  012737  000001  002160    3$:     MOV #1,MODE             ;SET MODE WORD TO SUPERVISOR (1)
     057556  000403                            BR 2$
     057560  012737  000003  002160    4$:     MOV #3,MODE             ;SET MODE WORD TO USER (3)
     057566  062716  000002            2$:     ADD #2,(SP)
     057572  000207                    5$:     RTS PC
```

```
                                                .SBTTL          PROGRAMMABLE CLOCK SERVICE ROUTINE
                                                ;NOTE: LOCATIONS 57670-60070  ARE RESERVED FOR STACK USAGE DURING
                                                ;       EXECUTION OF CIS STACK PROBEAHEAD MEMORY MGMT ABORT TESTS.

                060100                                  .=60100
                                                ;
                                                ; KW11-P (PROGRAMMABLE CLOCK) INTERRUPT SERVICE ROUTINES (ALWAYS ENTERED IN KERNEL MODE)
                                                ;
        060100                                  PCIS3:                                  ;P CLK SERVICE ROUTINE USED FOR INTR DURING
                                                                                        ;  EXECUTION OF 'STATE DISTURBING' DIVPI
                                                                                        ;  INSTRUCTION BELOW.
        060100  042777  000001  122412                  BIC #1,@PC1CSR                  ;TURN OFF PCLK1
        060106  000002                                  RTI

        060110  005037  177572                  PCIS2:  CLR @#MMR0                      ;P CLK INTR SERVICE ROUTINE USED WHEN
                                                                                        ;  TESTING LATENCY
                                                                                        ;THIS CLR INSTRUCTION TURNS OFF MEMORY MANAGEMENT
                                                                                        ; THE CLR IS OVERWRITTEN WITH NOPS IF NOT 11/44
                                                                                        ;  (SEE SIZEPT ROUTINE).
        060114  017737  122414  002542                  MOV @PC2CTR,LATCT               ;SAVE P-CLK2 COUNTER FOR LATENCY CALCULATION
        060122  042777  000001  122400                  BIC #1,@PC2CSR                  ;TURN OFF PCLK2
        060130  005077  122376                          CLR @PC2CSB                     ;CLEAR PCLK2 COUNTER

        060134  005037  177572                  PCIS1:  CLR @#MMR0                      ;NORMAL P CLK INTERRUPT SERVICE ROUTINE
                                                                                        ;THIS CLR TURNS OFF MEM MGMT.
                                                                                        ;THIS CLR GETS OVERWRITTEN WITH NOPS IF NOT 11/44
        060140  042777  000001  122352                  BIC #1,@PC1CSR                  ;TURN OFF P-CLK1
        060146  004737  061206                          JSR PC,SGPR06                   ;SAVE GENERAL PURPOSE REGS 0-6
        060152  021627  050012                          CMP (SP),#TINST                 ;INTERRUPTED THE TEST INST???
        060156  001154                                  BNE 1$                          ;BRANCH IF NO
        060160  032766  000400  000002                  BIT #400,2(SP)                  ;IS PSW BIT 8 SET?
        060166  001407                                  BEQ 4$                          ;BRANCH IF NO
        060170  005237  002546                          INC INTCT                       ;UPDATE INTERRUPT COUNT
        060174  052737  040000  002132                  BIS #40000,FATAL                ;SET INTERRUPT INDICATOR IN FATAL ERROR WORD
        060202  004737  061040                          JSR PC,RECLAT                   ;RECORD LATENCY
        060206  004737  061434                  4$:     JSR PC,STATCG                   ;HAS THE 'STATE' OF CIS INST CHANGED?
        060212  000504                                  BR 5$                           ;NO RETURN
        060214  005237  002540                          INC PROGCT                      ;YES RETURN - UPDATE PROGRESS COUNT
        060220  032766  000400  000002                  BIT #400,2(SP)                  ;IS PSW  BIT 8 SET?
        060226  001025                                  BNE 6$                          ;BRANCH IF YES
        060230                                          PRINTB  #HLTMSG
  (6)   060230  012746  012167                          MOV     #HLTMSG,-(SP)
  (3)   060234  010600                                  MOV     SP,R0
  (4)   060236  004737  065410                          JSR PC,FPRINT
        060242  012737  060300  002170                  MOV #100$,HLTLOC
        060250  004737  055402                          JSR PC,IDINFO                   ;IDENTIFY FAILING INST
        060254                                          PRINTB #FORM42                  ;MSG: CIS INST WAS SUSPENDED TO SERVICE INTR
  (6)   060254  012746  014745                          MOV     #FORM42,-(SP)
  (3)   060260  010600                                  MOV     SP,R0
  (4)   060262  004737  065410                          JSR PC,FPRINT
        060266                                          PRINTB #FORM43                  ;MSG: PSW BIT 8 SHOULD HAVE BEEN SET BUT WAS NOT
  (6)   060266  012746  015034                          MOV     #FORM43,-(SP)
  (3)   060272  010600                                  MOV     SP,R0
  (4)   060274  004737  065410                          JSR PC,FPRINT
```

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060300  000000                         100$:   HALT                     ;BIT 8 OF PSW SHOULD HAVE BEEN SET!!!
                                                                        ;PRESS CONTINUE TO PROCEED WITH TESTING
060302                                 6$:                              ;INST IS IN A NEW PART OF ITS OPERATION
060302  012737  000001  002556                 MOV #1,INTRVL            ;SET P-CLK  INTERVAL  TO MINIMUM = 1
060310  004737  061316                         JSR PC,SAVST             ;SAVE CIS INST STATE
060314  004737  061152                 11$:    JSR PC,DIC               ;ALLOW INTERRUPT DURING THIS DIVPI IF REQUESTED
060320  076175                                 DIVPI                    ;DISTURB INTERNAL CISP STATE BY
060322  003152                                 DIVDS                    ;  EXECUTING A DIVP IN-LINE INST.
060324  003152                                 DIVDS
060326  003156                                 DIVDD
060330  042777  000001  122162                 BIC #1,@PC1CSR           ;TURN OFF PCLK1
060336  013777  002036  122150                 MOV SPCV,@PCLK1V         ;RESTORE PCLK VECTOR
060344  013737  002040  120400                 MOV TPRECS,PRECSK        ;RESTORE 65TH STACK WORD
060352  004737  061264                         JSR PC,RGPR06            ;RESTORE GENERAL PURPOSE REGISTERS 0-6
060356  013777  002556  122136                 MOV INTRVL,@PC1CSB       ;SET INTERVAL
060364  005737  002544                         TST LATEN                ;LATENCY TESTING?
060370  001403                                 BEQ 7$                   ;BRANCH IF NO
060372  052777  000001  122130                 BIS #1,@PC2CSR           ;TURN ON P-CLK2
060400  005737  002156                 7$:     TST MMFLG                ;TESTING WITH MEM MGMT ON?
060404  001403                                 BEQ 8$                   ;BRANCH IF NO
060406  052737  000001  177572                 BIS #1,@#MMR0            ;TURN ON MEM MGMT
060414  052777  000001  122076         8$:     BIS #1,@PC1CSR           ;TURN ON P-CLK1
060422  000002                         14$:    RTI                      ;RETURN FROM SERVICE

060424  005237  002556                 5$:     INC INTRVL               ;INCREASE P-CLK1 INTERVAL
060430  023737  002556  002562                 CMP INTRVL,MAXIVL        ;IS INTERVAL GREATER THAN SOME PRESET
                                                                        ;  MAXIMUM ALLOWED?
060436  103420                                 BLO 12$                  ;BRANCH IF NO
060440                                         PRINTB #HLTMSG
  (6)  060440  012746  012167                  MOV     #HLTMSG,-(SP)
  (3)  060444  010600                          MOV     SP,R0
  (4)  060446  004737  065410                  JSR PC,FPRINT
060452  012737  060476  002170                 MOV #101$,HLTLOC
060460  004737  055402                         JSR PC,IDINFO            ;IDENTIFY FAILING INST
060464                                         PRINTB #NOPROG
  (6)  060464  012746  012206                  MOV     #NOPROG,-(SP)
  (3)  060470  010600                          MOV     SP,R0
  (4)  060472  004737  065410                  JSR PC,FPRINT
060476  000000                         101$:   HALT                     ;CIS INST DID NOT MAKE PROGRESS -
                                                                        ;  INTERVAL TILL INTERRUPT EXCEEDS USER
                                                                        ;  DEFINED MAXIMUM ALLOWED.
060500  005737  002540                 12$:    TST PROGCT               ;HAS PROGRESS BEEN MADE ON THIS INST PREVIOUSLY?
060504  001445                                 BEQ 13$                  ;BRANCH IF NO
060506  000702                                 BR 11$                   ;DISTURB INTERNAL STATE; THEN RETURN
                                                                        ;  FOR MORE PROGRESS
060510  101054                         1$:     BHI 15$                  ;BRANCH IF INST ALREADY HAS COMPLETED (PC>TINST)
060512  032766  000400  000002                 BIT #400,2(SP)           ;DID NOT REACH INST YET.
                                                                        ;VERIFY THAT BIT 8 OF PSW IS NOT SET.
060520  001435                                 BEQ 17$                  ;BRANCH IF BIT 8 = 0.
060522                                         PRINTB #HLTMSG
  (6)  060522  012746  012167                  MOV     #HLTMSG,-(SP)
  (3)  060526  010600                          MOV     SP,R0
  (4)  060530  004737  065410                  JSR PC,FPRINT
```

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      060534  012737  000102  002170          MOV #102,HLTLOC
      060542  004737  055402                  JSR PC,IDINFO           ;IDENTIFY FAILING INST
      060546                                  PRINTB #FORM44          ;MSG: BIT 8 OF PSW SET WITH PC < CIS INST PC
  (6) 060546  012746  015115                  MOV     #FORM44,-(SP)
  (3) 060552  010600                          MOV     SP,R0
  (4) 060554  004737  065410                  JSR PC,FPRINT
      060560                                  PRINTB #FORM45          ;MSG: SUSPECT THAT CIS INST BACKED UP TOO FAR
  (6) 060560  012746  015170                  MOV     #FORM45,-(SP)
  (3) 060564  010600                          MOV     SP,R0
  (4) 060566  004737  065410                  JSR PC,FPRINT
      060572                                  PRINTB #FORM46          ;MSG:   WHEN SERVICING INTERRUPT
  (6) 060572  012746  015247                  MOV     #FORM46,-(SP)
  (3) 060576  010600                          MOV     SP,R0
  (4) 060600  004737  065410                  JSR PC,FPRINT
      060604  000000                  102$:   HALT                    ;BIT 8 OF PSW SET WITH PC < CIS INST PC.
      060606  042766  000400  000002          BIC #400,2(SP)          ;SUSPECT THAT CIS INST BACKED UP PC TOO FAR
                                                                      ;  WHEN SERVICING INTERRUPT.
                                                                      ;PRESS CONTINUE TO PROCEED WITH TESTING
      060614  005237  002556          17$:    INC INTRVL
      060620  013777  002556  121674  13$:    MOV INTRVL,@PC1CSB      ;INCREASE INTERVAL
      060626  004737  061264                  JSR PC,RGPR06           ;RESTORE REGISTERS
      060632  005726                          TST (SP)+               ;FIX UP STACK POINTER
      060634  005726                          TST (SP)+
      060636  000137  047752                  JMP TOPC2               ;RETURN TO TURN ON PCLK-1 POINT

      060642  004737  061040          15$:    JSR PC,RECLAT           ;RECORD LATENCY
      060646  032737  000100  050012          BIT #100,TINST          ;IS INST UNDER TEST AN IN-LINE INST
      060654  001430                          BEQ 20$                 ;BRANCH IF NO
      060656  021637  002214                  CMP (SP),ICOMPC         ;VERIFY THAT PC HAS BEEN ADJUSTED TO POINT
                                                                      ;  TO NEXT INST
      060662  103025                          BHIS 20$                ;BRANCH IF PC IS OK
      060664                                  PRINTB #HLTMSG
  (6) 060664  012746  012167                  MOV     #HLTMSG,-(SP)
  (3) 060670  010600                          MOV     SP,R0
  (4) 060672  004737  065410                  JSR PC,FPRINT
      060676  012737  060734  002170          MOV #103$,HLTLOC
      060704  004737  055402                  JSR PC,IDINFO           ;IDENTIFY FAILING INST
      060710                                  PRINTB #FORM48          ;MSG: IN-LINE CIS INST COMPLETED WITH PC
  (6) 060710  012746  015401                  MOV     #FORM48,-(SP)
  (3) 060714  010600                          MOV     SP,R0
  (4) 060716  004737  065410                  JSR PC,FPRINT
      060722                                  PRINTB #FORM49          ;MSG: POINTING AT IN-LINE OPERANDS RATHER
  (6) 060722  012746  015457                  MOV     #FORM49,-(SP)
  (3) 060726  010600                          MOV     SP,R0
  (4) 060730  004737  065410                  JSR PC,FPRINT
                                                                      ;    THAN NEXT INST.
      060734  000000                  103$:   HALT                    ;PRESS CONTINUE TO PROCEED WITH TESTING
      060736  004737  061264          20$:    JSR PC,RGPR06           ;RESTORE REGISTERS
      060742  032766  000400  000002          BIT #400,2(SP)          ;CIS INST COMPLETE - VERIFY THAT PSW BIT 8
                                                                      ;  IS NOT SET
      060750  001420                          BEQ 16$
      060752                                  PRINTB #HLTMSG
  (6) 060752  012746  012167                  MOV     #HLTMSG,-(SP)
  (3) 060756  010600                          MOV     SP,R0
```

```
 (4) 060760  004737  065410                   JSR PC,FPRINT
     060764  012737  061010  002170           MOV #104$,HLTLOC
     060772  004737  055402                   JSR PC,IDINFO           ;IDENTIFY FAILING INST
     060776                                   PRINTB #FORM47          ;MSG: CIS INST COMPLETED BUT PSW BIT 8 STILL SET
 (6) 060776  012746  015320                   MOV     #FORM47,-(SP)
 (3) 061002  010600                           MOV     SP,R0
 (4) 061004  004737  065410                   JSR PC,FPRINT
     061010  000000                   104$:   HALT                    ;CIS INST COMPLETED BUT PSW BIT 8 STILL SET
                                                                      ;PRESS CONTINUE TO PROCEED WITH TESTING
     061012  042766  000400  000002   16$:    BIC #400,2(SP)
     061020  012777  000001  121474           MOV #1,@PC1CSB          ;SET UP FOR NEXT PASS
     061026  012737  000001  002556           MOV #1,INTRVL
     061034  000137  060422                   JMP 14$

                                      ;KW11-P INTERRUPT SERVICE ROUTINE SUBROUTINES
                                      ;
                                      ;ROUTINE TO RECORD INTERRUPT LATENCY
                                      ;
     061040  163737  002556  002542   RECLAT: SUB INTRVL,LATCT        ;CALCULATE LATENCY
     061046  005737  002560                   TST STOPLA              ;STOP ON EXCESSIVE LATENCY?
     061052  001424                           BEQ 2$                  ;BRANCH IF NO
     061054  023737  002560  002542           CMP STOPLA,LATCT        ;IS LATENCY EXCESSIVE?
     061062  101020                           BHI 2$                  ;BRANCH IF NO
     061064                                   PRINTB #HLTMSG
 (6) 061064  012746  012167                   MOV     #HLTMSG,-(SP)
 (3) 061070  010600                           MOV     SP,R0
 (4) 061072  004737  065410                   JSR PC,FPRINT
     061076  012737  000100  002170           MOV #100,HLTLOC
     061104  004737  055402                   JSR PC,IDINFO           ;IDENTIFY FAILING INST
     061110                                   PRINTB #LATEXC
 (6) 061110  012746  012254                   MOV     #LATEXC,-(SP)
 (3) 061114  010600                           MOV     SP,R0
 (4) 061116  004737  065410                   JSR PC,FPRINT
     061122  000000                   100$:   HALT                    ;LATENCY EXCEEDED USER DEFINED
                                                                      ;  "MAXIMUM ALLOWABLE"

     061124  013701  002276           2$:     MOV OCTIC,R1            ;RECORD LATENCY
     061130  006301                           ASL R1
     061132  062701  004106                   ADD #ILATEN,R1          ;FORM POINTER INTO INST LATENCY TABLE
     061136  021137  002542                   CMP (R1),LATCT          ;IS LATENCY BIGGER THAN THAT ALREADY
                                                                      ;  RECORDED FOR INST?
     061142  101002                           BHI 1$                  ;BRANCH IF NO
     061144  013711  002542                   MOV LATCT,(R1)          ;SAVE NEW LATENCY VALUE
     061150  000207                   1$:     RTS PC

                                      ;ROUTINE TO TURN ON P-CLK DURING DIVPI 'STATE DISTURBING' INST
                                      ;
     061152  017737  121336  002036   DIC:    MOV @PCLK1V,SPCV        ;SAVE CONTENTS OF P CLK INTERR VECTOR
     061160  013737  120400  002040           MOV PRECSK,TPRECS       ;SAVE CONTENTS OF 65TH STACK WORD
     061166  012777  060100  121320           MOV #PCIS3,@PCLK1V      ;SETUP INTR VECTOR
     061174  000207                   DI:     RTS PC                  ;OVERWRITTEN WITH A NOP IF USER REQUESTS
     061176  052777  000001  121314           BIS #1,@PC1CSR          ;TURN ON P-CLK1  - ENABLE INTR DURING
                                                                      ;  SUBSEQUENT (STATE DISTURBING) CIS INST
     061204  000207                           RTS PC
```

```

                                         ;ROUTINE TO SAVE GENERAL PURPOSE REGISTERS 0 THROUGH 6.
                                         ;
061206                                   SGPR06:
061206  010037  003004                          MOV R0,SGPR0
061212  010137  003006                          MOV R1,SGPR1
061216  010237  003010                          MOV R2,SGPR2
061222  010337  003012                          MOV R3,SGPR3
061226  010437  003014                          MOV R4,SGPR4
061232  010537  003016                          MOV R5,SGPR5
061236  032737  030000  177776                  BIT #30000,PSW           ;WAS PREVIOUS MODE USER OR SUPV?
061244  001404                                  BEQ 1$                   ;BRANCH IF NO
061246  006506                                  MFPI SP                  ;GET PREVIOUS MODE SP
061250  012637  003020                          MOV (SP)+,SGPR6          ;STORE PREVIOUS MODE SP IN SGPR6
061254  000402                                  BR 2$
061256  010637  003020                   1$:    MOV SP,SGPR6
061262  000207                           2$:    RTS PC

                                         ;
                                         ;ROUTINE TO RESTORE GENERAL PURPOSE REGISTERS 0 THROUGH 5
                                         ;
061264                                   RGPR06:
061264  013700  003004                          MOV SGPR0,R0
061270  013701  003006                          MOV SGPR1,R1
061274  013702  003010                          MOV SGPR2,R2
061300  013703  003012                          MOV SGPR3,R3
061304  013704  003014                          MOV SGPR4,R4
061310  013705  003016                          MOV SGPR5,R5
                                                                         ;NOTE NO NEED TO RESTORE R6 BECAUSE IT HAS NOT CHANGED.
061314  000207                                  RTS PC

                                         ;
                                         ;ROUTINE TO SAVE STATE OF CISP - STATE=STACK POINTER,GENERAL PURPOSE REGISTER
```

```
13783                                   ;  CONTENTS & STACK CONTENTS.
13784                                   ;
13785  061316                           SAVST:
13786  061316  016637  000004  002564          MOV 4(SP),STATPS         ;SAVE PSW STATE
13787  061324  013737  003004  002566          MOV SGPR0,STATR0         ;SAVE STATE OF GENERAL PURPOSE REGS 0-6
13788  061332  013737  003006  002570          MOV SGPR1,STATR1
13789  061340  013737  003010  002572          MOV SGPR2,STATR2
13790  061346  013737  003012  002574          MOV SGPR3,STATR3
13791  061354  013737  003014  002576          MOV SGPR4,STATR4
13792  061362  013737  003016  002600          MOV SGPR5,STATR5
```

```
 13794  061370  013737  003020  002602          MOV SGPR6,STATR6
 13795  061376  013700  003020                  MOV SGPR6,R0            ;SAVE STACK CONTENTS
```

```
 13797  061402  062700  000006                    ADD #6,R0
```

```
061406  020027  120602                  CMP R0,#CSTACK          ;DID CIS INST PUSH ANYTHING ONTO STACK?
061412  103007                          BHIS 1$                 ;BRANCH IF NO
061414  012702  003004                  MOV #SCSTK,R2           ;COPY USED PORTION OF STACK INTO A
061420  012701  120602                  MOV #CSTACK,R1          ;  SAVE AREA.
061424  014142                  2$:     MOV -(R1),-(R2)
061426  020100                          CMP R1,R0               ;ALL OF USED PORTION OF STACK COPIED?
061430  103375                          BHIS 2$                 ;BRANCH IF NO
061432  000207                  1$:     RTS PC

                                ;
                                ;ROUTINE TO CHECK FOR A CISP STATE CHANGE
                                ;  RETURNS TO CALL ON NO CHANGE; CALL+2 ON CHANGE
```

```
13812                                   ;
13813  061434                           STATCG:
13814  061434  026637  000004  002564           CMP 4(SP),STATPS        ;DID PSW CHANGE?
```

```
 13816  061442  001054                          BNE STHASC              ;BRANCH IF YES
 13817  061444  023737  003020  002602          CMP SGPR6,STATR6        ;DID STACK POINTER CHANGE?
 13818  061452  001050                          BNE STHASC              ;BRANCH IF YES
 13819  061454  023737  003004  002566          CMP SGPR0,STATR0        ;DID ANY OF THE GENERAL PURPOSE REGISTER
 13820                                                                  ;CONTENTS CHANGE?
 13821  061462  001044                          BNE STHASC              ;BRANCH IF R0 CHANGED
```

```
061464  023737  003006  002570          CMP SGPR1,STATR1
061472  001040                          BNE STHASC              ;BRANCH IF R1 HAS CHANGED
061474  023737  003010  002572          CMP SGPR2,STATR2
061502  001034                          BNE STHASC              ;BRANCH IF R2 HAS CHANGED
061504  023737  003012  002574          CMP SGPR3,STATR3
061512  001030                          BNE STHASC              ;BRANCH IF R3 HAS CHANGED
061514  023737  003014  002576          CMP SGPR4,STATR4
061522  001024                          BNE STHASC              ;BRANCH IF R4 HAS CHANGED
061524  023737  003016  002600          CMP SGPR5,STATR5        ;
061532  001020                          BNE STHASC              ;BRANCH IF R5 HAS CHANGED
061534  013700  003020                  MOV SGPR6,R0            ;DID THE STACK CONTENTS CHANGE
061540  062700  000006                  ADD #6,R0
061544  020027  120602                  CMP R0,#CSTACK          ;DID ANYTHING GET PUSHED ONTO THE STACK?
061550  103010                          BHIS 1$                 ;BRANCH IF NO
061552  012702  003004                  MOV #SCSTK,R2
061556  012701  120602                  MOV #CSTACK,R1
061562  024142                  2$:     CMP -(R1),-(R2)         ;DID ANY OF THE INFORMATION ON THE STACK GET CHANGED?
061564  001003                          BNE STHASC              ;BRANCH IF YES
061566  020100                          CMP R1,R0               ;ALL OF STACK CHECKED?
061570  103374                          BHIS 2$                 ;BRANCH IF NO
061572  000402                  1$:     BR NOSCHG
061574  062716  000002          STHASC: ADD #2,(SP)
061600  000207                  NOSCHG: RTS PC

                                ;ROUTINE TO CHECK FOR AND SETUP P-CLK 1
061602                          PC1CK:                          ;TEST FOR P-CLKS PRESENT
```

```
061602  013701  002536                    MOV TIMOUT,R1           ;SAVE TIME OUT VECTOR CONTENTS
061606  011146                            MOV (R1),-(SP)
061610  012721  061676                    MOV #1$,(R1)+
061614  011146                            MOV (R1),-(SP)
061616  005011                            CLR (R1)

061620  005777  120674                    TST @PC1CSR             ;ATTEMPT ACCESS P-CLK1 CSR
                                                                  ;PCLK1 IS RESPONDING
061624  012777  060134  120662            MOV #PCIS1,@PCLK1V      ;SET UP P-CLK1 INTERRUPT SERVICE VECTOR
061632  005077  120662                    CLR @PC1CSR             ;CLEAR P-CLK1 CSR
061636  012777  000000  120654            MOV #000,@PC1CSR        ;SET P-CLK1 FOR SINGLE INT,COUNT DOWN,100K HZ
                                                                  ;  CLOCK, INT ENABLE
061644  012777  000001  120650            MOV #1,@PC1CSB          ;SET COUNTER TO 1 (1 MICRO SEC INTERVAL
                                                                  ;  WITH 1 MHZ EXTERNAL CLOCK.
061652  012737  000001  002556            MOV #1,INTRVL           ;SAVE INTERVAL SETTING
061660  013737  002550  047762            MOV KNOP1,TOPC1         ;OVERWRITE BRANCH TO ALLOW TURNING ON OF
                                                                  ;        PCLK1 PRIOR TO CIS INST EXECUTION
061666  062766  000004  000004            ADD #4,4(SP)            ;ADJUST STACK FOR 'EXISTS RETURN'
061674  000402                            BR 2$
061676  005726                    1$:     TST (SP)+               ;FIX UP STACK POINTER
061700  005726                            TST (SP)+
061702  013701  002536            2$:     MOV TIMOUT,R1           ;RESTORE TIME OUT INTR VECTOR TO ORIGINAL STATE
061706  012661  000002                    MOV (SP)+,2(R1)
061712  012611                            MOV (SP)+,(R1)
061714  000207                            RTS PC

                                  ;ROUTINE TO CHECK FOR AND SETUP P-CLK2
061716  013701  002536            PC2CK:  MOV TIMOUT,R1           ;SAVE TIME OUT VECTOR CONTENTS
061722  011146                            MOV (R1),-(SP)
061724  012721  062024                    MOV #1$,(R1)+
061730  011146                            MOV (R1),-(SP)
061732  005011                            CLR (R1)
061734  005777  120570                    TST @PC2CSR             ;ATTEMPT ACCESS OF PCLK 2 CSR
061740  012737  177777  002544            MOV #177777,LATEN       ;SET LATENCY TESTING FLAG
061746  012700  004106                    MOV #ILATEN,R0          ;CLEAR INTERRUPT LATENCY TABLE
061752  005020                    12$:    CLR (R0)+
061754  020027  004176                    CMP R0,#LATEND+2
061760  001374                            BNE 12$
061762  012777  060110  120524            MOV #PCIS2,@PCLK1V
061770  005077  120534                    CLR @PC2CSR             ;CLEAR P-CLK2 CSR
```

```
061774  012777  000020  120526          MOV #20,@PC2CSR         ;SET P-CLK2 FOR INT. DISABLE, COUNT UP
                                                                ;  100KHZ CLOCK
062002  005077  120524                  CLR @PC2CSB             ;SET COUNTER TO 0
062006  013737  002552  047752          MOV KNOP2,TOPC2         ;OVERWRITE BRANCH TO ALLOW TURNING ON OF
                                                                ;  PCLK2 PRIOR TO CIS INST EXECUTION
062014  062766  000004  000004          ADD #4,4(SP)            ;ADJUST STACK FOR 'EXISTS RETURN'
062022  000402                          BR 2$
062024  005726                  1$:     TST (SP)+               ;FIX UP STACK POINTER
062026  005726                          TST (SP)+
062030  013701  002536          2$:     MOV TIMOUT,R1           ;RESTORE TIME OUT INTERRUPT VECTOR TO
062034  012661  000002                  MOV (SP)+,2(R1)         ;  ORIGINAL STATE
062040  012611                          MOV (SP)+,(R1)
062042  000207                          RTS PC
```

```
                                          .SBTTL           LINE TIME CLOCK ROUTINES
                                          ;
                                          ; KW11-L (LINE TIME CLOCK) INTERRUPT SERVICE ROUTINE
                                          ;
062044  013746  177572                    LTCIS:  MOV @#MMR0,-(SP)          ;SAVE MEM MGMT STATE ON STACK - OVERWRITTEN WITH A
                                                                            ; BRANCH (405) IF NO MEM MGMT ON SYSTEM
062050  005037  177572                            CLR @#MMR0                ;TURN OFF MEM MGMT
062054  012637  002210                            MOV (SP)+,MMSTAT          ;RESTORE STACK TO PROPER POINT
062060  042777  000100  120740                    BIC #100,@LKS             ;TURN OFF LTC
062066  004737  061206                            JSR PC,SGPR06             ;SAVE GENERAL PURPOSE REGS 0-6
```

```
      062072 021627 050012                CMP (SP),#TINST       ;INTERRUPTED THE CIS INST UNDER TEST?
      062076 001053                       BNE EXLTCS            ;NO - EXIT LTC SERVICE
      062100 004737 061434                JSR PC,STATCG         ;HAS THE STATE OF CIS INST CHANGED?
      062104 000450                       BR EXLTCS             ;NO RETURN - EXIT LTC SERVICE
      062106 032766 000400 000002         BIT #400,2(SP)        ;YES RETURN - IS PSW BIT 8 SET?
      062114 001025                       BNE 1$                ;BRANCH IF YES
      062116                              PRINTB #HLTMSG
  (6) 062116 012746 012167                MOV     #HLTMSG,-(SP)
  (3) 062122 010600                       MOV     SP,R0
  (4) 062124 004737 065410                JSR PC,FPRINT
      062130 012737 062166 002170         MOV #100$,HLTLOC
      062136 004737 055402                JSR PC,IDINFO         ;IDENTIFY FAILING INST
      062142                              PRINTB #FORM42        ;MSG: CIS INST WAS SUSPENDED TO SERVICE INTR
  (6) 062142 012746 014745                MOV     #FORM42,-(SP)
  (3) 062146 010600                       MOV     SP,R0
  (4) 062150 004737 065410                JSR PC,FPRINT
      062154                              PRINTB #FORM43        ;MSG: PSW BIT 8 SHOULD HAVE BEEN SET BUT WAS NOT
  (6) 062154 012746 015034                MOV     #FORM43,-(SP)
  (3) 062160 010600                       MOV     SP,R0
  (4) 062162 004737 065410                JSR PC,FPRINT
      062166 000000                100$:  HALT

      062170 005237 002546         1$:    INC INTCT             ;UPDATE INTERRUPT COUNT
      062174 052737 040000 002132         BIS #40000,FATAL      ;SET INTR INDICATION IN FATAL ERROR WORD
      062202 013737 120400 002040         MOV PRECSK,TPRECS     ;SAVE CONTENTS OF 65TH STACK WORD
      062210 076175                       DIVPI                 ;DISTURB INTERNAL CISP STATE BY
      062212 003152                       DIVDS                 ;  EXECUTING A DIVP IN-LINE INST.
      062214 003152                       DIVDS
      062216 003156                       DIVDD
      062220 013737 002040 120400         MOV TPRECS,PRECSK     ;RESTORE 65TH STACK WORD
      062226 004737 061264         EXLTCS: JSR PC,RGPR06        ;RESTORE GENERAL PURPOSE REGS 0-6
      062232 005737 002156                TST MMFLG             ;TESTING WITH MEM MGMT ON ?
      062236 001403                       BEQ 1$                ;BRANCH IF NO
      062240 013737 002210 177572         MOV MMSTAT,@#MMR0     ;TURN ON MEM MGMT
      062246 000002                1$:    RTI                   ;RETURN FROM SERVICE
```

```


                                        ;LTC SYNC UP ROUTINE
                                        ;
062250                                  LTCSUP:
062250  012777  062272  120544                  MOV #LSUPR,@LTCIV       ;SETUP LTC INTERRUPT VECTOR
062256  005077  120544                          CLR @LKS
062262  052777  000100  120536                  BIS #100,@LKS           ;ENABLE INTERRUPTS

062270  000001                          1$:     WAIT                    ;WAIT FOR CLOCK SIGNAL
062272  005077  120530                  LSUPR:  CLR @LKS                ;DISABLE LTC INTERRUPTS
062276  012777  062044  120516                  MOV #LTCIS,@LTCIV       ;RESTORE LTC INTERRUPT VECTOR
062304  005726                                  TST (SP)+               ;FIX UP STACK
062306  005726                                  TST (SP)+
062310  000207                                  RTS PC

```

```

                                        ;LTC  - DETERMINE COUNT PER CLOCK TICK
                                        ;
062312                                  LTCCNT:
062312  012777  062340  120502                  MOV #LTCINT,@LTCIV      ;SETUP LTC INTERRUPT SERVICE
062320  005077  120502                          CLR @LKS
062324  052777  000100  120474                  BIS #100,@LKS           ;ENABLE INTERRUPTS
062332  005237  003030                  1$:     INC LCNT                ;COUNT TILL LTC INTERRUPTS
062336  000775                                  BR 1$
062340  005077  120462                  LTCINT: CLR @LKS                ;DISABLE LTC INTERRUPTS
062344  163737  003036  003030                  SUB LTCDLY,LCNT         ;INTERRUPT RETURN
062352  012777  062044  120442                  MOV #LTCIS,@LTCIV       ;RESTORE LTC INTERRUPT VECTOR
062360  005726                                  TST (SP)+
062362  005726                                  TST (SP)+               ;FIX UP STACK
062364  000207                                  RTS PC


                                        ; LTC - ROUTINE TO CHECK FOR LINE TIME CLOCK ON SYSTEM
                                        ;
062366                                  LTCP:
062366  013701  002536                          MOV TIMOUT,R1           ;SAVE TIME OUT VECTOR
062372  011146                                  MOV (R1),-(SP)          ;SETUP INTERRUPT VECTOR
062374  012721  062432                          MOV #1$,(R1)+
062400  011146                                  MOV (R1),-(SP)
062402  005011                                  CLR (R1)
062404  005777  120416                          TST @LKS                ;ATTEMPT ACCESS OF LTC
062410  005077  120412                          CLR @LKS                ;CLEAR LTC CSR
```

```
062414  013737  003034  047720           MOV KNOP4,TOLTC          ;OVERWRITE BRANCH TO ALLOW TURNING ON OF
                                                                  ;  OF LTC PRIOR TO CIS INST EXECUTION.
062422  062766  000004  000004           ADD #4,4(SP)             ;ADJUST RETURN TO CALL + 4
062430  000402                           BR 2$
062432  005726                   1$:     TST (SP)+                ;FIX UP STACK POINTER
062434  005726                           TST (SP)+
062436  013701  002536           2$:     MOV TIMOUT,R1            ;RESTORE TIME OUT INTR VECTOR TO
062442  012661  000002                   MOV (SP)+,2(R1)          ;  ORIGINAL STATE
062446  012611                           MOV (SP)+,(R1)
062450  000207                           RTS PC
                                 ;
                                 ;RANDOM EXERCISE MODE SUBROUTINES
                                 ;

062452                           SRNGST:                          ;SUBROUTINE TO SAVE RANDOM # GEN STATE
                                                                  ;AT START OF EACH TEST
062452  013737  063612  001776           MOV RNCON,STRNC
062460  013737  063614  002000           MOV RP1,STRP1
062466  013737  063616  002002           MOV RP2,STRP2
062474  000207                           RTS PC

062476                           SRNGSX:                          ;SUBROUTINE TO SAVE RANDOM # GEN. STATE X.
062476  013737  063612  002004           MOV RNCON,SXRNC
062504  013737  063614  002006           MOV RP1,SXRP1
062512  013737  063616  002010           MOV RP2,SXRP2
062520  000207                           RTS PC

062522                           RRNGSX:                          ;SUBROUTINE TO RESTORE RANDOM # GEN STATE X.
062522  013737  002004  063612           MOV SXRNC,RNCON
```

```
 14023  062530  013737  002006  063614          MOV SXRP1,RP1
 14024  062536  013737  002010  063616          MOV SXRP2,RP2
 14025  062544  000207                          RTS PC
 14026
 14027  062546                          SRNGSY:                         ;SUBROUTINE TO SAVE RANDOM # GEN STATE Y.
 14028  062546  013737  063612  002012          MOV RNCON,SYRNC
```

```
062554  013737  063614  002014                   MOV RP1,SYRP1
062562  013737  063616  002016                   MOV RP2,SYRP2
062570  000207                                   RTS PC

062572                          RRNGSY:                                ;SUBROUTINE TO RESTORE RANDOM # GEN STATE Y.
062572  013737  002012  063612                   MOV SYRNC,RNCON
062600  013737  002014  063614                   MOV SYRP1,RP1
062606  013737  002016  063616                   MOV SYRP2,RP2
062614  000207                                   RTS PC

062616                          SRNGSW:                                ;SUBROUTINE TO SAVE RANDOM # GEN STATE W.
062616  013737  063612  002020                   MOV RNCON,SWRNC
062624  013737  063614  002022                   MOV RP1,SWRP1
062632  013737  063616  002024                   MOV RP2,SWRP2
062640  000207                                   RTS PC

062642                          RRNGSW:                                ;SUBROUTINE TO RESTORE RANDOM # GEN STATE W.
062642  013737  002020  063612                   MOV SWRNC,RNCON
062650  013737  002022  063614                   MOV SWRP1,RP1
062656  013737  002024  063616                   MOV SWRP2,RP2
062664  000207                                   RTS PC

062666                          SRNGSV:                                ;SUBROUTINE TO SAVE RANDOM # GEN STATE V.
062666  013737  063612  002026                   MOV RNCON,SVRNC
062674  013737  063614  002030                   MOV RP1,SVRP1
062702  013737  063616  002032                   MOV RP2,SVRP2
062710  000207                                   RTS PC

062712                          RRNGSV:                                ;SUBROUTINE TO RESTORE RANDOM # GEN STATE V.
062712  013737  002026  063612                   MOV SVRNC,RNCON
062720  013737  002030  063614                   MOV SVRP1,RP1
```

```
14062  062726  013737  002032  063616          MOV SVRP2,RP2
```

```
14064  062734  000207                    RTS PC
14065
```

```
                                        .SBTTL          RANDOM MODE SUBROUTINES
                                        ;
                                        ;SUBROUTINE TO GENERATE A RANDOM CIS INST AND LOAD ITS IDENTIFIER
                                        ;(REFERENCE THE OINST TABLE) INTO THE FIRST WORD OF THE DUMMY
                                        ;INPUT TABLE. THIS ROUTINE ONLY GENERATES CIS INSTS WHICH HAVE A NON-ZERO
                                        ;ENCODING IN THE OINST TABLE.  ZERO OINST TABLE ENTRIES ASSOC WITH CIS INST
                                        ;NOT TO BE INCLUDED IN THE RANDOM EXERCISING.
                                        ;
062736                                  GENRI:
062736  004737  063532                          JSR PC,RN               ;GET A RANDOM #
062742  042700  177740                          BIC #BS128,R0           ;MASK OFF ALL BUT LEAST SIGNIF 5 BITS
062746  005200                                  INC R0
062750  020027  000031                          CMP R0,#31              ;VALID IDENTIFIERS = 1 TO 31
062754  101370                                  BHI GENRI               ;BRANCH IF IDENTIFIER IS INVALID
```

```
062756  010037  072144                  MOV R0,IDUM             ;LOAD INST IDENTIFIER INTO DUMMY INPUT TABLE
062762  006300                          ASL R0
062764  062700  003726                  ADD #OINST,R0           ;VERIFY THAT GENERATED INST IS
062770  005710                          TST (R0)                ;A MEMBER OF THE SET OF CIS INSTS
062772  001761                          BEQ GENRI               ;TO BE RANDOMLY EXERCISED.
062774  000207                          RTS PC
                                ;
                                ;ROUTINE TO LOAD UP DUMMY INPUT TABLE USING RANDOM NUMBER GENERATOR.
                                ;ROUTINE USES THE RANDOM EXERCISE MASK TABLES TO LIMIT OPERANDS
                                ;(LENGTHS,ADDRESSES,ETC) TO THE PROPER RANGE.
                                ;
062776  012702  072150          LDINPT: MOV #IDUM+4,R2          ;SETUP POINTER INTO DUMMY TABLE
063002  013701  072144                  MOV IDUM,R1
063006  006301                          ASL R1
063010  062701  004176                  ADD #MINST,R1
063014  011101                          MOV (R1),R1
063016  012137  001764          1$:     MOV (R1)+,PMASK         ;GET MASK FOR GIVEN INPUT PARAMETER
063022  022737  125252  001764          CMP #EOT,PMASK          ;IS MASK=END OF MASK TABLE (EOT)
063030  001431                          BEQ IDFLD               ;BRANCH IF YES
063032  022737  152525  001764          CMP #DSCPTR,PMASK       ;DOES MASK INDICATE THAT INPUT
                                                                ;PARAMETER IS A DESCRIPTOR POINTER?
063040  001003                          BNE 2$                  ;BRANCH IF NO
063042  012722  002510                  MOV #RANDSC,(R2)+       ;FILL TABLE ENTRY WITH A RANDOM
063046  000763                          BR 1$                   ;DESCRIPTOR POINTER.
063050  032737  100000  001764  2$:     BIT #100000,PMASK       ;MASK AND OFFSET?
063056  001010                          BNE 3$                  ;BRANCH IF NO(MASK ONLY).
063060  004737  063532                  JSR PC,RN               ;GENERATE A RANDOM #
063064  042700  176000                  BIC #BS4,R0             ;MASK WITH 176000
063070  063700  001764                  ADD PMASK,R0            ;ADD IN OFFSET
063074  010022                          MOV R0,(R2)+            ;STORE INPUT PARAMETER
063076  000747                          BR 1$
063100  004737  063532          3$:     JSR PC,RN               ;GENERATE A RANDOM NUMBER
063104  043700  001764                  BIC PMASK,R0            ;MASK TO VALID RANGE
063110  010022                          MOV R0,(R2)+            ;STORE INPUT PARAMETER IN DUMMY TABLE
063112  000741                          BR 1$
063114  005022                  IDFLD:  CLR (R2)+               ;CLEAR REMAINDER OF DUMMY INPUT TABLE
063116  020227  072216                  CMP R2,#IDUME
063122  001374                          BNE IDFLD
063124  022737  000020  072144          CMP #20,IDUM            ;IS RANDOM MODE INST = ASHP OR ASHN?
063132  001404                          BEQ 1$                  ;BRANCH IF YES
063134  022737  000030  072144          CMP #30,IDUM
063142  001007                          BNE 2$                  ;BRANCH IF NO
063144  123727  072155  000011  1$:     CMPB IDUM+11,#11        ;YES - LIMIT ROUND DIGIT TO 0 - 9
063152  101403                          BLOS 2$
063154  142737  000010  072155          BICB #10,IDUM+11                ;CONVERT INVALID DIGIT TO A VALID ONE
063162  022737  000003  072144  2$:     CMP #3,IDUM             ;IS RANDOM INST = MOVTC
063170  001006                          BNE 3$                  ;BRANCH IF NO
063172  013737  072200  002172          MOV IDUM+34,IRXLT       ;ADJUST IP15 FOR PROPER LEVEL OF INDIRECTING
063200  012737  002172  072200          MOV #IRXLT,IDUM+34
063206  000207                  3$:     RTS PC
                                ;
                                ;ROUTINE TO LOAD MISCELLANEOUS CONSTANTS USING RANDOM NUMBER GENERATOR
                                ;
063210                          LDCON:
```

```
063210  004737  063532                          JSR PC,RN
063214  010037  001660                          MOV R0,INCSQ1           ;LOAD TEST BUFFER INCREMENTING SEQUENCE
063220  004737  063532                          JSR PC,RN               ;  SEED WITH A RANDOM #
063224  010037  001662                          MOV R0,INCSQ2
063230  000207                                  RTS PC
                                ;
                                ;ROUTINE TO ACKNOWLEDGE OPERATOR REQUESTS
                                ;               CNTL T - DISPLAY CURRENT TEST #(DECIMAL) THEN RETURN TO CALL+6
                                ;               CNTL C - RETURN TO CALL+2
                                ;               CNTL D - SET DISPLAY AND NO QUERY SWITCH. THEN RETURN TO CALL + 6
                                ;               CNTL E - SET DISPLAY SWITCH. THEN RETURN TO CALL + 6
                                ;               CNTL N - CLEAR DISPLAY SWITCH. THEN RETURN TO CALL + 6
                                ;               CNTL O - TOGGLE PROGRESS DISPLAY SWITCH. THEN RETURN TO CALL +6
                                ;               OTHER - RETURN TO CALL+6
                                ;
063232                          EXTBK:
063232  005737  111202                          TST XOCHAR              ;DID TYPE ROUTINE XON/XOFF CHECK FIND A CHAR
063236  001406                                  BEQ 7$                  ;BRANCH IF NO
063240  013737  111202  064776                  MOV XOCHAR,RCHAR
063246  005037  111202                          CLR XOCHAR
063252  000406                                  BR 8$
063254  105777  116406          7$:             TSTB @TKS               ;CHAR THERE?
063260  100063                                  BPL 1$                  ;NO - EXIT ROUTINE
063262  117737  116424  064776                  MOVB @TKB,RCHAR         ;READ AND SAVE TTY CHAR
063270  042737  177600  064776  8$:             BIC #^C177,RCHAR        ;GET RID OF JUNK IF ANY
063276  023727  064776  000003                  CMP RCHAR,#003          ;IS CHAR A CNTL C?
063304  001453                                  BEQ 2$                  ;BRANCH IF YES
063306  023727  064776  000024                  CMP RCHAR,#024          ;IS CHAR A CNTL T?
063314  001003                                  BNE 3$
063316  004737  063436                          JSR PC,IDINST
063322  000442                                  BR 1$
063324  023727  064776  000004  3$:             CMP RCHAR,#004          ;IS CHAR A CNTL D?
063332  001007                                  BNE 5$
063334  012737  177777  002042                  MOV #177777,NOERDS      ;SET DISPLAY SWITCH
063342  012737  177777  002204                  MOV #177777,QRYFLG      ;SET QUERY FOR DISPLAY BUFFER FLAG
063350  000427                                  BR 1$
063352  023727  064776  000005  5$:             CMP RCHAR,#005          ;IS CHAR A CNTL E?
063360  001004                                  BNE 6$                  ;BRANCH IF NO
063362  012737  177777  002042                  MOV #177777,NOERDS      ;SET DISPLAY SWITCH
063370  000417                                  BR 1$
063372  023727  064776  000017  6$:             CMP RCHAR,#017          ;IS CHAR A CNTL O?
063400  001003                                  BNE 4$                  ;BRANCH IF NO
063402  005137  002044                          COM PROGD               ;TOGGLE PROGRESS DISPLAY SWITCH
063406  000410                                  BR 1$
063410  023727  064776  000016  4$:             CMP RCHAR,#016          ;IS CHAR A CNTL N?
063416  001004                                  BNE 1$
063420  005037  002042                          CLR NOERDS              ;YES - CLEAR NO ERROR DISPLAY SWITCH
063424  005037  002204                          CLR QRYFLG              ;CLEAR QUERY SWITCH
063430  062716  000004          1$:             ADD #4,(SP)             ;RETURN TO CALL+6
063434  000207                  2$:             RTS PC

                                ;ROUTINE TO DISPLAY CURRENT INST AND TEST #
```

```
      063436                              IDINST:
      063436  012737  177777  001762              MOV #177777,CTACT         ;SET CONTROL T ACTIVE FLAG
      063444                                      PRINTB #FORM21            ;PRINT A CRLF
  (6) 063444  012746  014074                      MOV     #FORM21,-(SP)
  (3) 063450  010600                              MOV     SP,R0
  (4) 063452  004737  065410                      JSR PC,FPRINT
      063456  004777  116460                      JSR PC,@EMPTR             ;PRINT 'INST & TEST #
      063462  000207                              RTS PC


                                          ;ROUTINE TO RANDOMIZE PACKED STRING DATA TYPE
                                          ;
      063464                              RPTYPE:
      063464  004737  063532                      JSR PC,RN                 ;GET A RANDOM #
      063470  032700  000001                      BIT #1,R0                 ;USE BIT 0 OF THE RANDOM # TO SELECT BETWEEN
      063474  001403                              BEQ 1$                    ; THE TWO TYPES FOR PACKED STRINGS (6,7).
      063476  012700  000007                      MOV #7,R0
      063502  000402                              BR 10$
      063504  012700  000006              1$:     MOV #6,R0
      063510  000207                      10$:    RTS PC

                                          ;ROUTINE TO RANDOMIZE ZONED STRING DATA TYPES
                                          ;
      063512                              RZTYPE:
      063512  004737  063532                      JSR PC,RN                 ;GET A RANDOM #
      063516  042700  177770                      BIC #177770,R0            ;USE BITS 0,1 & 2 TO SELECT BETWEEN
      063522  020027  000005                      CMP R0,#5                 ; THE 6 TYPES FOR ZONED STRINGS
      063526  101371                              BHI RZTYPE
      063530  000207                              RTS PC

                                          ;ROUTINE TO GENERATE A PSEUDO RANDOM NUMBER
                                          ;
                                          ;INPUTS:         NONE
                                          ;OUTPUTS:        PSEUDO RANDOM VALUE IN R0
                                          ;
                                          ;
      063532                              RN:
      063532  013700  063614                      MOV RP1,R0
      063536  000241                              CLC
      063540  005337  063612                      DEC RNCON
      063544  006100                              ROL R0
      063546  006100                              ROL R0
      063550  063700  063612                      ADD RNCON,R0
      063554  063700  063616                      ADD RP2,R0
      063560  010037  063614                      MOV R0,RP1
      063564  006100                              ROL R0
      063566  006100                              ROL R0
      063570  063700  063616                      ADD RP2,R0
      063574  006100                              ROL R0
      063576  006100                              ROL R0
      063600  010037  063616                      MOV R0,RP2
      063604  013700  063614                      MOV RP1,R0
      063610  000207                              RTS PC
      063612  000000                      RNCON:  .WORD 0                   ;RANDOM # GENERATOR SEEDS
```

```
14246  063614  001233              RP1:     .WORD 1233
14247  063616  007622              RP2:     .WORD 7622
14248  063620  000000              KRNCON:  .WORD 0
14249  063622  001233              KRP1:    .WORD 1233
14250  063624  007622              KRP2:    .WORD 7622
14251
```

```
 14253                                         .SBTTL          MESSAGE PRINT ROUTINES
 14254                                         ;++++++
 14255                                         ;
 14256                                         ;ERROR MESSAGE PRINT ROUTINES
 14257                                         ;       RETURNS TO CALL +2 FOR REPEAT TEST
 14258                                         ;       RETURNS TO CALL +6 FOR NORMAL RETURN
 14259                                         ;
 14260                                         ;------
 14261  063626                                 INSERR:
 14262  063626  004777  116310                         JSR     PC,@EMPTR               ;PRINT ERROR MESSAGE HEADER
 14263  063632  032737  000100  050012                 BIT     #100,TINST              ;INST UNDER TEST TYPE?
 14264  063640  001406                                 BEQ     11$                     ;BRANCH IF REGISTER TYPE
 14265  063642                                         PRINTB  #INMEM                  ;IN-LINE TYPE
   (6)  063642  012746  011120                         MOV     #INMEM,-(SP)
   (3)  063646  010600                                 MOV     SP,R0
   (4)  063650  004737  065410                         JSR PC,FPRINT
 14266  063654  000405                                 BR      12$
 14267  063656                                 11$:    PRINTB  #INREG
   (6)  063656  012746  011072                         MOV     #INREG,-(SP)
   (3)  063662  010600                                 MOV     SP,R0
   (4)  063664  004737  065410                         JSR PC,FPRINT
 14268  063670                                 12$:    PRINTB  #FORM13,ER0,ER1,ER2,ER3,ER4,ER5,TR6,<B,TCC>
  (14)  063670  005046                                 CLR     -(SP)
  (14)  063672  153716  003646                         BISB    TCC,(SP)
  (13)  063676  013746  003644                         MOV     TR6,-(SP)
  (12)  063702  013746  003702                         MOV     ER5,-(SP)
  (11)  063706  013746  003700                         MOV     ER4,-(SP)
  (10)  063712  013746  003676                         MOV     ER3,-(SP)
   (9)  063716  013746  003674                         MOV     ER2,-(SP)
   (8)  063722  013746  003672                         MOV     ER1,-(SP)
   (7)  063726  013746  003670                         MOV     ER0,-(SP)
   (6)  063732  012746  011174                         MOV     #FORM13,-(SP)
   (5)  063736  010600                                 MOV     SP,R0
   (4)  063740  004737  065410                         JSR PC,FPRINT
 14269  063744                                         PRINTB  #EMOUT
   (6)  063744  012746  011146                         MOV     #EMOUT,-(SP)
   (3)  063750  010600                                 MOV     SP,R0
   (4)  063752  004737  065410                         JSR PC,FPRINT
 14270  063756                                         PRINTB  #FORM14,ER0R,ER1R,ER2R,ER3R,ER4R,ER5R,ER6R,<B,ECCR>
  (14)  063756  005046                                 CLR     -(SP)
  (14)  063760  153716  003724                         BISB    ECCR,(SP)
  (13)  063764  013746  003722                         MOV     ER6R,-(SP)
  (12)  063770  013746  003720                         MOV     ER5R,-(SP)
  (11)  063774  013746  003716                         MOV     ER4R,-(SP)
  (10)  064000  013746  003714                         MOV     ER3R,-(SP)
   (9)  064004  013746  003712                         MOV     ER2R,-(SP)
   (8)  064010  013746  003710                         MOV     ER1R,-(SP)
   (7)  064014  013746  003706                         MOV     ER0R,-(SP)
   (6)  064020  012746  011254                         MOV     #FORM14,-(SP)
   (3)  064024  010600                                 MOV     SP,R0
   (4)  064026  004737  065410                         JSR PC,FPRINT
 14271  064032  005737  002146                         TST     ERRREG                  ;WAS THERE A REGISTER ERROR?
 14272  064036  001440                                 BEQ     1$
 14273  064040                                         PRINTB  #ACOUT                  ;YES - PRINT OUT DISCREPANCIES
```

```
   (6)  064040  012746  011334                MOV     #ACOUT,-(SP)
   (3)  064044  010600                        MOV     SP,R0
   (4)  064046  004737  065410                JSR PC,FPRINT
 14274  064052  012701  003650                MOV     #TR0R,R1
 14275  064056  012702  003706                MOV     #ER0R,R2
 14276  064062  021122                 5$:    CMP     (R1),(R2)+        ;COMPARE ACTUAL WITH EMULATOR REGS.
 14277  064064  001412                        BEQ     2$
 14278  064066  011137  002270                MOV     (R1),TERR         ;NOT EQUAL - PRINT ACTUAL
 14279  064072                                PRINTB  #FORM15,TERR
   (7)  064072  013746  002270                MOV     TERR,-(SP)
   (6)  064076  012746  011362                MOV     #FORM15,-(SP)
   (3)  064102  010600                        MOV     SP,R0
   (4)  064104  004737  065410                JSR PC,FPRINT
 14280  064110  000405                        BR      3$
 14281  064112                         2$:    PRINTB  #FORM16           ;EQUAL - PRINT SPACES
   (6)  064112  012746  011371                MOV     #FORM16,-(SP)
   (3)  064116  010600                        MOV     SP,R0
   (4)  064120  004737  065410                JSR PC,FPRINT
 14282  064124  020127  003664         3$:    CMP     R1,#TR6R          ;ALL REGISTERS COMPARED?
 14283  064130  001424                        BEQ     4$                ;BRANCH IF YES
 14284  064132  062701  000002                ADD     #2,R1
 14285  064136  000751                        BR      5$                ;LOOK AT NEXT REGISTER
 14286  064140  005737  002144         1$:    TST     ERRCC             ;WAS THERE A CONDITION CODE ERROR?
 14287  064144  001431                        BEQ     6$
 14288  064146                                PRINTB  #ACOUT            ;YES - PRINT ACTUAL COND. CODES
   (6)  064146  012746  011334                MOV     #ACOUT,-(SP)
   (3)  064152  010600                        MOV     SP,R0
   (4)  064154  004737  065410                JSR PC,FPRINT
 14289  064160                                PRINTB  #FORM17,<B,TCCR>
   (7)  064160  005046                        CLR     -(SP)
   (7)  064162  153716  003666                BISB    TCCR,(SP)
   (6)  064166  012746  011375                MOV     #FORM17,-(SP)
   (3)  064172  010600                        MOV     SP,R0
   (4)  064174  004737  065410                JSR PC,FPRINT
 14290  064200  000413                        BR      6$
 14291  064202  005737  002144         4$:    TST     ERRCC
 14292  064206  001410                        BEQ     6$
 14293  064210                                PRINTB  #FORM18,<B,TCCR>
   (7)  064210  005046                        CLR     -(SP)
   (7)  064212  153716  003666                BISB    TCCR,(SP)
   (6)  064216  012746  011405                MOV     #FORM18,-(SP)
   (3)  064222  010600                        MOV     SP,R0
   (4)  064224  004737  065410                JSR PC,FPRINT
 14294  064230  004737  066346         6$:    JSR PC,PRNIB               ;GO CHECK FOR POSSIBLE NIBBLE PRINTOUT.
 14295  064234  005037  002274                CLR FILLS2
 14296  064240  005737  002150                TST     ERRBUF            ;WAS THERE A BUFFER ERROR?
 14297  064244  001422                        BEQ     LODT
 14298  064246                                PRINTB  #EBUF0,EMADR,EMDTA       ;YES PRINT FIRST BUFFER
   (8)  064246  013746  002202                MOV     EMDTA,-(SP)
   (7)  064252  013746  002200                MOV     EMADR,-(SP)
   (6)  064256  012746  011411                MOV     #EBUF0,-(SP)
   (3)  064262  010600                        MOV     SP,R0
   (4)  064264  004737  065410                JSR PC,FPRINT
 14299  064270                                PRINTB  #ABUF0,AEADR,AEDTA       ;   BYTE DISCREPANCY.
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```
 (8)  064270  013746  002176                 MOV     AEDTA,-(SP)
 (7)  064274  013746  002174                 MOV     AEADR,-(SP)
 (6)  064300  012746  011446                 MOV     #ABUFO,-(SP)
 (3)  064304  010600                         MOV     SP,RO
 (4)  064306  004737  065410                 JSR PC,FPRINT
      064312                         LODT:
      064312  005737  002204                 TST     QRYFLG          ;INHIBIT BUFFER QUERY?
      064316  001110                         BNE     ERMDON          ;YES
      064320  104400                         TYPE
      064322  011477                         QDISP
      064324  004737  064546                 JSR     PC,YORN         ;DISPLAY BUFFER?
      064330  000137  064514                 JMP     3$              ;CONTINUE (C) RETURN
      064334  000137  064350                 JMP     1$              ;DISPLAY MEMORY (D) RETURN
      064340  000137  064544                 JMP     LERMD           ;REPEAT TEST (R) RETURN
      064344  000137  064534                 JMP     RTSUPV          ;RESTART (S) RETURN
      064350  104400                 1$:     TYPE                    ;PRINT 'ADDR(S)?'
      064352  013703                         AST
      064354  004737  065000                 JSR     PC,RANGE        ;GET RANGE OF LOCATIONS TO DISPLAY
      064360  000754                         BR      LODT            ;NO MORE DISPLAY REQUESTED-RETURN
      064362                                 PRINTB  #ADDHDR         ;PRINT BYTE HEADER
 (6)  064362  012746  013755                 MOV     #ADDHDR,-(SP)
 (3)  064366  010600                         MOV     SP,RO
 (4)  064370  004737  065410                 JSR PC,FPRINT
      064374  004737  065334         2$:     JSR     PC,FILLPB       ;FILL PRINT BUFFER
      064400  000763                         BR      1$              ;RANGE EXHAUSTED RETURN
      064402                                 PRINTB  #FORM19,BAD,<B,PB0>,<B,PB1>,<B,PB2>,<B,PB3>
(11)  064402  005046                         CLR     -(SP)
(11)  064404  153716  003145                 BISB    PB3,(SP)
(10)  064410  005046                         CLR     -(SP)
(10)  064412  153716  003144                 BISB    PB2,(SP)
 (9)  064416  005046                         CLR     -(SP)
 (9)  064420  153716  003143                 BISB    PB1,(SP)
 (8)  064424  005046                         CLR     -(SP)
 (8)  064426  153716  003142                 BISB    PB0,(SP)
 (7)  064432  013746  002226                 MOV     BAD,-(SP)
 (6)  064436  012746  013716                 MOV     #FORM19,-(SP)
 (3)  064442  010600                         MOV     SP,RO
 (4)  064444  004737  065410                 JSR PC,FPRINT
      064450                                 PRINTB  #FORM20,<B,PB4>,<B,PB5>,<B,PB6>,<B,PB7>
(10)  064450  005046                         CLR     -(SP)
(10)  064452  153716  003151                 BISB    PB7,(SP)
 (9)  064456  005046                         CLR     -(SP)
 (9)  064460  153716  003150                 BISB    PB6,(SP)
 (8)  064464  005046                         CLR     -(SP)
 (8)  064466  153716  003147                 BISB    PB5,(SP)
 (7)  064472  005046                         CLR     -(SP)
 (7)  064474  153716  003146                 BISB    PB4,(SP)
 (6)  064500  012746  014041                 MOV     #FORM20,-(SP)
 (3)  064504  010600                         MOV     SP,RO
 (4)  064506  004737  065410                 JSR PC,FPRINT
      064512  000730                         BR      2$
      064514  005737  002216         3$:     TST STOPTF              ;IS THE STOP TEST FLAG SET?
      064520  001404                         BEQ 4$                  ;BRANCH IF NO
      064522  005037  002216                 CLR STOPTF              ;CLEAR FLAG WHICH WILL CAUSE PROG TO
```

```
                                                                    ; TO QUERY FOR STOP TEST # AGAIN
064526  005037  002042                          CLR NOERDS
064532  000402                          4$:     BR ERMDON
064534  062716  000004                  RTSUPV: ADD #4,(SP)                 ;RETURN TO RESTART AT LOC 'START'
064540  062716  000004                  ERMDON: ADD #4,(SP)                 ;NORMAL RETURN TO CALL +6
064544  000207                          LERMD:  RTS PC                      ;REPEAT TEST RETURN TO CALL +2
                                        ;
                                        ;SUBROUTINE TO ACCEPT Y,N,C,R,S,D OR H RESPONSE FROM TTY. RETURNS TO CALL +2
                                        ;   ON N OR C RESPONSE; CALL +4 ON A Y OR D RESPONSE; CALL +6 ON AN R OR H RESPONSE;
                                        ;   AND CALL +10 ON AN S RESPONSE.
064546                                  YORN:
064546  105777  115114                  1$:     TSTB    @TKS                ;WAIT FOR A CHARACTER
064552  100375                                  BPL     1$
064554  117737  115132  064776                  MOVB    @TKB,RCHAR          ;READ & SAVE CHAR
064562  032737  000100  064776                  BIT     #100,RCHAR          ;CONVERT LOWER CASE INPUT TO UPPER
064570  001403                                  BEQ     12$                 ;  CASE LETTERS
064572  042737  000040  064776                  BIC     #40,RCHAR           ;
064600  042737  177600  064776  12$:            BIC     #^C177,RCHAR        ;GET RID OF JUNK IF ANY
064606  023727  064776  000123                  CMP     RCHAR,#123          ;IS CHAR AN S ?
064614  001450                                  BEQ     5$                  ;BRANCH IF YES
064616  023727  064776  000110                  CMP     RCHAR,#110          ;IS CHAR A H
064624  001003                                  BNE     6$                  ;BRANCH IF NO
064626  005037  047772                          CLR     PREINS              ;INSERT A HALT IMMEDIATELY BEFORE
                                                                    ; THE CIS INST UNDER TEST. THEN REPEAT TEST.
064632  000407                                  BR 10$
```

```
 14349  064634  023727  064776  000122  6$:    CMP     RCHAR,#122       ;IS CHAR R
 14350  064642  001011                         BNE 7$                   ;BRANCH IF NO
 14351  064644  013737  001670  047772         MOV KNOP,PREINS          ;RESTORE NOP TO INST IMMED BEFOR CIS INST UNDER TEST
 14352  064652  012737  177777  002272  10$:   MOV #177777,RPTFLG       ;SET REPEAT TEST FLAG
 14353  064660  005337  002054                 DEC ERRCT                ;DECREMENT ERROR COUNT SO THAT ERROR COUNT
 14354                                                                  ;  DOESN'T ADVANCE ON REPEAT OF TEST
 14355  064664  000426                         BR 4$
 14356  064666  023727  064776  000131  7$:    CMP     RCHAR,#131       ;IS CHAR = Y
 14357  064674  001424                         BEQ     2$
 14358  064676  023727  064776  000104         CMP     RCHAR,#104       ;IS CHAR = D?
 14359  064704  001420                         BEQ 2$
 14360  064706  023727  064776  000116         CMP     RCHAR,#116       ;NO - IS CHAR = N
 14361  064714  001404                         BEQ     11$
 14362  064716  023727  064776  000103         CMP     RCHAR,#103       ;IS CHAR = C?
 14363  064724  001310                         BNE 1$
 14364  064726  013737  001670  047772  11$:   MOV KNOP,PREINS          ;RESTORE NOP TO INST IMMED BEFORE CIS INST UNDER TEST
 14365  064734  000406                         BR      3$               ;YES - RETURN - CALL +2
 14366  064736  062716  000004          5$:    ADD     #4,(SP)
 14367  064742  062716  000004          4$:    ADD     #4,(SP)
 14368  064746  062716  000004          2$:    ADD     #4,(SP)          ;CHAR = Y OR D SETUP RETURN - CALL +4
 14369  064752  004737  064760          3$:    JSR     PC,ECHAR         ;ECHO CHARACTER - WAIT FOR
```

```
14371 064756 000207                              RTS     PC              ;   PRINTER READY
14372                                                                    ;LOAD CHAR TO BE TYPED INTO DATA REG.
14373 064760 105777 114730           ECHAR:      TSTB    @TPS            ;SUBROUTINE TO PRINT CHAR IN 'RCHAR'
14374 064764 100375                              BPL     ECHAR           ;WAIT UNTIL PRINTER IS READY
14375 064766 113777 064776 114722               MOVB    RCHAR,@TPB      ;LOAD CHAR INTO DATA REG
14376 064774 000207                              RTS     PC
```

```
064776  000000                          RCHAR:  .WORD   0
                                        ;
                                        ;SUBROUTINE TO GET RANGE OF LOCATIONS TO DISPLAY.
                                        ;    RETURNS TO CALL +2 ON NO MORE DISPLAY REQUESTED - USER
                                        ;    RESPONDED WITH IMMEDIATE 'CR'.
                                        ;    NORMAL RETURN IS TO CALL +4 WITH LOWER DISPLAY LIMIT
                                        ;    IN 'RLL' AND UPPER DISPLAY LIMIT IN 'RUL'.
065000                                  RANGE:                                  ;NORMAL RETURN = CALL +4.
065000  004737  065102                          JSR     PC,ACCOCT               ;GET RANGE LOWER LIMIT
065004  000207                                  RTS     PC                      ;RETURN - EXIT DISPLAY
065006  000411                                  BR      1$                      ;RETURN - SINGLE LIMIT SPECIFIED
065010  012637  002222                          MOV     (SP)+,RLL               ;NORMAL RETURN - SAVE LOWER LIMIT
065014  004737  065102                          JSR     PC,ACCOCT               ;GET RANGE UPPER LIMIT
065020  000207                                  RTS     PC                      ;RETURN - EXIT DISPLAY
065022  000411                                  BR      2$                      ;NORMAL RETURN - SAVE UPPER LIMIT
065024  104400                                  TYPE                            ;RETURN - TYPE? <CR><LF>REENTER:
065026  015552                                  QUES
065030  000763                                  BR      RANGE                   ;TRY AGAIN
065032  012637  002222                  1$:     MOV     (SP)+,RLL               ;SINGLE LIMIT SPECIFIED - SAVE AS
065036  013737  002222  002224                  MOV     RLL,RUL                 ;    BOTH LOWER & UPPER LIMIT
065044  000402                                  BR      3$                      ;EXIT
065046  012637  002224                  2$:     MOV     (SP)+,RUL               ;SAVE UPPER LIMIT
065052  042737  000007  002222          3$:     BIC     #7,RLL                  ;ROUND OFF RANGE TO GROUP OF
065060  042737  000007  002224                  BIC     #7,RUL                  ;TEN BYTES.
065066  062737  000010  002224                  ADD     #10,RUL
065074  062716  000002                          ADD     #2,(SP)                 ;EXIT TO CALL +4
065100  000207                                  RTS     PC
                                        ;
                                        ;SUBROUTINE TO ACCEPT OCTAL # FROM TTY. RETURNS TO CALL +2 ON INITIAL CR.
                                        ;    RETURNS TO CALL +4 ON <CR> OR / WITH LIMIT ON STACK. RETURNS TO CALL +6 ON <-> WITH
                                        ;    LIMIT ON STACK.
065102                                  ACCOCT:
065102  005046                                  CLR     -(SP)                   ;CLEAR STORAGE FOR OCTAL #
065104  105777  114556                  1$:     TSTB    @TKS                    ;CHAR THERE?
065110  100375                                  BPL     1$                      ;NO - WAIT
065112  117746  114574                          MOVB    @TKB,-(SP)              ;SAVE THE CHAR
065116  042716  177600                          BIC     #^C177,(SP)             ;STRIP-OFF THE ASCII
065122  022726  000015                          CMP     #15,(SP)+               ;IS IT A 'CR'?
065126  001005                                  BNE     2$
065130  104400                                  TYPE                            ;YES - ECHO CR & LF
065132  015566                                  XCRLF
065134  062706  000002                          ADD     #2,SP                   ;RETURN TO CALL +2
065140  000207                                  RTS     PC
065142  024627  000055                  2$:     CMP     -(SP),#55               ;IS CHAR = '-'
065146  001462                                  BEQ     6$                      ;BRANCH IF YES
065150  021627  000057                  3$:     CMP (SP),#57                    ;IS CHAR A / ?
065154  001403                                  BEQ 31$
065156  021627  000015                          CMP     (SP),#15                ;IS CHAR A <CR>?
065162  001016                                  BNE     4$
065164  104400                          31$:    TYPE                            ;YES - ECHO/<CR> AND <LF>
065166  015571                                  SLCRLF
065170  016616  000002                  7$:     MOV     2(SP),(SP)              ;SWAP POSITION OF OCTAL #
065174  016666  000004  000002                  MOV     4(SP),2(SP)             ;AND RETURN PC ON STACK
```

```
065202  011666  000004                  MOV     (SP),4(SP)
065206  062706  000002                  ADD     #2,SP
065212  062716  000002                  ADD     #2,(SP)         ;UPDATE RETURN POINTER
065216  000207                          RTS     PC              ;RETURN WITH OCTAL LIMIT ON STACK
065220  011637  064776          4$:     MOV     (SP),RCHAR      ;ECHO CHAR ACCEPTED
065224  004737  064760                  JSR     PC,ECHAR

065230  021627  000060                  CMP     (SP),#60        ;CHAR <0?
065234  002422                          BLT     5$              ;BRANCH IF YES
065236  021627  000067                  CMP     (SP),#67        ;CHAR>7?
065242  003017                          BGT     5$              ;BRANCH IF YES
065244  042726  000060                  BIC     #60,(SP)+       ;STRIP OFF ASCII
065250  006316                          ASL     (SP)            ;SHIFT PRESENT DATA OVER TO
065252  006316                          ASL     (SP)            ;   MAKE ROOM FOR NEW DIGIT
065254  006316                          ASL     (SP)
065256  056616  177776                  BIS     -2(SP),(SP)     ;SET IN NEW DIGIT
065262  105777  114400          10$:    TSTB    @TKS            ;CHAR THERE
065266  100375                          BPL 10$                 ;NO - WAIT
065270  117746  114416                  MOVB @TKB,-(SP)         ;SAVE CHAR
065274  042726  177600                  BIC #^C177,(SP)+
065300  000720                          BR 2$
065302  104400                  5$:     TYPE                    ;TYPE ?<CR><LF>*
065304  015552                          QUES
065306  062706  000002                  ADD     #2,SP
065312  000674                          BR      1$
065314  011637  064776          6$:     MOV     (SP),RCHAR      ;ECHO '-'
065320  004737  064760                  JSR     PC,ECHAR
065324  062766  000002  000004          ADD     #2,4(SP)        ;UPDATE RETURN POINTER
065332  000716                          BR      7$
                                ;
                                ;SUBROUTINE TO FILL BYTE PRINT BUFFER. RETURNS TO CALL +2 WHEN DISPLAY REQUEST IS
                                ;    COMPLETE (RLL=RUL). NORMAL RETURN TO CALL+4 WITH RLL=RLL +10 & PRINT BUFFER FILLED.
065334  023737  002222  002224  FILLPB: CMP     RLL,RUL
065342  001421                          BEQ     1$              ;   NORMAL RETURN TO CALL +4
065344  013701  002222                  MOV     RLL,R1          ;SETUP POINTER TO DISPLAY LOCS
065350  010137  002226                  MOV     R1,BAD          ;SAVE BUFFER ADDRESS FOR PRINTOUT
065354  012137  003142                  MOV     (R1)+,PB0       ;TRANSFER 10 BYTES AT DISPLAY
065360  012137  003144                  MOV     (R1)+,PB2       ;   LOC ADDRESS TO PRINT
065364  012137  003146                  MOV     (R1)+,PB4       ;   BUFFER.
065370  012137  003150                  MOV     (R1)+,PB6
065374  062737  000010  002222          ADD     #10,RLL         ;UPDATE LOWER LIMIT DISPLAY POINTER
065402  062716  000002                  ADD     #2,(SP)         ;UPDATE RETURN POINTER
065406  000207                  1$:     RTS     PC

                                        .EVEN
                                ;
                                ;SUBROUTINE TO TYPE FORMATED 'PRINTB' STATEMENTS
                                ;
065410                          FPRINT:
065410  010537  002062                  MOV R5,FSAVR5           ;SAVE REGISTERS
065414  010437  002064                  MOV R4,FSAVR4
065420  010337  002066                  MOV R3,FSAVR3
065424  010237  002070                  MOV R2,FSAVR2
065430  010137  002072                  MOV R1,FSAVR1
```

```
065434  012001                         MOV (R0)+,R1             ;SETUP R1 AS POINTER INTO FORMAT STATEMENT
065436  112102                 1$:     MOVB (R1)+,R2            ;GET NEXT FORMAT BYTE
065440  020227  000045                 CMP R2,#'%               ;IS BYTE = % ?
065444  001774                         BEQ 1$                   ;BRANCH IF YES
065446  020227  000117                 CMP R2,#'O               ;IS BYTE = O ?  (OCTAL)
065452  001426                         BEQ 2$                   ;BRANCH IF YES
065454  020227  000101                 CMP R2,#'A               ;IS BYTE = A ?  (ASCII)
065460  001432                         BEQ 3$                   ;BRANCH IF YES
065462  020227  000116                 CMP R2,#'N               ;IS BYTE = N ?  (CRLF)
065466  001443                         BEQ 4$                   ;BRANCH IF YES
065470  020227  000131                 CMP R2,#'Y               ;IS BYTE = Y ?  (BINARY)
065474  001446                         BEQ 5$                   ;BRANCH IF YES
065476  020227  000104                 CMP R2,#'D               ;IS BYTE = D ?  (DECIMAL)
065502  001452                         BEQ 6$                   ;BRANCH IF YES
065504  020227  000123                 CMP R2,#'S               ;IS BYTE = S ?  (SPACE)
065510  001463                         BEQ 7$                   ;BRANCH IF YES
065512  020227  000000                 CMP R2,#0                ;IS BYTE = 0 ?  (END OF FORMAT STATEMENT)
065516  001512                         BEQ 10$                  ;BRANCH IF YES
065520  020227  000102                 CMP R2,#'B               ;IS BYTE = B ?  (BYTE)
065524  001524                         BEQ 11$                  ;BRANCH IF YES
065526  000743                         BR 1$                    ;BYTE = NONE OF THE ABOVE - IGNORE IT.

065530  112102                 2$:     MOVB (R1)+,R2            ;SET R2 = COUNT OF # OF DIGITS TO PRINT
065532  042702  177770                 BIC #177770,R2
065536  012003                         MOV (R0)+,R3             ;SET R3 = WORD OF DIGITS TO PRINT
065540  004737  066020                 JSR PC,POCT              ;CALL ROUTINE TO PRINT OCTAL DIGITS
065544  000734                         BR 1$
065546  112102                 3$:     MOVB (R1)+,R2            ;SET R2 = NEXT ASCII CHAR TO PRINT
065550  022702  000045                 CMP #'%,R2               ;IS CHAR = %
065554  001730                         BEQ 1$                   ;BRANCH IF YES
065556  022702  000000                 CMP #0,R2                ;END OF FORMAT BYTES?
065562  001470                         BEQ 10$                  ;BRANCH IF YES
065564  110237  066122                 MOVB R2,TDIG             ;YES - PREPARE TO EXIT ROUTINE
065570  104400  066122                 TYPE ,TDIG               ;CALL ROUTINE TO PRINT ASCII BYTE
065574  000764                         BR 3$
065576  012737  000200  066122 4$:     MOV #CRLF,TDIG           ;CALL ROUTINE TO PRINT CRLF
065604  104400  066122                 TYPE ,TDIG
065610  000712                         BR 1$
065612  112102                 5$:     MOVB (R1)+,R2            ;SET R2 = COUNT OF # OF DIGITS TO PRINT
065614  042702  177770                 BIC #177770,R2
065620  012003                         MOV (R0)+,R3             ;SET R3 = WORD OF DIGITS TO PRINT
065622  004737  066124                 JSR PC,PBIN              ;CALL ROUTINE TO PRINT BINARY DIGITS
065626  000703                         BR 1$
065630  112102                 6$:     MOVB (R1)+,R2            ;SET R2 = COUNT OF DIGITS TO PRINT
065632  042702  177770                 BIC #177770,R2
065636  020227  000006                 CMP R2,#6                ;IF REQUEST IS TO PRINT MORE THAN 5 DIGITS
065642  103402                         BLO     61$              ;  PRINT 5 INSTEAD
065644  012702  000005                 MOV #5,R2
065650  012003                 61$:    MOV (R0)+,R3             ;SET R3 = WORD OF DIGITS TO PRINT
065652  004737  066216                 JSR PC,PDEC              ;CALL ROUTINE TO CONVERT (R3) TO DECIMAL
065656  000667                         BR 1$                    ;  AND PRINT DECIMAL DIGITS
065660  112102                 7$:     MOVB (R1)+,R2            ;GET MOST SIGN DIGIT OF 1 OR 2 DIGIT
                                                                ;  COUNT OF # OF SPACES TO PRINT
065662  042702  177770                 BIC #177770,R2
```

```
065666  121127  000045                    CMPB (R1),#'%           ;IS NEXT BYTE = % ?
065672  001415                            BEQ 12$
065674  121127  000000                    CMPB (R1),#0
065700  001412                            BEQ 12$
065702  006302                            ASL R2
065704  006302                            ASL R2
065706  006302                            ASL R2
065710  112137  066120                    MOVB (R1)+,OCNT
065714  142737  000370  066120            BICB #370,OCNT
065722  153702  066120                    BISB OCNT,R2            ;GET LEAST SIGN DIGIT INTO R2
065726  012737  000040  066122  12$:      MOV #' ,TDIG            ;PRINT A SPACE
065734  104400  066122                    TYPE ,TDIG
065740  077206                            SOB R2,12$
065742  000635                            BR 1$
065744  011640                  10$:      MOV (SP),-(R0)
065746  010006                            MOV R0,SP
065750  013705  002062                    MOV FSAVR5,R5
065754  013704  002064                    MOV FSAVR4,R4
065760  013703  002066                    MOV FSAVR3,R3
065764  013702  002070                    MOV FSAVR2,R2
065770  013701  002072                    MOV FSAVR1,R1
065774  000207                            RTS PC

065776  112102                  11$:      MOVB (R1)+,R2           ;SET R2 = COUNT OF # OF DIGITS TO PRINT
066000  042702  177770                    BIC #177770,R2
066004  012003                            MOV (R0)+,R3            ;SET R3 = BYTE TO PRINT
066006  042703  177400                    BIC #177400,R3
066012  004737  066020                    JSR PC,POCT
066016  000607                            BR 1$
                                ;
                                ;SUBROUTINE TO CONVERT A BINARY # TO OCTAL (ASCII) AN TYPE IT
                                ;ENTER WITH R2 = # OF OCTAL DIGITS TO TYPE
                                ;             R3 = BINARY #
                                ;
066020  112737  000005  066120  POCT:     MOVB #5,OCNT            ;SET THE ITERATION COUNT
066026  005402                            NEG R2
066030  062702  000006                    ADD #6,R2               ;SUBTRACT # OF DIGITS TO TYPE FROM MAX ALLOWED
066034  110237  066121                    MOVB R2,OMODE           ;SAVE IT FOR USE
066040  005004                            CLR R4
066042  006103                  1$:       ROL R3                  ;ROTATE MSB INTO "C"
066044  000404                            BR 3$
066046  006103                  2$:       ROL R3                  ;FORM THIS DIGIT
066050  006103                            ROL R3
066052  006103                            ROL R3
066054  010304                            MOV R3,R4
066056  006104                  3$:       ROL R4                  ;GET LSB OF THIS DIGIT
066060  105337  066121                    DECB OMODE              ;TYPE THIS DIGIT
066064  100010                            BPL 7$                  ;BRANCH IF NO
066066  042704  177770                    BIC #177770,R4          ;GET RID OF JUNK
066072  052704  000060                    BIS #'0,R4              ;MAKE THIS DIGIT ASCII
066076  110437  066122                    MOVB R4,TDIG            ;SAVE FOR TYPING
066102  104400  066122                    TYPE ,TDIG              ;TYPE THIS DIGIT
066106  105337  066120          7$:       DECB OCNT               ;COUNT BY 1
066112  002401                            BLT 6$                  ;BRANCH IF DONE
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```
066114  000754                          BR 2$                   ;BRANCH IF MORE TO DO
066116  000207                  6$:     RTS PC

066120     000                  OCNT:   .BYTE 0
066121     000                  OMODE:  .BYTE 0
066122     000                  TDIG:   .BYTE 0
066123     000                          .BYTE 0
                                ;
                                ;SUBROUTINE TO CHANGE A BINARY # TO ASCII AND TYPE IT
                                ;       ENTER WITH R2 = # OF BINARY DIGITS TO TYPE
                                ;                  R3 = BINARY #
                                ;
066124  112737  000017  066120  PBIN:   MOVB #17,OCNT           ;SET THE ITERATION COUNT
066132  005402                          NEG R2
066134  062702  000020                  ADD #20,R2              ;SUBTRACT # OF DIGITS TO TYPE FROM MAX ALLOWED
066140  110237  066121                  MOVB R2,OMODE           ;SAVE IT FOR USE
066144  005004                          CLR R4                  ;CLEAR THE OUTPUT WORD
066146  006103                  1$:     ROL R3
066150  012704  000000                  MOV #0,R4
066154  006104                          ROL R4                  ;GET BINARY DIGIT
066156  105337  066121                  DECB OMODE              ;TYPE THIS DIGIT?
066162  100010                          BPL 7$                  ;BRANCH IF NO
066164  042704  177776                  BIC #177776,R4          ;GET RID OF JUNK
066170  052704  000060                  BIS #'0,R4              ;MAKE THIS BIT ASCII
066174  010437  066122                  MOV R4,TDIG             ;SAVE FOR TYPING
066200  104400  066122                  TYPE ,TDIG              ;TYPE THIS DIGIT
066204  105337  066120          7$:     DECB OCNT               ;COUNT BY 1
066210  002401                          BLT 6$                  ;BRANCH IF DONE
066212  000755                          BR 1$                   ;BRANCH IF MORE TO DO
066214  000207                  6$:     RTS PC

                                ;
                                ;SUBROUTINE TO CONVERT A BINARY # TO DECIMAL (ASCII) AND TYPE  DECIMAL DIGITS
                                ;       ENTER WITH R3 = BINARY #
                                ;                  R2 = # OF DECIMAL DIGITS TO TYPE
                                ;
066216  010146                  PDEC:   MOV R1,-(SP)            ;SAVE R1
066220  010046                          MOV R0,-(SP)            ;SAVE R0
066222  012700  000005                  MOV #5,R0
066226  160200                          SUB R2,R0               ;R0 CONTAINS # OF DIGITS TO SKIP BEFORE PRINTING
066230  005004                          CLR R4                  ;ZERO CONSTANTS TABLE INDEX
066232  012705  066336                  MOV #DBLK,R5            ;SETUP THE OUTPUT POINTER
066236  005002                  2$:     CLR R2                  ;CLEAR THE BCD #
066240  016401  066326                  MOV DTBL(R4),R1         ;GET THE CONSTANT
066244  160103                  3$:     SUB R1,R3               ;FORM THIS BCD DIGIT
066246  103402                          BLO 4$                  ;BRANCH IF DONE
066250  005202                          INC R2                  ;INCREASE THE BCD DIGIT BY 1
066252  000774                          BR 3$
066254  060103                  4$:     ADD R1,R3               ;ADD BACK THE CONSTANT
066256  052702  000060          6$:     BIS #'0,R2              ;MAKE THE BCD DIGIT ASCII
066262  005700                          TST R0                  ;PRINT THIS DIGIT?
066264  001402                          BEQ 61$                 ;BRANCH IF YES
066266  005300                          DEC R0                  ;DECREMENT SKIP COUNT
066270  000401                          BR 62$
```

```
066272  110225                          61$:    MOVB R2,(R5)+           ;PUT THIS CHAR IN THE OUTPUT BUFFER
066274  005724                          62$:    TST (R4)+               ;JUST INCREMENTING
066276  020427  000010                          CMP R4,#10              ;CHECK THE TABLE INDEX
066302  002755                                  BLT 2$                  ;GO DO THE NEXT DIGIT
066304  003002                                  BGT 8$                  ;GO TO EXIT
066306  010302                                  MOV R3,R2               ;GET LSD
066310  000762                                  BR 6$                   ;GO CHANGE TO ASCII
066312  105015                          8$:     CLRB (R5)               ;SET THE TERMINATOR
066314  104400  066336                          TYPE ,DBLK              ;NOW TYPE THE #
066320  012600                                  MOV (SP)+,R0            ;RESTORE R0
066322  012601                                  MOV (SP)+,R1            ;RESTORE R1
066324  000207                                  RTS PC                  ;EXIT
066326  023420                          DTBL:   10000.
066330  001750                                  1000.
066332  000144                                  100.
066334  000012                                  10.
066336  000004                          DBLK:   .BLKW 4
                                        ;
                                        ;
                                        ;SUBROUTINE TO DISPLAY DECIMAL STRING SOURCES AND RESULTS IN
                                        ;  DECIMAL FORM.  STRINGS TO BE DISPLAYED ARE IDENTIFIED BY  THE
                                        ;  CONTENTS OF PZCODE AS FOLLOWS:
                                        ;
                                        ;       BIT 0 = 1       DISPLAY ZONED SOURCE STRING
                                        ;       BIT 1 = 1          ''     ''   SRC1    ''
                                        ;       BIT 2 = 1          ''     ''   SRC2    ''
                                        ;       BIT 3 = 1          ''     ''   DEST    ''  (DESC IN ER4,ER5)
                                        ;       BIT 4 = 1          ''     ''   DEST    ''  (DESC IN ER2,ER3)
                                        ;       BIT 5 = 1          ''     ''   DEST    ''  (DESC IN ER0,ER1)
                                        ;       BIT 8 = 1          ''  PACKED SOURCE   ''
                                        ;       BIT 9 = 1          ''     ''   SRC1    ''
                                        ;       BIT10 = 1          ''     ''   SRC2    ''
                                        ;       BIT11 = 1          ''     ''   DEST    ''  (DESC IN ER4,ER5)
                                        ;       BIT12 = 1          ''     ''   DEST    ''  (DESC IN ER2,ER3)
                                        ;       BIT13 = 1          ''     ''   DEST    ''  (DESC IN ER0,ER1)
                                        ;
                                        ;       NOTE: ALL SOURCE STRINGS MUST BE STORED IN THE INPUT
                                        ;       SOURCE BUFFER DESCRIBED BY THE DESCRIPTOR(S) AT
                                        ;       INSRC1 AND INSRC2.
                                        ;
                                        ;       IF THE DIVP BY 0 FLAG IS SET (EZDF) OR BIT 2 OF THE
                                        ;       SPECIAL HANDLING CODE IS SET (SPHAND) THEN THIS SUBROUTINE
                                        ;       RETURNS WITHOUT DISPLAYING ANY STRINGS.
                                        ;
                                        ;
066346  005737  036210                  PRNIB:  TST     EZDF            ;IS TEST CONDITION A 'DIVIDE BY ZERO'
066352  001401                                  BEQ 1$
066354  000207                                  RTS PC                  ;YES - EXIT WITHOUT DISPLAYING ANY BUFFER STRINGS
066356  032737  000004  002140          1$:     BIT #4,SPHAND           ;IS SPECIAL HANDLING BIT 2 SET?
066364  001401                                  BEQ 2$
066366  000207                                  RTS PC                  ;YES - EXIT WITHOUT DISPLAYING ANY BUFFER STRINGS.
066370  005737  002472                  2$:     TST PZCODE              ;ARE ANY STRINGS TO BE DISPLAYED?
066374  001001                                  BNE 3$
066376  000207                                  RTS PC                  ;NO - EXIT WITHOUT DISPLAY.
```

```
      066400  005037  026322          3$:     CLR EPAK
      066404  032737  000001  002472          BIT #1,PZCODE             ;PRINT A ZONED SRC STRING?
      066412  001402                          BEQ 4$
      066414  004737  066566                  JSR PC,SN                         ;YES
      066420  032737  000002  002472  4$:     BIT #2,PZCODE             ;PRINT A ZONED SRC1 STRING?
      066426  001402                          BEQ 5$
      066430  004737  066616                  JSR PC,S1N                        ;YES
      066434  032737  000004  002472  5$:     BIT #4,PZCODE             ;PRINT A ZONED SRC2 STRING?
      066442  001402                          BEQ 6$
      066444  004737  066706                  JSR PC,S2N                        ;YES
      066450  012737  177777  026322  6$:     MOV #177777,EPAK
      066456  032737  000400  002472          BIT #400,PZCODE           ;PRINT A PACKED SOURCE STRING?
      066464  001402                          BEQ 7$
      066466  004737  066566                  JSR PC,SN                         ;YES
      066472  032737  001000  002472  7$:     BIT #1000,PZCODE          ;PRINT A PACKED SRC1 STRING?
      066500  001402                          BEQ 10$
      066502  004737  066616                  JSR PC,S1N                        ;YES
      066506  032737  002000  002472  10$:    BIT #2000,PZCODE          ;PRINT A PACKED SRC2 STRING?
      066514  001402                          BEQ 11$
      066516  004737  066706                  JSR PC,S2N                        ;YES
      066522  032737  000070  002472  11$:    BIT #70,PZCODE            ;PRINT A ZONED DEST. STRING?
      066530  001404                          BEQ 12$
      066532  005037  026322                  CLR EPAK
      066536  004737  066776                  JSR PC,DN                         ;YES
      066542  032737  034000  002472  12$:    BIT #34000,PZCODE         ;PRINT A PACKED DEST. STRING?
      066550  001405                          BEQ 13$
      066552  012737  177777  026322          MOV #177777,EPAK
      066560  004737  066776                  JSR PC,DN                         ;YES
      066564  000207                  13$:    RTS PC                    ;EXIT DECIMAL DISPLAY SUBROUTINE.


      066566                          SN:     PRINTB #FORM22            ;PRINT 'SRC'
  (6) 066566  012746  014077                  MOV     #FORM22,-(SP)
  (3) 066572  010600                          MOV     SP,R0
  (4) 066574  004737  065410                  JSR PC,FPRINT
      066600  013701  002500                  MOV INSRC1,R1             ;LOAD R1 WITH STRING LEN
      066604  013700  002502                  MOV INSRC1+2,R0           ;LOAD R0 WITH STRING ADD
      066610  004737  067164                  JSR PC,DECPRT             ;PRINT DECIMAL DIGIT STRING
      066614  000207                          RTS PC
      066616  013701  050012          S1N:    MOV TINST,R1
      066622  042701  177700                  BIC #177700,R1
      066626  020127  000052                  CMP R1,#52                ;IS INST = CMPN?
      066632  001403                          BEQ 1$                    ;BRANCH IF YES
      066634  020127  000072                  CMP R1,#72                ;IS INST = CMPP?
      066640  001006                          BNE 2$                    ;BRANCH IF NO
      066642                          1$:     PRINTB #FORM24            ;PRINT 'SRC2'
  (6) 066642  012746  014132                  MOV     #FORM24,-(SP)
  (3) 066646  010600                          MOV     SP,R0
  (4) 066650  004737  065410                  JSR PC,FPRINT
      066654  000405                          BR 3$
      066656                          2$:     PRINTB #FORM23            ;PRINT 'SRC1'
  (6) 066656  012746  014114                  MOV     #FORM23,-(SP)
  (3) 066662  010600                          MOV     SP,R0
  (4) 066664  004737  065410                  JSR PC,FPRINT
```

```
 14747  066670  013701  002500          3$:     MOV INSRC1,R1           ;LOAD R1 WITH STRING LEN
 14748  066674  013700  002502                  MOV INSRC1+2,R0         ;LOAD R0 WITH STRING ADD
 14749  066700  004737  067164                  JSR PC,DECPRT           ;PRINT DECIMAL DIGIT STRING
 14750  066704  000207                          RTS PC
 14751  066706  013701  050012          S2N:    MOV TINST,R1
 14752  066712  042701  177700                  BIC #177700,R1
 14753  066716  020127  000052                  CMP R1,#52              ;IS INST = CMPN?
 14754  066722  001403                          BEQ 1$                  ;BRANCH IF YES
 14755  066724  020127  000072                  CMP R1,#72              ;IS INST = CMPP?
 14756  066730  001006                          BNE 2$                  ;BRANCH IF NO
 14757  066732                          1$:     PRINTB #FORM23          ;PRINT 'SRC1'
   (6)  066732  012746  014114                  MOV     #FORM23,-(SP)
   (3)  066736  010600                          MOV     SP,R0
   (4)  066740  004737  065410                  JSR PC,FPRINT
 14758  066744  000405                          BR 3$
 14759  066746                          2$:     PRINTB #FORM24          ;PRINT 'SRC2'
   (6)  066746  012746  014132                  MOV     #FORM24,-(SP)
   (3)  066752  010600                          MOV     SP,R0
   (4)  066754  004737  065410                  JSR PC,FPRINT
 14760  066760  013701  002504          3$:     MOV INSRC2,R1           ;LOAD R1 WITH STRING LENGTH
 14761  066764  013700  002506                  MOV INSRC2+2,R0         ;LOAD R0 WITH STRING ADD
 14762  066770  004737  067164                  JSR PC,DECPRT           ;PRINT DECIMAL DIGIT STRING
 14763  066774  000207                          RTS PC
 14764  066776                          DN:     PRINTB #FORM25          ;PRINT 'EM RESULT'
   (6)  066776  012746  014150                  MOV     #FORM25,-(SP)
   (3)  067002  010600                          MOV     SP,R0
   (4)  067004  004737  065410                  JSR PC,FPRINT
 14765  067010  032737  020040  002472          BIT #20040,PZCODE       ;LOAD R1 WITH STRING LEN
 14766  067016  001405                          BEQ 1$                  ;LOAD R0 WITH STRING ADDRESS
 14767  067020  013701  003670                  MOV ER0,R1
 14768  067024  013700  003672                  MOV ER1,R0
 14769  067030  000415                          BR 4$
 14770  067032  032737  010020  002472  1$:     BIT #10020,PZCODE
 14771  067040  001405                          BEQ 2$
 14772  067042  013701  003674                  MOV ER2,R1
 14773  067046  013700  003676                  MOV ER3,R0
 14774  067052  000404                          BR 4$
 14775  067054  013701  003700          2$:     MOV ER4,R1
 14776  067060  013700  003702                  MOV ER5,R0
 14777  067064  004737  067164          4$:     JSR PC,DECPRT           ;PRINT DECIMAL DIGIT STRING
 14778  067070                                  PRINTB #FORM26          ;PRINT 'ACT RESULT'
   (6)  067070  012746  014173                  MOV     #FORM26,-(SP)
   (3)  067074  010600                          MOV     SP,R0
   (4)  067076  004737  065410                  JSR PC,FPRINT
 14779  067102  032737  020040  002472          BIT #20040,PZCODE       ;LOAD R1 WITH STRING LEN
 14780  067110  001405                          BEQ 11$                 ;LOAD R0 WITH STRING ADDRESS
 14781  067112  013701  002234                  MOV TTR0,R1
 14782  067116  013700  002236                  MOV TTR1,R0
 14783  067122  000415                          BR 44$
 14784  067124  032737  010020  002472  11$:    BIT #10020,PZCODE
 14785  067132  001405                          BEQ 22$
 14786  067134  013701  002240                  MOV TTR2,R1
 14787  067140  013700  002242                  MOV TTR3,R0
 14788  067144  000404                          BR 44$
```

```
      067146  013701  002244          22$:    MOV TTR4,R1
      067152  013700  002246                  MOV TTR5,R0
      067156  004737  067164          44$:    JSR PC,DECPRT              ;PRINT DECIMAL DIGIT STRING
      067162  000207                          RTS PC


                                      ;
                                      ;SUBROUTINE TO PRINT A DECIMAL STRING OF DIGITS; MSD FIRST ....
                                      ;       LEAST SIGNIFICANT DIGIT, SIGN.
                                      ;       INPUT:  EPAK=0 FOR ZONED STRING;177777 FOR PACKED
                                      ;               R0=STRING ADR
                                      ;               R1=STRING LEN
                                      ;
                                      ;       NOTE: ROUTINE PRINTS '0 +' FOR ZONED STRINGS OF
                                      ;       ZERO LENGTH (EXCEPT SEPARATE TYPE).
                                      ;
      067164  012737  177777  002304  DECPRT: MOV #177777,PRTSGN         ;SET PRINTING IN PROGRESS FLAG
      067172  010003                          MOV R0,R3                  ;SAVE R0 IN R3
      067174  005037  025112                  CLR EODD
      067200  032701  000001                  BIT #1,R1                  ;IS STRING ODD IN LENGTH
      067204  001403                          BEQ 1$
      067206  012737  177777  025112          MOV #177777,EODD           ;SET ODD INDICATOR
      067214  010137  025130          1$:     MOV R1,ELSD
      067220  110137  002100                  MOVB R1,NBLKS              ;DETERMINE # OF BLANK DIGITS TO PRINT
      067224  012702  000037                  MOV #37,R2
      067230  163702  002100                  SUB NBLKS,R2
      067234  001002                          BNE 11$
      067236  012702  000001                  MOV #1,R2
      067242                          11$:    PRINTB #FORM27             ;PRINT THE BLANKS
  (6) 067242  012746  014216                  MOV     #FORM27,-(SP)
  (3) 067246  010600                          MOV     SP,R0
  (4) 067250  004737  065410                  JSR PC,FPRINT
      067254  005302                          DEC R2
      067256  001371                          BNE 11$
      067260  105701                  3$:     TSTB R1                    ;STRING LENGTH = 0?
      067262  001017                          BNE 4$                     ;BRANCH IF NO
      067264  005737  026322                  TST EPAK                   ;STRING PACKED?
      067270  001407                          BEQ 5$                     ;BRANCH IF NO
      067272  005201                          INC R1                     ;YES - SET LEN = 1
      067274  005237  025130                  INC ELSD
      067300  012737  177777  025112          MOV #177777,EODD
      067306  000405                          BR 4$
      067310  005002                  5$:     CLR R2                     ;ZONED - ZERO LENGTH
      067312  004537  067506                  JSR R5,CONVN               ;PRINT 0
      067316  067542                          DIGTBL
      067320  000413                          BR 12$                     ;EXIT
      067322  010300                  4$:     MOV R3,R0                  ;RESTORE R0
      067324  105001                          CLRB R1
      067326  004737  021372          7$:     JSR PC,ESNK                ;GET NEXT DIGIT
      067332  004537  067506                  JSR R5,CONVN               ;CONVERT NIBBLE & PRINT HEX DIGIT
      067336  067542                          DIGTBL
      067340  105201                          INCB R1
      067342  120137  025130                  CMPB R1,ELSD
      067346  001367                          BNE 7$
      067350  004737  021372          12$:    JSR PC,ESNK                ;CALL ROUTINE TO FIND SIGN
```

```
                                                                     ;SIGN RETURNED IN ERSNEG (0=+,/=0=-)
                                                                     ;SIGN BYTE RETURNED IN 'SGNBYT'
        067354  005737  025062                  TST ERSNEG           ;IS SIGN NEGATIVE
        067360  001006                          BNE 2$               ;BRANCH IF YES
        067362                                  PRINTB #FORM34       ;PRINT +
   (6)  067362  012746  014302                  MOV     #FORM34,-(SP)
   (3)  067366  010600                          MOV     SP,R0
   (4)  067370  004737  065410                  JSR PC,FPRINT
        067374  000405                          BR 33$
        067376                          2$:     PRINTB #FORM35       ;PRINT -
   (6)  067376  012746  014307                  MOV     #FORM35,-(SP)
   (3)  067402  010600                          MOV     SP,R0
   (4)  067404  004737  065410                  JSR PC,FPRINT
        067410                          33$:    PRINTB #FORM32       ;PRINT '  ('
   (6)  067410  012746  014256                  MOV     #FORM32,-(SP)
   (3)  067414  010600                          MOV     SP,R0
   (4)  067416  004737  065410                  JSR PC,FPRINT
        067422  013702  025166                  MOV SGNBYT,R2        ;GET HIGH NIBBLE OF SIGN BYTE
        067426  006202                          ASR R2
        067430  006202                          ASR R2
        067432  006202                          ASR R2
        067434  006202                          ASR R2
        067436  042702  177760                  BIC #177760,R2
        067442  004537  067506                  JSR R5,CONVN         ;CONVERT NIBBLE & PRINT HEX DIGIT
        067446  067542                          DIGTBL
        067450  113702  025166                  MOVB SGNBYT,R2       ;GET LOW NIBBLE OF SIGN BYTE
        067454  042702  177760                  BIC #177760,R2
        067460  004537  067506                  JSR R5,CONVN         ;CONVERT NIBBLE & PRINT HEX DIGIT
        067464  067542                          DIGTBL
        067466                                  PRINTB #FORM33       ;PRINT ')'
   (6)  067466  012746  014276                  MOV     #FORM33,-(SP)
   (3)  067472  010600                          MOV     SP,R0
   (4)  067474  004737  065410                  JSR PC,FPRINT
        067500  005037  002304          6$:     CLR PRTSGN           ;YES - CLEAR PRINTING FLAG
        067504  000207                          RTS PC


                                        ;
                                        ;SUBROUTINE TO CONVERT NIBBLE (IN R2) TO A PRINTABLE CHARACTER
                                        ;       AND PRINT CHARACTER.
                                        ;       INPUT PARAMETER FOLLOWS CALL - CONVERSION TABLE ADDRESS
                                        ;
        067506                          CONVN:
        067506  010046                          MOV R0,-(SP)         ;SAVE R0
        067510  012500                          MOV (R5)+,R0         ;GET ADDRESS OF CONVERSION TABLE
        067512  060200                          ADD R2,R0            ;INDEX INTO TABLE
        067514  111037  067540                  MOVB (R0),ANIB+2     ;TRANSFER PRINT CHAR FROM TABLE TO ASCIZ PRINT STREAM.
        067520                                  PRINTB #ANIB         ;PRINT CONVERTED NIBBLE
   (6)  067520  012746  067536                  MOV     #ANIB,-(SP)
   (3)  067524  010600                          MOV     SP,R0
   (4)  067526  004737  065410                  JSR PC,FPRINT
        067532  012600                          MOV (SP)+,R0         ;RESTORE R0
        067534  000205                          RTS R5               ;EXIT
```

```
067536    045                            ANIB:    .BYTE   045              ;%
067537    101                                     .BYTE   101              ;A
067540    000                                     .BYTE   000              ;PRINT CHAR
067541    000                                     .BYTE   000              ;ZERO BYTE


067542    060                            DIGTBL:  .BYTE   060              ;0
067543    061                                     .BYTE   061              ;1
067544    062                                     .BYTE   062              ;2
067545    063                                     .BYTE   063              ;3
067546    064                                     .BYTE   064              ;4
067547    065                                     .BYTE   065              ;5
067550    066                                     .BYTE   066              ;6
067551    067                                     .BYTE   067              ;7
067552    070                                     .BYTE   070              ;8
067553    071                                     .BYTE   071              ;9
067554    101                                     .BYTE   101              ;A
067555    102                                     .BYTE   102              ;B
067556    103                                     .BYTE   103              ;C
067557    104                                     .BYTE   104              ;D
067560    105                                     .BYTE   105              ;E
067561    106                                     .BYTE   106              ;F
                                         ;
                                         ;SUBROUTINE TO SEARCH FOR A MATCH BETWEEN ENTERED INST
                                         ;AND TABLED ASCII LIST OF CIS INSTRUCTIONS.
                                         ;
067562 012701 004450                     SFCI:    MOV #ASZINS,R1
067566 005711                            1$:      TST (R1)                 ;REACHED END OF TABLED ASCII LIST?
067570 001434                                     BEQ NOMTCH               ;BRANCH IF YES
067572 021137 002462                              CMP (R1),ACINST          ;DO 1ST TWO CHARS MATCH TABLED INST?
067576 001403                                     BEQ 2$                   ;BRANCH IF YES
067600 062701 000010                     11$:     ADD #10,R1               ;UPDATE TO NEXT TABLED INST
067604 000770                                     BR 1$                    ;RETURN TO CONTINUE SEARCH
067606 026137 000002 002464              2$:      CMP 2(R1),ACINST+2       ;DO 2ND GROUP OF 2 CHARS MATCH
067614 001401                                     BEQ 3$                   ;BRANCH IF YES
067616 000770                                     BR 11$
067620 026137 000004 002466              3$:      CMP 4(R1),ACINST+4       ;DO 3RD GROUP OF 2 CHARS MATCH
067626 001364                                     BNE 11$                  ;BRANCH IF NO
067630 005737 001760                              TST RANDOM               ;RANDOM EXERCISE MODE?
067634 001405                                     BEQ 4$                   ;BRANCH IF NO
067636 016100 000006                              MOV 6(R1),R0
067642 011037 072144                              MOV (R0),IDUM            ;LOAD OCTAL CODING FOR CIS INST INTO DUMMY INPUT TABLE
067646 000403                                     BR MTCH
067650 016137 000006 072220              4$:      MOV 6(R1),INPTBL         ;MATCH FOUND - RETURN TO CALL + 4
                                                                           ;SAVE DESIRED INST INPUT TABLE ADDRESS
                                                                           ;IN INPTBL.
067656 062716 000002                     MTCH:    ADD #2,(SP)
067662 000207                            NOMTCH:  RTS PC                   ;NO MATCH - RETURN TO CALL + 2

                                         ;
                                         ;SUBROUTINE TO ACCEPT ASCII CHARS (6MAX,LESS+CR) FROM TTY.
                                         ; STORES ASCII CHARS 2 PER WORD IN ACINST,ACINST+2, AND ACINST+4.
                                         ;
067664 005037 002462                     ACASZ:   CLR ACINST
```

```
067670 005037 002464                    CLR ACINST+2
067674 005037 002466                    CLR ACINST+4            ;CLEAR OUT STORAGE AREA
067700 012701 002462                    MOV #ACINST,R1          ;SETUP REG POINTER TO STORAGE AREA
067704 105777 111756            1$:     TSTB @TKS               ;WAIT FOR A CHAR
067710 100375                           BPL 1$
067712 117737 111774 064776             MOVB @TKB,RCHAR         ;READ AND SAVE CHAR
067720 032737 000100 064776             BIT #100,RCHAR          ;CONVERT LOWER CASE TO UPPER
067726 001403                           BEQ 3$                  ;  CASE LETTERS
067730 042737 000040 064776             BIC #40,RCHAR
067736 042737 177600 064776     3$:     BIC #^C177,RCHAR        ;GET RID OF JUNK IF ANY
067744 123727 064776 000015             CMPB RCHAR,#15          ;IS CHAR A CR?
067752 001412                           BEQ 2$                  ;BRANCH IF YES
067754 113721 064776                    MOVB RCHAR,(R1)+        ;SAVE CHAR
067760 004737 064760                    JSR PC,ECHAR            ;ECHO 6TH CHAR
067764 022701 002470                    CMP #ACINST+6,R1        ;6 CHARS ENTERED?
067770 001345                           BNE 1$                  ;BRANCH IF NO TO LISTEN FOR NEXT CHAR
067772 112737 000015 064776             MOVB #15,RCHAR          ;ECHO A CR
070000 004737 064760            2$:     JSR PC,ECHAR            ;ECHO CR
070004 000207                           RTS PC

                                ;SUBROUTINE TO RECORD WHICH CONDITION CODE STATES ARE EXERCISED
                                ;FOR EACH INSTRUCTION.
                                ;
070006                          RECCC:
070006 013701 002276                    MOV OCTIC,R1            ;FORM POINTER INTO TABLE OF COND. CODE USAGE
070012 006301                           ASL R1
070014 062701 004016                    ADD #CCREC,R1
070020 113737 003724 002035             MOVB ECCR,ZCCR+1
070026 153711 003724                    BISB ECCR,(R1)          ;LOG CC '1' STATES EXERCISED
070032 005137 002034                    COM ZCCR
070036 042737 170377 002034             BIC #170377,ZCCR
070044 053711 002034                    BIS ZCCR,(R1)           ;LOG CC '0' STATES EXERCISED
070050 000207                           RTS PC
```

```
                                  ;POINTERS TO CIS INSTRUCTION ERROR MESSAEGE HEADER ROUTINE
                                  ;
070052                            INEM:
070052  000000                            .WORD   0
070054  070142                            .WORD   YMOVC
070056  070176                            .WORD   YMOVRC
070060  070232                            .WORD   YMOV1C
070062  070266                            .WORD   YLOCC
070064  070322                            .WORD   YSKPC
070066  070356                            .WORD   YSCANC
070070  070412                            .WORD   YSPANC
070072  070446                            .WORD   YCMPC
070074  070502                            .WORD   YMATCHC
070076  070536                            .WORD   YADDN
070100  070600                            .WORD   YSUBN
070102  070642                            .WORD   YCMPN
070104  070704                            .WORD   YCVTNL
070106  070746                            .WORD   YCVTPN
070110  071010                            .WORD   YCVTNP
070112  071052                            .WORD   YASHN
070114  071114                            .WORD   YCVTLN
070116  071156                            .WORD   YADDP
070120  071220                            .WORD   YSUBP
070122  071262                            .WORD   YCMPP
070124  071324                            .WORD   YCVTPL
070126  071366                            .WORD   YMULP
070130  071430                            .WORD   YDIVP
070132  071472                            .WORD   YASHP
070134  071534                            .WORD   YCVTLP
070136  071576                            .WORD   YL2D
070140  071636                            .WORD   YL3D
                                  ;
```

```
                                        .SBTTL          ERROR MESSAGE HEADERS
                                        ;ERROR MESSAGE HEADERS
                                        ;
        070142                          YMOVC:
        070142                                  PRINTB  #AMOVC
   (6)  070142  012746  007440                  MOV     #AMOVC,-(SP)
   (3)  070146  010600                          MOV     SP,R0
   (4)  070150  004737  065410                  JSR PC,FPRINT
        070154  004737  071676                  JSR     PC,PRNTIQ       ;PRINT TEST #
        070160  000405                          BR 1$                   ;CNTL-T RETURN
        070162                                  PRINTB  #FORM1          ;NORMAL RETURN
   (6)  070162  012746  010006                  MOV     #FORM1,-(SP)
   (3)  070166  010600                          MOV     SP,R0
   (4)  070170  004737  065410                  JSR PC,FPRINT
        070174  000207                  1$:     RTS     PC
        070176                          YMOVRC:
        070176                                  PRINTB  #AMOVRC
   (6)  070176  012746  007450                  MOV     #AMOVRC,-(SP)
   (3)  070202  010600                          MOV     SP,R0
   (4)  070204  004737  065410                  JSR PC,FPRINT
        070210  004737  071676                  JSR     PC,PRNTIQ       ;PRINT TEST #
        070214  000405                          BR 1$
        070216                                  PRINTB  #FORM1
   (6)  070216  012746  010006                  MOV     #FORM1,-(SP)
   (3)  070222  010600                          MOV     SP,R0
   (4)  070224  004737  065410                  JSR PC,FPRINT
        070230  000207                  1$:     RTS     PC
        070232                          YMOVTC:
        070232                                  PRINTB  #AMOVTC
   (6)  070232  012746  007461                  MOV     #AMOVTC,-(SP)
   (3)  070236  010600                          MOV     SP,R0
   (4)  070240  004737  065410                  JSR PC,FPRINT
        070244  004737  071676                  JSR     PC,PRNTIQ       ;PRINT TEST #
        070250  000405                          BR 1$
        070252                                  PRINTB  #FORM2
   (6)  070252  012746  010066                  MOV     #FORM2,-(SP)
   (3)  070256  010600                          MOV     SP,R0
   (4)  070260  004737  065410                  JSR PC,FPRINT
        070264  000207                  1$:     RTS     PC
        070266                          YLOCC:
        070266                                  PRINTB  #ALOCC
   (6)  070266  012746  007472                  MOV     #ALOCC,-(SP)
   (3)  070272  010600                          MOV     SP,R0
   (4)  070274  004737  065410                  JSR PC,FPRINT
        070300  004737  071676                  JSR     PC,PRNTIQ       ;PRINT TEST #
        070304  000405                          BR 1$
        070306                                  PRINTB  #FORM3
   (6)  070306  012746  010154                  MOV     #FORM3,-(SP)
   (3)  070312  010600                          MOV     SP,R0
   (4)  070314  004737  065410                  JSR PC,FPRINT
        070320  000207                  1$:     RTS     PC
        070322                          YSKPC:
        070322                                  PRINTB  #ASKPC
   (6)  070322  012746  007502                  MOV     #ASKPC,-(SP)
```

```
  (3) 070326  010600                        MOV     SP,R0
  (4) 070330  004737  065410                JSR PC,FPRINT
      070334  004737  071676                JSR     PC,PRNTIQ        ;PRINT TEST #
      070340  000405                        BR 1$
      070342                                PRINTB  #FORM3
  (6) 070342  012746  010154                MOV     #FORM3,-(SP)
  (3) 070346  010600                        MOV     SP,R0
  (4) 070350  004737  065410                JSR PC,FPRINT
      070354  000207                1$:     RTS     PC
      070356                        YSCANC:
      070356                                PRINTB  #ASCANC
  (6) 070356  012746  007512                MOV     #ASCANC,-(SP)
  (3) 070362  010600                        MOV     SP,R0
  (4) 070364  004737  065410                JSR PC,FPRINT
      070370  004737  071676                JSR     PC,PRNTIQ        ;PRINT TEST #
      070374  000405                        BR 1$
      070376                                PRINTB  #FORM4
  (6) 070376  012746  010222                MOV     #FORM4,-(SP)
  (3) 070402  010600                        MOV     SP,R0
  (4) 070404  004737  065410                JSR PC,FPRINT
      070410  000207                1$:     RTS     PC
      070412                        YSPANC:
      070412                                PRINTB  #ASPANC
  (6) 070412  012746  007523                MOV     #ASPANC,-(SP)
  (3) 070416  010600                        MOV     SP,R0
  (4) 070420  004737  065410                JSR PC,FPRINT
      070424  004737  071676                JSR     PC,PRNTIQ        ;PRINT TEST #
      070430  000405                        BR 1$
      070432                                PRINTB  #FORM4
  (6) 070432  012746  010222                MOV     #FORM4,-(SP)
  (3) 070436  010600                        MOV     SP,R0
  (4) 070440  004737  065410                JSR PC,FPRINT
      070444  000207                1$:     RTS     PC
      070446                        YCMPC:
      070446                                PRINTB  #ACMPC
  (6) 070446  012746  007534                MOV     #ACMPC,-(SP)
  (3) 070452  010600                        MOV     SP,R0
  (4) 070454  004737  065410                JSR PC,FPRINT
      070460  004737  071676                JSR     PC,PRNTIQ        ;PRINT TEST #
      070464  000405                        BR 1$
      070466                                PRINTB  #FORM5
  (6) 070466  012746  010276                MOV     #FORM5,-(SP)
  (3) 070472  010600                        MOV     SP,R0
  (4) 070474  004737  065410                JSR PC,FPRINT
      070500  000207                1$:     RTS     PC
      070502                        YMATCHC:
      070502                                PRINTB  #AMATCHC
  (6) 070502  012746  007544                MOV     #AMATCHC,-(SP)
  (3) 070506  010600                        MOV     SP,R0
  (4) 070510  004737  065410                JSR PC,FPRINT
      070514  004737  071676                JSR     PC,PRNTIQ        ;PRINT TEST #
      070520  000405                        BR 1$
      070522                                PRINTB  #FORM6
  (6) 070522  012746  010362                MOV     #FORM6,-(SP)
```

```
   (3)  070526  010600                              MOV      SP,R0
   (4)  070530  004737  065410                      JSR PC,FPRINT
 15056  070534  000207                      1$:     RTS      PC
 15057  070536                              YADDN:
 15058  070536                                      PRINTB   #AADDN
   (6)  070536  012746  007554                      MOV      #AADDN,-(SP)
   (3)  070542  010600                              MOV      SP,R0
   (4)  070544  004737  065410                      JSR PC,FPRINT
 15059  070550  004737  071676                      JSR      PC,PRNTIQ          ;PRINT TEST #
 15060  070554  000410                              BR 1$
 15061  070556                                      PRINTB   #FORM7
   (6)  070556  012746  010434                      MOV      #FORM7,-(SP)
   (3)  070562  010600                              MOV      SP,R0
   (4)  070564  004737  065410                      JSR PC,FPRINT
 15062  070570  012737  000016  002472              MOV #000016,PZCODE          ;SET PRINTCODE TO DISPLAY ZONED SRC1,SRC2,DST
 15063  070576  000207                      1$:     RTS      PC
 15064  070600                              YSUBN:
 15065  070600                                      PRINTB   #ASUBN
   (6)  070600  012746  007564                      MOV      #ASUBN,-(SP)
   (3)  070604  010600                              MOV      SP,R0
   (4)  070606  004737  065410                      JSR PC,FPRINT
 15066  070612  004737  071676                      JSR      PC,PRNTIQ          ;PRINT TEST #
 15067  070616  000410                              BR 1$
 15068  070620                                      PRINTB   #FORM7
   (6)  070620  012746  010434                      MOV      #FORM7,-(SP)
   (3)  070624  010600                              MOV      SP,R0
   (4)  070626  004737  065410                      JSR PC,FPRINT
 15069  070632  012737  000016  002472              MOV #000016,PZCODE          ;SET PRINTCODE TO DISPLAY ZONED SRC1,SRC2,DST.
 15070  070640  000207                      1$:     RTS      PC
 15071  070642                              YCMPN:
 15072  070642                                      PRINTB   #ACMPN
   (6)  070642  012746  007574                      MOV      #ACMPN,-(SP)
   (3)  070646  010600                              MOV      SP,R0
   (4)  070650  004737  065410                      JSR PC,FPRINT
 15073  070654  004737  071676                      JSR      PC,PRNTIQ          ;PRINT TEST #
 15074  070660  000410                              BR 1$
 15075  070662                                      PRINTB   #FORM8
   (6)  070662  012746  010530                      MOV      #FORM8,-(SP)
   (3)  070666  010600                              MOV      SP,R0
   (4)  070670  004737  065410                      JSR PC,FPRINT
 15076  070674  012737  000006  002472              MOV #000006,PZCODE          ;SET PRINTCODE TO DISPLAY ZONED SRC1,SRC2.
 15077  070702  000207                      1$:     RTS      PC
 15078  070704                              YCVTNL:
 15079  070704                                      PRINTB   #ACVTNL
   (6)  070704  012746  007604                      MOV      #ACVTNL,-(SP)
   (3)  070710  010600                              MOV      SP,R0
   (4)  070712  004737  065410                      JSR PC,FPRINT
 15080  070716  004737  071676                      JSR      PC,PRNTIQ          ;PRINT TEST #
 15081  070722  000410                              BR 1$
 15082  070724                                      PRINTB   #FORM9
   (6)  070724  012746  010606                      MOV      #FORM9,-(SP)
   (3)  070730  010600                              MOV      SP,R0
   (4)  070732  004737  065410                      JSR PC,FPRINT
 15083  070736  012737  000001  002472              MOV #000001,PZCODE          ;SET PRINTCODE TO DISPLAY ZONED SRC.
```

```
      070744  000207                          1$:      RTS       PC
      070746                                  YCVTPN:
      070746                                           PRINTB    #ACVTPN
  (6) 070746  012746  007615                           MOV       #ACVTPN,-(SP)
  (3) 070752  010600                                   MOV       SP,R0
  (4) 070754  004737  065410                           JSR PC,FPRINT
      070760  004737  071676                           JSR       PC,PRNTIQ          ;PRINT TEST #
      070764  000410                                   BR 1$
      070766                                           PRINTB    #FORM10
  (6) 070766  012746  010662                           MOV       #FORM10,-(SP)
  (3) 070772  010600                                   MOV       SP,R0
  (4) 070774  004737  065410                           JSR PC,FPRINT
      071000  012737  000420  002472                   MOV #000420,PZCODE           ;SET PRINTCODE TO DISPLAY PACKED SRC AND ZONED DST.
      071006  000207                          1$:      RTS       PC
      071010                                  YCVTNP:
      071010                                           PRINTB    #ACVTNP
  (6) 071010  012746  007626                           MOV       #ACVTNP,-(SP)
  (3) 071014  010600                                   MOV       SP,R0
  (4) 071016  004737  065410                           JSR PC,FPRINT
      071022  004737  071676                           JSR       PC,PRNTIQ          ;PRINT TEST #
      071026  000410                                   BR 1$
      071030                                           PRINTB    #FORM10
  (6) 071030  012746  010662                           MOV       #FORM10,-(SP)
  (3) 071034  010600                                   MOV       SP,R0
  (4) 071036  004737  065410                           JSR PC,FPRINT
      071042  012737  010001  002472                   MOV #010001,PZCODE           ;SET PRINTCODE TO DSIPLAY ZONED SRC AND PACKED DST.
      071050  000207                          1$:      RTS       PC
      071052                                  YASHN:
      071052                                           PRINTB    #AASHN
  (6) 071052  012746  007637                           MOV       #AASHN,-(SP)
  (3) 071056  010600                                   MOV       SP,R0
  (4) 071060  004737  065410                           JSR PC,FPRINT
      071064  004737  071676                           JSR       PC,PRNTIQ          ;PRINT TEST #
      071070  000410                                   BR 1$
      071072                                           PRINTB    #FORM11
  (6) 071072  012746  010734                           MOV       #FORM11,-(SP)
  (3) 071076  010600                                   MOV       SP,R0
  (4) 071100  004737  065410                           JSR PC,FPRINT
      071104  012737  000021  002472                   MOV #000021,PZCODE           ;SET PRINTCODE TO DISPLAY ZONED SRC,DST.
      071112  000207                          1$:      RTS       PC
      071114                                  YCVTLN:
      071114                                           PRINTB    #ACVTLN
  (6) 071114  012746  007647                           MOV       #ACVTLN,-(SP)
  (3) 071120  010600                                   MOV       SP,R0
  (4) 071122  004737  065410                           JSR PC,FPRINT
      071126  004737  071676                           JSR       PC,PRNTIQ          ;PRINT TEST #
      071132  000410                                   BR 1$
      071134                                           PRINTB    #FORM12
  (6) 071134  012746  011016                           MOV       #FORM12,-(SP)
  (3) 071140  010600                                   MOV       SP,R0
  (4) 071142  004737  065410                           JSR PC,FPRINT
      071146  012737  000040  002472                   MOV #000040,PZCODE           ;SET PRINTCODE TO DISPLAY ZONED DST.
      071154  000207                          1$:      RTS       PC
      071156                                  YADDP:
```

```
      071156                                        PRINTB  #AADDP
 (6)  071156  012746  007660                        MOV     #AADDP,-(SP)
 (3)  071162  010600                                MOV     SP,R0
 (4)  071164  004737  065410                        JSR PC,FPRINT
      071170  004737  071676                        JSR     PC,PRNTIQ          ;PRINT TEST #
      071174  000410                                BR 1$
      071176                                        PRINTB  #FORM7
 (6)  071176  012746  010434                        MOV     #FORM7,-(SP)
 (3)  071202  010600                                MOV     SP,R0
 (4)  071204  004737  065410                        JSR PC,FPRINT
      071210  012737  007000  002472                MOV #007000,PZCODE         ;SET PRINTCODE TO DISPLAY PACKED SRC1,SRC2, AND DST.
      071216  000207                        1$:     RTS     PC
      071220                                YSUBP:
      071220                                        PRINTB  #ASUBP
 (6)  071220  012746  007670                        MOV     #ASUBP,-(SP)
 (3)  071224  010600                                MOV     SP,R0
 (4)  071226  004737  065410                        JSR PC,FPRINT
      071232  004737  071676                        JSR     PC,PRNTIQ          ;PRINT TEST #
      071236  000410                                BR 1$
      071240                                        PRINTB  #FORM7
 (6)  071240  012746  010434                        MOV     #FORM7,-(SP)
 (3)  071244  010600                                MOV     SP,R0
 (4)  071246  004737  065410                        JSR PC,FPRINT
      071252  012737  007000  002472                MOV #007000,PZCODE         ;SET PRINTCODE TO DISPLAY PACKED SRC1,SRC2,AND DST.
      071260  000207                        1$:     RTS     PC
      071262                                YCMPP:
      071262                                        PRINTB  #ACMPP
 (6)  071262  012746  007700                        MOV     #ACMPP,-(SP)
 (3)  071266  010600                                MOV     SP,R0
 (4)  071270  004737  065410                        JSR PC,FPRINT
      071274  004737  071676                        JSR     PC,PRNTIQ          ;PRINT TEST #
      071300  000410                                BR 1$
      071302                                        PRINTB  #FORM8
 (6)  071302  012746  010530                        MOV     #FORM8,-(SP)
 (3)  071306  010600                                MOV     SP,R0
 (4)  071310  004737  065410                        JSR PC,FPRINT
      071314  012737  003000  002472                MOV #003000,PZCODE         ;SET PRINTCODE TO DISPLAY PACKED SRC1, AND SRC2.
      071322  000207                        1$:     RTS     PC
      071324                                YCVTPL:
      071324                                        PRINTB  #ACVTPL
 (6)  071324  012746  007710                        MOV     #ACVTPL,-(SP)
 (3)  071330  010600                                MOV     SP,R0
 (4)  071332  004737  065410                        JSR PC,FPRINT
      071336  004737  071676                        JSR     PC,PRNTIQ          ;PRINT TEST #
      071342  000410                                BR 1$
      071344                                        PRINTB  #FORM9
 (6)  071344  012746  010606                        MOV     #FORM9,-(SP)
 (3)  071350  010600                                MOV     SP,R0
 (4)  071352  004737  065410                        JSR PC,FPRINT
      071356  012737  000400  002472                MOV #000400,PZCODE         ;SET PRINTCODE TO DISPLAY PACKED SRC.
      071364  000207                        1$:     RTS     PC
      071366                                YMULP:
      071366                                        PRINTB  #AMULP
 (6)  071366  012746  007721                        MOV     #AMULP,-(SP)
```

```
  (3)  071372  010600                           MOV     SP,R0
  (4)  071374  004737  065410                   JSR PC,FPRINT
15143  071400  004737  071676                   JSR     PC,PRNTIQ        ;PRINT TEST #
15144  071404  000410                           BR 1$
15145  071406                                   PRINTB  #FORM7
  (6)  071406  012746  010434                   MOV     #FORM7,-(SP)
  (3)  071412  010600                           MOV     SP,R0
  (4)  071414  004737  065410                   JSR PC,FPRINT
15146  071420  012737  007000  002472           MOV #007000,PZCODE       ;SET PRINTCODE TO DISPLAY PACKED SRC1,SRC2, AND DST.
15147  071426  000207                   1$:     RTS     PC
15148  071430                           YDIVP:
15149  071430                                   PRINTB  #ADIVP
  (6)  071430  012746  007731                   MOV     #ADIVP,-(SP)
  (3)  071434  010600                           MOV     SP,R0
  (4)  071436  004737  065410                   JSR PC,FPRINT
15150  071442  004737  071676                   JSR     PC,PRNTIQ        ;PRINT TEST #
15151  071446  000410                           BR 1$
15152  071450                                   PRINTB  #FORM7
  (6)  071450  012746  010434                   MOV     #FORM7,-(SP)
  (3)  071454  010600                           MOV     SP,R0
  (4)  071456  004737  065410                   JSR PC,FPRINT
15153  071462  012737  007000  002472           MOV #007000,PZCODE       ;SET PRINTCODE TO DISPLAY PACKED SRC1,SRC2, AND DST.
15154  071470  000207                   1$:     RTS     PC
15155  071472                           YASHP:
15156  071472                                   PRINTB  #AASHP
  (6)  071472  012746  007741                   MOV     #AASHP,-(SP)
  (3)  071476  010600                           MOV     SP,R0
  (4)  071500  004737  065410                   JSR PC,FPRINT
15157  071504  004737  071676                   JSR     PC,PRNTIQ        ;PRINT TEST #
15158  071510  000410                           BR 1$
15159  071512                                   PRINTB  #FORM11
  (6)  071512  012746  010734                   MOV     #FORM11,-(SP)
  (3)  071516  010600                           MOV     SP,R0
  (4)  071520  004737  065410                   JSR PC,FPRINT
15160  071524  012737  010400  002472           MOV #010400,PZCODE       ;SET PRINTCODE TO DISPLAY PACKED SRC,DST.
15161  071532  000207                   1$:     RTS     PC
15162  071534                           YCVTLP:
15163  071534                                   PRINTB  #ACVTLP
  (6)  071534  012746  007751                   MOV     #ACVTLP,-(SP)
  (3)  071540  010600                           MOV     SP,R0
  (4)  071542  004737  065410                   JSR PC,FPRINT
15164  071546  004737  071676                   JSR     PC,PRNTIQ        ;PRINT TEST #
15165  071552  000410                           BR 1$
15166  071554                                   PRINTB  #FORM12
  (6)  071554  012746  011016                   MOV     #FORM12,-(SP)
  (3)  071560  010600                           MOV     SP,R0
  (4)  071562  004737  065410                   JSR PC,FPRINT
15167  071566  012737  020000  002472           MOV #020000,PZCODE       ;SET PRINTCODE TO DISPLAY PACKED DST.
15168  071574  000207                   1$:     RTS     PC
15169  071576                           YL2D:
15170  071576                                   PRINTB #AL2D,TINST
  (7)  071576  013746  050012                   MOV     TINST,-(SP)
  (6)  071602  012746  007762                   MOV     #AL2D,-(SP)
  (3)  071606  010600                           MOV     SP,R0
```

```
   (4) 071610  004737  065410                   JSR PC,FPRINT
       071614  004737  071676                   JSR PC,PRNTIQ
       071620  000405                           BR 1$
       071622                                   PRINTB  #FORM41
   (6) 071622  012746  014647                   MOV     #FORM41,-(SP)
   (3) 071626  010600                           MOV     SP,R0
   (4) 071630  004737  065410                   JSR PC,FPRINT
       071634  000207                   1$:     RTS PC
       071636                           YL3D:
       071636                                   PRINTB #AL3D,TINST
   (7) 071636  013746  050012                   MOV     TINST,-(SP)
   (6) 071642  012746  007774                   MOV     #AL3D,-(SP)
   (3) 071646  010600                           MOV     SP,R0
   (4) 071650  004737  065410                   JSR PC,FPRINT
       071654  004737  071676                   JSR PC,PRNTIQ
       071660  000405                           BR 1$
       071662                                   PRINTB  #FORM41
   (6) 071662  012746  014647                   MOV     #FORM41,-(SP)
   (3) 071666  010600                           MOV     SP,R0
   (4) 071670  004737  065410                   JSR PC,FPRINT
       071674  000207                   1$:     RTS PC
                                        ;
                                        ;
                                        ;SUBROUTINE TO PRINT CURRENT TEST # (TOTTC)
                                        ;
       071676  032737  000100  050012   PRNTIQ: BIT #100,TINST          ;SUBROUTINE TO PRINT I ON END OF IN-LINE OPCODE
                                                                        ; NEUMONIC AND TEST NUMBER.
                                                                        ;IS OPCODE UNDER TEST AN IN-LINE TYPE?
       071704  001405                           BEQ 1$                  ;BRANCH IF NO
       071706                                   PRINTB  #FORM31         ;PRINT  I
   (6) 071706  012746  014252                   MOV     #FORM31,-(SP)
   (3) 071712  010600                           MOV     SP,R0
   (4) 071714  004737  065410                   JSR PC,FPRINT
       071720                           1$:     PRINTB  #FORM30,TOTTCH,TOTTC     ;PRINT TEST #
   (8) 071720  013746  001420                   MOV     TOTTC,-(SP)
   (7) 071724  013746  001416                   MOV     TOTTCH,-(SP)
   (6) 071730  012746  014222                   MOV     #FORM30,-(SP)
   (3) 071734  010600                           MOV     SP,R0
   (4) 071736  004737  065410                   JSR PC,FPRINT
       071742  005737  001762                   TST CTACT               ;CNTL-T REQUEST ACTIVE?
       071746  001066                           BNE 3$                  ;BRANCH IF YES
       071750                                   PRINTB #FORM40,INTCT,REGSET      ;PRINT INTERRUPT COUNT AND REG SET
   (8) 071750  013746  002052                   MOV     REGSET,-(SP)
   (7) 071754  013746  002546                   MOV     INTCT,-(SP)
   (6) 071760  012746  014567                   MOV     #FORM40,-(SP)
   (3) 071764  010600                           MOV     SP,R0
   (4) 071766  004737  065410                   JSR PC,FPRINT
       071772  062716  000002                   ADD #2,(SP)
       071776  005737  002160                   TST MODE                ;FORM ASCII MODE CHARACTER
       072002  001004                           BNE 4$
       072004  112737  000113  066122           MOVB #113,TDIG          ;KERNEL MODE (K)
       072012  000413                           BR 10$
       072014  022737  000001  002160   4$:     CMP #1,MODE
       072022  001004                           BNE 5$
```

```
      072024  112737  000123  066122          MOVB #123,TDIG          ;SUPERVISOR MODE (S)
      072032  000403                          BR 10$
      072034  112737  000125  066122  5$:     MOVB #125,TDIG          ;USER MODE (U)
      072042  104400                  10$:    TYPE
      072044  066122                          TDIG
      072046                                  PRINTB #FRM40A          ;PRINT D EN
  (6) 072046  012746  014635                  MOV     #FRM40A,-(SP)
  (3) 072052  010600                          MOV     SP,R0
  (4) 072054  004737  065410                  JSR PC,FPRINT
      072060  005737  002162                  TST DEN                 ;PRINT Y OR N
      072064  001004                          BNE 6$
      072066  112737  000116  066122          MOVB #116,TDIG
      072074  000403                          BR 11$
      072076  112737  000131  066122  6$:     MOVB #131,TDIG
      072104  104400                  11$:    TYPE
      072106  066122                          TDIG
      072110                                  PRINTB #FORM21          ;PRINT CRLF
  (6) 072110  012746  014074                  MOV     #FORM21,-(SP)
  (3) 072114  010600                          MOV     SP,R0
  (4) 072116  004737  065410                  JSR PC,FPRINT
      072122  000405                          BR 2$
      072124                          3$:     PRINTB #FORM21          ;PRINT CRLF
  (6) 072124  012746  014074                  MOV     #FORM21,-(SP)
  (3) 072130  010600                          MOV     SP,R0
  (4) 072132  004737  065410                  JSR PC,FPRINT
      072136  005037  001762          2$:     CLR CTACT               ;CLEAR CNTL-T FLAG
      072142  000207                          RTS PC


                                              .EVEN
```

```
                                        .SBTTL  DUMMY INPUT TABLE (FOR RANDOM MODE)
                                        ;DUMMY INPUT TABLE - USED ONLY IN RANDOM EXERCISE MODE
                                        ;
072144  000000                          IDUM:   .WORD   0               ;INST
072146  000000                                  .WORD   0               ;TYPE = 0
072150  000000                                  .WORD   0               ;IP1
072152  000000                                  .WORD   0               ;IP2
072154  000000                                  .WORD   0               ;IP3
072156  000000                                  .WORD   0               ;IP4
072160  000000                                  .WORD   0               ;IP5
072162  000000                                  .WORD   0               ;IP6
072164  000000                                  .WORD   0               ;IP7
072166  000000                                  .WORD   0               ;IP10
072170  000000                                  .WORD   0               ;IP11
072172  000000                                  .WORD   0               ;IP12
072174  000000                                  .WORD   0               ;IP13
072176  000000                                  .WORD   0               ;IP14
072200  000000                                  .WORD   0               ;IP15
072202  000000                                  .WORD   0               ;IP16
072204  000000                                  .WORD   0               ;IP17
072206  000000                                  .WORD   0               ;IP20
072210  000000                                  .WORD   0               ;IP21
072212  000000                                  .WORD   0               ;IP22
072214  000000                                  .WORD   0               ;IP23
072216  000000                          IDUME:  .WORD   0               ;IP24
```

```

                                .SBTTL  CIS INST INPUT TABLES
                                ;INPUT TABLES
                                ;
072220  000000                  INPTBL: .WORD 0
                                ;
```

```
                                .SBTTL          L2D TABLES
                                ;
                                ;ENTRY 0.1 - INSTRUCTION UNDER TEST = L2DR
                                ;
072222  000032                  IL2D:   .WORD 32        ;INST=L2DR; NOTE:R IS CALCULATED USING IP7.
072224  000003                          .WORD 3         ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
072226  107616                          .WORD T53       ;IP1 - R0 PATTERN
072230  107626                          .WORD T54       ;IP2 - R1 PATTERN
072232  107636                          .WORD T55       ;IP3 - R2 PATTERN
072234  107646                          .WORD T56       ;IP4 - R3 PATTERN
072236  107656                          .WORD T57       ;IP5 - R4 PATTERN
072240  107666                          .WORD T60       ;IP6 - R5 PATTERN
072242  107676                          .WORD T61       ;IP7 - DESC ADDRESS
072244  000000                          .WORD 0         ;IP10
072246  000000                          .WORD 0         ;IP11
072250  000000                          .WORD 0         ;IP12
072252  000000                          .WORD 0         ;IP13
072254  000000                          .WORD 0         ;IP14
072256  000000                          .WORD 0         ;IP15
072260  000000                          .WORD 0         ;IP16
072262  000000                          .WORD 0         ;IP17
072264  000000                          .WORD 0         ;IP20
072266  000000                          .WORD 0         ;IP21
072270  000000                          .WORD 0         ;IP22
072272  000000                          .WORD 0         ;IP23
072274  000000                          .WORD 0         ;IP24

                                ;TOTAL # OF TESTS = 8
```

```
                        .SBTTL          L3D TABLES
                        ;
                        ;ENTRY 0.2 - INSTRUCTION UNDER TEST = L3DR
                        ;
072276  000033          IL3D:   .WORD 33        ;INST=L3DR; NOTE:R IS CALCULATED USING IP7.
072300  000003                  .WORD 3         ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
072302  107616                  .WORD T53       ;IP1 - R0 PATTERN
072304  107626                  .WORD T54       ;IP2 - R1 PATTERN
072306  107636                  .WORD T55       ;IP3 - R2 PATTERN
072310  107646                  .WORD T56       ;IP4 - R3 PATTERN
072312  107656                  .WORD T57       ;IP5 - R4 PATTERN
072314  107666                  .WORD T60       ;IP6 - R5 PATTERN
072316  107676                  .WORD T61       ;IP7 - DESC ADDRESS
072320  000000                  .WORD 0         ;IP10
072322  000000                  .WORD 0         ;IP11
072324  000000                  .WORD 0         ;IP12
072326  000000                  .WORD 0         ;IP13
072330  000000                  .WORD 0         ;IP14
072332  000000                  .WORD 0         ;IP15
072334  000000                  .WORD 0         ;IP16
072336  000000                  .WORD 0         ;IP17
072340  000000                  .WORD 0         ;IP20
072342  000000                  .WORD 0         ;IP21
072344  000000                  .WORD 0         ;IP22
072346  000000                  .WORD 0         ;IP23
072350  000000                  .WORD 0         ;IP24

                        ;TOTAL # OF TESTS = 8
```

```
                                .SBTTL          MOVC TABLES
                                ;ENTRY 1 - INST UNDER TEST = MOVC
                                ;
072352  000001                  IMOVC:  .WORD   1               ;INST=MOVC
072354  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
072356  103074                          .WORD   TL1C            ;IP1 - SRC.LEN
072360  103134                          .WORD   T2              ;IP2 - SRC.ADR
072362  103114                          .WORD   TL2C            ;IP3 - DST.LEN
072364  103170                          .WORD   T4              ;IP4 - DST.ADR
072366  104026                          .WORD   T5              ;IP5 - FILL
072370  104056                          .WORD   T6              ;IP6 - SRC DATA
072372  104110                          .WORD   T7              ;IP7 - SRC SURR DATA
072374  104126                          .WORD   T10             ;IP10 - SRC.SURR.LEN
072376  104142                          .WORD   T11             ;IP11 - DST DATA
072400  104160                          .WORD   T12             ;IP12 - DST SURR DATA
072402  104176                          .WORD   T13             ;IP13 - DST.SURR.LEN
072404  104212                          .WORD   T14             ;IP14 - SEPARATION CONSTANT
072406  000000                          .WORD   0               ;IP15 - (TRANSLATION TABLE FOR MOVTC)
072410  102560                          .WORD   T0              ;IP16 - SPECIAL HANDLING
072412  000000                          .WORD   0               ;IP17
072414  000000                          .WORD   0               ;IP20
072416  000000                          .WORD   0               ;IP21
072420  000000                          .WORD   0               ;IP22
072422  000000                          .WORD   0               ;IP23
072424  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,300
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD < DEST. AD
                                ;                           - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD > DEST. AD
                                ;                           - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
                                ;                           - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                ;                           - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD =
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # = 1.
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 48
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)48 = 96
                                ;
```

```
                                ;ENTRY 2 - INST UNDER TEST = MOVC
                                ;
072426  000001                  IMOVC1: .WORD   1               ;INST=MOVC
072430  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
072432  102604                          .WORD   T1A             ;IP1 - SRC.LEN
072434  103152                          .WORD   T2AA            ;IP2 - SRC.ADR
072436  102604                          .WORD   T1A             ;IP3 - DST.LEN
072440  103432                          .WORD   T4A             ;IP4 - DST.ADR
072442  104026                          .WORD   T5              ;IP5 - FILL
072444  104100                          .WORD   T6A             ;IP6 - SRC DATA
072446  102560                          .WORD   T0              ;IP7 - SRC SURR DATA
072450  102560                          .WORD   T0              ;IP10 - SRC.SURR.LEN
072452  102560                          .WORD   T0              ;IP11 - DST DATA
072454  102560                          .WORD   T0              ;IP12 - DST SURR DATA
072456  102560                          .WORD   T0              ;IP13 - DST.SURR.LEN
072460  104212                          .WORD   T14             ;IP14 - SEPARATION CONSTANT
072462  000000                          .WORD   0               ;IP15 - (TRANSLATION TABLE FOR MOVTC)
072464  103030                          .WORD   TSPA            ;IP16 - SPECIAL HANDLING
072466  000000                          .WORD   0               ;IP17
072470  000000                          .WORD   0               ;IP20
072472  000000                          .WORD   0               ;IP21
072474  000000                          .WORD   0               ;IP22
072476  000000                          .WORD   0               ;IP23
072500  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START#=0
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 256
                                ;TOTAL # OF TESTS = (1 REG.)256 = 256
                                ;
```

```
                                  ;ENTRY 3 - INST UNDER TEST = MOVC
                                  ;
072502  000001                    IMOVC2: .WORD   1                ;INST=MOVC
072504  000000                            .WORD   0                ;TYPE = 0
072506  100010                            .WORD   100010           ;IP1 - SRC.LEN
072510  000201                            .WORD   201              ;IP2 - SRC.ADR
072512  000011                            .WORD   000011           ;IP3 - DST.LEN
072514  000224                            .WORD   224              ;IP4 - DST.ADR
072516  000377                            .WORD   377              ;IP5 - FILL
072520  104060                            .WORD   T6+2             ;IP6 - SRC DATA
072522  000240                            .WORD   240              ;IP7 - SRC SURR DATA
072524  000000                            .WORD   0                ;IP10 - SRC.SURR.LEN
072526  000252                            .WORD   252              ;IP11 - DST DATA
072530  000360                            .WORD   360              ;IP12 - DST SURR DATA
072532  000000                            .WORD   0                ;IP13 - DST.SURR.LEN
072534  000000                            .WORD   0                ;IP14 - SEPARATION CONSTANT
072536  000000                            .WORD   0                ;IP15
072540  000003                            .WORD   3                ;IP16 - SPECIAL HANDLING
072542  000000                            .WORD   0                ;IP17
072544  000000                            .WORD   0                ;IP20
072546  000000                            .WORD   0                ;IP21
072550  000000                            .WORD   0                ;IP22
072552  000000                            .WORD   0                ;IP23
072554  000000                            .WORD   0                ;IP24

                                  ;THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
                                  ;
                                  ;       SOURCE LENGTH - 100010
                                  ;       DESTINATION LENGTH - 11
                                  ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                  ;       DESTINATION ADDRESS - 224 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # = 1.
                                  ;
                                  ;THIS TEST WAS ADDED TO EXERCISE & TEST THE MOVC V-BIT OPERATION
                                  ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)= 2
                                  ;
```

```
                                 .SBTTL          LOCC TABLES
                                 ;
                                 ;ENTRY 4 - INSTRUCTION UNDER TEST = LOCC
                                 ;
072556  000004                   ILOCC:  .WORD   4                       ;INST=LOCC
072560  000003                           .WORD 3                         ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
072562  103074                           .WORD   TL1C                    ;IP1 - SRC.LEN
072564  103134                           .WORD   T2                      ;IP2 - SRC.ADR
072566  104236                           .WORD   T15                     ;IP3 - CHAR
072570  104056                           .WORD   T6                      ;IP4 - SRC DATA
072572  104110                           .WORD   T7                      ;IP5 - SRC SURR DATA
072574  104126                           .WORD   T10                     ;IP6 - SRC.SURR.LEN
072576  102560                           .WORD   T0                      ;IP7 - SPECIAL HANDLING
072600  000000                           .WORD   0                       ;IP10
072602  000000                           .WORD   0                       ;IP11
072604  000000                           .WORD   0                       ;IP12
072606  000000                           .WORD   0                       ;IP13
072610  000000                           .WORD   0                       ;IP14
072612  000000                           .WORD   0                       ;IP15
072614  000000                           .WORD   0                       ;IP16
072616  000000                           .WORD   0                       ;IP17
072620  000000                           .WORD   0                       ;IP20
072622  000000                           .WORD   0                       ;IP21
072624  000000                           .WORD   0                       ;IP22
072626  000000                           .WORD   0                       ;IP23
072630  000000                           .WORD   0                       ;IP24

                                 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                 ;
                                 ;       SOURCE LENGTH - 0,1,300
                                 ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                 ;       CHAR - 004,375,240
                                 ;       SOURCE DATA - INCREMENTING SEQUENCE;INC=1,START#=1
                                 ;
                                 ;TOTAL # OF TEST CONDITIONS = 9
                                 ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)9 = 18
                                 ;
```

```

                                ;ENTRY 5 - INSTRUCTION UNDER TEST = LOCC
                                ;
072632  000004                  ILOCC1: .WORD   4               ;INST=LOCC
072634  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
072636  102604                          .WORD   T1A             ;IP1 - SRC.LEN
072640  103152                          .WORD   T2AA            ;IP2 - SRC.ADR
072642  104256                          .WORD   T15A            ;IP3 - CHAR
072644  104100                          .WORD   T6A             ;IP4 - SRC DATA
072646  102560                          .WORD   T0              ;IP5 - SRC SURR DATA
072650  102560                          .WORD   T0              ;IP6 - SRC.SURR.LEN
072652  103030                          .WORD   TSPA            ;IP7 - SPECIAL HANDLING
072654  000000                          .WORD   0               ;IP10
072656  000000                          .WORD   0               ;IP11
072660  000000                          .WORD   0               ;IP12
072662  000000                          .WORD   0               ;IP13
072664  000000                          .WORD   0               ;IP14
072666  000000                          .WORD   0               ;IP15
072670  000000                          .WORD   0               ;IP16
072672  000000                          .WORD   0               ;IP17
072674  000000                          .WORD   0               ;IP20
072676  000000                          .WORD   0               ;IP21
072700  000000                          .WORD   0               ;IP22
072702  000000                          .WORD   0               ;IP23
072704  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                ;       CHAR - 004
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # =0
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 16
                                ;TOTAL # OF TESTS = (1 REG.)16 = 16
                                ;
```

```
                                       ;
                                       ;ENTRY 6 - INSTRUCTION UNDER TEST = LOCC
                                       ;
072706  000004                         ILOCC2: .WORD   4               ;INST=LOCC
072710  000000                                 .WORD   0               ;TYPE = 0
072712  100011                                 .WORD   100011          ;IP1 - SRC.LEN
072714  000201                                 .WORD   201             ;IP2 - SRC.ADR
072716  000002                                 .WORD   2               ;IP3 - CHAR
072720  104060                                 .WORD   T6+2            ;IP4 - SRC DATA DESCRIPTOR ADR
072722  000000                                 .WORD   0               ;IP5 - SRC SURR DATA DESCRIPTOR ADR
072724  000000                                 .WORD   0               ;IP6 - SRC.SURR.LEN
072726  000003                                 .WORD   3               ;IP7 - SPECIAL HANDLING
072730  000000                                 .WORD   0               ;IP10
072732  000000                                 .WORD   0               ;IP11
072734  000000                                 .WORD   0               ;IP12
072736  000000                                 .WORD   0               ;IP13
072740  000000                                 .WORD   0               ;IP14
072742  000000                                 .WORD   0               ;IP15
072744  000000                                 .WORD   0               ;IP16
072746  000000                                 .WORD   0               ;IP17
072750  000000                                 .WORD   0               ;IP20
072752  000000                                 .WORD   0               ;IP21
072754  000000                                 .WORD   0               ;IP22
072756  000000                                 .WORD   0               ;IP23
072760  000000                                 .WORD   0               ;IP24

                                       ;THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
                                       ;
                                       ;       SOURCE LENGTH - 100011
                                       ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                       ;       CHAR - 002
                                       ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START#=1
                                       ;
                                       ;THIS TEST WAS ADDED TO EXERCISE & TEST THE LOCC V-BIT OPERATION
                                       ;TOTAL # OF TESTS = (1 REG. + 1 INLINE) = 2
                                       ;
```

```
                                .SBTTL          CMPC TABLES
                                ;
                                ;ENTRY 7 - INSTRUCTION UNDER TEST = CMPC
                                ;
072762  000010                  ICMPC:  .WORD 10                ;INST = CMPC
072764  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
072766  103074                          .WORD TL1C              ;IP1 - SRC1.LEN
072770  103134                          .WORD T2                ;IP2 - SRC1.ADR
072772  103114                          .WORD TL2C              ;IP3 - SRC2.LEN
072774  104000                          .WORD T411              ;IP4 - SRC2.ADR
072776  104040                          .WORD T511              ;IP5 - FILL
073000  105172                          .WORD T20               ;IP6 - SRC1.DATA
073002  102560                          .WORD T0                ;IP7 - SRC1.SURR.DATA
073004  104126                          .WORD T10               ;IP10 - SRC1.SURR.LEN
073006  105172                          .WORD T20               ;IP11 - SRC2.DATA
073010  104160                          .WORD T12               ;IP12 - SRC2.SURR.DATA
073012  104176                          .WORD T13               ;IP13 - SRC2.SURR.LEN
073014  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
073016  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
073020  000000                          .WORD 0                 ;IP16
073022  000000                          .WORD 0                 ;IP17
073024  000000                          .WORD 0                 ;IP20
073026  000000                          .WORD 0                 ;IP21
073030  000000                          .WORD 0                 ;IP22
073032  000000                          .WORD 0                 ;IP23
073034  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0,1,300
                                ;       SOURCE 2 LENGTH - 0,1,5
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS - NO OVERLAP OF SOURCE STRINGS
                                ;       FILL CHAR - 201,377,127
                                ;       SOURCE 1 DATA - ALL STRING CHARS IDENTICAL = 127
                                ;       SOURCE 2 DATA - ALL STRING CHARS IDENTICAL = 127
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 27
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)27 = 54
                                ;
```

```
                                ;ENTRY 8 - INSTRUCTION UNDER TEST = CMPC
                                ;
073036  000010                  ICMPC1: .WORD 10                ;INST = CMPC
073040  000001                          .WORD 1                 ;TYPE = 1
073042  105262                          .WORD TL21C             ;IP1 - SRC1.LEN
073044  103134                          .WORD T2                ;IP2 - SRC1.ADR
073046  105300                          .WORD TL22C             ;IP3 - SRC2.LEN
073050  103170                          .WORD T4                ;IP4 - SRC2.ADR
073052  104026                          .WORD T5                ;IP5 - FILL
073054  104056                          .WORD T6                ;IP6 - SRC1.DATA
073056  104110                          .WORD T7                ;IP7 - SRC1.SURR.DATA
073060  104126                          .WORD T10               ;IP10 - SRC1.SURR.LEN
073062  104056                          .WORD T6                ;IP11 - SRC2.DATA
073064  104160                          .WORD T12               ;IP12 - SRC2.SURR.DATA
073066  104176                          .WORD T13               ;IP13 - SRC2.SURR.LEN
073070  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
073072  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
073074  000000                          .WORD 0                 ;IP16
073076  000000                          .WORD 0                 ;IP17
073100  000000                          .WORD 0                 ;IP20
073102  000000                          .WORD 0                 ;IP21
073104  000000                          .WORD 0                 ;IP22
073106  000000                          .WORD 0                 ;IP23
073110  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 1,5
                                ;       SOURCE 2 LENGTH - 1,5
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD < DEST. ADD
                                ;                        - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD > DEST. AD
                                ;                        - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
                                ;                        - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
                                ;                        - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
                                ;                        - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                ;                        - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD =
                                ;       FILL CHAR - 377
                                ;       SOURCE 1 DATA - INCREMENTING SEQUENCE; INC=1,START # =1
                                ;       SOURCE 2 DATA - INCREMENTING SEQUENCE; INC=1,START # =1
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 26
                                ;TOTAL # OF TESTS = (1 REG + 1 IN-LINE)26 = 52
                                ;
```

```

                                   ;ENTRY 9 - INSTRUCTION UNDER TEST = CMPC

                                   ;
     073112  000010                ICMPC2: .WORD 10                 ;INST = CMPC
     073114  000003                        .WORD 3                  ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
     073116  102604                        .WORD T1A                ;IP1 - SRC1.LEN
     073120  103152                        .WORD T2AA               ;IP2 - SRC1.ADR
     073122  102604                        .WORD T1A                ;IP3 - SRC2.LEN
     073124  103432                        .WORD T4A                ;IP4 - SRC2.ADR
     073126  104026                        .WORD T5                 ;IP5 - FILL
     073130  104100                        .WORD T6A                ;IP6 - SRC1.DATA
     073132  102560                        .WORD T0                 ;IP7 - SRC1.SURR.DATA
     073134  102560                        .WORD T0                 ;IP10 - SRC1.SURR.LEN
     073136  104100                        .WORD T6A                ;IP11 - SRC2.DATA
     073140  102560                        .WORD T0                 ;IP12 - SRC2.SURR.DATA
     073142  102560                        .WORD T0                 ;IP13 - SRC2.SURR.LEN
     073144  104212                        .WORD T14                ;IP14 - SEPARATION CONSTANT
     073146  103030                        .WORD TSPA               ;IP15 - SPECIAL HANDLING
     073150  000000                        .WORD 0                  ;IP16
     073152  000000                        .WORD 0                  ;IP17
     073154  000000                        .WORD 0                  ;IP20
     073156  000000                        .WORD 0                  ;IP21
     073160  000000                        .WORD 0                  ;IP22
     073162  000000                        .WORD 0                  ;IP23
     073164  000000                        .WORD 0                  ;IP24

                                   ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                   ;
                                   ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                                   ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                   ;       SOURCE 1 ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                   ;       SOURCE 2 ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DEST
                                   ;                        - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                   ;       FILL CHAR - 006
                                   ;       SOURCE 1 DATA - INCREMENTING SEQUENCE; INC=1,START # =0
                                   ;       SOURCE 2 DATA - INCREMENTING SEQUENCE; INC=1,START # =0
                                   ;
                                   ;TOTAL # OF TEST CONDITIONS = 256
                                   ;TOTAL # OF TESTS = (1 REG.)256 = 256
                                   ;
```

```
                                .SBTTL          MOVRC TABLES
                                ;
                                ;ENTRY 10 - INSTRUCTION UNDER TEST = MOVRC
                                ;
073166  000002                  IMOVR:  .WORD   2                       ;INST=MOVRC
073170  000003                          .WORD 3                         ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
073172  103074                          .WORD   TL1C                    ;IP1 - SRC.LEN
073174  103134                          .WORD   T2                      ;IP2 - SRC.ADR
073176  103114                          .WORD   TL2C                    ;IP3 - DST.LEN
073200  103170                          .WORD   T4                      ;IP4 - DST.ADR
073202  104026                          .WORD   T5                      ;IP5 - FILL
073204  104056                          .WORD   T6                      ;IP6 - SRC DATA
073206  104110                          .WORD   T7                      ;IP7 - SRC SURR DATA
073210  104126                          .WORD   T10                     ;IP10 - SRC.SURR.LEN
073212  104142                          .WORD   T11                     ;IP11 - DST DATA
073214  104160                          .WORD   T12                     ;IP12 - DST SURR DATA
073216  104176                          .WORD   T13                     ;IP13 - DST.SURR.LEN
073220  104212                          .WORD   T14                     ;IP14 - SEPARATION CONSTANT
073222  000000                          .WORD   0                       ;IP15
073224  102560                          .WORD   T0                      ;IP16 - SPECIAL HANDLING
073226  000000                          .WORD   0                       ;IP17
073230  000000                          .WORD   0                       ;IP20
073232  000000                          .WORD   0                       ;IP21
073234  000000                          .WORD   0                       ;IP22
073236  000000                          .WORD   0                       ;IP23
073240  000000                          .WORD   0                       ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,300
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD < DEST. AD
                                ;                           - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD > DEST. AD
                                ;                           - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
                                ;                           - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                ;                           - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD =
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # = 1.

                                ;TOTAL # OF TEST CONDITIONS = 48
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE) 48  = 96
                                ;
```

```
                                ;
                                ;ENTRY 11 - INSTRUCTION UNDER TEST = MOVRC
                                ;
073242  000002                  IMOVR1: .WORD   2               ;INST=MOVRC
073244  000001                          .WORD   1               ;TYPE = 1
073246  102604                          .WORD   T1A             ;IP1 - SRC.LEN
073250  103152                          .WORD   T2AA            ;IP2 - SRC.ADR
073252  102604                          .WORD   T1A             ;IP3 - DST.LEN
073254  103432                          .WORD   T4A             ;IP4 - DST.ADR
073256  104026                          .WORD   T5              ;IP5 - FILL
073260  104100                          .WORD   T6A             ;IP6 - SRC DATA
073262  102560                          .WORD   T0              ;IP7 - SRC SURR DATA
073264  102560                          .WORD   T0              ;IP10 - SRC.SURR.LEN
073266  102560                          .WORD   T0              ;IP11 - DST DATA
073270  102560                          .WORD   T0              ;IP12 - DST SURR DATA
073272  102560                          .WORD   T0              ;IP13 - DST.SURR.LEN
073274  104212                          .WORD   T14             ;IP14 - SEPARATION CONSTANT
073276  000000                          .WORD   0               ;IP15
073300  103030                          .WORD   TSPA            ;IP16 - SPECIAL HANDLING
073302  000000                          .WORD   0               ;IP17
073304  000000                          .WORD   0               ;IP20
073306  000000                          .WORD   0               ;IP21
073310  000000                          .WORD   0               ;IP22
073312  000000                          .WORD   0               ;IP23
073314  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD<DEST
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD>DEST
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START#=0
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 256
                                ;TOTAL # OF TESTS = (1 REG.)256 = 256
                                ;
```

```
                                        ;
                                        ;ENTRY 12 - INSTRUCTION UNDER TEST = MOVRC
                                        ;
073316  000002                          IMOVR2: .WORD   2               ;INST=MOVRC
073320  000000                                  .WORD   0               ;TYPE = 0
073322  100100                                  .WORD   100100          ;IP1 - SRC.LEN
073324  100000                                  .WORD   100000          ;IP2 - SRC.ADR
073326  000111                                  .WORD   000111          ;IP3 - DST.LEN
073330  000100                                  .WORD   100             ;IP4 - DST.ADR
073332  000376                                  .WORD   376             ;IP5 - FILL
073334  104060                                  .WORD   T6+2            ;IP6 - SRC DATA
073336  000240                                  .WORD   240             ;IP7 - SRC SURR DATA
073340  000000                                  .WORD   0               ;IP10 - SRC.SURR.LEN
073342  000255                                  .WORD   255             ;IP11 - DST DATA
073344  000366                                  .WORD   366             ;IP12 - DST SURR DATA
073346  000000                                  .WORD   0               ;IP13 - DST.SURR.LEN
073350  000000                                  .WORD   0               ;IP14 - SEPARATION CONSTANT
073352  000000                                  .WORD   0               ;IP15
073354  000037                                  .WORD   37              ;IP16 - SPECIAL HANDLING
073356  000000                                  .WORD   0               ;IP17
073360  000000                                  .WORD   0               ;IP20
073362  000000                                  .WORD   0               ;IP21
073364  000000                                  .WORD   0               ;IP22
073366  000000                                  .WORD   0               ;IP23
073370  000000                                  .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
                                        ;
                                        ;       SOURCE LENGTH - 100100
                                        ;       DESTINATION LENGTH - 111
                                        ;       SOURCE ADDRESS - 100000 (RELATIVE TO START OF TEST BUFFER)
                                        ;       DESTINATION ADDRESS - 100 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # = 1.
                                        ;
                                        ;THIS TEST WAS ADDED TO EXERCISE & TEST THE MOVRC V-BIT OPERATION
                                        ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)= 2
                                        ;
```

```
                                .SBTTL          MOVTC TABLES
                                ;ENTRY 13 - INSTRUCTION UNDER TEST = MOVTC
                                ;
073372  000003                  IMOVT:  .WORD   3               ;INST=MOVTC
073374  000001                          .WORD   1               ;TYPE = 1
073376  103074                          .WORD   TL1C            ;IP1 - SRC.LEN
073400  103134                          .WORD   T2              ;IP2 - SRC.ADR
073402  103114                          .WORD   TL2C            ;IP3 - DST.LEN
073404  103170                          .WORD   T4              ;IP4 - DST.ADR
073406  104026                          .WORD   T5              ;IP5 - FILL
073410  104056                          .WORD   T6              ;IP6 - SRC DATA
073412  104110                          .WORD   T7              ;IP7 - SRC SURR DATA
073414  104126                          .WORD   T10             ;IP10 - SRC.SURR.LEN
073416  104142                          .WORD   T11             ;IP11 - DST DATA
073420  104160                          .WORD   T12             ;IP12 - DST SURR DATA
073422  104176                          .WORD   T13             ;IP13 - DST.SURR.LEN
073424  104212                          .WORD   T14             ;IP14 - SEPARATION CONSTANT
073426  105356                          .WORD   T24             ;IP15 - TRANSLATION TABLE
073430  102560                          .WORD   T0              ;IP16 - SPECIAL HANDLING
073432  000000                          .WORD   0               ;IP17
073434  000000                          .WORD   0               ;IP20
073436  000000                          .WORD   0               ;IP21
073440  000000                          .WORD   0               ;IP22
073442  000000                          .WORD   0               ;IP23
073444  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,300
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD < DEST. AD
                                ;                           - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD > DEST. AD
                                ;                           - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
                                ;                           - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                ;                           - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD =
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # = 1.
                                ;       TRANSLATION TABLE DATA = 1 IN LOC 0, 2 IN LOC 1, ETC
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 48
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE) 48 = 96
```

```
                                ;ENTRY 14 - INSTRUCTION UNDER TEST = MOVTC
                                ;
073446  000003                  IMOVT1: .WORD   3               ;INST=MOVTC
073450  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
073452  102604                          .WORD   T1A             ;IP1 - SRC.LEN
073454  103152                          .WORD   T2AA            ;IP2 - SRC.ADR
073456  102604                          .WORD   T1A             ;IP3 - DST.LEN
073460  103432                          .WORD   T4A             ;IP4 - DST.ADR
073462  104026                          .WORD   T5              ;IP5 - FILL
073464  104100                          .WORD   T6A             ;IP6 - SRC DATA
073466  102560                          .WORD   T0              ;IP7 - SRC SURR DATA
073470  102560                          .WORD   T0              ;IP10 - SRC.SURR.LEN
073472  102560                          .WORD   T0              ;IP11 - DST DATA
073474  102560                          .WORD   T0              ;IP12 - DST SURR DATA
073476  102560                          .WORD   T0              ;IP13 - DST.SURR.LEN
073500  104212                          .WORD   T14             ;IP14 - SEPARATION CONSTANT
073502  105356                          .WORD   T24             ;IP15 - TRANSLATION TABLE
073504  103030                          .WORD   TSPA            ;IP16 - SPECIAL HANDLING
073506  000000                          .WORD   0               ;IP17
073510  000000                          .WORD   0               ;IP20
073512  000000                          .WORD   0               ;IP21
073514  000000                          .WORD   0               ;IP22
073516  000000                          .WORD   0               ;IP23
073520  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING;SRC ADD<DEST
                                ;                           - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD>DEST
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START#=0
                                ;       TRANSLATION TABLE DATA = 1 IN LOC 0, 2 IN LOC 1, ETC
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 256
                                ;TOTAL # OF TESTS = (1 REG.)256 = 256
                                ;
```

```
                        ;ENTRY 15 - INSTRUCTION UNDER TEST = MOVTC
                        ;
073522  000003          IMOV12: .WORD   3               ;INST=MOVTC
073524  000000                  .WORD   0               ;TYPE = 0
073526  100010                  .WORD   100010          ;IP1 - SRC.LEN
073530  000201                  .WORD   201             ;IP2 - SRC.ADR
073532  000011                  .WORD   000011          ;IP3 - DST.LEN
073534  000225                  .WORD   225             ;IP4 - DST.ADR
073536  000375                  .WORD   375             ;IP5 - FILL
073540  104060                  .WORD   T6+2            ;IP6 - SRC DATA
073542  000240                  .WORD   240             ;IP7 - SRC SURR DATA
073544  000000                  .WORD   0               ;IP10 - SRC.SURR.LEN
073546  000254                  .WORD   254             ;IP11 - DST DATA
073550  000355                  .WORD   355             ;IP12 - DST SURR DATA
073552  000000                  .WORD   0               ;IP13 - DST.SURR.LEN
073554  000000                  .WORD   0               ;IP14 - SEPARATION CONSTANT
073556  001734                  .WORD   IXLTB1          ;IP15 - TRANSLATION TABLE
073560  000003                  .WORD   3               ;IP16 - SPECIAL HANDLING
073562  000000                  .WORD   0               ;IP17
073564  000000                  .WORD   0               ;IP20
073566  000000                  .WORD   0               ;IP21
073570  000000                  .WORD   0               ;IP22
073572  000000                  .WORD   0               ;IP23
073574  000000                  .WORD   0               ;IP24

                        ;THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
                        ;
                        ;       SOURCE LENGTH - 100010
                        ;       DESTINATION LENGTH - 11
                        ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                        ;       DESTINATION ADDRESS - 225 (RELATIVE TO START OF TEST BUFFER)
                        ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # = 1.
                        ;       TRANSLATION TABLE DATA = 1 IN LOC 0, 2 IN LOC 1, ETC
                        ;
                        ;THIS TEST WAS ADDED TO EXERCISE & TEST THE MOVTC V-BIT OPERATION
                        ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)= 2
                        ;
```

```
                                        .SBTTL          SKPC TABLES
                                        ;ENTRY 16 - INSTRUCTION UNDER TEST = SKPC
                                        ;
073576  000005                          ISKPC:  .WORD   5               ;INST=SKPC
073600  000001                                  .WORD   1               ;TYPE = 1
073602  103074                                  .WORD   TL1C            ;IP1 - SRC.LEN
073604  103134                                  .WORD   T2              ;IP2 - SRC.ADR
073606  105372                                  .WORD   T25             ;IP3 - CHAR
073610  105416                                  .WORD   T26             ;IP4 - SRC DATA
073612  104110                                  .WORD   T7              ;IP5 - SRC SURR DATA
073614  104126                                  .WORD   T10             ;IP6 - SRC.SURR.LEN
073616  102560                                  .WORD   T0              ;IP7 - SPECIAL HANDLING
073620  000000                                  .WORD   0               ;IP10
073622  000000                                  .WORD   0               ;IP11
073624  000000                                  .WORD   0               ;IP12
073626  000000                                  .WORD   0               ;IP13
073630  000000                                  .WORD   0               ;IP14
073632  000000                                  .WORD   0               ;IP15
073634  000000                                  .WORD   0               ;IP16
073636  000000                                  .WORD   0               ;IP17
073640  000000                                  .WORD   0               ;IP20
073642  000000                                  .WORD   0               ;IP21
073644  000000                                  .WORD   0               ;IP22
073646  000000                                  .WORD   0               ;IP23
073650  000000                                  .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE LENGTH - 0,1,300
                                        ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE DATA - CHARACTERS FROM STRING = 001,001,007
                                        ;       CHAR - 001,240
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 6
                                        ;TOTAL # OF TESTS (1 REG + 1 INLINE)6 = 12
                                        ;
```

```
                              ;ENTRY 17 - INSTRUCTION UNDER TEST = SKPC
                              ;
073652  000005                ISKPC1: .WORD   5               ;INST=SKPC
073654  000001                        .WORD   1               ;TYPE = 1
073656  102604                        .WORD   T1A             ;IP1 - SRC.LEN
073660  103152                        .WORD   T2AA            ;IP2 - SRC.ADR
073662  105410                        .WORD   T25A            ;IP3 - CHAR
073664  104100                        .WORD   T6A             ;IP4 - SRC DATA
073666  102560                        .WORD   T0              ;IP5 - SRC SURR DATA
073670  102560                        .WORD   T0              ;IP6 - SRC.SURR.LEN
073672  103030                        .WORD   TSPA            ;IP7 - SPECIAL HANDLING
073674  000000                        .WORD   0               ;IP10
073676  000000                        .WORD   0               ;IP11
073700  000000                        .WORD   0               ;IP12
073702  000000                        .WORD   0               ;IP13
073704  000000                        .WORD   0               ;IP14
073706  000000                        .WORD   0               ;IP15
073710  000000                        .WORD   0               ;IP16
073712  000000                        .WORD   0               ;IP17
073714  000000                        .WORD   0               ;IP20
073716  000000                        .WORD   0               ;IP21
073720  000000                        .WORD   0               ;IP22
073722  000000                        .WORD   0               ;IP23
073724  000000                        .WORD   0               ;IP24
                              ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                              ;
                              ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                              ;       SOURCE ADDRESS - 200,201
                              ;       CHAR - 007
                              ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # =0
                              ;
                              ;TOTAL # OF TEST CONDITIONS = 16
                              ;TOTAL # OF TESTS = (1 REG.)16 = 16
                              ;
```

```
                                ;
                                ;ENTRY 18 - INSTRUCTION UNDER TEST = SKPC
                                ;
073726  000005                  ISKPC2: .WORD   5               ;INST=SKPC
073730  000000                          .WORD   0               ;TYPE = 0
073732  100111                          .WORD   100111          ;IP1 - SRC.LEN
073734  000203                          .WORD   203             ;IP2 - SRC.ADR
073736  000003                          .WORD   3               ;IP3 - CHAR
073740  104060                          .WORD   T6+2            ;IP4 - SRC DATA
073742  000000                          .WORD   0               ;IP5 - SRC SURR DATA
073744  000000                          .WORD   0               ;IP6 - SRC.SURR.LEN
073746  000003                          .WORD   3               ;IP7 - SPECIAL HANDLING
073750  000000                          .WORD   0               ;IP10
073752  000000                          .WORD   0               ;IP11
073754  000000                          .WORD   0               ;IP12
073756  000000                          .WORD   0               ;IP13
073760  000000                          .WORD   0               ;IP14
073762  000000                          .WORD   0               ;IP15
073764  000000                          .WORD   0               ;IP16
073766  000000                          .WORD   0               ;IP17
073770  000000                          .WORD   0               ;IP20
073772  000000                          .WORD   0               ;IP21
073774  000000                          .WORD   0               ;IP22
073776  000000                          .WORD   0               ;IP23
074000  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
                                ;
                                ;       SOURCE LENGTH - 100111
                                ;       SOURCE ADDRESS - 203
                                ;       CHAR - 003
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # = 1.
                                ;
                                ;THIS TEST WAS ADDED TO EXERCISE & TEST THE SKPC V-BIT OPERATION.
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE) = 2
                                ;
```

```
                                .SBTTL          MATCHC TABLES
                                ;
                                ;ENTRY 19 - INSTRUCTION UNDER TEST = MATCHC
                                ;
074002  000011                  IMATC:  .WORD 11                ;INST = MATCHC
074004  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
074006  103074                          .WORD TL1C              ;IP1 - OBJ.LEN
074010  103134                          .WORD T2                ;IP2 - OBJ.ADR
074012  103114                          .WORD TL2C              ;IP3 - SRC.LEN
074014  103510                          .WORD T4I               ;IP4 - SRC.ADR
074016  104026                          .WORD T5                ;IP5 - UNUSED PORTION OF REGISTER 4
074020  105172                          .WORD T20               ;IP6 - OBJ.DATA
074022  102560                          .WORD T0                ;IP7 - OBJ.SURR.DATA
074024  104126                          .WORD T10               ;IP10 - OBJ.SURR.LEN
074026  105172                          .WORD T20               ;IP11 - SRC.DATA
074030  104160                          .WORD T12               ;IP12 - SRC.SURR.DATA
074032  104176                          .WORD T13               ;IP13 - SRC.SURR.LEN
074034  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
074036  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
074040  000000                          .WORD 0                 ;IP16
074042  000000                          .WORD 0                 ;IP17
074044  000000                          .WORD 0                 ;IP20
074046  000000                          .WORD 0                 ;IP21
074050  000000                          .WORD 0                 ;IP22
074052  000000                          .WORD 0                 ;IP23
074054  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       OBJECT LENGTH - 0,1,300
                                ;       SOURCE LENGTH - 0,1,5
                                ;       OBJECT ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD < DEST. ADD
                                ;                       - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD > DEST. AD
                                ;                       - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
                                ;                       - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
                                ;                       - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
                                ;                       - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                ;                       - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD =
                                ;       OBJECT DATA - ALL STRING CHARACTERS IDENTICAL = 127
                                ;       SOURCE DATA - ALL STRING CHARACTERS IDENTICAL = 127
                                ;
                                ;TOTAL # OF TEST CONDITIONS =
                                ;TOTAL # OF TESTS =
                                ;
```

```
                                         ;
                                         ;ENTRY 21 - INSTRUCTION UNDER TEST = MATCHC
                                         ;
074056  000011                           IMATC1: .WORD 11               ;INST = MATCHC
074060  000003                                   .WORD 3                ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
074062  102604                                   .WORD T1A              ;IP1 - OBJ.LEN
074064  103152                                   .WORD T2AA             ;IP2 - OBJ.ADR
074066  102604                                   .WORD T1A              ;IP3 - SRC.LEN
074070  103510                                   .WORD T4I              ;IP4 - SRC.ADR
074072  102560                                   .WORD T0               ;IP5 - 0
074074  104100                                   .WORD T6A              ;IP6 - OBJ.DATA
074076  102560                                   .WORD T0               ;IP7 - OBJ.SURR.DATA
074100  102560                                   .WORD T0               ;IP10 - OBJ.SURR.LEN
074102  104056                                   .WORD T6               ;IP11 - SRC.DATA
074104  102560                                   .WORD T0               ;IP12 - SRC.SURR.DATA
074106  102560                                   .WORD T0               ;IP13 - SRC.SURR.LEN
074110  104212                                   .WORD T14              ;IP14 - SEPARATION CONSTANT
074112  103030                                   .WORD TSPA             ;IP15 - SPECIAL HANDLING
074114  000000                                   .WORD 0                ;IP16
074116  000000                                   .WORD 0                ;IP17
074120  000000                                   .WORD 0                ;IP20
074122  000000                                   .WORD 0                ;IP21
074124  000000                                   .WORD 0                ;IP22
074126  000000                                   .WORD 0                ;IP23
074130  000000                                   .WORD 0                ;IP24

                                         ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                         ;
                                         ;       OBJECT LENGTH - 0,1,2,3,4,5,11,20
                                         ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                         ;       OBJECT ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                         ;       SOURCE ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD < DEST. ADD
                                         ;                      - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD > DEST. AD
                                         ;                      - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
                                         ;                      - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
                                         ;                      - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
                                         ;                      - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
                                         ;                      - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD =
                                         ;       OBJECT DATA - INCREMENTING SEQUENCE; INC=1,START # = 0
                                         ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1; START # = 1
                                         ;
                                         ;TOTAL # OF TEST CONDITIONS = 896
                                         ;TOTAL # OF TESTS = (1 REG.)896 = 896
                                         ;
```

```
                              ;
                              ;ENTRY 22 - INSTRUCTION UNDER TEST = MATCHC
                              ;
074132  000011                IMATC2: .WORD 11              ;INST = MATCHC
074134  000000                        .WORD 0               ;TYPE = 0
074136  000020                        .WORD 20              ;IP1 - OBJ.LEN
074140  000100                        .WORD 100             ;IP2 - OBJ.ADR
074142  100020                        .WORD 100020          ;IP3 - SRC.LEN
074144  000201                        .WORD 201             ;IP4 - SRC.ADR
074146  000000                        .WORD 0               ;IP5 - 0
074150  104060                        .WORD T6+2            ;IP6 - OBJ.DATA
074152  000000                        .WORD 0               ;IP7 - OBJ.SURR.DATA
074154  000000                        .WORD 0               ;IP10 - OBJ.SURR.LEN
074156  104060                        .WORD T6+2            ;IP11 - SRC.DATA
074160  000000                        .WORD 0               ;IP12 - SRC.SURR.DATA
074162  000000                        .WORD 0               ;IP13 - SRC.SURR.LEN
074164  000000                        .WORD 0               ;IP14 - SEPARATION CONSTANT
074166  000003                        .WORD 3               ;IP15 - SPECIAL HANDLING
074170  000000                        .WORD 0               ;IP16
074172  000000                        .WORD 0               ;IP17
074174  000000                        .WORD 0               ;IP20
074176  000000                        .WORD 0               ;IP21
074200  000000                        .WORD 0               ;IP22
074202  000000                        .WORD 0               ;IP23
074204  000000                        .WORD 0               ;IP24

                              ;THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
                              ;
                              ;       OBJECT LENGTH - 20
                              ;       SOURCE LENGTH - 100020
                              ;       OBJECT ADDRESS - 100 (RELATIVE TO START OF TEST BUFFER)
                              ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                              ;       OBJECT DATA - INCREMENTING SEQUENCE; INC=1, START # = 1
                              ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # = 1
                              ;
                              ;THIS TEST WAS ADDED TO EXERCISE & TEST THE MATCHC N-BIT OPERATION.
                              ;TOTAL # OF TESTS = (1 REG. + 1 INLINE) = 2
                              ;
```

```
                                .SBTTL          SCANC TABLES

                                ;
                                ;ENTRY 23 - INSTRUCTION UNDER TEST = SCANC
                                ;
074206  000006                  ISCAN:  .WORD 6                 ;INST = SCANC
074210  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
074212  103074                          .WORD TL1C              ;IP1 - SRC.LEN
074214  103134                          .WORD T2                ;IP2 - SRC.ADR
074216  105434                          .WORD T27               ;IP3 - TABLE LEN (256 BYTES)
074220  105450                          .WORD T30               ;IP4 - MASK
074222  105524                          .WORD T31               ;IP5 - TABLE ADR
074224  104056                          .WORD T6                ;IP6 - SRC.DATA
074226  104160                          .WORD T12               ;IP7 - SRC.SURR DATA
074230  104176                          .WORD T13               ;IP10 - SRC.SURR.LEN
074232  105564                          .WORD T32               ;IP11 - TABLE DATA
074234  104110                          .WORD T7                ;IP12 - TABLE SURR DATA
074236  104126                          .WORD T10               ;IP13 - TABLE SURR LEN
074240  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
074242  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
074244  000000                          .WORD 0                 ;IP16
074246  000000                          .WORD 0                 ;IP17
074250  000000                          .WORD 0                 ;IP20
074252  000000                          .WORD 0                 ;IP21
074254  000000                          .WORD 0                 ;IP22
074256  000000                          .WORD 0                 ;IP23
074260  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,300
                                ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       MASK - 0,1,377
                                ;       TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
                                ;                     - OVERLAP - TABLE ADDRESS=SOURCE ADDRESS
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # =1
                                ;       TABLE DATA - ALL BYTES IDENTICAL = 0
                                ;                  - ALL BYTES IDENTICAL = 377
                                ;                  - INCREMENTING SEQUENCE; INC=1, START # =1
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 54
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)54=108
                                ;
```

```
                                        ;
                                        ;ENTRY 24 - INSTRUCTION UNDER TEST = SCANC
                                        ;
 074262  000006                         ISCAN1: .WORD 6           ;INST = SCANC
 074264  000003                                 .WORD 3           ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
 074266  102604                                 .WORD T1A         ;IP1 - SRC.LEN
 074270  103152                                 .WORD T2AA        ;IP2 - SRC.ADR
 074272  105434                                 .WORD T27         ;IP3 - TABLE LEN (256 BYTES)
 074274  105470                                 .WORD T30A        ;IP4 - MASK
 074276  105476                                 .WORD T31A        ;IP5 - TABLE ADR
 074300  104100                                 .WORD T6A         ;IP6 - SRC.DATA
 074302  102560                                 .WORD T0          ;IP7 - SRC.SURR DATA
 074304  102560                                 .WORD T0          ;IP10 - SRC.SURR.LEN
 074306  104100                                 .WORD T6A         ;IP11 - TABLE DATA
 074310  102560                                 .WORD T0          ;IP12 - TABLE SURR DATA
 074312  102560                                 .WORD T0          ;IP13 - TABLE SURR LEN
 074314  104212                                 .WORD T14         ;IP14 - SEPARATION CONSTANT
 074316  103030                                 .WORD TSPA        ;IP15 - SPECIAL HANDLING
 074320  000000                                 .WORD 0           ;IP16
 074322  000000                                 .WORD 0           ;IP17
 074324  000000                                 .WORD 0           ;IP20
 074326  000000                                 .WORD 0           ;IP21
 074330  000000                                 .WORD 0           ;IP22
 074332  000000                                 .WORD 0           ;IP23
 074334  000000                                 .WORD 0           ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                        ;       SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                        ;       MASK - 252
                                        ;       TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
                                        ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START #=0
                                        ;       TABLE DATA - INCREMENTING SEQUENCE;INC=1,START #=0
                                        ;
                                        ;TOTAL # OF TEST CONDTIONS = 16
                                        ;TOTAL # OF TESTS = (1 REG.) = 16
                                        ;
```

```
                                        ;
                                        ;ENTRY 25 - INSTRUCTION UNDER TEST = SCANC
                                        ;
074336  000006                          ISCAN2: .WORD 6                   ;INST = SCANC
074340  000000                                  .WORD 0                   ;TYPE = 0
074342  100040                                  .WORD 100040              ;IP1 - SRC.LEN
074344  000110                                  .WORD 110                 ;IP2 - SRC.ADR
074346  000256                                  .WORD 256                 ;IP3 - TABLE LEN (256 BYTES)
074350  000377                                  .WORD 377                 ;IP4 - MASK
074352  000200                                  .WORD 200                 ;IP5 - TABLE ADR
074354  104060                                  .WORD T6+2                ;IP6 - SRC.DATA
074356  000000                                  .WORD 0                   ;IP7 - SRC.SURR DATA
074360  000000                                  .WORD 0                   ;IP10 - SRC.SURR.LEN
074362  105572                                  .WORD T32+6               ;IP11 - TABLE DATA
074364  000000                                  .WORD 0                   ;IP12 - TABLE SURR DATA
074366  000000                                  .WORD 0                   ;IP13 - TABLE SURR LEN
074370  000000                                  .WORD 0                   ;IP14 - SEPARATION CONSTANT
074372  000003                                  .WORD 3                   ;IP15 - SPECIAL HANDLING
074374  000000                                  .WORD 0                   ;IP16
074376  000000                                  .WORD 0                   ;IP17
074400  000000                                  .WORD 0                   ;IP20
074402  000000                                  .WORD 0                   ;IP21
074404  000000                                  .WORD 0                   ;IP22
074406  000000                                  .WORD 0                   ;IP23
074410  000000                                  .WORD 0                   ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE LENGTH - 100040
                                        ;       SOURCE ADDRESS - 10
                                        ;       MARK - 377
                                        ;       TABLE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START#=1
                                        ;       TABLE DATA - ALL BYTES IDENTICAL = 377
                                        ;
                                        ;THIS TEST WAS ADDED TO EXERCISE & TEST THE SCANC N-BIT OPERATION.
                                        ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)=2
                                        ;
```

```
                                .SBTTL          SPANC TABLES

                                ;
                                ;ENTRY 26 - INSTRUCTION UNDER TEST = SPANC
                                ;
074412  000007                  ISPAN:  .WORD 7                 ;INST = SPANC
074414  000001                          .WORD 1                 ;TYPE = 1
074416  103074                          .WORD TL1C              ;IP1 - SRC.LEN
074420  103134                          .WORD T2                ;IP2 - SRC.ADR
074422  105434                          .WORD T27               ;IP3 - TABLE LEN (256 BYTES)
074424  105450                          .WORD T30               ;IP4 - MASK
074426  105524                          .WORD T31               ;IP5 - TABLE ADR
074430  104056                          .WORD T6                ;IP6 - SRC.DATA
074432  104160                          .WORD T12               ;IP7 - SRC.SURR DATA
074434  104176                          .WORD T13               ;IP10 - SRC.SURR.LEN
074436  105564                          .WORD T32               ;IP11 - TABLE DATA
074440  104110                          .WORD T7                ;IP12 - TABLE SURR DATA
074442  104126                          .WORD T10               ;IP13 - TABLE SURR LEN
074444  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
074446  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
074450  000000                          .WORD 0                 ;IP16
074452  000000                          .WORD 0                 ;IP17
074454  000000                          .WORD 0                 ;IP20
074456  000000                          .WORD 0                 ;IP21
074460  000000                          .WORD 0                 ;IP22
074462  000000                          .WORD 0                 ;IP23
074464  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,300
                                ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       MASK - 0,1,377
                                ;       TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
                                ;                     - OVERLAP - TABLE ADDRESS=SOURCE ADDRESS
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # =1
                                ;       TABLE DATA - ALL BYTES IDENTICAL = 0
                                ;                  - ALL BYTES IDENTICAL = 377
                                ;                  - INCREMENTING SEQUENCE; INC=1, START # =1
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 54
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)54=108
                                ;
```

```
                                ;
                                ;ENTRY 27 - INSTRUCTION UNDER TEST = SPANC
                                ;
074466  000007                  ISPAN1: .WORD 7                 ;INST = SPANC
074470  000001                          .WORD 1                 ;TYPE = 1
074472  102604                          .WORD T1A               ;IP1 - SRC.LEN
074474  103152                          .WORD T2AA              ;IP2 - SRC.ADR
074476  105434                          .WORD T27               ;IP3 - TABLE LEN (256 BYTES)
074500  105470                          .WORD T30A              ;IP4 - MASK
074502  105476                          .WORD T31A              ;IP5 - TABLE ADR
074504  104100                          .WORD T6A               ;IP6 - SRC.DATA
074506  102560                          .WORD T0                ;IP7 - SRC.SURR DATA
074510  102560                          .WORD T0                ;IP10 - SRC.SURR.LEN
074512  104100                          .WORD T6A               ;IP11 - TABLE DATA
074514  102560                          .WORD T0                ;IP12 - TABLE SURR DATA
074516  102560                          .WORD T0                ;IP13 - TABLE SURR LEN
074520  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
074522  103030                          .WORD TSPA              ;IP15 - SPECIAL HANDLING
074524  000000                          .WORD 0                 ;IP16
074526  000000                          .WORD 0                 ;IP17
074530  000000                          .WORD 0                 ;IP20
074532  000000                          .WORD 0                 ;IP21
074534  000000                          .WORD 0                 ;IP22
074536  000000                          .WORD 0                 ;IP23
074540  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                ;       MASK - 252
                                ;       TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START #=0
                                ;       TABLE DATA - INCREMENTING SEQUENCE;INC=1,START #=0
                                ;
                                ;TOTAL # OF TEST CONDTIONS = 16
                                ;TOTAL # OF TESTS = (1 REG.) = 16
                                ;
```

```
                                ;
                                ;ENTRY 28 - INSTRUCTION UNDER TEST = SPANC
                                ;
074542  000007                  ISPAN2: .WORD 7                 ;INST = SPANC
074544  000000                          .WORD 0                 ;TYPE = 0
074546  100040                          .WORD 100040            ;IP1 - SRC.LEN
074550  000110                          .WORD 110               ;IP2 - SRC.ADR
074552  000256                          .WORD 256               ;IP3 - TABLE LEN (256 BYTES)
074554  000000                          .WORD 0                 ;IP4 - MASK
074556  000200                          .WORD 200               ;IP5 - TABLE ADR
074560  104060                          .WORD T6+2              ;IP6 - SRC.DATA
074562  000000                          .WORD 0                 ;IP7 - SRC.SURR DATA
074564  000000                          .WORD 0                 ;IP10 - SRC.SURR.LEN
074566  105572                          .WORD T32+6             ;IP11 - TABLE DATA
074570  000000                          .WORD 0                 ;IP12 - TABLE SURR DATA
074572  000000                          .WORD 0                 ;IP13 - TABLE SURR LEN
074574  000000                          .WORD 0                 ;IP14 - SEPARATION CONSTANT
074576  000003                          .WORD 3                 ;IP15 - SPECIAL HANDLING
074600  000000                          .WORD 0                 ;IP16
074602  000000                          .WORD 0                 ;IP17
074604  000000                          .WORD 0                 ;IP20
074606  000000                          .WORD 0                 ;IP21
074610  000000                          .WORD 0                 ;IP22
074612  000000                          .WORD 0                 ;IP23
074614  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 100040
                                ;       SOURCE ADDRESS - 10
                                ;       MARK - 377
                                ;       TABLE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START#=1
                                ;       TABLE DATA - ALL BYTES IDENTICAL = 377
                                ;
                                ;THIS TEST WAS ADDED TO EXERCISE & TEST THE SCANC N-BIT OPERATION.
                                ;TOTAL # OF TESTS = (1 REG. + 1 INLINE)=2
                                ;
```

```
                        .SBTTL          CVTPN TABLES
                        ;
                        ;ENTRY 29 - INSTRUCTION UNDER TEST = CVTPN
                        ;
074616  000016          ICPZ:   .WORD 16                ;INST=CVTPN
074620  000001                  .WORD 1                 ;TYPE = 1
074622  105650                  .WORD T331              ;IP1 - SRC.LEN
074624  103134                  .WORD T2                ;IP2 - SRC.ADR
074626  105670                  .WORD T332              ;IP3 - DST.LEN
074630  105756                  .WORD T34               ;IP4 - DST.ADR
074632  106034                  .WORD T35               ;IP5 - SRC DATA
074634  104110                  .WORD T7                ;IP6 - SRC SURR DATA
074636  104126                  .WORD T10               ;IP7 - SRC SURR LEN
074640  104142                  .WORD T11               ;IP10 - DST DATA
074642  104160                  .WORD T12               ;IP11 - DST SURR DATA
074644  104176                  .WORD T13               ;IP12 - DST SURR LEN
074646  104212                  .WORD T14               ;IP13 - SEPARATION CONSTANT
074650  102560                  .WORD T0                ;IP14 - SPECIAL HANDLING
074652  000000                  .WORD 0                 ;IP15
074654  000000                  .WORD 0                 ;IP16
074656  000000                  .WORD 0                 ;IP17
074660  000000                  .WORD 0                 ;IP20
074662  000000                  .WORD 0                 ;IP21
074664  000000                  .WORD 0                 ;IP22
074666  000000                  .WORD 0                 ;IP23
074670  000000                  .WORD 0                 ;IP24

                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                        ;
                        ;       SOURCE LENGTH - 0,1,37
                        ;       DESTINATION LENGTH - 0,1,37
                        ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                        ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
                        ;                           - SOURCE & DESTINATION STRINGS ADJACENT
                        ;       SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                        ;                   - ALL DIGITS IDENTICAL = 8; SIGN -
                        ;                   - ALL DIGITS IDENTICAL = 0; SIGN -
                        ;
                        ;TOTAL # OF TEST CONDITIONS = 54
                        ;TOTAL # OF TESTS = (2 DATA TYPES + 1 IN LINE)54=162
                        ;
```

```
                                ;ENTRY 30 - INSTRUCTION UNDER TEST = CVTPN
                                ;
074672  000016                  ICPZ1:  .WORD 16                ;INST=CVTPN
074674  000001                          .WORD 1                 ;TYPE = 1
074676  102604                          .WORD T1A               ;IP1 - SRC.LEN
074700  103144                          .WORD T2A               ;IP2 - SRC.ADR
074702  102604                          .WORD T1A               ;IP3 - DST.LEN
074704  105724                          .WORD T34A              ;IP4 - DST.ADR
074706  106122                          .WORD TP19              ;IP5 - SRC DATA
074710  102560                          .WORD T0                ;IP6 - SRC SURR DATA
074712  102560                          .WORD T0                ;IP7 - SRC SURR LEN
074714  102560                          .WORD T0                ;IP10 - DST DATA
074716  102560                          .WORD T0                ;IP11 - DST SURR DATA
074720  102560                          .WORD T0                ;IP12 - DST SURR LEN
074722  104212                          .WORD T14               ;IP13 - SEPARATION CONSTANT
074724  103030                          .WORD TSPA              ;IP14 - SPECIAL HANDLING
074726  000000                          .WORD 0                 ;IP15
074730  000000                          .WORD 0                 ;IP16
074732  000000                          .WORD 0                 ;IP17
074734  000000                          .WORD 0                 ;IP20
074736  000000                          .WORD 0                 ;IP21
074740  000000                          .WORD 0                 ;IP22
074742  000000                          .WORD 0                 ;IP23
074744  000000                          .WORD 0                 ;IP24


                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
                                ;       SOURCE DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 64
                                ;TOTAL # OF TESTS = (1 REG.)64 = 64
                                ;
```

```
                                .SBTTL          CVTNP TABLES
                                ;ENTRY 31 - INSTRUCTION UNDER TEST = CVTNP
                                ;
074746  000017                  ICZP:   .WORD 17                ;INST=CVTNP
074750  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
074752  105650                          .WORD T331              ;IP1 - SRC.LEN
074754  103134                          .WORD T2                ;IP2 - SRC.ADR
074756  105670                          .WORD T332              ;IP3 - DST.LEN
074760  106312                          .WORD T36               ;IP4 - DST.ADR
074762  106374                          .WORD T37               ;IP5 - SRC DATA
074764  104110                          .WORD T7                ;IP6 - SRC SURR DATA
074766  104126                          .WORD T10               ;IP7 - SRC SURR LEN
074770  104142                          .WORD T11               ;IP10 - DST DATA
074772  104160                          .WORD T12               ;IP11 - DST SURR DATA
074774  104176                          .WORD T13               ;IP12 - DST SURR LEN
074776  104212                          .WORD T14               ;IP13 - SEPARATION CONSTANT
075000  102560                          .WORD T0                ;IP14 - SPECIAL HANDLING
075002  000000                          .WORD 0                 ;IP15
075004  000000                          .WORD 0                 ;IP16
075006  000000                          .WORD 0                 ;IP17
075010  000000                          .WORD 0                 ;IP20
075012  000000                          .WORD 0                 ;IP21
075014  000000                          .WORD 0                 ;IP22
075016  000000                          .WORD 0                 ;IP23
075020  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,37
                                ;       DESTINATION LENGTH - 0,1,37
                                ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
                                ;                           - SOURCE & DESTINATION STRINGS ADJACENT
                                ;       SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                ;                   - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                ;                   - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 54
                                ;TOTAL # OF TESTS = (6 DATA TYPES + 1 IN LINE)54 = 378
                                ;
```

```
                                        ;ENTRY 32 - INSTRUCTION UNDER TEST = CVTNP
                                        ;
        075022  000017                  ICZP1:  .WORD 17                ;INST=CVTNP
        075024  000001                          .WORD 1                 ;TYPE = 1
        075026  102604                          .WORD T1A               ;IP1 - SRC.LEN
        075030  103144                          .WORD T2A               ;IP2 - SRC.ADR
        075032  102604                          .WORD T1A               ;IP3 - DST.LEN
        075034  106264                          .WORD T36A              ;IP4 - DST.ADR
        075036  106462                          .WORD TZ19              ;IP5 - SRC DATA
        075040  102560                          .WORD T0                ;IP6 - SRC SURR DATA
        075042  102560                          .WORD T0                ;IP7 - SRC SURR LEN
        075044  102560                          .WORD T0                ;IP10 - DST DATA
        075046  102560                          .WORD T0                ;IP11 - DST SURR DATA
        075050  102560                          .WORD T0                ;IP12 - DST SURR LEN
        075052  104212                          .WORD T14               ;IP13 - SEPARATION CONSTANT
        075054  103030                          .WORD TSPA              ;IP14 - SPECIAL HANDLING
        075056  000000                          .WORD 0                 ;IP15
        075060  000000                          .WORD 0                 ;IP16
        075062  000000                          .WORD 0                 ;IP17
        075064  000000                          .WORD 0                 ;IP20
        075066  000000                          .WORD 0                 ;IP21
        075070  000000                          .WORD 0                 ;IP22
        075072  000000                          .WORD 0                 ;IP23
        075074  000000                          .WORD 0                 ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                        ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                        ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                        ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
                                        ;       SOURCE DATA - DIGIIS FROM STRING= 1234567891234567891234000891233; SIGN +
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 64
                                        ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)64 = 64
                                        ;
```

```
16568                          ;ENTRY 32A - INSTRUCTION UNDER TEST = CVTNP
16569                          ;
16570 075076 000017            ICZP2:  .WORD 17          ;INST=CVTNP
16571 075100 000001                    .WORD 1           ;TYPE = 1
16572 075102 102630                    .WORD T1B         ;IP1 - SRC.LEN
16573 075104 103152                    .WORD T2AA        ;IP2 - SRC.ADR
16574 075106 102630                    .WORD T1B         ;IP3 - DST.LEN
16575 075110 106264                    .WORD T36A        ;IP4 - DST.ADR
16576 075112 106462                    .WORD TZ19        ;IP5 - SRC DATA
16577 075114 102560                    .WORD T0          ;IP6 - SRC SURR DATA
16578 075116 102560                    .WORD T0          ;IP7 - SRC SURR LEN
16579 075120 102560                    .WORD T0          ;IP10 - DST DATA
16580 075122 102560                    .WORD T0          ;IP11 - DST SURR DATA
16581 075124 102560                    .WORD T0          ;IP12 - DST SURR LEN
16582 075126 104212                    .WORD T14         ;IP13 - SEPARATION CONSTANT
16583 075130 102560                    .WORD T0          ;IP14 - SPECIAL HANDLING
16584 075132 000000                    .WORD 0           ;IP15
16585 075134 000000                    .WORD 0           ;IP16
16586 075136 000000                    .WORD 0           ;IP17
16587 075140 000000                    .WORD 0           ;IP20
16588 075142 000000                    .WORD 0           ;IP21
16589 075144 000000                    .WORD 0           ;IP22
16590 075146 000000                    .WORD 0           ;IP23
16591 075150 000000                    .WORD 0           ;IP24
16592
16593                          ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
16594                          ;
16595                          ;       SOURCE LENGTH - 1,2,3
16596                          ;       DESTINATION LENGTH - 1,2,3
16597                          ;       SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
16598                          ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
16599                          ;       SOURCE DATA - DIGITS FROM STRING= 1234567891234567891234000891233; SIGN +
16600                          ;
16601                          ;TOTAL # OF TEST CONDITIONS = 18
16602                          ;TOTAL # OF TESTS = (6 DATA TYPES + 1 IN LINE)18 = 126
```

```
                                .SBTTL          CVTLP TABLES
                                ;ENTRY 33 - INSTRUCTION UNDER TEST = CVTLP
                                ;
075152  000031                  ICLP:   .WORD 31        ;INST=CVTLP
075154  000003                          .WORD 3         ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
075156  106540                          .WORD T40       ;IP1 - SRC.HIGH (R2)
075160  106620                          .WORD T41       ;IP2 - SRC.LOW (R3)
075162  105614                          .WORD T33       ;IP3 - DST.LEN (R4)
075164  103134                          .WORD T2        ;IP4 - DST.ADR (R5)
075166  104142                          .WORD T11       ;IP5 - DST DATA
075170  104160                          .WORD T12       ;IP6 - DST SURR DATA
075172  104176                          .WORD T13       ;IP7 - DST SURR LEN
075174  102560                          .WORD T0        ;IP10 - SPECIAL HANDLING
075176  000000                          .WORD 0         ;IP11
075200  000000                          .WORD 0         ;IP12
075202  000000                          .WORD 0         ;IP13
075204  000000                          .WORD 0         ;IP14
075206  000000                          .WORD 0         ;IP15
075210  000000                          .WORD 0         ;IP16
075212  000000                          .WORD 0         ;IP17
075214  000000                          .WORD 0         ;IP20
075216  000000                          .WORD 0         ;IP21
075220  000000                          .WORD 0         ;IP22
075222  000000                          .WORD 0         ;IP23
075224  000000                          .WORD 0         ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       DESTINATION LENGTH - 0,1,20
                                ;       DESTINATION ADDRESS - 200 (REATIVE TO START OF BUFFER)
                                ;       SOURCE DATA HIGH - 0+,0-,77777+,77777-,5+
                                ;       SOURCE DATA LOW - 0+,4+,77777-
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 45
                                ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)45 = 135
                                ;
```

```
                                ;ENTRY 34 - INSTRUCTION UNDER TEST = CVTLP
                                ;
075226  000031                  ICLP1:  .WORD 31          ;INST=CVTLP
075230  000003                          .WORD 3           ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
075232  106566                          .WORD T40A        ;IP1 - SRC.HIGH (R2)
075234  106604                          .WORD T41A        ;IP2 - SRC.LOW (R3)
075236  102604                          .WORD T1A         ;IP3 - DST.LEN (R4)
075240  103144                          .WORD T2A         ;IP4 - DST.ADR (R5)
075242  102560                          .WORD T0          ;IP5 - DST DATA
075244  102560                          .WORD T0          ;IP6 - DST SURR DATA
075246  102560                          .WORD T0          ;IP7 - DST SURR LEN
075250  103030                          .WORD TSPA        ;IP10 - SPECIAL HANDLING
075252  000000                          .WORD 0           ;IP11
075254  000000                          .WORD 0           ;IP12
075256  000000                          .WORD 0           ;IP13
075260  000000                          .WORD 0           ;IP14
075262  000000                          .WORD 0           ;IP15
075264  000000                          .WORD 0           ;IP16
075266  000000                          .WORD 0           ;IP17
075270  000000                          .WORD 0           ;IP20
075272  000000                          .WORD 0           ;IP21
075274  000000                          .WORD 0           ;IP22
075276  000000                          .WORD 0           ;IP23
075300  000000                          .WORD 0           ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION ADDRESS - 201
                                ;       SOURCE DATA HIGH - 0+
                                ;       SOURCE DATA LOW - 77777-
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 8
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 = 8
                                ;
```

```
                                   ;ENTRY 34A - INSTRUCTION UNDER TEST = CVTLP
                                   ;
075302  000031                     ICLP2:  .WORD 31          ;INST=CVTLP
075304  000003                             .WORD 3           ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
075306  106572                             .WORD T40B        ;IP1 - SRC.HIGH (R2)
075310  106640                             .WORD T41B        ;IP2 - SRC.LOW (R3)
075312  104212                             .WORD T14         ;IP3 - DST.LEN (R4)
075314  103134                             .WORD T2          ;IP4 - DST.ADR (R5)
075316  102560                             .WORD T0          ;IP5 - DST DATA
075320  102560                             .WORD T0          ;IP6 - DST SURR DATA
075322  102560                             .WORD T0          ;IP7 - DST SURR LEN
075324  102560                             .WORD T0          ;IP10 - SPECIAL HANDLING
075326  000000                             .WORD 0           ;IP11
075330  000000                             .WORD 0           ;IP12
075332  000000                             .WORD 0           ;IP13
075334  000000                             .WORD 0           ;IP14
075336  000000                             .WORD 0           ;IP15
075340  000000                             .WORD 0           ;IP16
075342  000000                             .WORD 0           ;IP17
075344  000000                             .WORD 0           ;IP20
075346  000000                             .WORD 0           ;IP21
075350  000000                             .WORD 0           ;IP22
075352  000000                             .WORD 0           ;IP23
075354  000000                             .WORD 0           ;IP24

                                   ;THIS TABLE EXERCISES THE FOLLOWING TEST CONDITION
                                   ;
                                   ;       DESTINATION LENGTH - 10
                                   ;       DESTINATION ADDRESS - 200
                                   ;       SOURCE DATA HIGH - 0,231,252
                                   ;       SOURCE DATA LOW - 120360,0,125
                                   ;
                                   ;TOTAL # OF TEST CONDITIONS = 9
                                   ;TOTAL # OF TESTS = (2 DATA TYPES + 1 IN-LINE)9 = 27
                                   ;
```

```
16714                                   .SBTTL          CVTLN TABLES
16715                                   ;ENTRY 35 - INSTRUCTION UNDER TEST = CVTLN
16716                                   ;
16717   075356  000021                  ICLZ:   .WORD 21                ;INST=CVTLN
16718   075360  000001                          .WORD 1                 ;TYPE = 1
16719   075362  106540                          .WORD T40               ;IP1 - SRC.HIGH (R2)
16720   075364  106620                          .WORD T41               ;IP2 - SRC.LOW (R3)
16721   075366  105614                          .WORD T33               ;IP3 - DST.LEN (R4)
16722   075370  103134                          .WORD T2                ;IP4 - DST.ADR (R5)
16723   075372  104142                          .WORD T11               ;IP5 - DST DATA
16724   075374  104160                          .WORD T12               ;IP6 - DST SURR DATA
16725   075376  104176                          .WORD T13               ;IP7 - DST SURR LEN
16726   075400  102560                          .WORD T0                ;IP10 - SPECIAL HANDLING
16727   075402  000000                          .WORD 0                 ;IP11
16728   075404  000000                          .WORD 0                 ;IP12
16729   075406  000000                          .WORD 0                 ;IP13
16730   075410  000000                          .WORD 0                 ;IP14
16731   075412  000000                          .WORD 0                 ;IP15
16732   075414  000000                          .WORD 0                 ;IP16
16733   075416  000000                          .WORD 0                 ;IP17
16734   075420  000000                          .WORD 0                 ;IP20
16735   075422  000000                          .WORD 0                 ;IP21
16736   075424  000000                          .WORD 0                 ;IP22
16737   075426  000000                          .WORD 0                 ;IP23
16738   075430  000000                          .WORD 0                 ;IP24
16739
16740                                   ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
16741                                   ;
16742                                   ;       DESTINATION LENGTH - 0,1,20
16743                                   ;       DESTINATION ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER(
16744                                   ;       SOURCE DATA HIGH - 0+,0-,77777+,77777-,5+
16745                                   ;       SOURCE DATA LOW - 0+,4+,77777-
16746                                   ;
16747                                   ;TOTAL # OF TEST CONDITIONS = 45
16748                                   ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)45 = 315
16749                                   ;
```

```
                                ;ENTRY 36 - INSTRUCTION UNDER TEST = CVTLN
                                ;
075432  000021                  ICLZ1:  .WORD 21                ;INST=CVTLN
075434  000001                          .WORD 1                 ;TYPE = 1
075436  106610                          .WORD T40AA             ;IP1 - SRC.HIGH (R2)
075440  106614                          .WORD T41AA             ;IP2 - SRC.LOW (R3)
075442  102604                          .WORD T1A               ;IP3 - DST.LEN (R4)
075444  103144                          .WORD T2A               ;IP4 - DST.ADR (R5)
075446  102560                          .WORD T0                ;IP5 - DST DATA
075450  102560                          .WORD T0                ;IP6 - DST SURR DATA
075452  102560                          .WORD T0                ;IP7 - DST SURR LEN
075454  103030                          .WORD TSPA              ;IP10 - SPECIAL HANDLING
075456  000000                          .WORD 0                 ;IP11
075460  000000                          .WORD 0                 ;IP12
075462  000000                          .WORD 0                 ;IP13
075464  000000                          .WORD 0                 ;IP14
075466  000000                          .WORD 0                 ;IP15
075470  000000                          .WORD 0                 ;IP16
075472  000000                          .WORD 0                 ;IP17
075474  000000                          .WORD 0                 ;IP20
075476  000000                          .WORD 0                 ;IP21
075500  000000                          .WORD 0                 ;IP22
075502  000000                          .WORD 0                 ;IP23
075504  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER(
                                ;       SOURCE DATA HIGH - 5+
                                ;       SOURCE DATA LOW - 4+
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 8
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 = 8
                                ;
```

```
                                  .SBTTL        CVTPL TABLES
                                  ;ENTRY 37 - INSTRUCTION UNDER TEST = CVTPL
                                  ;
 075506  000025                   ICPL:   .WORD 25                ;INST = CVTPL
 075510  000003                           .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
 075512  105614                           .WORD T33               ;IP1 - SRC.LEN (R0)
 075514  103134                           .WORD T2                ;IP2 - SRC.ADR (R1)
 075516  106034                           .WORD T35               ;IP3 - SRC DATA
 075520  104110                           .WORD T7                ;IP4 - SRC SURR DATA
 075522  104126                           .WORD T10               ;IP5 - SRC SURR LEN
 075524  104026                           .WORD T5                ;IP6- UNUSED PORTION OF REGISTER 4
 075526  102560                           .WORD T0                ;IP7 - SPECIAL HANDLING
 075530  000000                           .WORD 0                 ;IP10
 075532  000000                           .WORD 0                 ;IP11
 075534  000000                           .WORD 0                 ;IP12
 075536  000000                           .WORD 0                 ;IP13
 075540  000000                           .WORD 0                 ;IP14
 075542  000000                           .WORD 0                 ;IP15
 075544  000000                           .WORD 0                 ;IP16
 075546  000000                           .WORD 0                 ;IP17
 075550  000000                           .WORD 0                 ;IP20
 075552  000000                           .WORD 0                 ;IP21
 075554  000000                           .WORD 0                 ;IP22
 075556  000000                           .WORD 0                 ;IP23
 075560  000000                           .WORD 0                 ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE LENGTH - 0,1,20
                                  ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                  ;                   - ALL DIGITS IDENTICAL = 8; SIGN -
                                  ;                   - ALL DIGITS IDENTICAL = 0; SIGN -
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 9
                                  ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)9 = 27
                                  ;
```

```

                                        ;
                                        ;ENTRY 40 - INSTRUCTION UNDER TEST = CVTPL
                                        ;
        075562  000025                  ICPL1:  .WORD 25                ;INST = CVTPL
        075564  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
        075566  105634                          .WORD T33A              ;IP1 - SRC.LEN (R0)
        075570  103134                          .WORD T2                ;IP2 - SRC.ADR (R1)
        075572  107522                          .WORD T51               ;IP3 - SRC DATA
        075574  104110                          .WORD T7                ;IP4 - SRC SURR DATA
        075576  104126                          .WORD T10               ;IP5 - SRC SURR LEN
        075600  104026                          .WORD T5                ;IP6- UNUSED PORTION OF REGISTER 4
        075602  102560                          .WORD T0                ;IP7 - SPECIAL HANDLING
        075604  000000                          .WORD 0                 ;IP10
        075606  000000                          .WORD 0                 ;IP11
        075610  000000                          .WORD 0                 ;IP12
        075612  000000                          .WORD 0                 ;IP13
        075614  000000                          .WORD 0                 ;IP14
        075616  000000                          .WORD 0                 ;IP15
        075620  000000                          .WORD 0                 ;IP16
        075622  000000                          .WORD 0                 ;IP17
        075624  000000                          .WORD 0                 ;IP20
        075626  000000                          .WORD 0                 ;IP21
        075630  000000                          .WORD 0                 ;IP22
        075632  000000                          .WORD 0                 ;IP23
        075634  000000                          .WORD 0                 ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE LENGTH - 12
                                        ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE DATA - DIGIIS FROM STRING = 2,147,483,648+
                                        ;                   - DIGITS FROM STRING = 2,147,483,647+
                                        ;                   - DIGITS FROM STRING = 2,147,483,648-
                                        ;                   - DIGITS FROM STRING = 2,147,483,649-
                                        ;                   - DIGITS FROM STRING = 4,294,967,294+
                                        ;                   - DIGITS FROM STRING = 42,949,672,940+
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 6
                                        ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 = 18
                                        ;
```

```
                                ;ENTRY 41 - INSTRUCTION UNDER TEST = CVTPL
                                ;
        075636  000025          ICPL2:  .WORD 25                ;INST = CVTPL
        075640  000003                  .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
        075642  102604                  .WORD T1A               ;IP1 - SRC.LEN (R0)
        075644  103144                  .WORD T2A               ;IP2 - SRC.ADR (R1)
        075646  106122                  .WORD TP19              ;IP3 - SRC DATA
        075650  102560                  .WORD T0                ;IP4 - SRC SURR DATA
        075652  102560                  .WORD T0                ;IP5 - SRC SURR LEN
        075654  104026                  .WORD T5                ;IP6- UNUSED PORTION OF REGISTER 4
        075656  103030                  .WORD TSPA              ;IP7 - SPECIAL HANDLING
        075660  000000                  .WORD 0                 ;IP10
        075662  000000                  .WORD 0                 ;IP11
        075664  000000                  .WORD 0                 ;IP12
        075666  000000                  .WORD 0                 ;IP13
        075670  000000                  .WORD 0                 ;IP14
        075672  000000                  .WORD 0                 ;IP15
        075674  000000                  .WORD 0                 ;IP16
        075676  000000                  .WORD 0                 ;IP17
        075700  000000                  .WORD 0                 ;IP20
        075702  000000                  .WORD 0                 ;IP21
        075704  000000                  .WORD 0                 ;IP22
        075706  000000                  .WORD 0                 ;IP23
        075710  000000                  .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE DATA - DIGITS FROM STRING = 12345678912345678912340008912 33; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 8
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 = 8
                                ;
```

```
                                        ;ENTRY 41A - INSTRUCTION UNDER TEST = CVTPL
                                        ;
075712  000025                          ICPL3:  .WORD 25            ;INST = CVTPL
075714  000003                                  .WORD 3             ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
075716  105634                                  .WORD T33A          ;IP1 - SRC.LEN (R0)
075720  103134                                  .WORD T2            ;IP2 - SRC.ADR (R1)
075722  106132                                  .WORD TP19A         ;IP3 - SRC DATA
075724  102560                                  .WORD T0            ;IP4 - SRC SURR DATA
075726  102560                                  .WORD T0            ;IP5 - SRC SURR LEN
075730  104026                                  .WORD T5            ;IP6- UNUSED PORTION OF REGISTER 4
075732  102560                                  .WORD T0            ;IP7 - SPECIAL HANDLING
075734  000000                                  .WORD 0             ;IP10
075736  000000                                  .WORD 0             ;IP11
075740  000000                                  .WORD 0             ;IP12
075742  000000                                  .WORD 0             ;IP13
075744  000000                                  .WORD 0             ;IP14
075746  000000                                  .WORD 0             ;IP15
075750  000000                                  .WORD 0             ;IP16
075752  000000                                  .WORD 0             ;IP17
075754  000000                                  .WORD 0             ;IP20
075756  000000                                  .WORD 0             ;IP21
075760  000000                                  .WORD 0             ;IP22
075762  000000                                  .WORD 0             ;IP23
075764  000000                                  .WORD 0             ;IP24

                                        ;THIS TABLE EXERCISES THE FOLLOWING TEST CONDITION
                                        ;
                                        ;       SOURCE LENGTH - 12
                                        ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE DATA - 3 X 2 ** 31 = 6442450944 +
                                        ;                   - 3 X 2 ** 31 (-) = 6442450944 -
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 2
                                        ;TOTAL # OF TESTS = (2 DATA TYPES + 1 IN-LINE) 2 = 6
                                        ;
```

```
                                .SBTTL          CVTNL TABLES
                                ;ENTRY 42 - INSTRUCTION UNDER TEST = CVTNL
                                ;
075766  000015                  ICZL:   .WORD 15                ;INST = CVTNL
075770  000001                          .WORD 1                 ;TYPE = 1
075772  105614                          .WORD T33               ;IP1 - SRC.LEN (R0)
075774  103134                          .WORD T2                ;IP2 - SRC.ADR (R1)
075776  106374                          .WORD T37               ;IP3 - SRC DATA
076000  104110                          .WORD T7                ;IP4 - SRC SURR DATA
076002  104126                          .WORD T10               ;IP5 - SRC SURR LEN
076004  104026                          .WORD T5                ;IP6 - UNUSED PORTION OF REGISTER 4
076006  102560                          .WORD T0                ;IP7 - SPECIAL HANDLING
076010  000000                          .WORD 0                 ;IP10
076012  000000                          .WORD 0                 ;IP11
076014  000000                          .WORD 0                 ;IP12
076016  000000                          .WORD 0                 ;IP13
076020  000000                          .WORD 0                 ;IP14
076022  000000                          .WORD 0                 ;IP15
076024  000000                          .WORD 0                 ;IP16
076026  000000                          .WORD 0                 ;IP17
076030  000000                          .WORD 0                 ;IP20
076032  000000                          .WORD 0                 ;IP21
076034  000000                          .WORD 0                 ;IP22
076036  000000                          .WORD 0                 ;IP23
076040  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,20
                                ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE =7
                                ;                   - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                ;                   - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 9
                                ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)9 = 63
                                ;
```

```

                                  ;
                                  ;ENTRY 43 - INSTRUCTION UNDER TEST = CVTNL
                                  ;
 076042  000015                   ICZL1:  .WORD 15                ;INST = CVTNL
 076044  000001                           .WORD 1                 ;TYPE = 1
 076046  105634                           .WORD T33A              ;IP1 - SRC.LEN (R0)
 076050  103134                           .WORD T2                ;IP2 - SRC.ADR (R1)
 076052  107564                           .WORD T52               ;IP3 - SRC DATA
 076054  104110                           .WORD T7                ;IP4 - SRC SURR DATA
 076056  104126                           .WORD T10               ;IP5 - SRC SURR LEN
 076060  104026                           .WORD T5                ;IP6 - UNUSED PORTION OF REGISTER 4
 076062  102560                           .WORD T0                ;IP7 - SPECIAL HANDLING
 076064  000000                           .WORD 0                 ;IP10
 076066  000000                           .WORD 0                 ;IP11
 076070  000000                           .WORD 0                 ;IP12
 076072  000000                           .WORD 0                 ;IP13
 076074  000000                           .WORD 0                 ;IP14
 076076  000000                           .WORD 0                 ;IP15
 076100  000000                           .WORD 0                 ;IP16
 076102  000000                           .WORD 0                 ;IP17
 076104  000000                           .WORD 0                 ;IP20
 076106  000000                           .WORD 0                 ;IP21
 076110  000000                           .WORD 0                 ;IP22
 076112  000000                           .WORD 0                 ;IP23
 076114  000000                           .WORD 0                 ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE LENGTH - 12
                                  ;       SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE DATA - DIGIIS FROM STRING = 2,147,483,648+
                                  ;                   - DIGITS FROM STRING = 2,147,483,647+
                                  ;                   - DIGITS FROM STRING = 2,147,483,648-
                                  ;                   - DIGITS FROM STRING = 2,147,483,649-
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 4
                                  ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)4 = 28
                                  ;
```

```
                                ;ENTRY 44 - INSTRUCTION UNDER TEST = CVTNL
                                ;
076116  000015                  ICZL2:  .WORD 15                ;INST = CVTNL
076120  000001                          .WORD 1                 ;TYPE = 1
076122  102604                          .WORD T1A               ;IP1 - SRC.LEN (R0)
076124  103144                          .WORD T2A               ;IP2 - SRC.ADR (R1)
076126  106462                          .WORD TZ19              ;IP3 - SRC DATA
076130  102560                          .WORD T0                ;IP4 - SRC SURR DATA
076132  102560                          .WORD T0                ;IP5 - SRC SURR LEN
076134  104026                          .WORD T5                ;IP6 - UNUSED PORTION OF REGISTER 4
076136  103030                          .WORD TSPA              ;IP7 - SPECIAL HANDLING
076140  000000                          .WORD 0                 ;IP10
076142  000000                          .WORD 0                 ;IP11
076144  000000                          .WORD 0                 ;IP12
076146  000000                          .WORD 0                 ;IP13
076150  000000                          .WORD 0                 ;IP14
076152  000000                          .WORD 0                 ;IP15
076154  000000                          .WORD 0                 ;IP16
076156  000000                          .WORD 0                 ;IP17
076160  000000                          .WORD 0                 ;IP20
076162  000000                          .WORD 0                 ;IP21
076164  000000                          .WORD 0                 ;IP22
076166  000000                          .WORD 0                 ;IP23
076170  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 8
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 = 8
                                ;
```

```
                                .SBTTL          ADDP TABLES
                                ;ENTRY 45 - INSTRUCTION UNDER TEST = ADDP
                                ;
076172  000022                  IADDP:  .WORD   22              ;INST=ADDP
076174  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
076176  102560                          .WORD   T0              ;IP1 - SRC1.LEN
076200  103134                          .WORD   T2              ;IP2 - SRC1.ADR
076202  102560                          .WORD   T0              ;IP3 - SRC2.LEN
076204  104402                          .WORD   T16             ;IP4 - SRC2.ADR
076206  102564                          .WORD   XT1             ;IP5 - DST.LEN
076210  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
076212  105320                          .WORD   T22             ;IP7 - SRC1 DATA
076214  104110                          .WORD   T7              ;IP10 - SRC1 SURR DATA
076216  104126                          .WORD   T10             ;IP11 - SRC1 SURR LEN
076220  105320                          .WORD   T22             ;IP12 - SRC2 DATA
076222  105172                          .WORD   T20             ;IP13 - SRC2 SURR DATA
076224  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;   AS NOT TO DESTROY ANY OF SRC1)
076226  104142                          .WORD   T11             ;IP15 - DST DATA
076230  104160                          .WORD   T12             ;IP16 - DST SURR DATA
076232  104176                          .WORD   T13             ;IP17 - DST SURR LEN
076234  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
076236  102560                          .WORD   T0      ;IP21 - SPECIAL HANDLING
076240  000000                          .WORD   0               ;IP22
076242  000000                          .WORD   0               ;IP23
076244  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0
                                ;       SOURCE 2 LENGTH - 0
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;                                     - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGNT +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 6
                                ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 = 18
                                ;
```

```
                                  ;ENTRY 46 - INSTRUCTION UNDER TEST = ADDP
                                  ;
076246  000022                    IADDP1: .WORD   22              ;INST=ADDP
076250  000001                            .WORD   1               ;TYPE = 1
076252  102560                            .WORD   T0              ;IP1 - SRC1.LEN
076254  103134                            .WORD   T2              ;IP2 - SRC1.ADR
076256  105210                            .WORD   T21             ;IP3 - SRC2.LEN
076260  104402                            .WORD   T16             ;IP4 - SRC2.ADR
076262  102564                            .WORD   XT1             ;IP5 - DST.LEN
076264  102560                            .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
076266  105320                            .WORD   T22             ;IP7 - SRC1 DATA
076270  104110                            .WORD   T7              ;IP10 - SRC1 SURR DATA
076272  104126                            .WORD   T10             ;IP11 - SRC1 SURR LEN
076274  105116                            .WORD   T17             ;IP12 - SRC2 DATA
076276  105172                            .WORD   T20             ;IP13 - SRC2 SURR DATA
076300  102560                            .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                  ;   AS NOT TO DESTROY ANY OF SRC1)
076302  104142                            .WORD   T11             ;IP15 - DST DATA
076304  104160                            .WORD   T12             ;IP16 - DST SURR DATA
076306  104176                            .WORD   T13             ;IP17 - DST SURR LEN
076310  104212                            .WORD   T14             ;IP20 - SEPARATION CONSTRANT
076312  102560                            .WORD   T0              ;IP21 - SPECIAL HANDLING
076314  000000                            .WORD   0               ;IP22
076316  000000                            .WORD   0               ;IP23
076320  000000                            .WORD   0               ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE 1 LENGTH - 0
                                  ;       SOURCE 2 LENGTH - 1,5
                                  ;       DESTINATION LENGTH - 0,1,5
                                  ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                  ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                                  ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                  ;       SOURCE 2 DATA - DIGTIS FROM STRING = 1234567891234567891234000891233; SIGN +
                                  ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                  ;                     - ALL DIGITS IDENTICAL =3; SIGN -
                                  ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 48
                                  ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                                  ;
```

```
                                 ;ENTRY 47 - INSTRUCTION UNDER TEST = ADDP

                                 ;
076322  000022                   IADDP2: .WORD   22              ;INST=ADDP
076324  000001                           .WORD   1               ;TYPE = 1
076326  105210                           .WORD   T21             ;IP1 - SRC1.LEN
076330  103134                           .WORD   T2              ;IP2 - SRC1.ADR
076332  102560                           .WORD   T0              ;IP3 - SRC2.LEN
076334  104402                           .WORD   T16             ;IP4 - SRC2.ADR
076336  102564                           .WORD   XT1             ;IP5 - DST.LEN
076340  102560                           .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
076342  105116                           .WORD   T17             ;IP7 - SRC1 DATA
076344  104110                           .WORD   T7              ;IP10 - SRC1 SURR DATA
076346  104126                           .WORD   T10             ;IP11 - SRC1 SURR LEN
076350  105320                           .WORD   T22             ;IP12 - SRC2 DATA
076352  105172                           .WORD   T20             ;IP13 - SRC2 SURR DATA
076354  102560                           .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                 ;  AS NOT TO DESTROY ANY OF SRC1)
076356  104142                           .WORD   T11             ;IP15 - DST DATA
076360  104160                           .WORD   T12             ;IP16 - DST SURR DATA
076362  104176                           .WORD   T13             ;IP17 - DST SURR LEN
076364  104212                           .WORD   T14             ;IP20 - SEPARATION CONSTRANT
076366  102560                           .WORD   T0              ;IP21 - SPECIAL HANDLING
076370  000000                           .WORD   0               ;IP22
076372  000000                           .WORD   0               ;IP23
076374  000000                           .WORD   0               ;IP24

                                 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                 ;
                                 ;       SOURCE 1 LENGTH - 1,5
                                 ;       SOURCE 2 LENGTH - 0
                                 ;       DESTINATION LENGTH - 0,1,5
                                 ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                 ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                 ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                                 ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                 ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                 ;
                                 ;TOTAL # OF TEST CONDITIONS =48
                                 ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                                 ;
```

```
                                 ;ENTRY 48 - INSTRUCTION UNDER TEST = ADDP
                                 ;
076376  000022                   IADDP3: .WORD   22              ;INST=ADDP
076400  000001                           .WORD   1               ;TYPE = 1
076402  105224                           .WORD   T211            ;IP1 - SRC1.LEN
076404  103134                           .WORD   T2              ;IP2 - SRC1.ADR
076406  105242                           .WORD   T212            ;IP3 - SRC2.LEN
076410  104402                           .WORD   T16             ;IP4 - SRC2.ADR
076412  102764                           .WORD   T1P             ;IP5 - DST.LEN
076414  102560                           .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
076416  105116                           .WORD   T17             ;IP7 - SRC1 DATA
076420  104110                           .WORD   T7              ;IP10 - SRC1 SURR DATA
076422  104126                           .WORD   T10             ;IP11 - SRC1 SURR LEN
076424  105116                           .WORD   T17             ;IP12 - SRC2 DATA
076426  105172                           .WORD   T20             ;IP13 - SRC2 SURR DATA
076430  102560                           .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                 ;  AS NOT TO DESTROY ANY OF SRC1)
076432  104142                           .WORD   T11             ;IP15 - DST DATA
076434  104160                           .WORD   T12             ;IP16 - DST SURR DATA
076436  104176                           .WORD   T13             ;IP17 - DST SURR LEN
076440  104224                           .WORD   T14A            ;IP20 - SEPARATION CONSTRANT
076442  102560                           .WORD   T0              ;IP21 - SPECIAL HANDLING
076444  000000                           .WORD   0               ;IP22
076446  000000                           .WORD   0               ;IP23
076450  000000                           .WORD   0               ;IP24

                                 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                 ;
                                 ;       SOURCE 1 LENGTH - 1,37
                                 ;       SOURCE 2 LENGTH - 1,37
                                 ;       DESTINATION LENGTH - 0,1,37
                                 ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                 ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                 ;                                      - SOURCE 2 STRING ALIGNED WITH DEST STRING
                                 ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                 ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                 ;
                                 ;TOTAL # OF TEST CONDITIONS = 384
                                 ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 = 1152
                                 ;
```

```
                                ;ENTRY 49 - INSTRUCTION UNDER TEST = ADDP
                                ;
076452  000022                  IADDP4: .WORD   22              ;INST=ADDP
076454  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
076456  102604                          .WORD   T1A             ;IP1 - SRC1.LEN
076460  103144                          .WORD   T2A             ;IP2 - SRC1.ADR
076462  102604                          .WORD   T1A             ;IP3 - SRC2.LEN
076464  104264                          .WORD   T16A            ;IP4 - SRC2.ADR
076466  102604                          .WORD   T1A             ;IP5 - DST.LEN
076470  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
076472  106122                          .WORD   TP19            ;IP7 - SRC1 DATA
076474  102560                          .WORD   T0              ;IP10 - SRC1 SURR DATA
076476  102560                          .WORD   T0              ;IP11 - SRC1 SURR LEN
076500  106122                          .WORD   TP19            ;IP12 - SRC2 DATA
076502  102560                          .WORD   T0              ;IP13 - SRC2 SURR DATA
076504  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;   AS NOT TO DESTROY ANY OF SRC1)
076506  102560                          .WORD   T0              ;IP15 - DST DATA
076510  102560                          .WORD   T0              ;IP16 - DST SURR DATA
076512  102560                          .WORD   T0              ;IP17 - DST SURR LEN
076514  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
076516  103030                          .WORD   TSPA            ;IP21 - SPECIAL HANDLING
076520  000000                          .WORD   0               ;IP22
076522  000000                          .WORD   0               ;IP23
076524  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 512
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
                                ;
```

```
                                .SBTTL          ADDN TABLES
                                ;ENTRY 50 - INSTRUCTION UNDER TEST = ADDN
                                ;
        076526  000012          IADDN:  .WORD   12                      ;INST=ADDN
        076530  000001                  .WORD   1                       ;TYPE = 1
        076532  102560                  .WORD   T0                      ;IP1 - SRC1.LEN
        076534  103134                  .WORD   T2                      ;IP2 - SRC1.ADR
        076536  102560                  .WORD   T0                      ;IP3 - SRC2.LEN
        076540  104754                  .WORD   T16Z                    ;IP4 - SRC2.ADR
        076542  102564                  .WORD   XT1                     ;IP5 - DST.LEN
        076544  102560                  .WORD   T0                      ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        076546  106652                  .WORD   T42                     ;IP7 - SRC1 DATA
        076550  104110                  .WORD   T7                      ;IP10 - SRC1 SURR DATA
        076552  104126                  .WORD   T10                     ;IP11 - SRC1 SURR LEN
        076554  106652                  .WORD   T42                     ;IP12 - SRC2 DATA
        076556  105172                  .WORD   T20                     ;IP13 - SRC2 SURR DATA
        076560  102560                  .WORD   T0                      ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;  AS NOT TO DESTROY ANY OF SRC1)
        076562  104142                  .WORD   T11                     ;IP15 - DST DATA
        076564  102560                  .WORD   T0                      ;IP16 - DST SURR DATA
        076566  102560                  .WORD   T0                      ;IP17 - DST SURR LEN
        076570  106670                  .WORD   T43                     ;IP20 - SEPARATION CONSTRANT
        076572  102560                  .WORD   T0                      ;IP21 - SPECIAL HANDLING
        076574  000000                  .WORD   0                       ;IP22
        076576  000000                  .WORD   0                       ;IP23
        076600  000000                  .WORD   0                       ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0
                                ;       SOURCE 2 LENGTH - 0
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;                                     - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE =17
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 6
                                ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)6 = 42
                                ;
```

```
                                        ;ENTRY 51 - INSTRUCTION UNDER TEST = ADDN
                                        ;
076602  000012                          IADDN1: .WORD   12              ;INST=ADDN
076604  000001                                  .WORD   1               ;TYPE = 1
076606  102560                                  .WORD   T0              ;IP1 - SRC1.LEN
076610  103134                                  .WORD   T2              ;IP2 - SRC1.ADR
076612  105210                                  .WORD   T21             ;IP3 - SRC2.LEN
076614  104754                                  .WORD   T16Z            ;IP4 - SRC2.ADR
076616  102564                                  .WORD   XT1             ;IP5 - DST.LEN
076620  102560                                  .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
076622  106652                                  .WORD   T42             ;IP7 - SRC1 DATA
076624  104110                                  .WORD   T7              ;IP10 - SRC1 SURR DATA
076626  104126                                  .WORD   T10             ;IP11 - SRC1 SURR LEN
076630  106374                                  .WORD   T37             ;IP12 - SRC2 DATA
076632  105172                                  .WORD   T20             ;IP13 - SRC2 SURR DATA
076634  102560                                  .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;  AS NOT TO DESTROY ANY OF SRC1)
076636  104142                                  .WORD   T11             ;IP15 - DST DATA
076640  104160                                  .WORD   T12             ;IP16 - DST SURR DATA
076642  104176                                  .WORD   T13             ;IP17 - DST SURR LEN
076644  104212                                  .WORD   T14             ;IP20 - SEPARATION CONSTRANT
076646  102560                                  .WORD   T0              ;IP21 - SPECIAL HANDLING
076650  000000                                  .WORD   0               ;IP22
076652  000000                                  .WORD   0               ;IP23
076654  000000                                  .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 0
                                        ;       SOURCE 2 LENGTH - 1,5
                                        ;       DESTINATION LENGTH - 0,1,5
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                        ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                                        ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                                        ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                        ;                     - ALL DIGITS IDENTICAL =8; SIGN -; HIGH NIBBLE = 8
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 36
                                        ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)36 = 252
                                        ;
```

```
                                        ;ENTRY 52 - INSTRUCTION UNDER TEST = ADDN
                                        ;
076656  000012                          IADDN2: .WORD   12              ;INST=ADDN
076660  000001                                  .WORD   1               ;TYPE = 1
076662  105210                                  .WORD   T21             ;IP1 - SRC1.LEN
076664  103134                                  .WORD   T2              ;IP2 - SRC1.ADR
076666  102560                                  .WORD   T0              ;IP3 - SRC2.LEN
076670  104754                                  .WORD   T16Z            ;IP4 - SRC2.ADR
076672  102564                                  .WORD   XT1             ;IP5 - DST.LEN
076674  102560                                  .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
076676  106374                                  .WORD   T37             ;IP7 - SRC1 DATA
076700  104110                                  .WORD   T7              ;IP10 - SRC1 SURR DATA
076702  104126                                  .WORD   T10             ;IP11 - SRC1 SURR LEN
076704  106652                                  .WORD   T42             ;IP12 - SRC2 DATA
076706  105172                                  .WORD   T20             ;IP13 - SRC2 SURR DATA
076710  102560                                  .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;  AS NOT TO DESTROY ANY OF SRC1)
076712  104142                                  .WORD   T11             ;IP15 - DST DATA
076714  104160                                  .WORD   T12             ;IP16 - DST SURR DATA
076716  104176                                  .WORD   T13             ;IP17 - DST SURR LEN
076720  104212                                  .WORD   T14             ;IP20 - SEPARATION CONSTRANT
076722  102560                                  .WORD   T0              ;IP21 - SPECIAL HANDLING
076724  000000                                  .WORD   0               ;IP22
076726  000000                                  .WORD   0               ;IP23
076730  000000                                  .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 1,5
                                        ;       SOURCE 2 LENGTH - 0
                                        ;       DESTINATION LENGTH - 0,1,5
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                        ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                                        ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                        ;                     - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                        ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 36
                                        ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)36 = 252
                                        ;
```

```
                                        ;ENTRY 53 - INSTRUCTION UNDER TEST = ADDN
                                        ;
        076732  000012                  IADDN3: .WORD   12              ;INST=ADDN
        076734  000001                          .WORD   1               ;TYPE = 1
        076736  105224                          .WORD   T211            ;IP1 - SRC1.LEN
        076740  103134                          .WORD   T2              ;IP2 - SRC1.ADR
        076742  105242                          .WORD   T212            ;IP3 - SRC2.LEN
        076744  104754                          .WORD   T16Z            ;IP4 - SRC2.ADR
        076746  102764                          .WORD   T1P             ;IP5 - DST.LEN
        076750  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        076752  106424                          .WORD   T37A            ;IP7 - SRC1 DATA
        076754  104110                          .WORD   T7              ;IP10 - SRC1 SURR DATA
        076756  104126                          .WORD   T10             ;IP11 - SRC1 SURR LEN
        076760  106424                          .WORD   T37A            ;IP12 - SRC2 DATA
        076762  105172                          .WORD   T20             ;IP13 - SRC2 SURR DATA
        076764  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;   AS NOT TO DESTROY ANY OF SRC1)
        076766  104142                          .WORD   T11             ;IP15 - DST DATA
        076770  102560                          .WORD   T0              ;IP16 - DST SURR DATA
        076772  102560                          .WORD   T0              ;IP17 - DST SURR LEN
        076774  106704                          .WORD   T43A            ;IP20 - SEPARATION CONSTRANT
        076776  102560                          .WORD   T0              ;IP21 - SPECIAL HANDLING
        077000  000000                          .WORD   0               ;IP22
        077002  000000                          .WORD   0               ;IP23
        077004  000000                          .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 1,37
                                        ;       SOURCE 2 LENGTH - 1,37
                                        ;       DESTINATION LENGTH - 0,1,37
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                        ;                                      - SOURCE 2 STRING ALIGNED WITH DEST STRING
                                        ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                        ;                     - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                        ;                     - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                        ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                        ;                     - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                        ;                     - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 384
                                        ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)384 = 2688
                                        ;
```

```
                                ;ENTRY 54 - INSTRUCTION UNDER TEST = ADDN
                                ;
077006  000012                  IADDN4: .WORD   12              ;INST=ADDN
077010  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
077012  102604                          .WORD   T1A             ;IP1 - SRC1.LEN
077014  103144                          .WORD   T2A             ;IP2 - SRC1.ADR
077016  102604                          .WORD   T1A             ;IP3 - SRC2.LEN
077020  104706                          .WORD   T16ZA           ;IP4 - SRC2.ADR
077022  102604                          .WORD   T1A             ;IP5 - DST.LEN
077024  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077026  106462                          .WORD   TZ19            ;IP7 - SRC1 DATA
077030  102560                          .WORD   T0              ;IP10 - SRC1 SURR DATA
077032  102560                          .WORD   T0              ;IP11 - SRC1 SURR LEN
077034  106462                          .WORD   TZ19            ;IP12 - SRC2 DATA
077036  102560                          .WORD   T0              ;IP13 - SRC2 SURR DATA
077040  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;   AS NOT TO DESTROY ANY OF SRC1)
077042  102560                          .WORD   T0              ;IP15 - DST DATA
077044  102560                          .WORD   T0              ;IP16 - DST SURR DATA
077046  102560                          .WORD   T0              ;IP17 - DST SURR LEN
077050  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
077052  103030                          .WORD   TSPA            ;IP21 - SPECIAL HANDLING
077054  000000                          .WORD   0               ;IP22
077056  000000                          .WORD   0               ;IP23
077060  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE  1 LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 512
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
                                ;
```

```

                                ;ENTRY 54A - INSTRUCTION UNDER TEST = ADDN
                                ;
077062  000012                  IADDN5: .WORD   12              ;INST=ADDN
077064  000001                          .WORD   1               ;TYPE = 1
077066  102642                          .WORD   T1C             ;IP1 - SRC1.LEN
077070  103152                          .WORD   T2AA            ;IP2 - SRC1.ADR
077072  102642                          .WORD   T1C             ;IP3 - SRC2.LEN
077074  104706                          .WORD   T16ZA           ;IP4 - SRC2.ADR
077076  104212                          .WORD   T14             ;IP5 - DST.LEN
077100  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077102  106462                          .WORD   TZ19            ;IP7 - SRC1 DATA
077104  102560                          .WORD   T0              ;IP10 - SRC1 SURR DATA
077106  102560                          .WORD   T0              ;IP11 - SRC1 SURR LEN
077110  106462                          .WORD   TZ19            ;IP12 - SRC2 DATA
077112  102560                          .WORD   T0              ;IP13 - SRC2 SURR DATA
077114  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;  AS NOT TO DESTROY ANY OF SRC1)
077116  102560                          .WORD   T0              ;IP15 - DST DATA
077120  102560                          .WORD   T0              ;IP16 - DST SURR DATA
077122  102560                          .WORD   T0              ;IP17 - DST SURR LEN
077124  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
077126  102560                          .WORD   T0              ;IP21 - SPECIAL HANDLING
077130  000000                          .WORD   0               ;IP22
077132  000000                          .WORD   0               ;IP23
077134  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE  1 LENGTH - 2,4,6
                                ;       SOURCE 2 LENGTH - 2,4,6
                                ;       DESTINATION LENGTH - 10
                                ;       SOURCE 1 ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 18
                                ;TOTAL # OF TESTS = (6 DATA TYPES + 1 IN-LINE)18 = 126
                                ;
```

```
                                  .SBTTL      SUBP TABLES
                                  ;ENTRY 55 - INSTRUCTION UNDER TEST = SUBP
                                  ;
077136  000023                    ISUBP:  .WORD   23        ;INST=SUBP
077140  000001                            .WORD   1         ;TYPE = 1
077142  102560                            .WORD   T0        ;IP1 - SRC1.LEN
077144  103134                            .WORD   T2        ;IP2 - SRC1.ADR
077146  102560                            .WORD   T0        ;IP3 - SRC2.LEN
077150  104402                            .WORD   T16       ;IP4 - SRC2.ADR
077152  102564                            .WORD   XT1       ;IP5 - DST.LEN
077154  102560                            .WORD   T0        ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077156  105320                            .WORD   T22       ;IP7 - SRC1 DATA
077160  104110                            .WORD   T7        ;IP10 - SRC1 SURR DATA
077162  104126                            .WORD   T10       ;IP11 - SRC1 SURR LEN
077164  105320                            .WORD   T22       ;IP12 - SRC2 DATA
077166  105172                            .WORD   T20       ;IP13 - SRC2 SURR DATA
077170  102560                            .WORD   T0        ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                            ;  AS NOT TO DESTROY ANY OF SRC1)
077172  104142                            .WORD   T11       ;IP15 - DST DATA
077174  104160                            .WORD   T12       ;IP16 - DST SURR DATA
077176  104176                            .WORD   T13       ;IP17 - DST SURR LEN
077200  104212                            .WORD   T14       ;IP20 - SEPARATION CONSTRANT
077202  102560                            .WORD   T0        ;IP21 - SPECIAL HANDLING
077204  000000                            .WORD   0         ;IP22
077206  000000                            .WORD   0         ;IP23
077210  000000                            .WORD   0         ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE 1 LENGTH - 0
                                  ;       SOURCE 2 LENGTH - 0
                                  ;       DESTINATION LENGTH - 0,1,5
                                  ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                  ;                                     - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
                                  ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                  ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGNT +
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 6
                                  ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 = 18
                                  ;
```

```
                                        ;
                                        ;ENTRY 56 - INSTRUCTION UNDER TEST = SUBP
                                        ;
077212  000023                          ISUBP1: .WORD   23              ;INST=SUBP
077214  000001                                  .WORD   1               ;TYPE = 1
077216  102560                                  .WORD   T0              ;IP1 - SRC1.LEN
077220  103134                                  .WORD   T2              ;IP2 - SRC1.ADR
077222  105210                                  .WORD   T21             ;IP3 - SRC2.LEN
077224  104402                                  .WORD   T16             ;IP4 - SRC2.ADR
077226  102564                                  .WORD   XT1             ;IP5 - DST.LEN
077230  102560                                  .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077232  105320                                  .WORD   T22             ;IP7 - SRC1 DATA
077234  104110                                  .WORD   T7              ;IP10 - SRC1 SURR DATA
077236  104126                                  .WORD   T10             ;IP11 - SRC1 SURR LEN
077240  105116                                  .WORD   T17             ;IP12 - SRC2 DATA
077242  105172                                  .WORD   T20             ;IP13 - SRC2 SURR DATA
077244  102560                                  .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;  AS NOT TO DESTROY ANY OF SRC1)
077246  104142                                  .WORD   T11             ;IP15 - DST DATA
077250  104160                                  .WORD   T12             ;IP16 - DST SURR DATA
077252  104176                                  .WORD   T13             ;IP17 - DST SURR LEN
077254  104212                                  .WORD   T14             ;IP20 - SEPARATION CONSTRANT
077256  102560                                  .WORD   T0              ;IP21 - SPECIAL HANDLING
077260  000000                                  .WORD   0               ;IP22
077262  000000                                  .WORD   0               ;IP23
077264  000000                                  .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 0
                                        ;       SOURCE 2 LENGTH - 1,5
                                        ;       DESTINATION LENGTH - 0,1,5
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                        ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                                        ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                        ;       SOURCE 2 DATA - DIGTIS FROM STRING = 1234567891234567891234000891233; SIGN +
                                        ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                        ;                     - ALL DIGITS IDENTICAL =3; SIGN -
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 48
                                        ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                                        ;
```

```
                                ;ENTRY 57 - INSTRUCTION UNDER TEST = SUBP
                                ;
077266  000023                  ISUBP2: .WORD   23              ;INST=SUBP
077270  000001                          .WORD   1               ;TYPE = 1
077272  105210                          .WORD   T21             ;IP1 - SRC1.LEN
077274  103134                          .WORD   T2              ;IP2 - SRC1.ADR
077276  102560                          .WORD   T0              ;IP3 - SRC2.LEN
077300  104402                          .WORD   T16             ;IP4 - SRC2.ADR
077302  102564                          .WORD   XT1             ;IP5 - DST.LEN
077304  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077306  105116                          .WORD   T17             ;IP7 - SRC1 DATA
077310  104110                          .WORD   T7              ;IP10 - SRC1 SURR DATA
077312  104126                          .WORD   T10             ;IP11 - SRC1 SURR LEN
077314  105320                          .WORD   T22             ;IP12 - SRC2 DATA
077316  105172                          .WORD   T20             ;IP13 - SRC2 SURR DATA
077320  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;  AS NOT TO DESTROY ANY OF SRC1)
077322  104142                          .WORD   T11             ;IP15 - DST DATA
077324  104160                          .WORD   T12             ;IP16 - DST SURR DATA
077326  104176                          .WORD   T13             ;IP17 - DST SURR LEN
077330  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
077332  102560                          .WORD   T0              ;IP21 - SPECIAL HANDLING
077334  000000                          .WORD   0               ;IP22
077336  000000                          .WORD   0               ;IP23
077340  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 1,5
                                ;       SOURCE 2 LENGTH - 0
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                                ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS =48
                                ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                                ;
```

```
                                    ;ENTRY 58 - INSTRUCTION UNDER TEST = SUBP
                                    ;
077342  000023                      ISUBP3: .WORD   23              ;INST=SUBP
077344  000001                              .WORD   1               ;TYPE = 1
077346  105224                              .WORD   T211            ;IP1 - SRC1.LEN
077350  103134                              .WORD   T2              ;IP2 - SRC1.ADR
077352  105242                              .WORD   T212            ;IP3 - SRC2.LEN
077354  104402                              .WORD   T16             ;IP4 - SRC2.ADR
077356  102764                              .WORD   T1P             ;IP5 - DST.LEN
077360  102560                              .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077362  105116                              .WORD   T17             ;IP7 - SRC1 DATA
077364  104110                              .WORD   T7              ;IP10 - SRC1 SURR DATA
077366  104126                              .WORD   T10             ;IP11 - SRC1 SURR LEN
077370  105116                              .WORD   T17             ;IP12 - SRC2 DATA
077372  105172                              .WORD   T20             ;IP13 - SRC2 SURR DATA
077374  102560                              .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                    ;  AS NOT TO DESTROY ANY OF SRC1)
077376  104142                              .WORD   T11             ;IP15 - DST DATA
077400  104160                              .WORD   T12             ;IP16 - DST SURR DATA
077402  104176                              .WORD   T13             ;IP17 - DST SURR LEN
077404  104224                              .WORD   T14A            ;IP20 - SEPARATION CONSTRANT
077406  102560                              .WORD   T0              ;IP21 - SPECIAL HANDLING
077410  000000                              .WORD   0               ;IP22
077412  000000                              .WORD   0               ;IP23
077414  000000                              .WORD   0               ;IP24

                                    ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                    ;
                                    ;       SOURCE 1 LENGTH - 1,37
                                    ;       SOURCE 2 LENGTH - 1,37
                                    ;       DESTINATION LENGTH - 0,1,37
                                    ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                    ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                    ;                                      - SOURCE 2 STRING ALIGNED WITH DEST STRING
                                    ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;
                                    ;TOTAL # OF TEST CONDITIONS = 384
                                    ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 = 1152
                                    ;
```

```
                                    ;ENTRY 59 - INSTRUCTION UNDER TEST = SUBP
                                    ;
        077416  000023              ISUBP4: .WORD   23          ;INST=SUBP
        077420  000001                      .WORD   1           ;TYPE = 1
        077422  102604                      .WORD   T1A         ;IP1 - SRC1.LEN
        077424  103144                      .WORD   T2A         ;IP2 - SRC1.ADR
        077426  102604                      .WORD   T1A         ;IP3 - SRC2.LEN
        077430  104264                      .WORD   T16A        ;IP4 - SRC2.ADR
        077432  102604                      .WORD   T1A         ;IP5 - DST.LEN
        077434  102560                      .WORD   T0          ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        077436  106122                      .WORD   TP19        ;IP7 - SRC1 DATA
        077440  102560                      .WORD   T0          ;IP10 - SRC1 SURR DATA
        077442  102560                      .WORD   T0          ;IP11 - SRC1 SURR LEN
        077444  106122                      .WORD   TP19        ;IP12 - SRC2 DATA
        077446  102560                      .WORD   T0          ;IP13 - SRC2 SURR DATA
        077450  102560                      .WORD   T0          ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;  AS NOT TO DESTROY ANY OF SRC1)
        077452  102560                      .WORD   T0          ;IP15 - DST DATA
        077454  102560                      .WORD   T0          ;IP16 - DST SURR DATA
        077456  102560                      .WORD   T0          ;IP17 - DST SURR LEN
        077460  104212                      .WORD   T14         ;IP20 - SEPARATION CONSTRANT
        077462  103030                      .WORD   TSPA        ;IP21 - SPECIAL HANDLING
        077464  000000                      .WORD   0           ;IP22
        077466  000000                      .WORD   0           ;IP23
        077470  000000                      .WORD   0           ;IP24

                                    ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                    ;
                                    ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                                    ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                    ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                    ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                    ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                    ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;
                                    ;TOTAL # OF TEST CONDITIONS = 512
                                    ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
                                    ;
```

```
                                .SBTTL          SUBN TABLES
                                ;ENTRY 60 - INSTRUCTION UNDER TEST = SUBN
                                ;
077472  000013                  ISUBN:  .WORD   13              ;INST=SUBN
077474  000001                          .WORD   1               ;TYPE = 1
077476  102560                          .WORD   T0              ;IP1 - SRC1.LEN
077500  103134                          .WORD   T2              ;IP2 - SRC1.ADR
077502  102560                          .WORD   T0              ;IP3 - SRC2.LEN
077504  104754                          .WORD   T16Z            ;IP4 - SRC2.ADR
077506  102564                          .WORD   XT1             ;IP5 - DST.LEN
077510  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077512  106652                          .WORD   T42             ;IP7 - SRC1 DATA
077514  104110                          .WORD   T7              ;IP10 - SRC1 SURR DATA
077516  104126                          .WORD   T10             ;IP11 - SRC1 SURR LEN
077520  106652                          .WORD   T42             ;IP12 - SRC2 DATA
077522  105172                          .WORD   T20             ;IP13 - SRC2 SURR DATA
077524  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;  AS NOT TO DESTROY ANY OF SRC1)
077526  104142                          .WORD   T11             ;IP15 - DST DATA
077530  102560                          .WORD   T0              ;IP16 - DST SURR DATA
077532  102560                          .WORD   T0              ;IP17 - DST SURR LEN
077534  106670                          .WORD   T43             ;IP20 - SEPARATION CONSTRANT
077536  102560                          .WORD   T0              ;IP21 - SPECIAL HANDLING
077540  000000                          .WORD   0               ;IP22
077542  000000                          .WORD   0               ;IP23
077544  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0
                                ;       SOURCE 2 LENGTH - 0
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;                                     - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE =17
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 6
                                ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)6 = 42
                                ;
```

```
                              ;ENTRY 61 - INSTRUCTION UNDER TEST = SUBN
                              ;
077546  000013                ISUBN1: .WORD   13              ;INST=SUBN
077550  000001                        .WORD   1               ;TYPE = 1
077552  102560                        .WORD   T0              ;IP1 - SRC1.LEN
077554  103134                        .WORD   T2              ;IP2 - SRC1.ADR
077556  105210                        .WORD   T21             ;IP3 - SRC2.LEN
077560  104754                        .WORD   T16Z            ;IP4 - SRC2.ADR
077562  102564                        .WORD   XT1             ;IP5 - DST.LEN
077564  102560                        .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077566  106652                        .WORD   T42             ;IP7 - SRC1 DATA
077570  104110                        .WORD   T7              ;IP10 - SRC1 SURR DATA
077572  104126                        .WORD   T10             ;IP11 - SRC1 SURR LEN
077574  106374                        .WORD   T37             ;IP12 - SRC2 DATA
077576  105172                        .WORD   T20             ;IP13 - SRC2 SURR DATA
077600  102560                        .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                              ;  AS NOT TO DESTROY ANY OF SRC1)
077602  104142                        .WORD   T11             ;IP15 - DST DATA
077604  104160                        .WORD   T12             ;IP16 - DST SURR DATA
077606  104176                        .WORD   T13             ;IP17 - DST SURR LEN
077610  104212                        .WORD   T14             ;IP20 - SEPARATION CONSTRANT
077612  102560                        .WORD   T0              ;IP21 - SPECIAL HANDLING
077614  000000                        .WORD   0               ;IP22
077616  000000                        .WORD   0               ;IP23
077620  000000                        .WORD   0               ;IP24

                              ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                              ;
                              ;       SOURCE 1 LENGTH - 0
                              ;       SOURCE 2 LENGTH - 1,5
                              ;       DESTINATION LENGTH - 0,1,5
                              ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                              ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                              ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                              ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                              ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                              ;                     - ALL DIGITS IDENTICAL =8; SIGN -; HIGH NIBBLE = 8
                              ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                              ;
                              ;TOTAL # OF TEST CONDITIONS = 36
                              ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)36 = 252
                              ;
```

```
                                        ;
                                        ;ENTRY 62 - INSTRUCTION UNDER TEST = SUBN
                                        ;
 077622  000013                         ISUBN2: .WORD   13              ;INST=SUBN
 077624  000001                                 .WORD   1               ;TYPE = 1
 077626  105210                                 .WORD   T21             ;IP1 - SRC1.LEN
 077630  103134                                 .WORD   T2              ;IP2 - SRC1.ADR
 077632  102560                                 .WORD   T0              ;IP3 - SRC2.LEN
 077634  104754                                 .WORD   T16Z            ;IP4 - SRC2.ADR
 077636  102564                                 .WORD   XT1             ;IP5 - DST.LEN
 077640  102560                                 .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
 077642  106374                                 .WORD   T37             ;IP7 - SRC1 DATA
 077644  104110                                 .WORD   T7              ;IP10 - SRC1 SURR DATA
 077646  104126                                 .WORD   T10             ;IP11 - SRC1 SURR LEN
 077650  106652                                 .WORD   T42             ;IP12 - SRC2 DATA
 077652  105172                                 .WORD   T20             ;IP13 - SRC2 SURR DATA
 077654  102560                                 .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;  AS NOT TO DESTROY ANY OF SRC1)
 077656  104142                                 .WORD   T11             ;IP15 - DST DATA
 077660  104160                                 .WORD   T12             ;IP16 - DST SURR DATA
 077662  104176                                 .WORD   T13             ;IP17 - DST SURR LEN
 077664  104212                                 .WORD   T14             ;IP20 - SEPARATION CONSTRANT
 077666  102560                                 .WORD   T0              ;IP21 - SPECIAL HANDLING
 077670  000000                                 .WORD   0               ;IP22
 077672  000000                                 .WORD   0               ;IP23
 077674  000000                                 .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 1,5
                                        ;       SOURCE 2 LENGTH - 0
                                        ;       DESTINATION LENGTH - 0,1,5
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                        ;                                      - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
                                        ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                        ;                     - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                        ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 36
                                        ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)36 = 252
                                        ;
```

```
                                        ;ENTRY 63 - INSTRUCTION UNDER TEST = SUBN
                                        ;
        077676  000013                  ISUBN3: .WORD   13              ;INST=SUBN
        077700  000001                          .WORD   1               ;TYPE = 1
        077702  105224                          .WORD   T211            ;IP1 - SRC1.LEN
        077704  103134                          .WORD   T2              ;IP2 - SRC1.ADR
        077706  105242                          .WORD   T212            ;IP3 - SRC2.LEN
        077710  104754                          .WORD   T16Z            ;IP4 - SRC2.ADR
        077712  102764                          .WORD   T1P             ;IP5 - DST.LEN
        077714  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        077716  106424                          .WORD   T37A            ;IP7 - SRC1 DATA
        077720  104110                          .WORD   T7              ;IP10 - SRC1 SURR DATA
        077722  104126                          .WORD   T10             ;IP11 - SRC1 SURR LEN
        077724  106424                          .WORD   T37A            ;IP12 - SRC2 DATA
        077726  105172                          .WORD   T20             ;IP13 - SRC2 SURR DATA
        077730  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;  AS NOT TO DESTROY ANY OF SRC1)
        077732  104142                          .WORD   T11             ;IP15 - DST DATA
        077734  102560                          .WORD   T0              ;IP16 - DST SURR DATA
        077736  102560                          .WORD   T0              ;IP17 - DST SURR LEN
        077740  106704                          .WORD   T43A            ;IP20 - SEPARATION CONSTRANT
        077742  102560                          .WORD   T0              ;IP21 - SPECIAL HANDLING
        077744  000000                          .WORD   0               ;IP22
        077746  000000                          .WORD   0               ;IP23
        077750  000000                          .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 1,37
                                        ;       SOURCE 2 LENGTH - 1,37
                                        ;       DESTINATION LENGTH - 0,1,37
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                        ;                                      - SOURCE 2 STRING ALIGNED WITH DEST STRING
                                        ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                        ;                     - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                        ;                     - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                        ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
                                        ;                     - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                        ;                     - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 384
                                        ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)384 = 2688
                                        ;
```

```
                                     ;ENTRY 64 - INSTRUCTION UNDER TEST = SUBN
                                     ;
077752  000013                       ISUBN4: .WORD   13              ;INST=SUBN
077754  000001                               .WORD   1               ;TYPE = 1
077756  102604                               .WORD   T1A             ;IP1 - SRC1.LEN
077760  103144                               .WORD   T2A             ;IP2 - SRC1.ADR
077762  102604                               .WORD   T1A             ;IP3 - SRC2.LEN
077764  104706                               .WORD   T16ZA           ;IP4 - SRC2.ADR
077766  102604                               .WORD   T1A             ;IP5 - DST.LEN
077770  102560                               .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
077772  106462                               .WORD   TZ19            ;IP7 - SRC1 DATA
077774  102560                               .WORD   T0              ;IP10 - SRC1 SURR DATA
077776  102560                               .WORD   T0              ;IP11 - SRC1 SURR LEN
100000  106462                               .WORD   TZ19            ;IP12 - SRC2 DATA
100002  102560                               .WORD   T0              ;IP13 - SRC2 SURR DATA
100004  102560                               .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                     ;   AS NOT TO DESTROY ANY OF SRC1)
100006  102560                               .WORD   T0              ;IP15 - DST DATA
100010  102560                               .WORD   T0              ;IP16 - DST SURR DATA
100012  102560                               .WORD   T0              ;IP17 - DST SURR LEN
100014  104212                               .WORD   T14             ;IP21 - SEPARATION CONSTRANT
100016  103030                               .WORD   TSPA            ;IP21 - SPECIAL HANDLING
100020  000000                               .WORD   0               ;IP22
100022  000000                               .WORD   0               ;IP23
100024  000000                               .WORD   0               ;IP24

                                     ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                     ;
                                     ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                                     ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                     ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                     ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                     ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                     ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                     ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                     ;
                                     ;TOTAL # OF TEST CONDITIONS = 512
                                     ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
                                     ;
```

```
                                .SBTTL          CMPP TABLES
                                ;ENTRY 65 - INSTRUCTION UNDER TEST = CMPP
                                ;
100026  000024                  ICMPP:  .WORD 24                ;INST = CMPP
100030  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
100032  102560                          .WORD T0                ;IP1 - SRC1.LEN
100034  103134                          .WORD T2                ;IP2 - SRC1.ADR
100036  102560                          .WORD T0                ;IP3 - SRC2.LEN
100040  106752                          .WORD T44               ;IP4 - SRC2.ADR
100042  104026                          .WORD T5                ;IP5 - UNUSED PORTION OF REG. 4
100044  105320                          .WORD T22               ;IP6 - SRC1.DATA
100046  105172                          .WORD T20               ;IP7 - SRC1.SURR.DATA
100050  102560                          .WORD T0                ;IP10 - SRC1.SURR.LEN
100052  105320                          .WORD T22               ;IP11 - SRC2.DATA
100054  104110                          .WORD T7                ;IP12 - SRC2.SURR.DATA
100056  104126                          .WORD T10               ;IP13 - SRC2.SURR.LEN
100060  106670                          .WORD T43               ;IP14 - SEPARATION CONSTANT
100062  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
100064  000000                          .WORD 0                 ;IP16
100066  000000                          .WORD 0                 ;IP17
100070  000000                          .WORD 0                 ;IP20
100072  000000                          .WORD 0                 ;IP21
100074  000000                          .WORD 0                 ;IP22
100076  000000                          .WORD 0                 ;IP23
100100  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0
                                ;       SOURCE 2 LENGTH - 0
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                                ;                        - ALIGNED SOURCE 1 - SOURCE 2 STRINGS
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 2
                                ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)2 = 6
                                ;
```

```

                                 ;ENTRY 66 - INSTRUCTION UNDER TEST = CMPP
                                 ;
100102  000024                   ICMPP1: .WORD 24                ;INST = CMPP
100104  000001                           .WORD 1                 ;TYPE = 1
100106  102560                           .WORD T0                ;IP1 - SRC1.LEN
100110  103134                           .WORD T2                ;IP2 - SRC1.ADR
100112  105210                           .WORD T21               ;IP3 - SRC2.LEN
100114  106752                           .WORD T44               ;IP4 - SRC2.ADR
100116  104026                           .WORD T5                ;IP5 - UNUSED PORTION OF REG. 4
100120  105320                           .WORD T22               ;IP6 - SRC1.DATA
100122  105172                           .WORD T20               ;IP7 - SRC1.SURR.DATA
100124  102560                           .WORD T0                ;IP10 - SRC1.SURR.LEN
100126  107072                           .WORD T45               ;IP11 - SRC2.DATA
100130  104110                           .WORD T7                ;IP12 - SRC2.SURR.DATA
100132  104126                           .WORD T10               ;IP13 - SRC2.SURR.LEN
100134  106670                           .WORD T43               ;IP14 - SEPARATION CONSTANT
100136  102560                           .WORD T0                ;IP15 - SPECIAL HANDLING
100140  000000                           .WORD 0                 ;IP16
100142  000000                           .WORD 0                 ;IP17
100144  000000                           .WORD 0                 ;IP20
100146  000000                           .WORD 0                 ;IP21
100150  000000                           .WORD 0                 ;IP22
100152  000000                           .WORD 0                 ;IP23
100154  000000                           .WORD 0                 ;IP24

                                 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                 ;
                                 ;       SOURCE 1 LENGTH - 0
                                 ;       SOURCE 2 LENGTH - 1,5
                                 ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                 ;       SOURCE 2 ADDRESS - NO OVERLAP OF THE STRINGS
                                 ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                 ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN -
                                 ;
                                 ;TOTAL # OF TEST CONDITIONS = 8
                                 ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)8 = 24
                                 ;
```

```

                              ;ENTRY 67 - INSTRUCTION UNDER TEST = CMPP
                              ;
100156  000024                ICMPP2: .WORD 24          ;INST = CMPP
100160  000001                        .WORD 1           ;TYPE = 1
100162  105210                        .WORD T21         ;IP1 - SRC1.LEN
100164  103134                        .WORD T2          ;IP2 - SRC1.ADR
100166  102560                        .WORD T0          ;IP3 - SRC2.LEN
100170  106752                        .WORD T44         ;IP4 - SRC2.ADR
100172  104026                        .WORD T5          ;IP5 - UNUSED PORTION OF REG. 4
100174  107072                        .WORD T45         ;IP6 - SRC1.DATA
100176  105172                        .WORD T20         ;IP7 - SRC1.SURR.DATA
100200  102560                        .WORD T0          ;IP10 - SRC1.SURR.LEN
100202  105320                        .WORD T22         ;IP11 - SRC2.DATA
100204  104110                        .WORD T7          ;IP12 - SRC2.SURR.DATA
100206  104126                        .WORD T10         ;IP13 - SRC2.SURR.LEN
100210  106670                        .WORD T43         ;IP14 - SEPARATION CONSTANT
100212  102560                        .WORD T0          ;IP15 - SPECIAL HANDLING
100214  000000                        .WORD 0           ;IP16
100216  000000                        .WORD 0           ;IP17
100220  000000                        .WORD 0           ;IP20
100222  000000                        .WORD 0           ;IP21
100224  000000                        .WORD 0           ;IP22
100226  000000                        .WORD 0           ;IP23
100230  000000                        .WORD 0           ;IP24

                              ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                              ;
                              ;       SOURCE 1 LENGTH - 1,5
                              ;       SOURCE 2 LENGTH - 0
                              ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                              ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                              ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                              ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                              ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                              ;                     - ALL DIGITS IDENTICAL = 0; SIGN -
                              ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                              ;
                              ;TOTAL # OF TEST CONDITIONS =8
                              ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)8 = 24
                              ;
```

```

                                 ;ENTRY 68 - INSTRUCTION UNDER TEST = CMPP

                                 ;
100232  000024                   ICMPP3: .WORD 24               ;INST = CMPP
100234  000001                           .WORD 1                ;TYPE = 1
100236  105224                           .WORD T211             ;IP1 - SRC1.LEN
100240  103134                           .WORD T2               ;IP2 - SRC1.ADR
100242  105242                           .WORD T212             ;IP3 - SRC2.LEN
100244  106752                           .WORD T44              ;IP4 - SRC2.ADR
100246  104026                           .WORD T5               ;IP5 - UNUSED PORTION OF REG. 4
100250  107072                           .WORD T45              ;IP6 - SRC1.DATA
100252  105172                           .WORD T20              ;IP7 - SRC1.SURR.DATA
100254  102560                           .WORD T0               ;IP10 - SRC1.SURR.LEN
100256  107072                           .WORD T45              ;IP11 - SRC2.DATA
100260  104110                           .WORD T7               ;IP12 - SRC2.SURR.DATA
100262  104126                           .WORD T10              ;IP13 - SRC2.SURR.LEN
100264  106670                           .WORD T43              ;IP14 - SEPARATION CONSTANT
100266  102560                           .WORD T0               ;IP15 - SPECIAL HANDLING
100270  000000                           .WORD 0                ;IP16
100272  000000                           .WORD 0                ;IP17
100274  000000                           .WORD 0                ;IP20
100276  000000                           .WORD 0                ;IP21
100300  000000                           .WORD 0                ;IP22
100302  000000                           .WORD 0                ;IP23
100304  000000                           .WORD 0                ;IP24

                                 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                 ;
                                 ;       SOURCE 1 LENGTH - 1,37
                                 ;       SOURCE 2 LENGTH - 1,37
                                 ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                 ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                                 ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN -
                                 ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                 ;                     - ALL DIGITS IDENTICAL = 0; SIGN -
                                 ;
                                 ;TOTAL # OF TEST CONDITIONS = 128
                                 ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)128 = 384
                                 ;
```

```
                                  ;ENTRY 69 - INSTRUCTION UNDER TEST = CMPP
                                  ;
100306  000024                    ICMPP4: .WORD 24             ;INST = CMPP
100310  000003                            .WORD 3              ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
100312  102604                            .WORD T1A            ;IP1 - SRC1.LEN
100314  103144                            .WORD T2A            ;IP2 - SRC1.ADR
100316  102604                            .WORD T1A            ;IP3 - SRC2.LEN
100320  106720                            .WORD T44A           ;IP4 - SRC2.ADR
100322  104026                            .WORD T5             ;IP5 - UNUSED PORTION OF REG. 4
100324  106122                            .WORD TP19           ;IP6 - SRC1.DATA
100326  102560                            .WORD T0             ;IP7 - SRC1.SURR.DATA
100330  102560                            .WORD T0             ;IP10 - SRC1.SURR.LEN
100332  106122                            .WORD TP19           ;IP11 - SRC2.DATA
100334  102560                            .WORD T0             ;IP12 - SRC2.SURR.DATA
100336  102560                            .WORD T0             ;IP13 - SRC2.SURR.LEN
100340  104212                            .WORD T14            ;IP14 - SEPARATION CONSTANT
100342  103030                            .WORD TSPA           ;IP15 - SPECIAL HANDLING
100344  000000                            .WORD 0              ;IP16
100346  000000                            .WORD 0              ;IP17
100350  000000                            .WORD 0              ;IP20
100352  000000                            .WORD 0              ;IP21
100354  000000                            .WORD 0              ;IP22
100356  000000                            .WORD 0              ;IP23
100360  000000                            .WORD 0              ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                                  ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                  ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE 2 ADDRESS - NO OVERLAP OF ANY OF THE STRINGS
                                  ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                  ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 64
                                  ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)64 = 64
                                  ;
```

```
                                .SBTTL          CMPN TABLES
                                ;ENTRY 70 - INSTRUCTION UNDER TEST = CMPN
                                ;
100362  000014                  ICMPN:  .WORD 14                ;INST = CMPN
100364  000001                          .WORD 1                 ;TYPE = 1
100366  102560                          .WORD T0                ;IP1 - SRC1.LEN
100370  103134                          .WORD T2                ;IP2 - SRC1.ADR
100372  102560                          .WORD T0                ;IP3 - SRC2.LEN
100374  107154                          .WORD T46               ;IP4 - SRC2.ADR
100376  104026                          .WORD T5                ;IP5 - UNUSED PORTION OF REG. 4
100400  106652                          .WORD T42               ;IP6 - SRC1.DATA
100402  105172                          .WORD T20               ;IP7 - SRC1.SURR.DATA
100404  102560                          .WORD T0                ;IP10 - SRC1.SURR.LEN
100406  106652                          .WORD T42               ;IP11 - SRC2.DATA
100410  104110                          .WORD T7                ;IP12 - SRC2.SURR.DATA
100412  104126                          .WORD T10               ;IP13 - SRC2.SURR.LEN
100414  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
100416  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
100420  000000                          .WORD 0                 ;IP16
100422  000000                          .WORD 0                 ;IP17
100424  000000                          .WORD 0                 ;IP20
100426  000000                          .WORD 0                 ;IP21
100430  000000                          .WORD 0                 ;IP22
100432  000000                          .WORD 0                 ;IP23
100434  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0
                                ;       SOURCE 2 LENGTH - 0
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                                ;                        - STRINGS ADJACENT
                                ;                        - STRINGS PARTIALLY OVERLAP
                                ;                        - STRINGS COMPLETELY OVERLAP
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE =17
                                ;
                                ;TOTAL # OF TEST CONDITIONS =
                                ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)  =
                                ;
```

```

                                        ;ENTRY 71 - INSTRUCTION UNDER TEST = CMPN

                                        ;
        100436  000014                  ICMPN1: .WORD 14                        ;INST = CMPN
        100440  000001                          .WORD 1                         ;TYPE = 1
        100442  102560                          .WORD T0                        ;IP1 - SRC1.LEN
        100444  103134                          .WORD T2                        ;IP2 - SRC1.ADR
        100446  105210                          .WORD T21                       ;IP3 - SRC2.LEN
        100450  107154                          .WORD T46                       ;IP4 - SRC2.ADR
        100452  104026                          .WORD T5                        ;IP5 - UNUSED PORTION OF REG. 4
        100454  106652                          .WORD T42                       ;IP6 - SRC1.DATA
        100456  105172                          .WORD T20                       ;IP7 - SRC1.SURR.DATA
        100460  102560                          .WORD T0                        ;IP10 - SRC1.SURR.LEN
        100462  107376                          .WORD T47                       ;IP11 - SRC2.DATA
        100464  104110                          .WORD T7                        ;IP12 - SRC2.SURR.DATA
        100466  104126                          .WORD T10                       ;IP13 - SRC2.SURR.LEN
        100470  104212                          .WORD T14                       ;IP14 - SEPARATION CONSTANT
        100472  102560                          .WORD T0                        ;IP15 - SPECIAL HANDLING
        100474  000000                          .WORD 0                         ;IP16
        100476  000000                          .WORD 0                         ;IP17
        100500  000000                          .WORD 0                         ;IP20
        100502  000000                          .WORD 0                         ;IP21
        100504  000000                          .WORD 0                         ;IP22
        100506  000000                          .WORD 0                         ;IP23
        100510  000000                          .WORD 0                         ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 0
                                        ;       SOURCE 2 LENGTH - 1,5
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                                        ;                        - STRINGS ADJACENT
                                        ;                        - STRINGS PARTIALLY OVERLAP
                                        ;                        - STRINGS COMPLETELY OVERLAP
                                        ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
                                        ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 1
                                        ;                     - ALL DIGITS IDENTICAL = 8; SIGN +; HIGH NIBBLE = 17
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN +; HIGH NIBBLE = 1
                                        ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 8
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS =
                                        ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE) =
                                        ;
```

```

                                    ;ENTRY 72 - INSTRUCTION UNDER TEST = CMPN
                                    ;
100512  000014                      ICMPN2: .WORD 14            ;INST = CMPN
100514  000001                              .WORD 1             ;TYPE = 1
100516  105210                              .WORD T21           ;IP1 - SRC1.LEN
100520  103134                              .WORD T2            ;IP2 - SRC1.ADR
100522  102560                              .WORD T0            ;IP3 - SRC2.LEN
100524  107154                              .WORD T46           ;IP4 - SRC2.ADR
100526  104026                              .WORD T5            ;IP5 - UNUSED PORTION OF REG. 4
100530  107376                              .WORD T47           ;IP6 - SRC1.DATA
100532  105172                              .WORD T20           ;IP7 - SRC1.SURR.DATA
100534  102560                              .WORD T0            ;IP10 - SRC1.SURR.LEN
100536  106652                              .WORD T42           ;IP11 - SRC2.DATA
100540  104110                              .WORD T7            ;IP12 - SRC2.SURR.DATA
100542  104126                              .WORD T10           ;IP13 - SRC2.SURR.LEN
100544  104212                              .WORD T14           ;IP14 - SEPARATION CONSTANT
100546  102560                              .WORD T0            ;IP15 - SPECIAL HANDLING
100550  000000                              .WORD 0             ;IP16
100552  000000                              .WORD 0             ;IP17
100554  000000                              .WORD 0             ;IP20
100556  000000                              .WORD 0             ;IP21
100560  000000                              .WORD 0             ;IP22
100562  000000                              .WORD 0             ;IP23
100564  000000                              .WORD 0             ;IP24

                                    ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                    ;
                                    ;       SOURCE 1 LENGTH - 1,5
                                    ;       SOURCE 2 LENGTH - 0
                                    ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                    ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                                    ;                        - STRINGS ADJACENT
                                    ;                        - STRINGS PARTIALLY OVERLAP
                                    ;                        - STRINGS COMPLETELY OVERLAP
                                    ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 1
                                    ;                     - ALL DIGITS IDENTICAL = 8; SIGN +; HIGH NIBBLE = 17
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +; HIGH NIBBLE = 1
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 8
                                    ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17

                                    ;TOTAL # OF TEST CONDITIONS =
                                    ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE) =
                                    ;
```

```

                               ;ENTRY 73 - INSTRUCTION UNDER TEST = CMPN
                               ;
100566  000014                 ICMPN3: .WORD 14                ;INST = CMPN
100570  000001                         .WORD 1                 ;TYPE = 1
100572  105224                         .WORD T211              ;IP1 - SRC1.LEN
100574  103134                         .WORD T2                ;IP2 - SRC1.ADR
100576  105242                         .WORD T212              ;IP3 - SRC2.LEN
100600  107154                         .WORD T46               ;IP4 - SRC2.ADR
100602  104026                         .WORD T5                ;IP5 - UNUSED PORTION OF REG. 4
100604  107376                         .WORD T47               ;IP6 - SRC1.DATA
100606  105172                         .WORD T20               ;IP7 - SRC1.SURR.DATA
100610  102560                         .WORD T0                ;IP10 - SRC1.SURR.LEN
100612  107376                         .WORD T47               ;IP11 - SRC2.DATA
100614  104110                         .WORD T7                ;IP12 - SRC2.SURR.DATA
100616  104126                         .WORD T10               ;IP13 - SRC2.SURR.LEN
100620  104212                         .WORD T14               ;IP14 - SEPARATION CONSTANT
100622  102560                         .WORD T0                ;IP15 - SPECIAL HANDLING
100624  000000                         .WORD 0                 ;IP16
100626  000000                         .WORD 0                 ;IP17
100630  000000                         .WORD 0                 ;IP20
100632  000000                         .WORD 0                 ;IP21
100634  000000                         .WORD 0                 ;IP22
100636  000000                         .WORD 0                 ;IP23
100640  000000                         .WORD 0                 ;IP24

                               ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                               ;
                               ;       SOURCE 1 LENGTH - 1,37
                               ;       SOURCE 2 LENGTH - 1,37
                               ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                               ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                               ;                        - STRINGS ADJACENT
                               ;                        - STRINGS PARTIALLY OVERLAP
                               ;                        - STRINGS COMPLETELY OVERLAP
                               ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 1
                               ;                     - ALL DIGITS IDENTICAL = 8; SIGN +; HIGH NIBBLE = 17
                               ;                     - ALL DIGITS IDENTICAL = 0; SIGN +; HIGH NIBBLE = 1
                               ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 8
                               ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 1
                               ;                     - ALL DIGITS IDENTICAL = 8; SIGN +; HIGH NIBBLE = 17
                               ;                     - ALL DIGITS IDENTICAL = 0; SIGN +; HIGH NIBBLE = 1
                               ;                     - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 8
                               ;
                               ;TOTAL # OF TEST CONDITIONS = 256
                               ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE) = 832
                               ;
```

```
                                ;ENTRY 74 - INSTRUCTION UNDER TEST = CMPN
                                ;
100642  000014                  ICMPN4: .WORD 14                ;INST = CMPN
100644  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
100646  102604                          .WORD T1A               ;IP1 - SRC1.LEN
100650  103144                          .WORD T2A               ;IP2 - SRC1.ADR
100652  102604                          .WORD T1A               ;IP3 - SRC2.LEN
100654  107126                          .WORD T46A              ;IP4 - SRC2.ADR
100656  104026                          .WORD T5                ;IP5 - UNUSED PORTION OF REG. 4
100660  106462                          .WORD TZ19              ;IP6 - SRC1.DATA
100662  102560                          .WORD T0                ;IP7 - SRC1.SURR.DATA
100664  102560                          .WORD T0                ;IP10 - SRC1.SURR.LEN
100666  106462                          .WORD TZ19              ;IP11 - SRC2.DATA
100670  102560                          .WORD T0                ;IP12 - SRC2.SURR.DATA
100672  102560                          .WORD T0                ;IP13 - SRC2.SURR.LEN
100674  104212                          .WORD T14               ;IP14 - SEPARATION CONSTANT
100676  103030                          .WORD TSPA              ;IP15 - SPECIAL HANDLING
100700  000000                          .WORD 0                 ;IP16
100702  000000                          .WORD 0                 ;IP17
100704  000000                          .WORD 0                 ;IP20
100706  000000                          .WORD 0                 ;IP21
100710  000000                          .WORD 0                 ;IP22
100712  000000                          .WORD 0                 ;IP23
100714  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
                                ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 64
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)64 = 64
                                ;
```

```
                                .SBTTL          ASHP TABLES
                                ;ENTRY 75 - INSTRUCTION UNDER TEST = ASHP
                                ;
100716  000030                  IASHP:  .WORD 30                ;INST=ASHP
100720  000001                          .WORD 1                 ;TYPE = 1
100722  103034                          .WORD T111              ;IP1 - SRC.LEN
100724  103134                          .WORD T2                ;IP2 - SRC.ADR
100726  107432                          .WORD T50               ;IP3 - RND.DGT,SHFT.CNT
100730  103054                          .WORD T112              ;IP4 - DST.LEN
100732  105756                          .WORD T34               ;IP5 - DST.ADR
100734  106214                          .WORD T35B              ;IP6 - SRC DATA
100736  105172                          .WORD T20               ;IP7 - SRC SURR DATA
100740  102560                          .WORD T0                ;IP10 - SRC SURR LEN
100742  104142                          .WORD T11               ;IP11 - DST DATA
100744  104160                          .WORD T12               ;IP12 - DST SURR DATA
100746  104176                          .WORD T13               ;IP13 - DST SURR LEN
100750  106670                          .WORD T43               ;IP14 - SEP CONST
100752  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
100754  000000                          .WORD 0                 ;IP16
100756  000000                          .WORD 0                 ;IP17
100760  000000                          .WORD 0                 ;IP20
100762  000000                          .WORD 0                 ;IP21
100764  000000                          .WORD 0                 ;IP22
100766  000000                          .WORD 0                 ;IP23
100770  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,37
                                ;       DESTINATION LENGTH - 0,1,37
                                ;       SOURCE ADDRESS - 200
                                ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
                                ;                           - STRINGS ADJACENT
                                ;       SOURCE DATA - ALL DIGITS IDENTICAL = 8; SIGN -
                                ;                   - ALL DIGITS IDENTICAL = 0; SIGN -
                                ;                   - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;                   - DIGITS FROM STRING = 000888-
                                ;                   - DIGITS FROM STRING = 4000000000000000000000000000000-
                                ;       ROUND DIGIT, SHIFT COUNT -      0,0
                                ;                                -      5,-2
                                ;                                -      9,2
                                ;                                -      3,-3
                                ;                                -      1,-3
                                ;                                -      0,5
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 540
                                ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)540 = 1620
                                ;
```

```
                                ;ENTRY 76 - INSTRUCTION UNDER TEST = ASHP
                                ;
100772  000030                  IASHP1: .WORD 30        ;INST=ASHP
100774  000001                          .WORD 1         ;TYPE = 1
100776  102604                          .WORD T1A       ;IP1 - SRC.LEN
101000  103144                          .WORD T2A       ;IP2 - SRC.ADR
101002  107476                          .WORD T50C      ;IP3 - RND.DGT,SHFT.CNT
101004  102604                          .WORD T1A       ;IP4 - DST.LEN
101006  105724                          .WORD T34A      ;IP5 - DST.ADR
101010  106122                          .WORD TP19      ;IP6 - SRC DATA
101012  102560                          .WORD T0        ;IP7 - SRC SURR DATA
101014  102560                          .WORD T0        ;IP10 - SRC SURR LEN
101016  102560                          .WORD T0        ;IP11 - DST DATA
101020  102560                          .WORD T0        ;IP12 - DST SURR DATA
101022  102560                          .WORD T0        ;IP13 - DST SURR LEN
101024  104212                          .WORD T14       ;IP14 - SEP CONST
101026  103030                          .WORD TSPA      ;IP15 - SPECIAL HANDLING
101030  000000                          .WORD 0         ;IP16
101032  000000                          .WORD 0         ;IP17
101034  000000                          .WORD 0         ;IP20
101036  000000                          .WORD 0         ;IP21
101040  000000                          .WORD 0         ;IP22
101042  000000                          .WORD 0         ;IP23
101044  000000                          .WORD 0         ;IP24

                                ;THIS TABLE EXERCISE ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - NO OVERLAP
                                ;       SOURCE DATA - DIGIIS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;       ROUND DIGIT, SHIFT COUNT -      7,-1
                                ;                                       7,-2
                                ;                                       1, 0
                                ;                                       8, 3
                                ;
                                ;TOTAL # OF TESTS = 256
```

```
                                        ;ENTRY 76A - INSTRUCTION UNDER TEST = ASHP
                                        ;
 101046  000030                         IASHP2: .WORD 30                ;INST=ASHP
 101050  000003                                 .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
 101052  102672                                 .WORD T1F               ;IP1 - SRC.LEN
 101054  103144                                 .WORD T2A               ;IP2 - SRC.ADR
 101056  107512                                 .WORD T50D              ;IP3 - RND.DGT,SHFT.CNT
 101060  102730                                 .WORD T1K               ;IP4 - DST.LEN
 101062  105724                                 .WORD T34A              ;IP5 - DST.ADR
 101064  106206                                 .WORD TP99              ;IP6 - SRC DATA
 101066  102560                                 .WORD T0                ;IP7 - SRC SURR DATA
 101070  102560                                 .WORD T0                ;IP10 - SRC SURR LEN
 101072  102560                                 .WORD T0                ;IP11 - DST DATA
 101074  102560                                 .WORD T0                ;IP12 - DST SURR DATA
 101076  102560                                 .WORD T0                ;IP13 - DST SURR LEN
 101100  104212                                 .WORD T14               ;IP14 - SEP CONST
 101102  102560                                 .WORD T0                ;IP15 - SPECIAL HANDLING
 101104  000000                                 .WORD 0                 ;IP16
 101106  000000                                 .WORD 0                 ;IP17
 101110  000000                                 .WORD 0                 ;IP20
 101112  000000                                 .WORD 0                 ;IP21
 101114  000000                                 .WORD 0                 ;IP22
 101116  000000                                 .WORD 0                 ;IP23
 101120  000000                                 .WORD 0                 ;IP24

                                        ;THIS TABLE EXERCISE ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE LENGTH - 20,16,17,3
                                        ;       DESTINATION LENGTH - 20,16,17,1
                                        ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                        ;       DESTINATION ADDRESS - NO OVERLAP
                                        ;       SOURCE DATA - ALL DIGITS IDENTICAL = 9; SIGN -
                                        ;       ROUND DIGIT, SHIFT COUNT -    2,-2
                                        ;                                     9,-3
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 32
                                        ;TOTAL # OF TESTS = (2 DATA TYPES + 1 IN-LINE) 32 = 96
```

```
                                .SBTTL          ASHN TABLES
                                ;ENTRY 77 - INSTRUCTION UNDER TEST = ASHN
                                ;
        101122  000020          IASHN:  .WORD 20                ;INST=ASHN
        101124  000001                  .WORD 1                 ;TYPE = 1
        101126  103034                  .WORD T111              ;IP1 - SRC.LEN
        101130  103134                  .WORD T2                ;IP2 - SRC.ADR
        101132  107432                  .WORD T50               ;IP3 - RND.DGT,SHFT.CNT
        101134  103054                  .WORD T112              ;IP4 - DST.LEN
        101136  106312                  .WORD T36               ;IP5 - DST.ADR
        101140  106472                  .WORD T37B              ;IP6 - SRC DATA
        101142  105172                  .WORD T20               ;IP7 - SRC SURR DATA
        101144  102560                  .WORD T0                ;IP10 - SRC SURR LEN
        101146  104142                  .WORD T11               ;IP11 - DST DATA
        101150  104160                  .WORD T12               ;IP12 - DST SURR DATA
        101152  104176                  .WORD T13               ;IP13 - DST SURR LEN
        101154  106670                  .WORD T43               ;IP14 - SEP CONST
        101156  102560                  .WORD T0                ;IP15 - SPECIAL HANDLING
        101160  000000                  .WORD 0                 ;IP16
        101162  000000                  .WORD 0                 ;IP17
        101164  000000                  .WORD 0                 ;IP20
        101166  000000                  .WORD 0                 ;IP21
        101170  000000                  .WORD 0                 ;IP22
        101172  000000                  .WORD 0                 ;IP23
        101174  000000                  .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 0,1,37
                                ;       DESTINATION LENGTH - 0,1,37
                                ;       SOURCE ADDRESS - 200
                                ;       DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
                                ;                           - STRINGS ADJACENT
                                ;       SOURCE DATA - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
                                ;                   - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
                                ;                   - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;                   - DIGITS FROM STRING = 000888-
                                ;                   - DIGITS FROM STRING = 4000000000000000000000000000000-
                                ;       ROUND DIGIT, SHIFT COUNT -      0,0
                                ;                                -      5,-2
                                ;                                -      9,2
                                ;                                -      3,-3
                                ;                                -      1,-3
                                ;                                -      0,5
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 540
                                ;TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)540 = 3780
                                ;
```

```
                                  ;ENTRY 78 - INSTRUCTION UNDER TEST = ASHN
                                  ;
101176  000020                    IASHN1: .WORD 20           ;INST=ASHN
101200  000003                            .WORD 3            ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
101202  102604                            .WORD T1A          ;IP1 - SRC.LEN
101204  103144                            .WORD T2A          ;IP2 - SRC.ADR
101206  107462                            .WORD T50A         ;IP3 - RND.DGT,SHFT.CNT
101210  102604                            .WORD T1A          ;IP4 - DST.LEN
101212  106264                            .WORD T36A         ;IP5 - DST.ADR
101214  106462                            .WORD TZ19         ;IP6 - SRC DATA
101216  102560                            .WORD T0           ;IP7 - SRC SURR DATA
101220  102560                            .WORD T0           ;IP10 - SRC SURR LEN
101222  102560                            .WORD T0           ;IP11 - DST DATA
101224  102560                            .WORD T0           ;IP12 - DST SURR DATA
101226  102560                            .WORD T0           ;IP13 - DST SURR LEN
101230  104212                            .WORD T14          ;IP14 - SEP CONST
101232  103030                            .WORD TSPA         ;IP15 - SPECIAL HANDLING
101234  000000                            .WORD 0            ;IP16
101236  000000                            .WORD 0            ;IP17
101240  000000                            .WORD 0            ;IP20
101242  000000                            .WORD 0            ;IP21
101244  000000                            .WORD 0            ;IP22
101246  000000                            .WORD 0            ;IP23
101250  000000                            .WORD 0            ;IP24

                                  ;THIS TABLE EXERCISE ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE LENGTH - 0,1,2,3,4,5,11,20
                                  ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                  ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                  ;       DESTINATION ADDRESS - NO OVERLAP
                                  ;       SOURCE DATA - DIGITS FROM STRING = 12345678912345678912340008912 33; SIGN +
                                  ;       ROUND DIGIT, SHIFT COUNT -    5,-1
                                  ;
                                  ;TOTAL # OF TESTS = 64
```

```
                                ;ENTRY 78A - INSTRUCTION UNDER TEST = ASHN
                                ;
101252  000020                  IASHN2: .WORD 20                ;INST=ASHN
101254  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
101256  102654                          .WORD T1D               ;IP1 - SRC.LEN
101260  103144                          .WORD T2A               ;IP2 - SRC.ADR
101262  107466                          .WORD T50B              ;IP3 - RND.DGT,SHFT.CNT
101264  102664                          .WORD T1E               ;IP4 - DST.LEN
101266  106264                          .WORD T36A              ;IP5 - DST.ADR
101270  106462                          .WORD TZ19              ;IP6 - SRC DATA
101272  102560                          .WORD T0                ;IP7 - SRC SURR DATA
101274  102560                          .WORD T0                ;IP10 - SRC SURR LEN
101276  102560                          .WORD T0                ;IP11 - DST DATA
101300  102560                          .WORD T0                ;IP12 - DST SURR DATA
101302  102560                          .WORD T0                ;IP13 - DST SURR LEN
101304  104212                          .WORD T14               ;IP14 - SEP CONST
101306  102560                          .WORD T0                ;IP15 - SPECIAL HANDLING
101310  000000                          .WORD 0                 ;IP16
101312  000000                          .WORD 0                 ;IP17
101314  000000                          .WORD 0                 ;IP20
101316  000000                          .WORD 0                 ;IP21
101320  000000                          .WORD 0                 ;IP22
101322  000000                          .WORD 0                 ;IP23
101324  000000                          .WORD 0                 ;IP24

                                ;THIS TABLE EXERCISE ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE LENGTH - 1,2
                                ;       DESTINATION LENGTH - 2,3
                                ;       SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                ;       DESTINATION ADDRESS - NO OVERLAP
                                ;       SOURCE DATA - DIGIIS FROM STRING = 1234567891234567891234000891233; SIGN +
                                ;       ROUND DIGIT, SHIFT COUNT -    7,-1
                                ;                                     7, 2
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 8
                                ;TOTAL # OF TESTS (6 DATA TYPES + 1 IN-LINE)8 = 56
```

```
                                  .SBTTL          MULP TABLES
                                  ;ENTRY 79 - INSTRUCTION UNDER TEST = MULP
                                  ;
101326  000026                    IMULP:  .WORD   26              ;INST=MULP
101330  000003                            .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
101332  102560                            .WORD   T0              ;IP1 - SRC1.LEN
101334  103134                            .WORD   T2              ;IP2 - SRC1.ADR
101336  102560                            .WORD   T0              ;IP3 - SRC2.LEN
101340  104564                            .WORD   T161            ;IP4 - SRC2.ADR
101342  102564                            .WORD   XT1             ;IP5 - DST.LEN
101344  102560                            .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
101346  105320                            .WORD   T22             ;IP7 - SRC1 DATA
101350  104110                            .WORD   T7              ;IP10 - SRC1 SURR DATA
101352  104126                            .WORD   T10             ;IP11 - SRC1 SURR LEN
101354  105320                            .WORD   T22             ;IP12 - SRC2 DATA
101356  105172                            .WORD   T20             ;IP13 - SRC2 SURR DATA
101360  102560                            .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                  ;   AS NOT TO DESTROY ANY OF SRC1)
101362  104142                            .WORD   T11             ;IP15 - DST DATA
101364  104160                            .WORD   T12             ;IP16 - DST SURR DATA
101366  104176                            .WORD   T13             ;IP17 - DST SURR LEN
101370  104212                            .WORD   T14             ;IP20 - SEPARATION CONSTRANT
101372  102560                            .WORD   T0              ;IP21 -SPECIAL HANDLING
101374  000000                            .WORD   0               ;IP22
101376  000000                            .WORD   0               ;IP23
101400  000000                            .WORD   0               ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE 1 LENGTH - 0
                                  ;       SOURCE 2 LENGTH - 0
                                  ;       DESTINATION LENGTH - 0,1,5
                                  ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                  ;                                     - SOURCE 2 STRING ADJACENT WITH DESTINATION STRING
                                  ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                  ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 6
                                  ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 = 18
                                  ;
```

```

                                  ;
                                  ;ENTRY 80 - INSTRUCTION UNDER TEST = MULP
                                  ;
      101402  000026              IMULP1: .WORD   26              ;INST=MULP
      101404  000001                      .WORD   1               ;TYPE = 1
      101406  102560                      .WORD   T0              ;IP1 - SRC1.LEN
      101410  103134                      .WORD   T2              ;IP2 - SRC1.ADR
      101412  105210                      .WORD   T21             ;IP3 - SRC2.LEN
      101414  104564                      .WORD   T161            ;IP4 - SRC2.ADR
      101416  102564                      .WORD   XT1             ;IP5 - DST.LEN
      101420  102560                      .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
      101422  105320                      .WORD   T22             ;IP7 - SRC1 DATA
      101424  104110                      .WORD   T7              ;IP10 - SRC1 SURR DATA
      101426  104126                      .WORD   T10             ;IP11 - SRC1 SURR LEN
      101430  105116                      .WORD   T17             ;IP12 - SRC2 DATA
      101432  105172                      .WORD   T20             ;IP13 - SRC2 SURR DATA
      101434  102560                      .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                  ;  AS NOT TO DESTROY ANY OF SRC1)
      101436  104142                      .WORD   T11             ;IP15 - DST DATA
      101440  104160                      .WORD   T12             ;IP16 - DST SURR DATA
      101442  104176                      .WORD   T13             ;IP17 - DST SURR LEN
      101444  104212                      .WORD   T14             ;IP20 - SEPARATION CONSTRANT
      101446  102560                      .WORD   T0              ;IP21 -SPECIAL HANDLING
      101450  000000                      .WORD   0               ;IP22
      101452  000000                      .WORD   0               ;IP23
      101454  000000                      .WORD   0               ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE 1 LENGTH - 0
                                  ;       SOURCE 2 LENGTH - 1,5
                                  ;       DESTINATION LENGTH - 0,1,5
                                  ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                  ;                                      - SOURCE 2 STRING ADJACENT WITH DESTINATION STRIN
                                  ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                  ;       SOURCE 2 DATA - DIGTIS FROM STRING = 1234567891234567891234000891233; SIGN +
                                  ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                  ;                     - ALL DIGITS IDENTICAL =3; SIGN -
                                  ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 48
                                  ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                                  ;
```

```
                                    ;ENTRY 81 - INSTRUCTION UNDER TEST = MULP
                                    ;
 101456  000026                     IMULP2: .WORD   26              ;INST=MULP
 101460  000001                             .WORD   1               ;TYPE = 1
 101462  105210                             .WORD   T21             ;IP1 - SRC1.LEN
 101464  103134                             .WORD   T2              ;IP2 - SRC1.ADR
 101466  102560                             .WORD   T0              ;IP3 - SRC2.LEN
 101470  104564                             .WORD   T161            ;IP4 - SRC2.ADR
 101472  102564                             .WORD   XT1             ;IP5 - DST.LEN
 101474  102560                             .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
 101476  105116                             .WORD   T17             ;IP7 - SRC1 DATA
 101500  104110                             .WORD   T7              ;IP10 - SRC1 SURR DATA
 101502  104126                             .WORD   T10             ;IP11 - SRC1 SURR LEN
 101504  105320                             .WORD   T22             ;IP12 - SRC2 DATA
 101506  105172                             .WORD   T20             ;IP13 - SRC2 SURR DATA
 101510  102560                             .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                    ;  AS NOT TO DESTROY ANY OF SRC1)
 101512  104142                             .WORD   T11             ;IP15 - DST DATA
 101514  104160                             .WORD   T12             ;IP16 - DST SURR DATA
 101516  104176                             .WORD   T13             ;IP17 - DST SURR LEN
 101520  104212                             .WORD   T14             ;IP20 - SEPARATION CONSTRANT
 101522  102560                             .WORD   T0              ;IP21 - SPECIAL HANDLING
 101524  000000                             .WORD   0               ;IP22
 101526  000000                             .WORD   0               ;IP23
 101530  000000                             .WORD   0               ;IP24

                                    ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                    ;
                                    ;       SOURCE 1 LENGTH - 1,5
                                    ;       SOURCE 2 LENGTH - 0
                                    ;       DESTINATION LENGTH - 0,1,5
                                    ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                    ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                    ;                                      - SOURCE 2 STRING ADJACENT WITH DESTINATION STRIN
                                    ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                    ;
                                    ;TOTAL # OF TEST CONDITIONS =48
                                    ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                                    ;
```

```
                                    ;ENTRY 82 - INSTRUCTION UNDER TEST = MULP
                                    ;
        101532  000026              IMULP3: .WORD   26              ;INST=MULP
        101534  000001                      .WORD   1               ;TYPE = 1
        101536  105224                      .WORD   T211            ;IP1 - SRC1.LEN
        101540  103134                      .WORD   T2              ;IP2 - SRC1.ADR
        101542  105242                      .WORD   T212            ;IP3 - SRC2.LEN
        101544  104564                      .WORD   T161            ;IP4 - SRC2.ADR
        101546  102764                      .WORD   T1P             ;IP5 - DST.LEN
        101550  102560                      .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        101552  105116                      .WORD   T17             ;IP7 - SRC1 DATA
        101554  104110                      .WORD   T7              ;IP10 - SRC1 SURR DATA
        101556  104126                      .WORD   T10             ;IP11 - SRC1 SURR LEN
        101560  105116                      .WORD   T17             ;IP12 - SRC2 DATA
        101562  105172                      .WORD   T20             ;IP13 - SRC2 SURR DATA
        101564  102560                      .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                    ;   AS NOT TO DESTROY ANY OF SRC1)
        101566  104142                      .WORD   T11             ;IP15 - DST DATA
        101570  104160                      .WORD   T12             ;IP16 - DST SURR DATA
        101572  104176                      .WORD   T13             ;IP17 - DST SURR LEN
        101574  104212                      .WORD   T14             ;IP20 - SEPARATION CONSTRANT
        101576  102560                      .WORD   T0              ;IP21 - SPECIAL HANDLING
        101600  000000                      .WORD   0               ;IP22
        101602  000000                      .WORD   0               ;IP23
        101604  000000                      .WORD   0               ;IP24

                                    ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                    ;
                                    ;       SOURCE 1 LENGTH - 1,37
                                    ;       SOURCE 2 LENGTH - 1,37
                                    ;       DESTINATION LENGTH - 0,1,37
                                    ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                    ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                    ;                                      - SOURCE 2 STRING ADJACENT WITH DEST STRING
                                    ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;
                                    ;TOTAL # OF TEST CONDITIONS = 384
                                    ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 = 1152
                                    ;
```

```
                                  ;ENTRY 83 - INSTRUCTION UNDER TEST = MULP
                                  ;
 101606  000026                   IMULP4: .WORD   26          ;INST=MULP
 101610  000001                           .WORD   1           ;TYPE = 1
 101612  102604                           .WORD   T1A         ;IP1 - SRC1.LEN
 101614  103144                           .WORD   T2A         ;IP2 - SRC1.ADR
 101616  102604                           .WORD   T1A         ;IP3 - SRC2.LEN
 101620  104264                           .WORD   T16A        ;IP4 - SRC2.ADR
 101622  102604                           .WORD   T1A         ;IP5 - DST.LEN
 101624  102560                           .WORD   T0          ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
 101626  106122                           .WORD   TP19        ;IP7 - SRC1 DATA
 101630  102560                           .WORD   T0          ;IP10 - SRC1 SURR DATA
 101632  102560                           .WORD   T0          ;IP11 - SRC1 SURR LEN
 101634  106122                           .WORD   TP19        ;IP12 - SRC2 DATA
 101636  102560                           .WORD   T0          ;IP13 - SRC2 SURR DATA
 101640  102560                           .WORD   T0          ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                              ;  AS NOT TO DESTROY ANY OF SRC1)
 101642  102560                           .WORD   T0          ;IP15 - DST DATA
 101644  102560                           .WORD   T0          ;IP16 - DST SURR DATA
 101646  102560                           .WORD   T0          ;IP17 - DST SURR LEN
 101650  104212                           .WORD   T14         ;IP20 - SEPARATION CONSTRANT
 101652  103030                           .WORD   TSPA        ;IP21 - SPECIAL HANDLING
 101654  000000                           .WORD   0           ;IP22
 101656  000000                           .WORD   0           ;IP23
 101660  000000                           .WORD   0           ;IP24

                                  ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                  ;
                                  ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                                  ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                                  ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                                  ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                                  ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS -
                                  ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                  ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                  ;
                                  ;TOTAL # OF TEST CONDITIONS = 512
                                  ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
                                  ;
```

```
                                        ;ENTRY 83A - INSTRUCTION UNDER TEST = MULP
                                        ;
101662  000026                          IMULP5: .WORD   26              ;INST=MULP
101664  000003                                  .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
101666  102714                                  .WORD   T1H             ;IP1 - SRC1.LEN
101670  103134                                  .WORD   T2              ;IP2 - SRC1.ADR
101672  102714                                  .WORD   T1H             ;IP3 - SRC2.LEN
101674  104264                                  .WORD   T16A            ;IP4 - SRC2.ADR
101676  102742                                  .WORD   T1L             ;IP5 - DST.LEN
101700  102560                                  .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
101702  106122                                  .WORD   TP19            ;IP7 - SRC1 DATA
101704  102560                                  .WORD   T0              ;IP10 - SRC1 SURR DATA
101706  102560                                  .WORD   T0              ;IP11 - SRC1 SURR LEN
101710  106122                                  .WORD   TP19            ;IP12 - SRC2 DATA
101712  102560                                  .WORD   T0              ;IP13 - SRC2 SURR DATA
101714  102560                                  .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;   AS NOT TO DESTROY ANY OF SRC1)
101716  102560                                  .WORD   T0              ;IP15 - DST DATA
101720  102560                                  .WORD   T0              ;IP16 - DST SURR DATA
101722  102560                                  .WORD   T0              ;IP17 - DST SURR LEN
101724  104212                                  .WORD   T14             ;IP20 - SEPARATION CONSTRANT
101726  103030                                  .WORD   TSPA            ;IP21 - SPECIAL HANDLING
101730  000000                                  .WORD   0               ;IP22
101732  000000                                  .WORD   0               ;IP23
101734  000000                                  .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 12,13,14,15
                                        ;       SOURCE 2 LENGTH - 12,13,14,15
                                        ;       DESTINATION LENGTH - 35
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                        ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                        ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 16
                                        ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)16 = 16
                                        ;
```

```
                                ;ENTRY 83B - INSTRUCTION UNDER TEST = MULP
                                ;
101736  000026                  IMULP6: .WORD   26              ;INST=MULP
101740  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
101742  102756                          .WORD   T1N             ;IP1 - SRC1.LEN
101744  103134                          .WORD   T2              ;IP2 - SRC1.ADR
101746  103004                          .WORD   T1Q             ;IP3 - SRC2.LEN
101750  104264                          .WORD   T16A            ;IP4 - SRC2.ADR
101752  102742                          .WORD   T1L             ;IP5 - DST.LEN
101754  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
101756  106160                          .WORD   TP19C           ;IP7 - SRC1 DATA
101760  102560                          .WORD   T0              ;IP10 - SRC1 SURR DATA
101762  102560                          .WORD   T0              ;IP11 - SRC1 SURR LEN
101764  106172                          .WORD   TP19D           ;IP12 - SRC2 DATA
101766  102560                          .WORD   T0              ;IP13 - SRC2 SURR DATA
101770  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;   AS NOT TO DESTROY ANY OF SRC1)
101772  102560                          .WORD   T0              ;IP15 - DST DATA
101774  102560                          .WORD   T0              ;IP16 - DST SURR DATA
101776  102560                          .WORD   T0              ;IP17 - DST SURR LEN
102000  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
102002  103030                          .WORD   TSPA            ;IP21 - SPECIAL HANDLING
102004  000000                          .WORD   0               ;IP22
102006  000000                          .WORD   0               ;IP23
102010  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 3
                                ;       SOURCE 2 LENGTH - 0,3
                                ;       DESTINATION LENGTH - 35
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 0; SIGN +
                                ;                       ALL DIGITS IDENTICAL = 4; SIGN +
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 0; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 4
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)4 = 4
```

```
                                        ;
                                        ;ENTRY 83C - INSTRUCTION UNDER TEST = MULP
                                        ;
102012  000026                          IMULP7: .WORD   26              ;INST=MULP
102014  000001                                  .WORD   1               ;TYPE = 1
102016  102750                                  .WORD   T1M             ;IP1 - SRC1.LEN
102020  103134                                  .WORD   T2              ;IP2 - SRC1.ADR
102022  102750                                  .WORD   T1M             ;IP3 - SRC2.LEN
102024  104342                                  .WORD   T16B            ;IP4 - SRC2.ADR
102026  104176                                  .WORD   T13             ;IP5 - DST.LEN
102030  102560                                  .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102032  106150                                  .WORD   TP19B           ;IP7 - SRC1 DATA
102034  102560                                  .WORD   T0              ;IP10 - SRC1 SURR DATA
102036  102560                                  .WORD   T0              ;IP11 - SRC1 SURR LEN
102040  106150                                  .WORD   TP19B           ;IP12 - SRC2 DATA
102042  102560                                  .WORD   T0              ;IP13 - SRC2 SURR DATA
102044  102560                                  .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                        ;  AS NOT TO DESTROY ANY OF SRC1)
102046  102560                                  .WORD   T0              ;IP15 - DST DATA
102050  102560                                  .WORD   T0              ;IP16 - DST SURR DATA
102052  102560                                  .WORD   T0              ;IP17 - DST SURR LEN
102054  102560                                  .WORD   T0              ;IP20 - SEPARATION CONSTRANT
102056  102560                                  .WORD   T0              ;IP21 - SPECIAL HANDLING
102060  000000                                  .WORD   0               ;IP22
102062  000000                                  .WORD   0               ;IP23
102064  000000                                  .WORD   0               ;IP24

                                        ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                        ;
                                        ;       SOURCE 1 LENGTH - 17
                                        ;       SOURCE 2 LENGTH - 17
                                        ;       DESTINATION LENGTH - 5
                                        ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                        ;       SOURCE 2 ADDRESS - 200
                                        ;       DEST ADDRESS - NO OVERLAP WITH SOURCE STRINGS
                                        ;       SOURCE 1 DATA = SOURCE 2 DATA - 000000000000333+
                                        ;
                                        ;TOTAL # OF TEST CONDITIONS = 1
                                        ;TOTAL # OF TESTS = (2 DATA TYPES + 1 IN-LINE) 1 = 3
                                        ;
```

```
                                .SBTTL          DIVP TABLES
                                ;ENTRY 84 - INSTRUCTION UNDER TEST = DIVP
                                ;
102066  000027                  IDIVP:  .WORD   27              ;INST=DIVP
102070  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
102072  102560                          .WORD   T0              ;IP1 - SRC1.LEN
102074  103134                          .WORD   T2              ;IP2 - SRC1.ADR
102076  102560                          .WORD   T0              ;IP3 - SRC2.LEN
102100  104564                          .WORD   T161            ;IP4 - SRC2.ADR
102102  102564                          .WORD   XT1             ;IP5 - DST.LEN
102104  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102106  105320                          .WORD   T22             ;IP7 - SRC1 DATA
102110  104110                          .WORD   T7              ;IP10 - SRC1 SURR DATA
102112  104126                          .WORD   T10             ;IP11 - SRC1 SURR LEN
102114  105320                          .WORD   T22             ;IP12 - SRC2 DATA
102116  105172                          .WORD   T20             ;IP13 - SRC2 SURR DATA
102120  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;  AS NOT TO DESTROY ANY OF SRC1)
102122  104142                          .WORD   T11             ;IP15 - DST DATA
102124  104160                          .WORD   T12             ;IP16 - DST SURR DATA
102126  104176                          .WORD   T13             ;IP17 - DST SURR LEN
102130  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
102132  102560                          .WORD   T0              ;IP21 - SPECIAL HANDLING
102134  000000                          .WORD   0               ;IP22
102136  000000                          .WORD   0               ;IP23
102140  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 0
                                ;       SOURCE 2 LENGTH - 0
                                ;       DESTINATION LENGTH - 0,1,5
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;                                     - SOURCE 2 STRING ADJACENT WITH DESTINATION STRING
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 6
                                ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 = 18
                                ;
```

```
                               ;ENTRY 85 - INSTRUCTION UNDER TEST = DIVP
                               ;
102142  000027                 IDIVP1: .WORD   27              ;INST=DIVP
102144  000001                         .WORD   1               ;TYPE = 1
102146  102560                         .WORD   T0              ;IP1 - SRC1.LEN
102150  103134                         .WORD   T2              ;IP2 - SRC1.ADR
102152  105210                         .WORD   T21             ;IP3 - SRC2.LEN
102154  104564                         .WORD   T161            ;IP4 - SRC2.ADR
102156  102564                         .WORD   XT1             ;IP5 - DST.LEN
102160  102560                         .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102162  105320                         .WORD   T22             ;IP7 - SRC1 DATA
102164  104110                         .WORD   T7              ;IP10 - SRC1 SURR DATA
102166  104126                         .WORD   T10             ;IP11 - SRC1 SURR LEN
102170  105116                         .WORD   T17             ;IP12 - SRC2 DATA
102172  105172                         .WORD   T20             ;IP13 - SRC2 SURR DATA
102174  102560                         .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                               ;   AS NOT TO DESTROY ANY OF SRC1)
102176  104142                         .WORD   T11             ;IP15 - DST DATA
102200  104160                         .WORD   T12             ;IP16 - DST SURR DATA
102202  104176                         .WORD   T13             ;IP17 - DST SURR LEN
102204  104212                         .WORD   T14             ;IP20 - SEPARATION CONSTRANT
102206  102560                         .WORD   T0              ;IP21 - SPECIAL HANDLING
102210  000000                         .WORD   0               ;IP22
102212  000000                         .WORD   0               ;IP23
102214  000000                         .WORD   0               ;IP24

                               ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                               ;
                               ;       SOURCE 1 LENGTH - 0
                               ;       SOURCE 2 LENGTH - 1,5
                               ;       DESTINATION LENGTH - 0,1,5
                               ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                               ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                               ;                                      - SOURCE 2 STRING ADJACENT WITH DESTINATION STRIN
                               ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                               ;       SOURCE 2 DATA - DIGTIS FROM STRING = 1234567891234567891234000891233; SIGN +
                               ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                               ;                     - ALL DIGITS IDENTICAL =3; SIGN -
                               ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                               ;
                               ;TOTAL # OF TEST CONDITIONS = 48
                               ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                               ;
```

```

                                    ;ENTRY 86 - INSTRUCTION UNDER TEST = DIVP
                                    ;
102216  000027                      IDIVP2: .WORD   27              ;INST=DIVP
102220  000001                              .WORD   1               ;TYPE = 1
102222  105210                              .WORD   T21             ;IP1 - SRC1.LEN
102224  103134                              .WORD   T2              ;IP2 - SRC1.ADR
102226  102560                              .WORD   T0              ;IP3 - SRC2.LEN
102230  104564                              .WORD   T161            ;IP4 - SRC2.ADR
102232  102564                              .WORD   XT1             ;IP5 - DST.LEN
102234  102560                              .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102236  105116                              .WORD   T17             ;IP7 - SRC1 DATA
102240  104110                              .WORD   T7              ;IP10 - SRC1 SURR DATA
102242  104126                              .WORD   T10             ;IP11 - SRC1 SURR LEN
102244  105320                              .WORD   T22             ;IP12 - SRC2 DATA
102246  105172                              .WORD   T20             ;IP13 - SRC2 SURR DATA
102250  102560                              .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                    ;  AS NOT TO DESTROY ANY OF SRC1)
102252  104142                              .WORD   T11             ;IP15 - DST DATA
102254  104160                              .WORD   T12             ;IP16 - DST SURR DATA
102256  104176                              .WORD   T13             ;IP17 - DST SURR LEN
102260  104212                              .WORD   T14             ;IP20 - SEPARATION CONSTRANT
102262  102560                              .WORD   T0              ;IP21 - SPECIAL HANDLING
102264  000000                              .WORD   0               ;IP22
102266  000000                              .WORD   0               ;IP23
102270  000000                              .WORD   0               ;IP24

                                    ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                    ;
                                    ;       SOURCE 1 LENGTH - 1,5
                                    ;       SOURCE 2 LENGTH - 0
                                    ;       DESTINATION LENGTH - 0,1,5
                                    ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                    ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                    ;                                      - SOURCE 2 STRING ADJACENT WITH DESTINATION STRIN
                                    ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
                                    ;
                                    ;TOTAL # OF TEST CONDITIONS =48
                                    ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
                                    ;
```

```
                                    ;ENTRY 87 - INSTRUCTION UNDER TEST = DIVP
                                    ;
102272  000027                      IDIVP3: .WORD   27              ;INST=DIVP
102274  000001                              .WORD   1               ;TYPE = 1
102276  105224                              .WORD   T211            ;IP1 - SRC1.LEN
102300  103134                              .WORD   T2              ;IP2 - SRC1.ADR
102302  105242                              .WORD   T212            ;IP3 - SRC2.LEN
102304  104564                              .WORD   T161            ;IP4 - SRC2.ADR
102306  102764                              .WORD   T1P             ;IP5 - DST.LEN
102310  102560                              .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102312  105116                              .WORD   T17             ;IP7 - SRC1 DATA
102314  104110                              .WORD   T7              ;IP10 - SRC1 SURR DATA
102316  104126                              .WORD   T10             ;IP11 - SRC1 SURR LEN
102320  105116                              .WORD   T17             ;IP12 - SRC2 DATA
102322  105172                              .WORD   T20             ;IP13 - SRC2 SURR DATA
102324  102560                              .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                    ;   AS NOT TO DESTROY ANY OF SRC1)
102326  104142                              .WORD   T11             ;IP15 - DST DATA
102330  104160                              .WORD   T12             ;IP16 - DST SURR DATA
102332  104176                              .WORD   T13             ;IP17 - DST SURR LEN
102334  104212                              .WORD   T14             ;IP20 - SEPARATION CONSTRANT
102336  102560                              .WORD   T0              ;IP21 - SPECIAL HANDLING
102340  000000                              .WORD   0               ;IP22
102342  000000                              .WORD   0               ;IP23
102344  000000                              .WORD   0               ;IP24

                                    ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                    ;
                                    ;       SOURCE 1 LENGTH - 1,37
                                    ;       SOURCE 2 LENGTH - 1,37
                                    ;       DESTINATION LENGTH - 0,1,37
                                    ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                    ;       SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                    ;                                      - SOURCE 2 STRING ADJACENT WITH DEST STRING
                                    ;       SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 5; SIGN +
                                    ;                     - ALL DIGITS IDENTICAL = 3; SIGN -
                                    ;                     - ALL DIGITS IDENTICAL = 0; SIGN +
                                    ;
                                    ;TOTAL # OF TEST CONDITIONS = 384
                                    ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 = 1152
                                    ;
```

```
                          ;ENTRY 88 - INSTRUCTION UNDER TEST = DIVP
                          ;
102346  000027            IDIVP4: .WORD   27          ;INST=DIVP
102350  000001                    .WORD   1           ;TYPE = 1
102352  102604                    .WORD   T1A         ;IP1 - SRC1.LEN
102354  103144                    .WORD   T2A         ;IP2 - SRC1.ADR
102356  102604                    .WORD   T1A         ;IP3 - SRC2.LEN
102360  104264                    .WORD   T16A        ;IP4 - SRC2.ADR
102362  102604                    .WORD   T1A         ;IP5 - DST.LEN
102364  102560                    .WORD   T0          ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102366  106122                    .WORD   TP19        ;IP7 - SRC1 DATA
102370  102560                    .WORD   T0          ;IP10 - SRC1 SURR DATA
102372  102560                    .WORD   T0          ;IP11 - SRC1 SURR LEN
102374  106122                    .WORD   TP19        ;IP12 - SRC2 DATA
102376  102560                    .WORD   T0          ;IP13 - SRC2 SURR DATA
102400  102560                    .WORD   T0          ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                      ;  AS NOT TO DESTROY ANY OF SRC1)
102402  102560                    .WORD   T0          ;IP15 - DST DATA
102404  102560                    .WORD   T0          ;IP16 - DST SURR DATA
102406  102560                    .WORD   T0          ;IP17 - DST SURR LEN
102410  104212                    .WORD   T14         ;IP20 - SEPARATION CONSTRANT
102412  103030                    .WORD   TSPA        ;IP21 - SPECIAL HANDLING
102414  000000                    .WORD   0           ;IP22
102416  000000                    .WORD   0           ;IP23
102420  000000                    .WORD   0           ;IP24

                          ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                          ;
                          ;       SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
                          ;       SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
                          ;       DESTINATION LENGTH - 0,1,2,3,4,5,11,20
                          ;       SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
                          ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                          ;       SOURCE 1 DATA - DIGITS FROM STRING = 12345678912345678912340008912 33; SIGN +
                          ;       SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                          ;
                          ;TOTAL # OF TEST CONDITIONS = 512
                          ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
                          ;
```

```
                                ;ENTRY 88A - INSTRUCTION UNDER TEST = DIVP
                                ;
102422  000027                  IDIVP5: .WORD   27              ;INST=DIVP
102424  000003                          .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
102426  102706                          .WORD   T1G             ;IP1 - SRC1.LEN
102430  103134                          .WORD   T2              ;IP2 - SRC1.ADR
102432  102706                          .WORD   T1G             ;IP3 - SRC2.LEN
102434  104264                          .WORD   T16A            ;IP4 - SRC2.ADR
102436  102706                          .WORD   T1G             ;IP5 - DST.LEN
102440  102560                          .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102442  105156                          .WORD   T17A            ;IP7 - SRC1 DATA
102444  102560                          .WORD   T0              ;IP10 - SRC1 SURR DATA
102446  102560                          .WORD   T0              ;IP11 - SRC1 SURR LEN
102450  105156                          .WORD   T17A            ;IP12 - SRC2 DATA
102452  102560                          .WORD   T0              ;IP13 - SRC2 SURR DATA
102454  102560                          .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                ;   AS NOT TO DESTROY ANY OF SRC1)
102456  102560                          .WORD   T0              ;IP15 - DST DATA
102460  102560                          .WORD   T0              ;IP16 - DST SURR DATA
102462  102560                          .WORD   T0              ;IP17 - DST SURR LEN
102464  104212                          .WORD   T14             ;IP20 - SEPARATION CONSTRANT
102466  103030                          .WORD   TSPA            ;IP21 - SPECIAL HANDLING
102470  000000                          .WORD   0               ;IP22
102472  000000                          .WORD   0               ;IP23
102474  000000                          .WORD   0               ;IP24

                                ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                ;
                                ;       SOURCE 1 LENGTH - 11
                                ;       SOURCE 2 LENGTH - 11
                                ;       DESTINATION LENGTH - 11
                                ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 7,0; SIGN = +
                                ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 7,0; SIGN +
                                ;
                                ;TOTAL # OF TEST CONDITIONS = 4
                                ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)4 = 4
                                ;
```

```
                                      ;ENTRY 888 - INSTRUCTION UNDER TEST = DIVP
                                      ;
102476  000027                        IDIVP6: .WORD   27              ;INST=DIVP
102500  000003                                .WORD 3                 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
102502  103014                                .WORD   T1R             ;IP1 - SRC1.LEN
102504  103134                                .WORD   T2              ;IP2 - SRC1.ADR
102506  103022                                .WORD   T1S             ;IP3 - SRC2.LEN
102510  104264                                .WORD   T16A            ;IP4 - SRC2.ADR
102512  103014                                .WORD   T1R             ;IP5 - DST.LEN
102514  102560                                .WORD   T0              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
102516  106200                                .WORD   TP19E           ;IP7 - SRC1 DATA
102520  102560                                .WORD   T0              ;IP10 - SRC1 SURR DATA
102522  102560                                .WORD   T0              ;IP11 - SRC1 SURR LEN
102524  106200                                .WORD   TP19E           ;IP12 - SRC2 DATA
102526  102560                                .WORD   T0              ;IP13 - SRC2 SURR DATA
102530  102560                                .WORD   T0              ;IP14 - SRC2 SURR LEN  (LENGTH SET TO 0 SO
                                                                      ;   AS NOT TO DESTROY ANY OF SRC1)
102532  102560                                .WORD   T0              ;IP15 - DST DATA
102534  102560                                .WORD   T0              ;IP16 - DST SURR DATA
102536  102560                                .WORD   T0              ;IP17 - DST SURR LEN
102540  104212                                .WORD   T14             ;IP20 - SEPARATION CONSTRANT
102542  103030                                .WORD   TSPA            ;IP21 - SPECIAL HANDLING
102544  000000                                .WORD   0               ;IP22
102546  000000                                .WORD   0               ;IP23
102550  000000                                .WORD   0               ;IP24

                                      ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
                                      ;
                                      ;       SOURCE 1 LENGTH - 11
                                      ;       SOURCE 2 LENGTH - 21
                                      ;       DESTINATION LENGTH - 11
                                      ;       SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
                                      ;       SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                      ;       SOURCE 1 DATA - ALL DIGITS IDENTICAL = 7; SIGN = +
                                      ;       SOURCE 2 DATA - ALL DIGITS IDENTICAL = 7; SIGN +
                                      ;
                                      ;TOTAL # OF TEST CONDITIONS = 1
                                      ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)1 = 1
                                      ;
```

```
19273                          ;ENTRY 89 -
19274                          ;
19275  102552  000000                  .WORD 0
19276  102554  000000                  .WORD 0
19277  102556  000000                  .WORD 0
```

```
                                .SBTTL  PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)
                                ;
                                ;PARAMETER TABLES
                                ;
102560                          T0:                          ;DUMMY TABLE - USED WHEN AN INPUT PARAMETER
                                                             ;  IS ALREADY SPECIFIED BY A PRECEDING INPUT PARAMETER T
                                                .            ;ALSO PROVIDES A SINGLE ENTRY = 0 TABLE
102560  000401                          .WORD 401
102562  000000                          .WORD 0

102564                          XT1:
102564  000403                          .WORD   403          ;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
102566  000000                          .WORD   0
102570  000001                          .WORD   1
102572  000005                          .WORD   5
102574  000000                          .WORD   0
102576  000000                          .WORD   0
102600  000000                          .WORD   0
102602  000000                          .WORD   0

102604  000410                  T1A:    .WORD 410
102606  000000                          .WORD 0
102610  000001                          .WORD 1
102612  000002                          .WORD 2
102614  000003                          .WORD 3
102616  000004                          .WORD 4
102620  000005                          .WORD 5
102622  000011                          .WORD 11
102624  000020                          .WORD 20
102626  000000                          .WORD 0

102630  000403                  T1B:    .WORD 403
102632  000001                          .WORD 1
102634  000002                          .WORD 2
102636  000003                          .WORD 3
102640  000000                          .WORD 0

102642  000403                  T1C:    .WORD 403
102644  000002                          .WORD 2
102646  000004                          .WORD 4
102650  000006                          .WORD 6
102652  000000                          .WORD 0

102654  000402                  T1D:    .WORD 402
102656  000001                          .WORD 1
102660  000002                          .WORD 2
102662  000000                          .WORD 0

102664  000401                  T1E:    .WORD 401
102666  000002                          .WORD 2
102670  000000                          .WORD 0

102672  000404                  T1F:    .WORD 404
102674  000020                          .WORD 20
```

```
102676  000016                  .WORD 16
102700  000017                  .WORD 17
102702  000003                  .WORD 3
102704  000000                  .WORD 0

102706  000401          T1G:    .WORD 401
102710  000011                  .WORD 11
102712  000000                  .WORD 0

102714  000404          T1H:    .WORD 404
102716  000012                  .WORD 12
102720  000013                  .WORD 13
102722  000014                  .WORD 14
102724  000015                  .WORD 15
102726  000000                  .WORD 0

102730  000404          T1K:    .WORD 404
102732  000020                  .WORD 20
102734  000016                  .WORD 16
102736  000017                  .WORD 17
102740  000001                  .WORD 1

102742  000401          T1L:    .WORD 401
102744  000035                  .WORD 35
102746  000000                  .WORD 0

102750  000401          T1M:    .WORD 401
102752  000017                  .WORD 17
102754  000000                  .WORD 0

102756  000401          T1N:    .WORD 401
102760  000003                  .WORD 3
102762  000000                  .WORD 0

102764  000403          T1P:    .WORD 403
102766  000000                  .WORD 0
102770  000001                  .WORD 1
102772  000037                  .WORD 37
102774  000000                  .WORD 0
102776  000000                  .WORD 0
103000  000000                  .WORD 0
103002  000000                  .WORD 0

103004  000402          T1Q:    .WORD 402
103006  000000                  .WORD 0
103010  000003                  .WORD 3
103012  000000                  .WORD 0

103014  000401          T1R:    .WORD 401
103016  000011                  .WORD 11
103020  000000                  .WORD 0

103022  000401          T1S:    .WORD 401
103024  000021                  .WORD 21
```

```
103026  000000                        .WORD 0

103030                        TSPA:
103030  000401                        .WORD 401
103032  140000                        .WORD 140000
103034                        T111:
103034  000403                        .WORD   403             ;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
103036  000000                        .WORD   0
103040  000001                        .WORD   1
103042  000037                        .WORD   37
103044  000000                        .WORD   0
103046  000000                        .WORD   0
103050  000000                        .WORD   0
103052  000000                        .WORD   0

103054                        T112:
103054  000403                        .WORD   403             ;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
103056  000000                        .WORD   0
103060  000001                        .WORD   1
103062  000037                        .WORD   37
103064  000000                        .WORD   0
103066  000000                        .WORD   0
103070  000000                        .WORD   0
103072  000000                        .WORD   0

103074                        TL1C:
103074  000403                        .WORD   403             ;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
103076  000000                        .WORD   0
103100  000001                        .WORD   1
103102  000300                        .WORD   300
103104  000000                        .WORD   0
103106  000000                        .WORD   0
103110  000000                        .WORD   0
103112  000000                        .WORD   0

103114                        TL2C:
103114  000403                        .WORD   403             ;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
103116  000000                        .WORD   0
103120  000001                        .WORD   1
103122  000005                        .WORD   5
103124  000000                        .WORD   0
103126  000000                        .WORD   0
103130  000000                        .WORD   0
103132  000000                        .WORD   0

103134                        T2:
103134  000401                        .WORD   401
103136  000200                        .WORD   200
103140  000000                        .WORD   0
103142  000000                        .WORD   0

103144                        T2A:
103144  000401                        .WORD 401
103146  000201                        .WORD 201
```

```
103150  000000                          .WORD 0

103152  000402                  T2AA:   .WORD 402
103154  000200                          .WORD 200
103156  000201                          .WORD 201
103160  000000                          .WORD 0

103162  000401                  T2B:    .WORD 401
103164  000230                          .WORD 230
103166  000000                          .WORD 0

103170                          T4:
103170  040007                          .WORD   40007           ;VARIABLE LENGTH ENTRIES;7 ENTRIES
103172  013701  003632                  MOV TR1,R1              ;ENTRY 1; NO OVERLAP; TR3=TR1+TR0+SEP. CONSTANT
103176  063701  003630                  ADD TR0,R1
103202  067701  076410                  ADD @PTP14,R1
103206  010137  003636                  MOV R1,TR3
103212  000207                          RTS PC
103214  000000                          0
103216  013701  003632                  MOV TR1,R1              ;ENTRY 2; NO OVERLAP; TR3=TR1-TR2-SEP CONSTANT
103222  163701  003634                  SUB TR2,R1
103226  167701  076364                  SUB @PTP14,R1
103232  010137  003636                  MOV R1,TR3
103236  000207                          RTS PC
103240  000000                          0
103242  005737  003630                  TST TR0
103246  001465                          BEQ 1$
103250  013701  003632                  MOV TR1,R1              ;ENTRY 3; ADJACENT; TR3=TR1+TR0
103254  063701  003630                  ADD TR0,R1              ;REDUNDANT WITH ENTRY 7 IF TR0=0
103260  010137  003636                  MOV R1,TR3
103264  000207                          RTS PC
103266  000000                          0
103270  005737  003634                  TST TR2
103274  001452                          BEQ 1$
103276  013701  003632                  MOV TR1,R1              ;ENTRY 4; ADJACENT; TR3=TR1-TR2
103302  163701  003634                  SUB TR2,R1              ;REDUNDANT WITH ENTRY 7 IF TR2=0
103306  010137  003636                  MOV R1,TR3
103312  000207                          RTS PC
103314  000000                          0
103316  013701  003630                  MOV TR0,R1              ;ENTRY 5; PARTIAL OVERLAP; TR3=TR1+TR0-(TR2/2)
103322  013702  003634                  MOV TR2,R2              ;REDUNDANT WITH ENTRY 7 IF TR0-(TR2/2)=0
103326  006202                          ASR R2
103330  160201                          SUB R2,R1
103332  005701                          TST R1
103334  001432                          BEQ 1$
103336  063701  003632                  ADD TR1,R1
103342  010137  003636                  MOV R1,TR3
103346  000207                          RTS PC
103350  000000                          0
103352  005737  003630                  TST TR0
103356  001421                          BEQ 1$
103360  013701  003632                  MOV TR1,R1              ;ENTRY 6; PARTIAL OVERLAP; TR3=TR1-(TR2/2)
103364  013702  003634                  MOV TR2,R2              ;REDUNDANT WITH ENTRY 5 IF TR0=0
103370  006202                          ASR R2                  ;REDUNDANT WITH ENTRY 7 IF TR2/2 =0
```

```
103372  005702                          TST R2
103374  001412                          BEQ 1$
103376  160201                          SUB R2,R1
103400  010137  003636                  MOV R1,TR3
103404  000207                          RTS PC
103406  000000                          0
103410  013737  003632  003636          MOV TR1,TR3             ;ENTRY 7; COMPLETE OVERLAP; TR3=TR1
103416  000207                          RTS PC
103420  000000                          0
103422  062706  000002          1$:     ADD #2,SP               ;FIXUP STACK POINTER
103426  000137  042334                  JMP REDNTC              ;SKIP ENTRY TEST CONDITION - REDUNDANT

103432                          T4A:
103432  040002                          .WORD 40002             ;VARIABLE LENGTH ENTRIES; 2 ENTRIES
103434  013701  003630                  MOV TR0,R1              ;ENTRY 1; PARTIAL OVERLAP; TR3=TR1+TR0-(TR2/2)
103440  013702  003634                  MOV TR2,R2
103444  006202                          ASR R2
103446  160201                          SUB R2,R1
103450  063701  003632                  ADD TR1,R1
103454  010137  003636                  MOV R1,TR3
103460  000207                          RTS PC
103462  000000                          0
103464  013701  003632                  MOV TR1,R1              ;ENTRY 2; PARTIAL OVERLAP; TR3=TR1-(TR2/2)
103470  013702  003634                  MOV TR2,R2
103474  006202                          ASR R2
103476  160201                          SUB R2,R1
103500  010137  003636                  MOV R1,TR3
103504  000207                          RTS PC
103506  000000                          0
103510                          T4I:
103510  040007                          .WORD   40007           ;VARIABLE LENGTH ENTRIES;7 ENTRIES
103512  013701  003636                  MOV TR3,R1              ;ENTRY 1; NO OVERLAP; TR1=TR2+TR3  +SEP. CONSTANT
103516  063701  003634                  ADD TR2,R1
103522  067701  076070                  ADD @PTP14,R1
103526  010137  003632                  MOV R1,TR1
103532  000207                          RTS PC
103534  000000                          0
103536  013701  003636                  MOV TR3,R1              ;ENTRY 2; NO OVERLAP; TR1=TR3-TR0-SEP CONSTANT
103542  163701  003630                  SUB TR0,R1
103546  167701  076044                  SUB @PTP14,R1
103552  010137  003632                  MOV R1,TR1
103556  000207                          RTS PC
103560  000000                          0
103562  005737  003634                  TST TR2
103566  001465                          BEQ 1$
103570  013701  003636                  MOV TR3,R1              ;ENTRY 3; ADJACENT; TR1=TR3+TR2
103574  063701  003634                  ADD TR2,R1              ;REDUNDANT WITH ENTRY 7 IF TR2=0
103600  010137  003632                  MOV R1,TR1
103604  000207                          RTS PC
103606  000000                          0
103610  005737  003630                  TST TR0
103614  001452                          BEQ 1$
103616  013701  003636                  MOV TR3,R1              ;ENTRY 4; ADJACENT; TR1=TR3-TR0
103622  163701  003630                  SUB TR0,R1              ;REDUNDANT WITH ENTRY 7 IF TR0=0
```

```
103626  010137  003632                   MOV R1,TR1
103632  000207                           RTS PC
103634  000000                           0
103636  013701  003634                   MOV TR2,R1          ;ENTRY 5; PARTIAL OVERLAP; TR1=TR3+TR2-(TR0/2)
103642  013702  003630                   MOV TR0,R2          ;REDUNDANT WITH ENTRY 7 IF TR2-(TR0/2)=0
103646  006202                           ASR R2
103650  160201                           SUB R2,R1
103652  005701                           TST R1
103654  001432                           BEQ 1$
103656  063701  003636                   ADD TR3,R1
103662  010137  003632                   MOV R1,TR1
103666  000207                           RTS PC
103670  000000                           0
103672  005737  003634                   TST TR2
103676  001421                           BEQ 1$
103700  013701  003636                   MOV TR3,R1          ;ENTRY 6; PARTIAL OVERLAP; TR1=TR3-(TR0/2)
103704  013702  003630                   MOV TR0,R2          ;REDUNDANT WITH ENTRY 5 IF TR2=0
103710  006202                           ASR R2              ;REDUNDANT WITH ENTRY 7 IF TR0/2 =0
103712  005702                           TST R2
103714  001412                           BEQ 1$
103716  160201                           SUB R2,R1
103720  010137  003632                   MOV R1,TR1
103724  000207                           RTS PC
103726  000000                           0
103730  013737  003636  003632           MOV TR3,TR1         ;ENTRY 7; COMPLETE OVERLAP; TR1=TR3
103736  000207                           RTS PC
103740  000000                           0
103742  062706  000002          1$:      ADD #2,SP           ;FIXUP STACK POINTER
103746  000137  042334                   JMP REDNTC          ;SKIP ENTRY TEST CONDITION - REDUNDANT

103752                          T4IA:
103752  040001                           .WORD 40001
103754  013701  003636                   MOV TR3,R1
103760  063701  003634                   ADD TR2,R1
103764  067701  075626                   ADD @PTP14,R1
103770  010137  003632                   MOV R1,TR1
103774  000207                           RTS PC
103776  000000                           0
104000                          T411:
104000  040001                           .WORD   40001       ;VARIABLE LENGTH ENTRY;1 ENTRY
104002  013701  003632                   MOV TR1,R1          ;ENTRY 1; NO OVERLAP; TR3=TR1+TR0+SEP. CONSTANT
104006  063701  003630                   ADD TR0,R1
104012  067701  075600                   ADD @PTP14,R1
104016  010137  003636                   MOV R1,TR3
104022  000207                           RTS PC
104024  000000                           0
104026                          T5:
104026  000401                           .WORD   401
104030  000377                           .WORD   377
104032  000000                           .WORD   0
104034  000000                           .WORD   0
104036  000000                           .WORD   0

104040                          T511:
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```
104040  000403                          .WORD 403
104042  000201                          .WORD 201
104044  000377                          .WORD 377
104046  000127                          .WORD 127
104050  000000                          .WORD 0
104052  000000                          .WORD 0
104054  000000                          .WORD 0

104056                          T6:
104056  040001                          .WORD   40001           ;DATA DESCRIPTOR ENTRIES;# OF ENTRIES=1
104060  020001                          .WORD   020001          ;ENTRY TYPE =1; STARTING BYTE=1;INCREMENT=1
104062  000001                          .WORD   1
104064  000000                          .WORD   0
104066  000000                          .WORD   0
104070  000000                          .WORD   0
104072  000000                          .WORD   0
104074  000000                          .WORD   0
104076  000000                          .WORD   0

104100                          T6A:
104100  040001                          .WORD   40001           ;DATA DESCRIPTOR ENTRIES;# OF ENTRIES=1
104102  020001                          .WORD   020001          ;ENTRY TYPE =1; STARTING BYTE=0;INCREMENT=1
104104  000000                          .WORD   0
104106  000000                          .WORD   0
104110                          T7:
104110  040001                          .WORD   40001           ;DATA DESCRIPTOR ENTRIES;# OF ENTRIES=1
104112  000240                          .WORD   240             ;ENTRY TYPE=0; ALL BYTES IDENTICAL=240
104114  000000                          .WORD   0
104116  000000                          .WORD   0
104120  000000                          .WORD   0
104122  000000                          .WORD   0
104124  000000                          .WORD   0

104126                          T10:
104126  000401                          .WORD   401
104130  000003                          .WORD   3
104132  000000                          .WORD   0
104134  000000                          .WORD   0
104136  000000                          .WORD   0
104140  000000                          .WORD   0

104142                          T11:
104142  040001                          .WORD   40001           ;DATA DESCRIPTOR ENTRIES; # OF ENTRIES=1
104144  000252                          .WORD   252             ;ENTRY TYPE=0; ALL BYTES IDENTICAL =252
104146  000000                          .WORD   0
104150  000000                          .WORD   0
104152  000000                          .WORD   0
104154  000000                          .WORD   0
104156  000000                          .WORD   0

104160                          T12:
104160  040001                          .WORD   40001           ;DATA DESCRIPTOR ENTRIES; # OF ENTRIES=1
104162  000360                          .WORD   360             ;ENTRY TYPE=0; ALL BYTES IDENTICAL = 360
104164  000000                          .WORD   0
```

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104166  000000                          .WORD   0
104170  000000                          .WORD   0
104172  000000                          .WORD   0
104174  000000                          .WORD   0

104176                          T13:
104176  000401                          .WORD   401
104200  000005                          .WORD   5
104202  000000                          .WORD   0
104204  000000                          .WORD   0
104206  000000                          .WORD   0
104210  000000                          .WORD   0

104212                          T14:
104212  000401                          .WORD   401
104214  000010                          .WORD   10
104216  000000                          .WORD   0
104220  000000                          .WORD   0
104222  000000                          .WORD   0

104224                          T14A:
104224  000401                          .WORD 401
104226  000100                          .WORD 100
104230  000000                          .WORD   0
104232  000000                          .WORD   0
104234  000000                          .WORD   0

104236                          T15:
104236  000403                          .WORD   403
104240  000004                          .WORD   4
104242  000375                          .WORD   375
104244  000240                          .WORD   240
104246  000000                          .WORD   0
104250  000000                          .WORD   0
104252  000000                          .WORD   0
104254  000000                          .WORD   0

104256                          T15A:
104256  000401                          .WORD 401
104260  000004                          .WORD 4
104262  000000                          .WORD 0
104264                          T16A:
104264  040001                          .WORD 40001             ;FOR USE WITH PACKED STRINGS ONLY
104266  113701  003630                  MOVB TR0,R1             ;ENTRY 1; NO OVERLAP
104272  006201                          ASR R1                  ;TR3=TR1+[(TR0/2)+1]+SEP. CONST.
104274  005201                          INC R1                  ;TR5=TR3+[(TR2/2)+1]+SEP. CONST
104276  063701  003632                  ADD TR1,R1
104302  067701  075320                  ADD @PTP20,R1
104306  010137  003636                  MOV R1,TR3
104312  113701  003634                  MOVB TR2,R1
104316  006201                          ASR R1
104320  005201                          INC R1
104322  063701  003636                  ADD TR3,R1
104326  067701  075274                  ADD @PTP20,R1
```

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104332  010137  003642                          MOV R1,TR5
104336  000207                                  RTS PC
104340  000000                                  0

104342  040001                  T16B:           .WORD 40001             ;FOR USE WITH PACKED STRINGS ONLY
104344  013737  003632  003636                  MOV TR1,TR3             ;S1A=S2A; S1 = S2
104352  113701  003634                          MOVB TR2,R1             ;DA = S2A+[(S2L/2)+1]+SEP CONST
104356  006201                                  ASR R1
104360  005201                                  INC R1
104362  063701  003636                          ADD TR3,R1
104366  067701  075234                          ADD @PTP20,R1
104372  010137  003642                          MOV R1,TR5
104376  000207                                  RTS PC
104400  000000                                  0

104402                          T16:
104402  040002                                  .WORD   40002           ;FOR USE WITH PACKED STRINGS ONLY
104404  113701  003630                          MOVB TR0,R1             ;ENTRY 1; NO OVERLAP
104410  006201                                  ASR R1                  ;  TR3=TR1+[(TR0/2)+1]+SEP. CONSTANT
104412  005201                                  INC R1                  ;  TR5=TR3+[(TR2/2)+1]+SEP. CONSTANT
104414  063701  003632                          ADD TR1,R1
104420  067701  075202                          ADD @PTP20,R1
104424  010137  003636                          MOV R1,TR3
104430  113701  003634                          MOVB TR2,R1
104434  006201                                  ASR R1
104436  005201                                  INC R1
104440  063701  003636                          ADD TR3,R1
104444  067701  075156                          ADD @PTP20,R1
104450  010137  003642                          MOV R1,TR5
104454  000207                                  RTS PC
104456  000000                                  0
104460  113701  003630                          MOVB TR0,R1             ;ENTRY 2; ALIGNED SRC2 - DST
104464  006201                                  ASR R1                  ;  TR3=TR1+[(TR0/2)+1]+SEP. CONSTANT
104466  005201                                  INC R1                  ;  TR5=TR3+(TR2/2)-(TR4/2)
104470  063701  003632                          ADD TR1,R1
104474  067701  075126                          ADD @PTP20,R1
104500  010137  003636                          MOV R1,TR3
104504  113701  003634                          MOVB TR2,R1
104510  006201                                  ASR R1
104512  113702  003640                          MOVB TR4,R2
104516  006202                                  ASR R2
104520  160201                                  SUB R2,R1
104522  063701  003636                          ADD TR3,R1
104526  010137  003642                          MOV R1,TR5
104532  013701  003636                          MOV TR3,R1              ;DST MUST NOT OVERLAP SRC1
104536  167701  075064                          SUB @PTP20,R1           ;FIND END OF SRC1
104542  023701  003642                          CMP TR5,R1              ;COMPARE END WITH START OF DST
104546  103401                                  BLO 1$                  ;OVERLAP-SKIP TEST CONDITION
104550  000207                                  RTS PC
104552  062706  000002          1$:             ADD #2,SP               ;FIXUP STACK POINTER
104556  000137  042620                          JMP NXTC                ;SKIP TEST CONDITION - INVALID
104562  000000                                  0

104564                          T161:
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104564  040002                          .WORD   40002           ;FOR USE WITH PACKED STRINGS ONLY
104566  113701  003630                  MOVB TR0,R1             ;ENTRY 1; NO OVERLAP
104572  006201                          ASR R1                  ;  TR3=TR1+[(TR0/2)+1]+SEP. CONSTANT
104574  005201                          INC R1                  ;  TR5=TR3+[(TR2/2)+1]+SEP. CONSTANT
104576  063701  003632                  ADD TR1,R1
104602  067701  075020                  ADD @PTP20,R1
104606  010137  003636                  MOV R1,TR3
104612  113701  003634                  MOVB TR2,R1
104616  006201                          ASR R1
104620  005201                          INC R1
104622  063701  003636                  ADD TR3,R1
104626  067701  074774                  ADD @PTP20,R1
104632  010137  003642                  MOV R1,TR5
104636  000207                          RTS PC
104640  000000                          0
104642  113701  003630                  MOVB TR0,R1             ;ENTRY 2; ADJACENT
104646  006201                          ASR R1                  ;  TR3=TR1+(TR0/2)+1
104650  005201                          INC R1                  ;  TR5=TR3+(TR2/2)+1
104652  063701  003632                  ADD TR1,R1
104656  010137  003636                  MOV R1,TR3
104662  113701  003634                  MOVB TR2,R1
104666  006201                          ASR R1
104670  005201                          INC R1
104672  063701  003636                  ADD TR3,R1
104676  010137  003642                  MOV R1,TR5
104702  000207                          RTS PC
104704  000000                          0

104706                          T16ZA:
104706  040001                          .WORD 40001
104710  113701  003630                  MOVB TR0,R1             ;ENTRY 1: NO OVERLAP
104714  063701  003632                  ADD TR1,R1              ;  TR3=TR1+TR0+SEP CONST
104720  067701  074702                  ADD @PTP20,R1           ;  TR5=TR3+TR2+SEP CONST
104724  010137  003636                  MOV R1,TR3
104730  113701  003634                  MOVB TR2,R1
104734  063701  003636                  ADD TR3,R1
104740  067701  074662                  ADD @PTP20,R1
104744  010137  003642                  MOV R1,TR5
104750  000207                          RTS PC
104752  000000                          0
104754                          T16Z:                           ;FOR USE WITH ZONED STRINGS
104754  040002                          .WORD 40002
104756  113701  003630                  MOVB TR0,R1             ;ENTRY 1: NO OVERLAP
104762  063701  003632                  ADD TR1,R1              ;  TR3=TR1+TR0+SEP CONST
104766  067701  074634                  ADD @PTP20,R1           ;  TR5=TR3+TR2+SEP CONST
104772  010137  003636                  MOV R1,TR3
104776  113701  003634                  MOVB TR2,R1
105002  063701  003636                  ADD TR3,R1
105006  067701  074614                  ADD @PTP20,R1
105012  010137  003642                  MOV R1,TR5
105016  000207                          RTS PC
105020  000000                          0
105022  113701  003630                  MOVB TR0,R1             ;ENTRY 2 - ALIGNED SRC2 - DST
105026  063701  003632                  ADD TR1,R1              ;  TR3=TR1+TR0+SEP CONST
```

```
105032  067701  074570              ADD @PTP20,R1           ;  TR5=TR3+TR2-TR4
105036  010137  003636              MOV R1,TR3
105042  113701  003634              MOVB TR2,R1
105046  063701  003636              ADD TR3,R1
105052  113702  003640              MOVB TR4,R2
105056  160201                      SUB R2,R1
105060  010137  003642              MOV R1,TR5
105064  013701  003636              MOV TR3,R1              ;DST MUST NOT OVERLAP SRC1
105070  167701  074532              SUB @PTP20,R1           ;FIND END OF SRC1
105074  023701  003642              CMP TR5,R1              ;COMPARE END WITH START OF DST
105100  103401                      BLO 1$
105102  000207                      RTS PC
105104  062706  000002      1$:     ADD #2,SP               ;FIXUP STACK POINTER
105110  000137  042620              JMP NXTC                ;SKIP TEST CONDITION - INVALID
105114  000000                      0

105116                      T17:
105116  040004                      .WORD   40004
105120  100037                      .WORD   100037          ;DATA DESCRIPTOR TYPE 4 - PACKED STRING,
105122  003364                      .WORD SSTG12            ;  PRE SPECIFIED STRING;SIGN POSITIVE
105124  000000                      .WORD   0
105126  060134                      .WORD   060134          ;DATA DESCRIPTOR TYPE 3 - PACKED STRING;
                                                            ;  ALL DIGITS IDENTICAL = 5; SIGN POSTIIVE
105130  000000                      .WORD   0
105132  060075                      .WORD   060075          ;DATA DESCRIPTOR TYPE 3 - PACKED STRING;
                                                            ;  ALL DIGITS IDENTICAL = 3; SIGN NEGATIVE
105134  000000                      .WORD   0
105136  060014                      .WORD   060014          ;DATA DESCRIPTOR TYPE 3 - PACKED STRING;
                                                            ;  ALL DIGITS IDENTICAL = 0; SIGN POSITIVE
105140  000000                      .WORD 0
105142  000000                      .WORD 0
105144  000000                      .WORD 0
105146  000000                      .WORD 0
105150  000000                      .WORD 0
105152  000000                      .WORD 0
105154  000000                      .WORD 0

105156  040002              T17A:   .WORD 40002
105160  060174                      .WORD 060174            ;ALL DIGITS = 7+
105162  000000                      .WORD 0
105164  060014                      .WORD 060014            ;ALL DIGITS = 0+
105166  000000                      .WORD 0
105170  000000                      .WORD 0
105172                      T20:
105172  040001                      .WORD   40001           ;DATA DESCRIPTOR TYPE ENTRIES; # OF ENTRIES=1
105174  000127                      .WORD   127             ;ENTRY TYPE=0; ALL BYTES IDENTICAL = 127
105176  000000                      .WORD   0
105200  000000                      .WORD   0
105202  000000                      .WORD   0
105204  000000                      .WORD   0
105206  000000                      .WORD   0

105210                      T21:
105210  000402                      .WORD 402
```

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105212 000001                         .WORD 1
105214 000005                         .WORD 5
105216 000000                         .WORD 0
105220 000000                         .WORD 0
105222 000000                         .WORD 0

105224                       T211:
105224 000402                         .WORD 402
105226 000001                         .WORD 1
105230 000037                         .WORD 37
105232 000000                         .WORD 0
105234 000000                         .WORD 0
105236 000000                         .WORD 0
105240 000000                         .WORD 0

105242                       T212:
105242 000402                         .WORD 402
105244 000001                         .WORD 1
105246 000037                         .WORD 37
105250 000000                         .WORD 0
105252 000000                         .WORD 0
105254 000000                         .WORD 0
105256 000000                         .WORD 0
105260 000000                         .WORD 0

105262                       TL21C:
105262 000402                         .WORD 402
105264 000001                         .WORD 1
105266 000005                         .WORD 5
105270 000000                         .WORD 0
105272 000000                         .WORD 0
105274 000000                         .WORD 0
105276 000000                         .WORD 0

105300                       TL22C:
105300 000402                         .WORD 402
105302 000001                         .WORD 1
105304 000005                         .WORD 5
105306 000000                         .WORD 0
105310 000000                         .WORD 0
105312 000000                         .WORD 0
105314 000000                         .WORD 0
105316 000000                         .WORD 0

105320                       T22:
105320 040001                         .WORD 40001             ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
105322 060074                         .WORD 060074            ;  ALL DIGITS IDENTICAL = 3; SIGN POSITIVE
105324 000000                         .WORD 0
105326 000000                         .WORD 0
105330 000000                         .WORD 0
105332 000000                         .WORD 0
105334 000000                         .WORD 0
105336 000000                         .WORD 0
```

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105340                           T23:
105340  040001                          .WORD 40001             ;DATA DESCRIPTOR TYPE ENTRIES; # OF ENTRIES = 1
105342  000120                          .WORD 120               ;ENTRY TYPE=0; ALL BYTES IDENTICAL = 120
105344  000000                          .WORD 0
105346  000000                          .WORD 0
105350  000000                          .WORD 0
105352  000000                          .WORD 0
105354  000000                          .WORD 0

105356                           T24:
105356  000401                          .WORD 401
105360  120606                          .WORD XLTBL1
105362  000000                          .WORD 0
105364  000000                          .WORD 0
105366  000000                          .WORD 0
105370  000000                          .WORD 0

105372                           T25:
105372  000402                          .WORD 402
105374  000001                          .WORD 1
105376  000240                          .WORD 240
105400  000000                          .WORD 0
105402  000000                          .WORD 0
105404  000000                          .WORD 0
105406  000000                          .WORD 0

105410                           T25A:
105410  000401                          .WORD 401
105412  000007                          .WORD 007
105414  000000                          .WORD 0
105416                           T26:
105416  001001                          .WORD 1001
105420  040003                          .WORD 040003    ;DATA DESCRIPTOR TYPE 2 - CHAR STRING
105422  003244                          .WORD SSTG1             ;  STRING PRE-SPECIFIED AT SSTG1.
105424  000000                          .WORD 0
105426  000000                          .WORD 0
105430  000000                          .WORD 0
105432  000000                          .WORD 0

105434                           T27:
105434  000401                          .WORD 401
105436  000256                          .WORD 256               ;TABLE LENGTH = 256 BYTES
105440  000000                          .WORD 0
105442  000000                          .WORD 0
105444  000000                          .WORD 0
105446  000000                          .WORD 0

105450                           T30:
105450  000403                          .WORD 403
105452  000000                          .WORD 0
105454  000001                          .WORD 1
105456  000377                          .WORD 377
105460  000000                          .WORD 0
105462  000000                          .WORD 0
```

```
105464  000000                               .WORD 0
105466  000000                               .WORD 0
105470                             T30A:
105470  000401                               .WORD 401
105472  000252                               .WORD 252
105474  000000                               .WORD 0
105476                             T31A:
105476  040001                               .WORD 40001
105500  013701  003630                       MOV TR0,R1             ;ENTRY 1; NO OVERLAP
105504  063701  003632                       ADD TR1,R1             ;TR5 = TR0+TR1+SEP CONSTANT
105510  067701  074102                       ADD @PTP14,R1
105514  010137  003642                       MOV R1,TR5
105520  000207                               RTS PC
105522  000000                               0
105524                             T31:
105524  040002                               .WORD 40002
105526  013701  003630                       MOV TR0,R1             ;ENTRY 1; NO OVERLAP
105532  063701  003632                       ADD TR1,R1             ;TR5 = TR0+TR1+SEP CONSTANT
105536  067701  074054                       ADD @PTP14,R1
105542  010137  003642                       MOV R1,TR5
105546  000207                               RTS PC
105550  000000                               0
105552  013737  003632  003642               MOV TR1,TR5            ;ENTRY 2; OVERLAP
105560  000207                               RTS PC                 ;TR5 = TR1
105562  000000                               0

105564                             T32:
105564  040003                               .WORD 40003            ;DATA DESCRIPTOR ENTRIES; # OF ENTRIES = 3
105566  001000                               .WORD 1000             ;ENTRY TYPE 0;  ALL BYTES IDENTICAL = 0
                                                                    ;  NOTE: 1000 RATHER THAN 0 IS USED HERE BECAUSE
                                                                    ;        0 CAN BE USED ONLY FOR DELIMITING TABLE
                                                                    ;           ENTRIES.
105570  000000                               .WORD 0                ;ENTRY DELIMITER.
105572  000377                               .WORD 377              ;ENTRY TYPE 0;  ALL BYTES IDENTICAL = 377
105574  000000                               .WORD 0
105576  020001                               .WORD 20001            ;ENTRY TYPE=1;STARTING BYTE=1;INC=1
105600  000001                               .WORD 1
105602  000000                               .WORD 0
105604  000000                               .WORD 0
105606  000000                               .WORD 0
105610  000000                               .WORD 0
105612  000000                               .WORD 0

105614                             T33:
105614  000403                               .WORD 403
105616  000000                               .WORD 0
105620  000001                               .WORD 1
105622  000020                               .WORD 20
105624  000000                               .WORD 0
105626  000000                               .WORD 0
105630  000000                               .WORD 0
105632  000000                               .WORD 0

105634  000401                     T33A:     .WORD 401
```

```
105636  000012                            .WORD 12
105640  000000                            .WORD 0
105642  000000                            .WORD 0
105644  000000                            .WORD 0
105646  000000                            .WORD 0

105650                           T331:
105650  000403                            .WORD 403
105652  000000                            .WORD 0
105654  000001                            .WORD 1
105656  000037                            .WORD 37
105660  000000                            .WORD 0
105662  000000                            .WORD 0
105664  000000                            .WORD 0
105666  000000                            .WORD 0
105670                           T332:
105670  000403                            .WORD 403
105672  000000                            .WORD 0
105674  000001                            .WORD 1
105676  000037                            .WORD 37
105700  000000                            .WORD 0
105702  000000                            .WORD 0
105704  000000                            .WORD 0
105706  000000                            .WORD 0

105710  000401                   T333:    .WORD 401
105712  000037                            .WORD 37
105714  000000                            .WORD 0
105716  000000                            .WORD 0
105720  000000                            .WORD 0
105722  000000                            .WORD 0

105724                           T34A:
105724  040001                            .WORD 40001
105726  113701  003630                    MOVB TR0,R1              ;ENTRY 1; NO OVERLAP
105732  006201                            ASR R1
105734  005201                            INC R1                   ;NOTE: SRC IS PACKED, THEREFORE # BYTES = # (DIGITS/2)+
105736  063701  003632                    ADD TR1,R1               ;TR3 = TR1+[(TR0/2)+1] + SEP CONSTANT
105742  067701  073646                    ADD @PTP13,R1
105746  010137  003636                    MOV R1,TR3
105752  000207                            RTS PC
105754  000000                            0
105756                           T34:
105756  040002                            .WORD 40002
105760  113701  003630                    MOVB TR0,R1              ;ENTRY 1; NO OVERLAP
105764  006201                            ASR R1
105766  005201                            INC R1                   ;NOTE: SRC IS PACKED, THEREFORE # BYTES = # (DIGITS/2)+
105770  063701  003632                    ADD TR1,R1               ;TR3 = TR1+[(TR0/2)+1] + SEP CONSTANT
105774  067701  073614                    ADD @PTP13,R1
106000  010137  003636                    MOV R1,TR3
106004  000207                            RTS PC
106006  000000                            0
106010  113701  003630                    MOVB TR0,R1              ;ENTRY 2; ADJACENT
106014  006201                            ASR R1                   ; TR3 = TR1+[(TR0/2)+1]
```

```
106016  005201                            INC R1
106020  063701  003632                    ADD TR1,R1
106024  010137  003636                    MOV R1,TR3
106030  000207                            RTS PC
106032  000000                            0

106034                            T35:
106034  040003                            .WORD 40003
106036  060074                            .WORD 060074       ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                             ;  ALL DIGITS IDENTICAL=3; SIGN POSITIVE
106040  000000                            .WORD 0
106042  060215                            .WORD 060215       ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                             ;  ALL DIGITS IDENTICAL=8; SIGN NEGATIVE
106044  000000                            .WORD 0
106046  060015                            .WORD 060015       ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                             ;  ALL DIGITS IDENTICAL = 0;SIGN NEGATIVE
106050  000000                            .WORD 0
106052  000000                            .WORD 0
106054  000000                            .WORD 0
106056  000000                            .WORD 0
106060  000000                            .WORD 0
106062  000000                            .WORD 0

106064                            T35A:
106064  040004                            .WORD 40004
106066  060074                            .WORD 060074       ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                             ;  ALL DIGITS IDENTICAL=3; SIGN POSITIVE
106070  000000                            .WORD 0
106072  060215                            .WORD 060215       ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                             ;  ALL DIGITS IDENTICAL=8; SIGN NEGATIVE
106074  000000                            .WORD 0
106076  060015                            .WORD 060015       ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                             ;  ALL DIGITS IDENTICAL = 0;SIGN NEGATIVE
106100  000000                            .WORD 0
106102  100037                            .WORD 100037       ;DATA DESCRIPTOR TYPE 4 - PACKED STRING
106104  003364                            .WORD SSTG12       ;  PRE SPECIFIED STRING; SIGN POSITIVE
106106  000000                            .WORD 0
106110  000000                            .WORD 0
106112  000000                            .WORD 0
106114  000000                            .WORD 0
106116  000000                            .WORD 0
106120  000000                            .WORD 0

106122  040001                    TP19:   .WORD 40001
106124  100037                            .WORD 100037
106126  003364                            .WORD SSTG12
106130  000000                            .WORD 0

106132  040002                    TP19A:  .WORD 40002
106134  100013                            .WORD 100013       ;DATA DESC TYPE 4; PACKED STRING
106136  003604                            .WORD SSTG14       ;PRESPECIFIED DATA; SIGN +
106140  000000                            .WORD 0
106142  100013                            .WORD 100013
106144  003612                            .WORD SSTG15
```

```
106146  000000                    .WORD 0

106150  040001            TP19B:  .WORD 40001
106152  100017                    .WORD 100017
106154  003620                    .WORD SSTG16
106156  000000                    .WORD 0

106160  040002            TP19C:  .WORD 40002             ;PACKED STRING
106162  060014                    .WORD 060014            ; ALL DIGITS IDENTICAL = 0; SIGN +
106164  000000                    .WORD 0
106166  060114                    .WORD 060114            ; ALL DIGITS IDENTICAL = 4; SIGN +
106170  000000                    .WORD 0

106172  040001            TP19D:  .WORD 40001             ;PACKED STRING
106174  060014                    .WORD 060014            ;  ALL DIGITS IDENTICAL = 0; SIGN +
106176  000000                    .WORD 0

106200  040001            TP19E:  .WORD 40001             ;PACKED STRING
106202  060174                    .WORD 060174            ; ALL DIGITS IDENTICAL = 7; SIGN +
106204  000000                    .WORD 0

106206  040001            TP99:   .WORD 40001             ;DATA DESC TYPE 3; PACKED STRING
106210  060235                    .WORD 060235            ;ALL DIGITS IDENTICAL = 9; SIGN -
106212  000000                    .WORD 0

106214                    T35B:
106214  040005                    .WORD 40005
106216  060215                    .WORD 060215            ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                          ;  ALL DIGITS IDENTICAL=8; SIGN NEGATIVE
106220  000000                    .WORD 0
106222  060015                    .WORD 060015            ;DATA DESCRIPTOR TYPE 3 - PACKED STRING
                                                          ;  ALL DIGITS IDENTICAL = 0;SIGN NEGATIVE
106224  000000                    .WORD 0
106226  100037                    .WORD 100037            ;DATA DESCRIPTOR TYPE 4 - PACKED STRING
106230  003364                    .WORD SSTG12            ;  PRE SPECIFIED STRING; SIGN POSITIVE
106232  000000                    .WORD 0
106234  100037                    .WORD 100037            ;DATA DESCRIPTOR TYPE 4 - PACKED STRING
106236  003404                    .WORD STG12B            ;  PRE SPECIFIED STRING;SIGN NEG
106240  000000                    .WORD 0
106242  100037                    .WORD 100037
106244  003424                    .WORD STG12C
106246  000000                    .WORD 0
106250  000000                    .WORD 0
106252  000000                    .WORD 0
106254  000000                    .WORD 0
106256  000000                    .WORD 0
106260  000000                    .WORD 0
106262  000000                    .WORD 0

106264                    T36A:
106264  040001                    .WORD 40001
106266  113701  003630            MOVB TR0,R1             ;ENTRY 1; NO OVERLAP
106272  063701  003632            ADD TR1,R1              ;  NOTE SRC IS ZONED THEREFORE #BYTES=#DIGITS
106276  067701  073312            ADD @PTP13,R1           ;TR3 = TR0+TR1+SEP CONSTANT
```

```
106302  010137  003636                       MOV R1,TR3
106306  000207                               RTS PC
106310  000000                               0
106312                               T36:
106312  040002                               .WORD 40002
106314  113701  003630                       MOVB TR0,R1              ;ENTRY 1; NO OVERLAP
106320  063701  003632                       ADD TR1,R1               ;  NOTE SRC IS ZONED THEREFORE #BYTES=#DIGITS
106324  067701  073264                       ADD @PTP13,R1            ;TR3 = TR0+TR1+SEP CONSTANT
106330  010137  003636                       MOV R1,TR3
106334  000207                               RTS PC
106336  000000                               0
106340  113701  003630                       MOVB TR0,R1
106344  063701  003632                       ADD TR1,R1               ;ENTRY 2; ADJACENT
106350  010137  003636                       MOV R1,TR3               ;  TR3 = TR0 + TR1
106354  123727  003631  000100               CMPB TR0+1,#100          ;IF DATA TYPE = TRAILING SEPARATE
106362  001002                               BNE 1$                   ;  THEN TR3 = TR0 + TR1 + 1
106364  005237  003636                       INC TR3
106370  000207                       1$:     RTS PC
106372  000000                               0

106374                               T37:
106374  040003                                .WORD 40003
106376  073463                                .WORD 073463            ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                                      ;  ALL DIGITS IDENTICAL =3; SIGN POSITIVE
                                                                      ;  HIGH NIBBLE = 7.
106400  000000                                .WORD 0
106402  074207                                .WORD 074207            ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                                      ;  ALL DIGITS IDENTICAL =8; SIGN NEGATIVE
                                                                      ;  HIGH NIBBLE = 8.
106404  000000                                .WORD 0
106406  070407                                .WORD 070407            ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                                      ;  ALL DIGITS IDENTICAL = 0; SIGN NEGATIVE
                                                                      ;  HIGH NIBBLE = 1.
106410  000000                                .WORD 0
106412  000000                                .WORD 0
106414  000000                                .WORD 0
106416  000000                                .WORD 0
106420  000000                                .WORD 0
106422  000000                                .WORD 0

106424                               T37A:
106424  040004                                .WORD 40004
106426  073463                                .WORD 073463            ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                                      ;  ALL DIGITS IDENTICAL =3; SIGN POSITIVE
                                                                      ;  HIGH NIBBLE = 7.
106430  000000                                .WORD 0
106432  074207                                .WORD 074207            ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                                      ;  ALL DIGITS IDENTICAL =8; SIGN NEGATIVE
                                                                      ;  HIGH NIBBLE = 8.
106434  000000                                .WORD 0
106436  070407                                .WORD 070407            ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                                      ;  ALL DIGITS IDENTICAL = 0; SIGN NEGATIVE
                                                                      ;  HIGH NIBBLE = 1.
106440  000000                                .WORD 0
```

```
106442  110037                  .WORD 110037        ;DATA DESCRIPTOR TYPE 4 - ZONED STRING
106444  003444                  .WORD SSTG13        ;PRE SPECIFIED STRING; SIGN POSTIVE
106446  000000                  .WORD 0
106450  000000                  .WORD 0
106452  000000                  .WORD 0
106454  000000                  .WORD 0
106456  000000                  .WORD 0
106460  000000                  .WORD 0

106462                  TZ19:
106462  040001                  .WORD 40001
106464  110037                  .WORD 110037
106466  003444                  .WORD SSTG13
106470  000000                  .WORD 0
106472                  T37B:
106472  040005                  .WORD 40005
106474  074207                  .WORD 074207        ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                    ;  ALL DIGITS IDENTICAL =8; SIGN NEGATIVE
                                                    ;  HIGH NIBBLE = 8.
106476  000000                  .WORD 0
106500  070407                  .WORD 070407        ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                    ;  ALL DIGITS IDENTICAL = 0; SIGN NEGATIVE
                                                    ;  HIGH NIBBLE = 1.
106502  000000                  .WORD 0
106504  110037                  .WORD 110037        ;DATA DESCRIPTOR TYPE 4 - ZONED STRING
106506  003444                  .WORD SSTG13        ;PRE SPECIFIED STRING; SIGN POSTIVE
```

```
 20279  106510  000000                          .WORD 0
```

```
20281  106512  110037                      .WORD 110037
20282  106514  003504                      .WORD STG13B
20283  106516  000000                      .WORD 0
20284  106520  110037                      .WORD 110037
20285  106522  003544                      .WORD STG13C
20286  106524  000000                      .WORD 0
20287  106526  000000                      .WORD 0
20288  106530  000000                      .WORD 0
20289  106532  000000                      .WORD 0
20290  106534  000000                      .WORD 0
20291  106536  000000                      .WORD 0
20292
20293  106540                  T40:
```

```
106540  000405                          .WORD 405               ;LONG INTEGER - HIGH WORD
106542  000000                          .WORD 0                 ; 0+
106544  100000                          .WORD 100000            ; 0-
106546  077777                          .WORD 077777            ; 77777+
106550  177777                          .WORD 177777            ; 77777-
106552  000005                          .WORD 05                ; 5+
106554  000000                          .WORD 0
106556  000000                          .WORD 0
106560  000000                          .WORD 0
106562  000000                          .WORD 0
106564  000000                          .WORD 0

106566                          T40A:
106566  000401                          .WORD 401
106570  000000                          .WORD 0

106572  000403                  T40B:   .WORD 403
106574  000000                          .WORD 0
106576  000231                          .WORD 231
106600  000252                          .WORD 252
106602  000000                          .WORD 0
106604                          T41A:
106604  000401                          .WORD 401
106606  177777                          .WORD 177777
106610                          T40AA:
106610  000401                          .WORD 401
106612  000005                          .WORD 5
106614                          T41AA:
106614  000401                          .WORD 401
106616  000004                          .WORD 4
106620                          T41:
106620  000403                          .WORD 403               ;LONG INTEGER - LOW WORD
106622  000000                          .WORD 0
106624  000004                          .WORD 4
106626  177777                          .WORD 177777
106630  000000                          .WORD 0
106632  000000                          .WORD 0
106634  000000                          .WORD 0
106636  000000                          .WORD 0

106640  000403                  T41B:   .WORD 403
106642  120360                          .WORD 120360
106644  000000                          .WORD 0
106646  000125                          .WORD 125
106650  000000                          .WORD 0

106652                          T42:
106652  040001                          .WORD 40001
106654  077623                          .WORD 077623            ;DATA DESCRIPTOR TYPE 3 - ZONED STRING
                                                                ;  ALL DIGITS IDENTICAL = 9;SIGN +
                                                                ;  HIGH NIBBLE = 17
106656  000000                          .WORD 0
106660  000000                          .WORD 0
106662  000000                          .WORD 0
```

```
 20349  106664  000000                        .WORD 0
 20350  106666  000000                        .WORD 0
 20351
 20352  106670                  T43:
```

```
106670  000401                          .WORD 401
106672  000011                          .WORD 11
106674  000000                          .WORD 0
106676  000000                          .WORD 0
106700  000000                          .WORD 0
106702  000000                          .WORD 0

106704                          T43A:
106704  000401                          .WORD 401
106706  000101                          .WORD 101
106710  000000                          .WORD 0
106712  000000                          .WORD 0
106714  000000                          .WORD 0
106716  000000                          .WORD 0

106720                          T44A:
106720  040001                          .WORD 40001
106722  113701  003630                  MOVB TR0,R1             ;ENTRY 1; NO OVERLAP
106726  006201                          ASR R1                  ;     TR3=TR1+[(TR0/2)+1] + SEP CONST
106730  005201                          INC R1
106732  063701  003632                  ADD TR1,R1
106736  067701  072654                  ADD @PTP14,R1
106742  010137  003636                  MOV R1,TR3
106746  000207                          RTS PC
106750  000000                          0
106752                          T44:
106752  040002                          .WORD 40002
106754  113701  003630                  MOVB TR0,R1             ;ENTRY 1; NO OVERLAP
106760  006201                          ASR R1                  ;     TR3=TR1+[(TR0/2)+1] + SEP CONST
106762  005201                          INC R1
106764  063701  003632                  ADD TR1,R1
106770  067701  072622                  ADD @PTP14,R1
106774  010137  003636                  MOV R1,TR3
107000  000207                          RTS PC
107002  000000                          0
107004  105737  003630                  TSTB TR0                        ;IF EITHER SRC1=0 OR SRC2=0 BUT NOT BOTH
107010  001004                          BNE 1$                  ;  THEN SKIP THIS TEST CONDITION.
107012  105737  003634                  TSTB TR2                        ;SCR1=0
107016  001404                          BEQ 2$                  ;BRANCH IF SRC2 ALSO = 0.
107020  000417                          BR 3$                   ;SKIP TEST
107022  105737  003634          1$:     TSTB TR2                        ;SRC1 NOT = 0
107026  001414                          BEQ 3$                  ;SKIP TEST IF SRC2 = 0
107030  113701  003630          2$:     MOVB TR0,R1             ;ENTRY 2; ALIGNED SRC1-SRC2 LEAST SIGN DIGIT
107034  006201                          ASR R1                  ;     TR3=TR1+(TR0/2)-(TR2/2)
107036  113702  003634                  MOVB TR2,R2
107042  006202                          ASR R2
107044  160201                          SUB R2,R1
107046  063701  003632                  ADD TR1,R1
107052  010137  003636                  MOV R1,TR3
107056  000207                          RTS PC
107060  062706  000002          3$:     ADD #2,SP               ;FIXUP STACK POINTER
107064  000137  042620                  JMP NXTC                ;SKIP TEST CONDITION - INVALID
107070  000000                          0

```

```
20408  107072                   T45:
20409  107072  040004                   .WORD 40004
20410  107074  100037                   .WORD 100037         ;DATA DESC. TYPE 4 - PACKED STRING
20411  107076  003364                   .WORD SSTG12         ;  ALL DIGITS IDENTICAL = 3 SIGN +
20412  107100  000000                   .WORD 0
20413  107102  060075                   .WORD 060075         ;DATA DESC. TYPE 3 - PACKED STRING
20414                                                        ;   ALL DIGITS IDENTICAL = 3, SIGN -
20415  107104  000000                   .WORD 0
20416  107106  060014                   .WORD 060014         ;DATA DESC TYPE 3 - PACKED STRING
20417                                                        ;  ALL DIGITS IDENTICAL=0, SIGN POS
20418  107110  000000                   .WORD 0
20419  107112  060015                   .WORD 060015         ;DATA DESC TYPE 3 - PACKED STG
20420                                                        ;  ALL DIGITS IDENTICAL = 0, SIGN -
20421  107114  000000                   .WORD 0
20422  107116  000000                   .WORD 0
20423  107120  000000                   .WORD 0
20424  107122  000000                   .WORD 0
20425  107124  000000                   .WORD 0
20426
20427  107126                   T46A:
20428  107126  040001                   .WORD 40001          ;FOR CMPN ONLY
20429  107130  113701  003630           MOVB TRO,R1          ;ENTRY 1; NO OVERLAP
```

```
 20431  107134  063701  003632                  ADD TR1,R1              ;       TR3=TR1+TR0+SEP CONST
```

```
 20433  107140  067701  072452                     ADD @PTP14,R1
 20434  107144  010137  003636                     MOV R1,TR3
```

```
107150 000207                          RTS PC
107152 000000                          0
107154                        T46:
107154 040004                          .WORD 40004              ;FOR CMPN ONLY
107156 113701 003630                   MOVB TR0,R1              ;ENTRY 1; NO OVERLAP
107162 063701 003632                   ADD TR1,R1               ;     TR3=TR1+TR0+SEP CONST
107166 067701 072424                   ADD @PTP14,R1
107172 010137 003636                   MOV R1,TR3
107176 000207                          RTS PC
107200 000000                          0
107202 023727 002442 000001            CMP S1TYPE,#1            ;SKIP TEST IS EITHER SRC DATA TYPE IS NOT 0 OR 1.
107210 101066                          BHI 2$
107212 023727 002444 000001            CMP S2TYPE,#1
107220 101062                          BHI 2$
107222 105737 003630                   TSTB TR0                       ;ENTRY 2; ADJACENT
107226 001453                          BEQ 1$                   ;   TR3=TR1+TR0
107230 113701 003630                   MOVB TR0,R1              ;    REDUNDANT WITH ENTRY 4 IF TR0=0
107234 063701 003632                   ADD TR1,R1
107240 010137 003636                   MOV R1,TR3
107244 000207                          RTS PC
107246 000000                          0
107250 023727 002442 000001            CMP S1TYPE,#1            ;SKIP TEST IS EITHER SRC DATA TYPE IS NOT 0 OR 1.
107256 101043                          BHI 2$
107260 023727 002444 000001            CMP S2TYPE,#1
107266 101037                          BHI 2$
107270 113701 003630                   MOVB TR0,R1              ;ENTRY 3; PARTIAL OVERLAP
107274 113702 003634                   MOVB TR2,R2              ;      TR3=TR1+TR0-(TR2/2)
107300 006202                          ASR R2                   ;       REDUNDANT WITH ENTRY 4 IF
107302 160201                          SUB R2,R1                ;       TR0-(TR2/2)=0
107304 005701                          TST R1
107306 001423                          BEQ 1$
107310 063701 003632                   ADD TR1,R1
107314 010137 003636                   MOV R1,TR3
107320 000207                          RTS PC
107322 000000                          0
107324 023727 002442 000001            CMP S1TYPE,#1            ;SKIP TEST IS EITHER SRC DATA TYPE IS NOT 0 OR 1.
107332 101015                          BHI 2$
107334 023727 002444 000001            CMP S2TYPE,#1
107342 101011                          BHI 2$
107344 013737 003632 003636            MOV TR1,TR3              ;ENTRY 4;  COMPLETE OVERLAP
107352 000207                          RTS PC                   ;          TR3=TR1
107354 000000                          0
107356 062706 000002          1$:      ADD #2,SP                ;FIXUP STACK POINTER
107362 000137 042334                   JMP REDNTC               ;SKIP ENTRY TEST CONDITION - REDUNDANT
107366 062706 000002          2$:      ADD #2,SP
107372 000137 042620                   JMP NXTC                 ;SKIP TEST CONDITION - ILLEGAL

107376                        T47:
107376 040004                          .WORD 40004
107400 070607                          .WORD 070607             ;DATA DESC TYPE 3 - ZONED STRING
                                                                ;  ALL DIGITS IDENTICAL = 8, SIGN -
                                                                ;  HIGH NIBBLE = 1
107402 000000                          .WORD 0
107404 077603                          .WORD 077603             ;DATA DESC TYPE 3 - ZONED STRING
```

```
                                                        ;  ALL DIGITS IDENTICAL = 8, SIGN +
                                                        ;  HIGH NIBBLE = 17
107406  000000                   .WORD 0
107410  070403                   .WORD 070403           ;DATA DESC TYPE 3 - ZONED STG
                                                        ;  ALL DIGITS IDENTICAL = 0, SIGN +
                                                        ;  HIGH NIBBLE = 1
107412  000000                   .WORD 0
107414  074007                   .WORD 074007           ;DATA DESC TYPE 3 - ZONED STRING
                                                        ;  ALL DIGITS IDENTICAL = 0, SIGN -
                                                        ;  HIGH NIBBLE = 8
107416  000000                   .WORD 0
107420  000000                   .WORD 0
107422  000000                   .WORD 0
107424  000000                   .WORD 0
107426  000000                   .WORD 0
107430  000000                   .WORD 0

107432                   T50:
107432  000406                   .WORD 406
107434  000000                   .WORD 0                ;RND.DGT=0, SHFT.CNT=0
107436  002776                   .WORD 002776           ;RND.DGT=5, SHFT.CNT=-2
107440  004402                   .WORD 004402           ;RND.DGT=9, SHFT.CNT=+2
107442  001775                   .WORD 001775           ;RND.DGT=3, SHFT.CNT=-3
107444  000775                   .WORD 000775           ;RND.DGT=1, SHFT.CNT=-3
107446  000005                   .WORD 000005           ;RND.DGT=0, SHFT.CNT=5
107450  000000                   .WORD 0
107452  000000                   .WORD 0
107454  000000                   .WORD 0
107456  000000                   .WORD 0
107460  000000                   .WORD 0

107462                   T50A:
107462  000401                   .WORD 401
107464  002777                   .WORD 002777

107466  000402           T50B:   .WORD 402
107470  003777                   .WORD 003777           ;RND.DGT = 7,SHFT.CT=-1
107472  003402                   .WORD 003402           ;RND.DGT = 7,SHFT.CT=2
107474  000000                   .WORD 0

107476  000404           T50C:   .WORD 404
107500  003777                   .WORD 3777             ;RND.DGT = 7,SHFT.CT=-1
107502  003776                   .WORD 3776             ;RND.DGT = 7,SHFT.CT=-2
107504  000400                   .WORD 0400             ;RND.DGT = 1,SHFT.CT=0
107506  004003                   .WORD 4003             ;RND.DGT = 8,SHFT.CT=3
107510  000000                   .WORD 0

107512  000402           T50D:   .WORD 402
107514  001376                   .WORD 1376             ;RND.DGT = 2,SHFT.CT=-2
107516  004775                   .WORD 4775             ;RND.DGT = 9,SHFT.CT=-3
107520  000000                   .WORD 0

107522                   T51:
107522  001004                   .WORD 1004             ;PACKED STRINGS
```

```
107524  100012                  .WORD 100012            ;DATA DESC TYPE 4 - PRE SPECIFIED STRING
                                                        ;   OF TEN DIGITS
107526  003250                  .WORD SSTG2             ;+2,147,483,648
107530  100012                  .WORD 100012
107532  003304                  .WORD SSTG4             ;+2,147,483,647
107534  100012                  .WORD 100012
107536  003324                  .WORD SSTG6             ;-2,147,483,648
107540  100012                  .WORD 100012
107542  003344                  .WORD SSTG10            ;-2,147,483,649
107544  100012                  .WORD 100012
107546  003256                  .WORD SSTG2A            ;+4,294,967,294
107550  100012                  .WORD 100012
107552  003264                  .WORD SSTG2B            ;+42,949,672,940
107554  000000                  .WORD 0
107556  000000                  .WORD 0
107560  000000                  .WORD 0
107562  000000                  .WORD 0

107564                  T52:
107564  001004                  .WORD 1004              ;ZONED STRINGS
107566  110012                  .WORD 110012            ;DATA DESC TYPE 4 - PRE SPECIFIED STRING
                                                        ;   OF 10 DIGITS
107570  003272                  .WORD SSTG3             ;+2,147,483,648
107572  110012                  .WORD 110012
107574  003312                  .WORD SSTG5             ;+2,147,483,647
107576  110012                  .WORD 110012
107600  003332                  .WORD SSTG7             ;-2,147,483,648
107602  110012                  .WORD 110012
107604  003352                  .WORD SSTG11            ;-2,147,483,649
107606  000000                  .WORD 0
107610  000000                  .WORD 0
107612  000000                  .WORD 0
107614  000000                  .WORD 0

107616  000401          T53:    .WORD 401
107620  177777                  .WORD 177777
107622  000000                  .WORD 0
107624  000000                  .WORD 0

107626  000401          T54:    .WORD 401
107630  111111                  .WORD 111111
107632  000000                  .WORD 0
107634  000000                  .WORD 0


107636  000401          T55:    .WORD 401
107640  122222                  .WORD 122222
107642  000000                  .WORD 0
107644  000000                  .WORD 0

107646  000401          T56:    .WORD 401
107650  133333                  .WORD 133333
107652  000000                  .WORD 0
107654  000000                  .WORD 0
```

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20599
20600  107656  000401                 T57:     .WORD 401
20601  107660  144444                          .WORD 144444
```

```
107662  000000                            .WORD 0
107664  000000                            .WORD 0

107666  000401                  T60:      .WORD 401
107670  155555                            .WORD 155555
107672  000000                            .WORD 0
107674  000000                            .WORD 0

107676                          T61:                                ;LOAD DESC - DESC ADDRESS TABLE
107676  040010                            .WORD 40010               ;VARIABLE LENGTH ENTRIES; 8 ENTRIES
107700  042737  000007  050012            BIC #7,TINST              ;ENTRY 1;RN=R0;OPCODE = 0760X0
107706  013737  001640  003630            MOV TBADR,TR0             ;       LOAD PTR ADDRESS INTO R0
107714  013702  001640          1$:       MOV TBADR,R2              ;       LOAD 1ST PTR WITH 1ST DESC ADDR.
107720  010201                            MOV R2,R1
107722  063701  001642                    ADD TBLEN,R1              ;       1ST DESC ADDR=TBADR+TBLEN-10
107726  162701  000010                    SUB #10,R1
107732  010112                            MOV R1,(R2)
107734  162701  000010                    SUB #10,R1                ;       LOAD 2ND PTR WITH 2ND DESC ADDR.
107740  010162  000002                    MOV R1,2(R2)              ;       2ND DESC ADDR=TBADR+TBLEN-20
107744  162701  000010                    SUB #10,R1                ;       LOAD 3RD PTR WITH 3RD DESC ADDR.
107750  010162  000004                    MOV R1,4(R2)              ;       3RD DESC ADDR=TBADR+TBLEN-30
107754  013737  050012  046136            MOV TINST,EINSTR
107762  000207                            RTS PC
107764  000000                            0

107766  052737  000001  050012            BIS #1,TINST              ;ENTRY 2;RN=R1;OPCODE=0760X1
107774  013737  001640  003632            MOV TBADR,TR1
110002  000744                            BR 1$
110004  000000                            0

110006  042737  000007  050012            BIC #7,TINST
110014  052737  000002  050012            BIS #2,TINST              ;ENTRY 3;RN=R2;OPCODE=0760X2
110022  013737  001640  003634            MOV TBADR,TR2
110030  000731                            BR 1$
110032  000000                            0

110034  052737  000003  050012            BIS #3,TINST              ;ENTRY 4;RN=R3;OPCODE=0760X3
110042  013737  001640  003636            MOV TBADR,TR3
110050  000721                            BR 1$
110052  000000                            0

110054  042737  000007  050012            BIC #7,TINST
110062  052737  000004  050012            BIS #4,TINST              ;ENTRY 5;RN=R4;OPCODE=0760X4
110070  013737  001640  003640            MOV TBADR,TR4
110076  000706                            BR 1$
110100  000000                            0

110102  052737  000005  050012            BIS #5,TINST              ;ENTRY 6;RN=R5;OPCODE=0760X5
110110  013737  001640  003642            MOV TBADR,TR5
110116  000676                            BR 1$
110120  000000                            0

110122  042737  000007  050012            BIC #7,TINST
110130  052737  000006  050012            BIS #6,TINST              ;ENTRY 7:RN=R6;OPCODE=0760X6
```

```
     110136  013737  001640  003644          MOV TBADR,TR6
     110144  000663                          BR 1$
     110146  000000                          0

     110150  052737  000007  050012          BIS #7,TINST                ;ENTRY 8;RN=R7;OPCODE=0760X7
     110156  013702  001640                  MOV TBADR,R2
     110162  063702  001642                  ADD TBLEN,R2
     110166  162702  000010                  SUB #10,R2
     110172  010237  050014                  MOV R2,TINST+2
     110176  162702  000010                  SUB #10,R2
     110202  010237  050016                  MOV R2,TINST+4
     110206  023727  050012  076067          CMP TINST,#076067
     110214  001021                          BNE 2$
     110216  162702  000010                  SUB #10,R2
     110222  010237  050020                  MOV R2,TINST+6
     110226  013737  001700  050022          MOV KBR2,TINST+10
     110234  013737  001672  050024  3$:     MOV KHALT,TINST+12
     110242  013737  001672  050026          MOV KHALT,TINST+14
     110250  013737  050012  046136          MOV TINST,EINSTR
     110256  000207                          RTS PC
     110260  013737  001676  050020  2$:     MOV KBR3,TINST+6
     110266  013737  001672  050022          MOV KHALT,TINST+10
     110274  000757                          BR 3$
     110276  000000                          0


     110300                          STARS
                                     ;*******************************************************************
(1)
(1)                                  .SBTTL  READ A DECIMAL NUMBER FROM THE TTY
(1)
(1)                                  ;*THIS ROUTINE WILL READ A DECIMAL (ASCII) NUMBER FROM THE TTY AND
(1)                                  ;*CHANGE IT TO BINARY. IF TOO MANY CHARACTERS OR ANY ILLEGAL CHARACTERS
(1)                                  ;*ARE READ A "?" FOLLOWED BY A CARRIAGE RETURN-LINE FEED WILL BE TYPED.
(1)                                  ;*THE COMPLETE NUMBER MUST BE RETYPED. THE INPUT IS TERMINATED BY THE
(1)                                  ;*USER TYPING A CARRIAGE RETURN. THE RANGE OF THE INPUT NUMBER IS
(1)                                  ;*POSITIVE 32767 TO NEGATIVE 32768.
(1)                                  ;*CALL:
(1)                                  ;*      RDDEC                       ;;READ A DECIMAL NUMBER
(1)                                  ;*      RETURN HERE                 ;;NUMBER IS ON TOP OF THE STACK
(1)                                  ;
(1)
(1)  110300  011646                  $RDDEC: MOV     (SP),-(SP)          ;;PROVIDE SPACE FOR
(1)  110302  016666  000004  000002          MOV     4(SP),2(SP)         ;;THE INPUT NUMBER
(3)  110310  010046                          MOV     R0,-(SP)            ;;PUSH R0 ON STACK
(3)  110312  010146                          MOV     R1,-(SP)            ;;PUSH R1 ON STACK
(3)  110314  010246                          MOV     R2,-(SP)            ;;PUSH R2 ON STACK
(1)  110316  104402                  1$:     RDLIN                       ;;READ AN ASCIZ LINE
(1)  110320  012600                          MOV     (SP)+,R0            ;;ADDRESS OF 1ST CHAR.
(1)  110322  010037  110446                  MOV     R0,6$               ;;SAVE INCASE OF BAD INPUT
(1)  110326  005046                          CLR     -(SP)               ;;CLEAR DATA WORD
(1)  110330  005002                          CLR     R2                  ;;SIGN SET POSITIVE
(1)  110332  122710  000055                  CMPB    #'-,(R0)            ;;SEE IF A MINUS SIGN WAS TYPED
(1)  110336  001001                          BNE     2$                  ;;BR IF NO MINUS SIGN
```

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   (1)  110340  112002                          MOVB    (R0)+,R2          ;;SAVE FOR LATER USE
   (1)  110342  112001                  2$:     MOVB    (R0)+,R1          ;;PICKUP THIS CHARACTER
   (1)  110344  001424                          BEQ     3$                ;;GET OUT IF ZERO
   (1)  110346  122701  000060                  CMPB    #'0,R1            ;;MAKE SURE THIS CHARACTER
   (1)  110352  003032                          BGT     5$                ;;IS A DIGIT BETWEEN 0 & 9
   (1)  110354  122701  000071                  CMPB    #'9,R1
   (1)  110360  002427                          BLT     5$
   (1)  110362  032716  170000                  BIT     #^C7777,(SP)      ;;DON'T LET NUMBER GET TO BIG
   (1)  110366  001024                          BNE     5$                ;;BR IF NUMBER WOULD OVERFLOW
   (1)  110370  006316                          ASL     (SP)              ;;*2
   (1)  110372  011646                          MOV     (SP),-(SP)        ;;SAVE FOR LATER
   (1)  110374  006316                          ASL     (SP)              ;;*4
   (1)  110376  006316                          ASL     (SP)              ;;*8.
   (1)  110400  062616                          ADD     (SP)+,(SP)        ;;*10.
   (1)  110402  102416                          BVS     5$                ;;OVERFLOW ISN'T ALLOWED
   (1)  110404  162701  000060                  SUB     #'0,R1            ;;STRIP AWAY THE ASCII JUNK
   (1)  110410  060116                          ADD     R1,(SP)           ;;ADD IN THIS DIGIT
   (1)  110412  102412                          BVS     5$                ;;OVERFLOW ISN'T ALLOWED
   (1)  110414  000752                          BR      2$                ;;LOOP
   (1)  110416  005702                  3$:     TST     R2                ;;CHECK IF NUMBER IS NEG
   (1)  110420  001401                          BEQ     4$                ;;BR IF NO
   (1)  110422  005416                          NEG     (SP)              ;;YES--NEGATE THE NUMBER
   (1)  110424  012666  000012          4$:     MOV     (SP)+,12(SP)      ;;SAVE THE RESULT
   (3)  110430  012602                          MOV     (SP)+,R2          ;;POP STACK INTO R2
   (3)  110432  012601                          MOV     (SP)+,R1          ;;POP STACK INTO R1
   (3)  110434  012600                          MOV     (SP)+,R0          ;;POP STACK INTO R0
   (1)  110436  000002                          RTI                       ;;RETURN
   (1)
   (1)  110440  005726                  5$:     TST     (SP)+             ;;CLEAN PARTIAL NUMBER FROM STACK
   (1)  110442  105010                          CLRB    (R0)              ;;SET A TERMINATOR
   (1)  110444  104400                          TYPE                      ;;TYPE THE INPUT UP TO BAD CHAR.
   (1)  110446  000000                  6$:     .WORD   0                 ;;POINTER GOES HERE
   (1)  110450  104400  110456                  TYPE    ,$QUES            ;;"?" "CR" &"LF"
   (1)  110454  000720                          BR      1$                ;;TRY AGAIN
   (1)  110456     077                  $QUES:  .ASCII  "?"                       ;;QUESTION MARK
   (1)  110457     015                  $CRLF:  .ASCII  <15>                      ;;CARRAIGE RETURN
   (1)  110460  000012                  $LF:    .ASCIZ  <12>                      ;;LINEFEED
 20689                                  ;*****************************************************************
   (1)
   (1)                                  .SBTTL  TTY INPUT ROUTINE
   (1)
   (1)  110462  177560                  $TKS:   .WORD   177560            ;;TTY KBD STATUS
   (1)  110464  177562                  $TKB:   .WORD   177562            ;;TTY KBD BUFFER
   (1)                                  ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
   (1)                                  ;*CALL:
   (1)                                  ;*      RDCHR                     ;;INPUT A SINGLE CHARACTER FROM THE TTY
   (1)                                  ;*      RETURN HERE               ;;CHARACTER IS ON THE STACK
   (1)                                  ;
   (1)
   (1)  110466  011646                  $RDCHR: MOV     (SP),-(SP)        ;;PUSH DOWN THE PC
   (1)  110470  016666  000004  000002          MOV     4(SP),2(SP)       ;;SAVE THE PS
   (1)  110476  105777  177760          1$:     TSTB    @$TKS             ;;WAIT FOR
   (1)  110502  100375                          BPL     1$                ;;A CHARACTER
   (1)  110504  117766  177754  000004          MOVB    @$TKB,4(SP)       ;;READ THE TTY
```

```
  (1)  110512  042766  177600  000004          BIC     #^C<177>,4(SP)     ;;GET RID OF JUNK IF ANY
  (1)  110520  000002                          RTI                        ;;GO BACK TO USER
  (2)                                  ;*******************************************************************
  (1)                                  ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
  (1)                                  ;*CALL:
  (1)                                  ;*      RDLIN                      ;;INPUT A STRING FROM THE TTY
  (1)                                  ;*      RETURN HERE                ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
  (1)                                  ;*                                 ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
  (1)
  (1)  110522  010346                  $RDLIN: MOV     R3,-(SP)           ;;SAVE R3
  (1)  110524  012703  110630          1$:     MOV     #$TTYIN,R3         ;;GET ADDRESS
  (1)  110530  022703  110640          2$:     CMP     #$TTYIN+8.,R3      ;;BUFFER FULL?
  (1)  110534  101405                          BLOS    4$                 ;;BR IF YES
  (1)  110536  104401                          RDCHR                      ;;GO READ ONE CHARACTER FROM THE TTY
  (1)  110540  112613                          MOVB    (SP)+,(R3)         ;;GET CHARACTER
  (1)  110542  122713  000177                  CMPB    #177,(R3)          ;;IS IT A RUBOUT
  (1)  110546  001003                          BNE     3$                 ;;SKIP IF NOT
  (1)  110550  104400  110456          4$:     TYPE    ,$QUES             ;;TYPE A '?'
  (1)  110554  000763                          BR      1$                 ;;CLEAR THE BUFFER AND LOOP
  (1)  110556  111337  110626          3$:     MOVB    (R3),9$            ;;ECHO THE CHARACTER
  (1)  110562  104400  110626                  TYPE    ,9$
  (1)  110566  122723  000015                  CMPB    #15,(R3)+          ;;CHECK FOR RETURN
  (1)  110572  001356                          BNE     2$                 ;;LOOP IF NOT RETURN
  (1)  110574  105063  177777                  CLRB    -1(R3)             ;;CLEAR RETURN (THE 15)
  (1)  110600  104400  110460                  TYPE    ,$LF               ;;TYPE A LINE FEED
  (1)  110604  012603                          MOV     (SP)+,R3           ;;RESTORE R3
  (1)  110606  011646                          MOV     (SP),-(SP)         ;;ADJUST THE STACK AND PUT ADDRESS OF THE
  (1)  110610  016666  000004  000002          MOV     4(SP),2(SP)        ;;      FIRST ASCII CHARACTER ON IT
  (1)  110616  012766  110630  000004          MOV     #$TTYIN,4(SP)
  (1)  110624  000002                          RTI                        ;;RETURN
  (1)  110626     000                  9$:     .BYTE   0                  ;;STORAGE FOR ASCII CHAR. TO TYPE
  (1)  110627     000                          .BYTE   0                  ;;TERMINATOR
  (1)  110630  000010                  $TTYIN: .BLKB   8.                 ;;RESERVE 8 BYTES FOR TTY INPUT
                                       ;*******************************************************************
  (1)
  (1)                                  .SBTTL  TYPE ROUTINE
  (1)
  (1)                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
  (1)                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
  (1)                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
  (1)                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
  (1)                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
  (1)                                  ;*
  (1)                                  ;*CALL:
  (1)                                  ;*1) USING A TRAP INSTRUCTION
  (1)                                  ;*      TYPE    ,MESADR            ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
  (1)                                  ;*OR
  (1)                                  ;*      TYPE
  (1)                                  ;*      MESADR
  (1)                                  ;*
  (1)
  (1)  110640  105737  111213          $TYPE:  TSTB    $TPFLG             ;;IS THERE A TERMINAL?
  (1)  110644  100002                          BPL     1$                 ;;BR IF YES
  (1)  110646  000000                          HALT                       ;;HALT HERE IF NO TERMINAL
```

```
(1)  110650  000430                          BR      3$                  ;;LEAVE
(1)  110652  010046                  1$:     MOV     R0,-(SP)            ;;SAVE R0
(1)  110654  017600  000002                  MOV     @2(SP),R0           ;;GET ADDRESS OF ASCIZ STRING
(1)  110660  122737  000001  001134          CMPB    #APTENV,$ENV        ;;RUNNING IN APT MODE
(1)  110666  001011                          BNE     62$                 ;;NO,GO CHECK FOR APT CONSOLE
(1)  110670  132737  000100  001135          BITB    #APTSPOOL,$ENVM     ;;SPOOL MESSAGE TO APT
(1)  110676  001405                          BEQ     62$                 ;;NO,GO CHECK FOR CONSOLE
(1)  110700  010037  110710                  MOV     R0,61$              ;;SETUP MESSAGE ADDRESS FOR APT
(1)  110704  004737  001156                  JSR     PC,$ATY3            ;;SPOOL MESSAGE TO APT
(1)  110710  000000                  61$:    .WORD   0                   ;;MESSAGE ADDRESS
(1)  110712  132737  000040  001135  62$:    BITB    #APTCSUP,$ENVM      ;;APT CONSOLE SUPPRESSED
(1)  110720  001003                          BNE     60$                 ;;YES,SKIP TYPE OUT
(1)  110722  112046                  2$:     MOVB    (R0)+,-(SP)         ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(1)  110724  001005                          BNE     4$                  ;;BR IF IT ISN'T THE TERMINATOR
(1)  110726  005726                          TST     (SP)+               ;;IF TERMINATOR POP IT OFF THE STACK
(1)  110730  012600                  60$:    MOV     (SP)+,R0            ;;RESTORE R0
(1)  110732  062716  000002          3$:     ADD     #2,(SP)             ;;ADJUST RETURN PC
(1)  110736  000002                          RTI                         ;;RETURN
(1)  110740  122716  000011          4$:     CMPB    #THT,(SP)           ;;BRANCH IF <HT>
(1)  110744  001426                          BEQ     8$
(1)  110746  122716  000200                  CMPB    #TCRLF,(SP)         ;;BRANCH IF NOT <CRLF>
(1)  110752  001004                          BNE     5$
(1)  110754  005726                          TST     (SP)+               ;;POP  <CR><LF> EQUIV
(1)  110756  104400                          TYPE                        ;;TYPE A CR AND LF
(1)  110760  110457                          $CRLF
(1)  110762  000757                          BR      2$                  ;;GET NEXT CHARACTER
(1)  110764  004737  111046          5$:     JSR     PC,$TYPEC           ;;GO TYPE THIS CHARACTER
(1)  110770  123726  111212          6$:     CMPB    $FILLC,(SP)+        ;;IS IT TIME FOR FILLER CHARS.?
(1)  110774  001352                          BNE     2$                  ;;IF NO GO GET NEXT CHAR.
(1)  110776  013746  111210                  MOV     $NULL,-(SP)         ;;GET # OF FILLER CHARS. NEEDED
(1)                                                                      ;;AND THE NULL CHAR.
(1)  111002  105366  000001          7$:     DECB    1(SP)               ;;DOES A NULL NEED TO BE TYPED?
(1)  111006  002770                          BLT     6$                  ;;BR IF NO--GO POP THE NULL OFF OF STACK
(1)  111010  004737  111046                  JSR     PC,$TYPEC           ;;GO TYPE A NULL
(1)  111014  105337  111176                  DECB    $CHARCNT            ;;DO NOT COUNT AS A COUNT
(1)  111020  000770                          BR      7$                  ;;LOOP
(1)
(1)                                  ;HORIZONTAL TAB PROCESSOR
(1)
(1)  111022  112716  000040          8$:     MOVB    #40,(SP)            ;;REPLACE TAB WITH SPACE
(1)  111026  004737  111046          9$:     JSR     PC,$TYPEC           ;;TYPE A SPACE
(1)  111032  132737  000007  111176          BITB    #7,$CHARCNT         ;;BRANCH IF NOT AT
(1)  111040  001372                          BNE     9$                  ;;TAB STOP
(1)  111042  005726                          TST     (SP)+               ;;POP SPACE OFF STACK.
(1)  111044  000726                          BR      2$                  ;;GET NEXT CHARACTER
(1)  111046  105777  000132          $TYPEC: TSTB    @$TPS               ;;WAIT UNTIL PRINTER IS READY
(1)  111052  100375                          BPL     $TYPEC
(1)  111054  105777  070606                  TSTB    @TKS                ;CHECK FOR XOFF
(1)  111060  100027                          BPL 2$                      ;BRANCH IF NO RECEIVE CHAR PRESENT
(1)  111062  117737  070624  111202          MOVB    @TKB,XOCHAR         ;READ AND SAVE TTY CHAR
(1)  111070  042737  177600  111202          BIC     #^C177,XOCHAR
(1)  111076  023727  111202  000023          CMP     XOCHAR,#023         ;IS CHAR A ^S
(1)  111104  001015                          BNE 2$                      ;BRANCH IF NO
(1)  111106  105777  070554          3$:     TSTB    @TKS                ;WAIT FOR XON
```

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   (1)  111112  100375                              BPL     3$
   (1)  111114  117737  070572  064776              MOVB    @TKB,RCHAR
   (1)  111122  042737  177600  064776              BIC     #^C177,RCHAR
   (1)  111130  023727  064776  000021              CMP     RCHAR,#021          ;IGNORE ALL CHARS EXCEPT ^Q
   (1)  111136  001363                              BNE     3$
   (1)  111140  116677  000002  000040  2$:         MOVB    2(SP),@$TPB         ;;LOAD CHAR TO BE TYPED INTO DATA REG.
   (1)  111146  122766  000015  000002              CMPB    #15,2(SP)           ;;BRANCH IF
   (1)  111154  001003                              BNE     1$                  ;;NOT <CR>
   (1)  111156  105037  111176                      CLRB    $CHARCNT            ;;
   (1)  111162  000406                              BR      $TYPEX              ;;EXIT
   (1)  111164  122766  000012  000002  1$:         CMPB    #12,2(SP)           ;;BRANCH IF
   (1)  111172  002002                              BGE     $TYPEX              ;;<LF>
   (1)  111174  105227                              INCB    (PC)+               ;;INC SPACE
   (1)  111176  000000                      $CHARCNT:.WORD  0                   ;;COUNT
   (1)  111200  000207                      $TYPEX: RTS     PC
   (1)  111202  000000                      XOCHAR: .WORD 0
   (1)                                      ;;      EQUATES
   (1)          000011                      THT=11
   (1)          000200                      TCRLF=200
   (1)
   (1)  111204  177564                      $TPS:   .WORD   177564              ;;TTY PRINTER STATUS REG. ADDRESS
   (1)  111206  177566                      $TPB:   .WORD   177566              ;;TTY PRINTER BUFFER REG. ADDRESS
   (1)  111210     000                      $NULL:  .BYTE   0                   ;;CONTAINS NULL CHARACTER FOR FILLS
   (1)  111211     002                      $FILLS: .BYTE   2                   ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
   (1)  111212     012                      $FILLC: .BYTE   12                  ;;INSERT FILL CHARS. AFTER A "LINE FEED"
   (1)  111213     000                      $TPFLG: .BYTE   0                   ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
                                            ;*******************************************************************
   (1)
   (1)                                      .SBTTL  TRAP DECODER
   (1)
   (1)                                      ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
   (1)                                      ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
   (1)                                      ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
   (1)                                      ;*GO TO THAT ROUTINE.
   (1)
   (1)  111214  010046                      $TRAP:  MOV     R0,-(SP)            ;;SAVE R0
   (1)  111216  016600  000002                      MOV     2(SP),R0            ;;GET TRAP ADDRESS
   (1)  111222  005740                              TST     -(R0)               ;;BACKUP BY 2
   (1)  111224  111000                              MOVB    (R0),R0             ;;GET RIGHT BYTE OF TRAP
   (1)  111226  006300                              ASL     R0                  ;;POSITION FOR INDEXING
   (1)  111230  016000  111236                      MOV     $TRPAD(R0),R0       ;;INDEX TO TABLE
   (1)  111234  000200                              RTS     R0                  ;;GO TO ROUTINE
   (1)
   (3)
   (3)                                      .SBTTL  TRAP TABLE
   (3)
   (3)                                      ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
   (3)                                      ;*BY THE "TRAP" INSTRUCTION.
   (3)
   (3)                                      ;       ROUTINE
   (3)                                      ;       -------
   (3)  111236                              $TRPAD:
   (3)  111236  110640                              $TYPE   ;;CALL=TYPE     TRAP+0(104400)  TTY TYPEOUT ROUTINE
   (3)  111240  110466                              $RDCHR  ;;CALL=RDCHR    TRAP+1(104401)  TTY TYPEIN CHARACTER ROUTINE
```

```
 (3)  111242  110522                          $RDLIN  ;;CALL=RDLIN     TRAP+2(104402)  TTY TYPEIN STRING ROUTINE
 (3)  111244  110300                          $RDDEC  ;;CALL=RDDEC     TRAP+3(104403)  READ A DECIMAL NUMBER FROM TTY
                                      ;*******************************************************************
 (1)
 (1)                                  .SBTTL  POWER DOWN AND UP ROUTINES
 (1)
 (1)                                  ;POWER DOWN ROUTINE
 (1)  111246  012737  111370  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
 (1)  111254  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
 (3)  111262  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 (3)  111264  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 (3)  111266  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 (3)  111270  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
 (3)  111272  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
 (3)  111274  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
 (1)  111276  010637  111374                  MOV     SP,$SAVR6       ;;SAVE SP
 (1)  111302  012737  111314  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
 (1)  111310  000000                          HALT
 (1)  111312  000776                          BR      .-2             ;;HANG UP
 (1)
 (1)                                  ;POWER UP ROUTINE
 (1)  111314  013706  111374          $PWRUP: MOV     $SAVR6,SP       ;;GET SP
 (1)  111320  005037  111374                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
 (1)  111324  005237  111374          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
 (1)  111330  001375                          BNE     1$              ;;OF  WORD
 (3)  111332  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
 (3)  111334  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
 (3)  111336  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
 (3)  111340  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
 (3)  111342  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
 (3)  111344  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 (1)  111346  012737  111246  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
 (1)  111354  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
 (1)  111362  104400                          TYPE                    ;REPORT THE POWER FAILURE
 (1)  111364  111376                  $PWRMG: .WORD   $POWER          ;;POWER FAIL MESSAGE POINTER
 (1)  111366  000002                          RTI
 (1)  111370  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
 (1)  111372  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
 (1)  111374  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
 (1)  111376  005015  047520  042527  $POWER: .ASCIZ  <15><12>"POWER"
 (1)  111404  000122
 (1)                                          .EVEN
                                      ;*************************************************************************
              000377                  FILL=377
              076130                  MOVCI=76130
                                      ;
                                      ;CIS STACK "PROBE AHEAD" MEMORY MANAGEMENT ABORT TESTS
                                      ;
                                      ;       NOTE: THESE THREE TESTS ARE FOR THE 11/44 ONLY
                                      ;       THEY ARE NOT TO BE RUN ON THE 11/23 OR 11/24 BECAUSE
                                      ;       THESE PROCESSORS TREAT PROBE AHEAD DIFFERENTLY - THEY
                                      ;       ONLY PROBE AHEAD SPECIFIC NUMBER OF WORDS NEEDED FOR
                                      ;       GIVEN INST.
                                      ;
```

```
                                         ;       THE NEXT THREE TESTS ARE AIMED AT TESTING THE KT
                                         ;       PAGE FAULT ROM (11/44 SCHEMATIC PAGE K1-8) AND ASSOCIATED LOGIC.
                                         ;
                                         ;       EACH OF THESE 3 TESTS SETUP THE STACK POINTER SUCH THAT
                                         ;       WHEN THE CIS PROCESSOR CHECKS TO SEE IF THERE IS ENOUGH
                                         ;       SPACE ON THE STACK (200 BYTES) THE ANSWER FOUND SHOULD BE
                                         ;       NO BECAUSE A PORTION OF THE STACK IS IN PROTECTED MEMORY.
                                         ;
                                         ;       EACH OF THESE 3 TESTS VERIFY THAT THE CIS INSTRUCTION ABORTS
                                         ;       UNDER SEVERAL CONDITIONS OF MEMORY MANAGEMENT PAGE PROTECTION.
                                         ;       ALL OF THE PAGE PROTECTION DATA IS LISTED IN TABLE 'PDRTAB'.
                                         ;


                                         ;SETUP PAR'S FOR DIRECT MAPPING
                                         ;
111406  005737  002156                   PROBAH: TST MMFLG               ;11/70 TYPE MEM MGMT?
111412  001002                                   BNE 4$                  ;BRANCH IF YES
111414  000137  053354                   5$:     JMP DONE                ;SKIP THESE MEM MGMT ABORT TESTS

111420  005737  002154                   4$:     TST PT34                ;IS THIS AN 11/34 TYPE PROCESSOR?
111424  001373                                   BNE 5$                  ;BRANCH IF YES
111426  005037  172516                           CLR @#MMR3              ;CLEAR OUT D-SPACE ENABLES
111432  010637  112556                           MOV SP,STK1             ;SAVE STACK POINTER

111436  012737  000000  172340                   MOV #0,@#KIPAR0         ;SETUP KERNEL I-SPACE PAR'S
111444  012737  000200  172342                   MOV #200,@#KIPAR1
111452  012737  000400  172344                   MOV #400,@#KIPAR2
111460  012737  000600  172346                   MOV #600,@#KIPAR3
111466  012737  001000  172350                   MOV #1000,@#KIPAR4
111474  012737  001200  172352                   MOV #1200,@#KIPAR5
111502  012737  001400  172354                   MOV #1400,@#KIPAR6
111510  012737  177600  172356                   MOV #177600,@#KIPAR7

111516  012737  000000  172240                   MOV #0,@#SIPAR0         ;SETUP SUPERVISOR I-SPACE PAR'S
111524  012737  000200  172242                   MOV #200,@#SIPAR1
111532  012737  000400  172244                   MOV #400,@#SIPAR2
111540  012737  000600  172246                   MOV #600,@#SIPAR3
111546  012737  001000  172250                   MOV #1000,@#SIPAR4
111554  012737  001200  172252                   MOV #1200,@#SIPAR5
111562  012737  001400  172254                   MOV #1400,@#SIPAR6
111570  012737  177600  172256                   MOV #177600,@#SIPAR7

111576  012737  000000  177640                   MOV #0,@#UIPAR0         ;SETUP USER I-SPACE PAR'S
111604  012737  000200  177642                   MOV #200,@#UIPAR1
111612  012737  000400  177644                   MOV #400,@#UIPAR2
111620  012737  000600  177646                   MOV #600,@#UIPAR3
111626  012737  001000  177650                   MOV #1000,@#UIPAR4
111634  012737  001200  177652                   MOV #1200,@#UIPAR5
111642  012737  001400  177654                   MOV #1400,@#UIPAR6
111650  012737  177600  177656                   MOV #177600,@#UIPAR7


                                         ;SETUP PDR'S FOR R/W ACCESS
```

```
                                ;
111656  012700  172300                  MOV #KIPDR0,R0
111662  012720  177406          1$:     MOV #177406,(R0)+
111666  020027  172316                  CMP R0,#KIPDR7
111672  101773                          BLOS 1$
111674  012700  172200                  MOV #SIPDR0,R0
111700  012720  177406          2$:     MOV #177406,(R0)+
111704  020027  172216                  CMP R0,#SIPDR7
111710  101773                          BLOS 2$
111712  012700  177600                  MOV #UIPDR0,R0
111716  012720  177406          3$:     MOV #177406,(R0)+
111722  020027  177616                  CMP R0,#UIPDR7
111726  101773                          BLOS 3$
```

```
                                ;*************************************************************************
                                .SBTTL  MEMORY MGMT ABORT TESTS
                                ;KERNEL MODE CIS STACK PROBE AHEAD MEM MGMT ABORT TESTS
                                ;

111730                          KMTSTS:
111730  005237  001120                  INC $TESTN                      ;UPDATE TEST NUMBER FOR APT
111734  012737  112434  000250          MOV #MMHDLR,@#MMVEC             ;SETUP MEM MGMT INTERRRUPT VECTOR
111742  012737  000340  000252          MOV #PR7,@#MMVEC+2
111750  012701  112040                  MOV #1$,R1                      ;SETUP INTR RETURN ADDRESS
111754  012700  112560                  MOV #PDRTAB,R0
111760  012706  060070          3$:     MOV #60070,SP

111764  011037  172304          2$:     MOV (R0),@#KIPDR2               ;PROTECT PART OF STACK
111770  012737  000001  177572          MOV #1,@#MMR0                   ;TURN ON MEMORY MGMT

111776  004737  112456                  JSR PC,SAVR                     ;SAVE REGISTERS

112002  076130                          MOVCI                           ;EXECUTE THE CIS INSTRUCTION
112004  112446                          SRC.PTR
112006  112452                          DST.PTR
112010  000377                          FILL
112012  000240                          NOP                             ;TO LOOP ON THIS TEST REPLACE
112014  000240                          NOP                             ;  THE TWO NOPS WITH A JMP TO 3$.
112016                                  PRINTB #NOABO                   ;PRINT  CIS INST FAILED TO ABORT
112016  012746  013561                  MOV     #NOABO,-(SP)
112022  010600                          MOV     SP,R0
112024  004737  065410                  JSR PC,FPRINT
112030  012737  000001  001116          MOV #1,$FATAL                   ;SET APT FATAL ERROR INDICATOR
112036  000000                          HALT                            ;CIS INSTRUCTION SHOULD HAVE ABORTED BUT DIDN'T

112040  004737  112510          1$:     JSR PC,RESR                     ;RESTORE REGISTERS
112044  062700  000002                  ADD #2,R0                       ;UPDATE PROTECTION SCHEME TO NEXT TABLE CASE
112050  005710                          TST (R0)                        ;ANY CASES LEFT TO TRY?
112052  001344                          BNE 2$                          ;BRANCH IF YES

112054  005037  177572                  CLR @#MMR0                      ;NO - PREPARE TO EXIT TEST
112060  012737  177406  172304          MOV #177406,@#KIPDR2            ;RESTORE R/W ACCESS TO STACK AREA
112066  000400                          BR SMTSTS                       ;GO TO NEXT TEST
```

```
                                        ;*************************************************************************

                                        ;SUPERVISOR MODE CIS STACK PROBEAHEAD MEMORY MGMT ABORT TESTS
                                        ;

112070                                  SMTSTS:
112070  005237  001120                          INC $TESTN                      ;UPDATE TEST NUMBER FOR APT
112074  012737  112434  000250                  MOV #MMHDLR,@#MMVEC             ;SETUP MEM MGMT INTERRRUPT VECTOR
112102  012737  040340  000252                  MOV #040340,@#MMVEC+2
112110  012701  112214                          MOV #1$,R1                      ;SETUP INTR RETURN ADDRESS
112114  012700  112560                          MOV #PDRTAB,R0
112120  012737  040340  177776                  MOV #040340,@#PSW               ;SWITCH TO SUPERVISOR MODE
112126  012706  060070                  3$:     MOV #60070,SP

112132  011037  172204                  2$:     MOV (R0),@#SIPDR2               ;PROTECT PART OF STACK
112136  012737  000001  177572                  MOV #1,@#MMR0                   ;TURN ON MEMORY MGMT

112144  004737  112456                          JSR PC,SAVR                     ;SAVE REGISTERS

112150  076130                                  MOVCI                           ;EXECUTE THE CIS INSTRUCTION
112152  112446                                  SRC.PTR
112154  112452                                  DST.PTR
112156  000377                                  FILL

112160  000240                                  NOP                             ;TO LOOP ON THIS TEST, REPLACE THE
112162  000240                                  NOP                             ;  TWO NOPS WITH A JMP TO 3$.
112164  012737  000340  177776                  MOV #340,@#PSW                  ;SWITCH BACK TO KERNEL MODE BEFORE HALT
112172                                          PRINTB #NOABO                   ;PRINT CIS INST FAILED TO ABORT
112172  012746  013561                          MOV     #NOABO,-(SP)
112176  010600                                  MOV     SP,R0
112200  004737  065410                          JSR PC,FPRINT
112204  012737  000001  001116                  MOV #1,$FATAL
112212  000000                                  HALT                            ;CIS INSTRUCTION SHOULD HAVE ABORTED BUT DIDN'T

112214  004737  112510                  1$:     JSR PC,RESR                     ;RESTOERE REGISTERS
112220  062700  000002                          ADD #2,R0                       ;UPDATE PROTECTION SCHEME TO NEXT TABLE CASE
112224  005710                                  TST (R0)                        ;ANY CASES LEFT TO TRY?
112226  001341                                  BNE 2$                          ;BRANCH IF YES

112230  005037  177572                          CLR @#MMR0                      ;NO - PREPARE TO EXIT TEST
112234  012737  177406  172204                  MOV #177406,@#SIPDR2            ;RESTORE R/W ACCESS TO STACK AREA
112242  000400                                  BR UMTSTS                       ;GO TO NEXT TEST
```

```
                                        ;*************************************************************************

                                        ;USER MODE CIS STACK PROBEAHEAD MEM MGMT ABORT TESTS
                                        ;

    112244                              UMTSTS:
    112244  005237  001120                      INC $TESTN                      ;UPDATE TEST NUMBER FOR APT
    112250  012737  112434  000250              MOV #MMHDLR,@#MMVEC             ;SETUP MEM MGMT INTERRRUPT VECTOR
    112256  012737  140340  000252              MOV #140340,@#MMVEC+2
    112264  012701  112370                      MOV #1$,R1                      ;SETUP INTR RETURN ADDRESS
    112270  012700  112560                      MOV #PDRTAB,R0
    112274  012737  140340  177776              MOV #140340,@#PSW               ;SWITCH TO USER MODE
    112302  012706  060070              3$:     MOV #60070,SP

    112306  011037  177604              2$:     MOV (R0),@#UIPDR2               ;PROTECT PART OF STACK
    112312  012737  000001  177572              MOV #1,@#MMR0                   ;TURN ON MEMORY MGMT

    112320  004737  112456                      JSR PC,SAVR                     ;SAVE REGISTERS

    112324  076130                              MOVCI                           ;EXECUTE THE CIS INSTRUCTION
    112326  112446                              SRC.PTR
    112330  112452                              DST.PTR
    112332  000377                              FILL

    112334  000240                              NOP                             ;TO LOOP ON THIS TEST REPLACE THE
    112336  000240                              NOP                             ;  TWO NOPS WITH A JMP TO 3$.
    112340  012737  000340  177776              MOV #340,@#PSW                  ;SWITCH BACK TO KERNEL MODE BEFORE HALT
    112346                                      PRINTB #NOABO                   ;PRINT CIS INST FAILED TO ABORT
(6) 112346  012746  013561                      MOV     #NOABO,-(SP)
(3) 112352  010600                              MOV     SP,R0
(4) 112354  004737  065410                      JSR PC,FPRINT
    112360  012737  000001  001116              MOV #1,$FATAL                   ;SET APT FATAL ERROR INDICATOR
    112366  000000                              HALT                            ;CIS INSTRUCTION SHOULD HAVE ABORTED BUT DIDN'T

    112370  004737  112510              1$:     JSR PC,RESR                     ;RESTORE REGISTERS
    112374  062700  000002                      ADD #2,R0                       ;UPDATE PROTECTION SCHEME TO NEXT TABLE CASE
    112400  005710                              TST (R0)                        ;ANY CASES LEFT TO TRY?
    112402  001341                              BNE 2$                          ;BRANCH IF YES

    112404  005037  177572                      CLR @#MMR0                      ;NO - PREPARE TO EXIT TEST
    112410  012737  177406  177604              MOV #177406,@#UIPDR2            ;RESTORE R/W ACCESS TO STACK AREA
    112416  012737  000000  177776              MOV #0,@#PSW            ;SWITCH BACK TO KERNEL MODE
    112424  013706  112556                      MOV STK1,SP             ;RESTORE NORMAL STACK POINTER
    112430  000137  053354                      JMP DONE
```

```
                                        ;MEMORY MANAGEMENT TRAP HANDLER
                                        ;
112434                                  MMHDLR:
112434  005037  177572                          CLR @#MMR0                      ;TURN OFF MEM MGMT
112440  005726                                  TST (SP)+                       ;FIX UP STACK
112442  005726                                  TST (SP)+
112444  000111                                  JMP (R1)                        ;RETURN VIA R1

                                        ;CIS INSTRUCTION SOURCE AND DESTINATION DESCRIPTORS
                                        ;
112446  000001                          SRC.PTR:        .WORD 1
112450  076000                                          .WORD 76000
112452  000001                          DST.PTR:        .WORD 1
112454  076001                                          .WORD 76001

                                        ;SUBROUTINES
                                        ;
112456  010037  112542                  SAVR:   MOV R0,SVR0                     ;SAVE REGISTERS
112462  010137  112544                          MOV R1,SVR1
112466  010237  112546                          MOV R2,SVR2
112472  010337  112550                          MOV R3,SVR3
112476  010437  112552                          MOV R4,SVR4
112502  010537  112554                          MOV R5,SVR5
112506  000207                                  RTS PC

112510  013700  112542                  RESR:   MOV SVR0,R0                     ;RESTORE REGISTERS
112514  013701  112544                          MOV SVR1,R1
112520  013702  112546                          MOV SVR2,R2
112524  013703  112550                          MOV SVR3,R3
112530  013704  112552                          MOV SVR4,R4
112534  013705  112554                          MOV SVR5,R5
112540  000207                                  RTS PC

112542  000000                          SVR0:   .WORD 0
112544  000000                          SVR1:   .WORD 0
112546  000000                          SVR2:   .WORD 0
112550  000000                          SVR3:   .WORD 0
112552  000000                          SVR4:   .WORD 0
112554  000000                          SVR5:   .WORD 0

112556  000000                          STK1:   .WORD 0

                                        ;PROTECTION TABLE  (WORD FORMAT = PDR FORMAT)
112560                                  PDRTAB:
112560  177000                                  177000          ;ACF=00         ED=0  PLF=176
112562  177410                                  177410          ;ACF=00         ED=1  PLF=177
112564  177400                                  177400          ;ACF=00         ED=0  PLF=177
112566  100010                                  100010          ;ACF=00         ED=1  PLF=0

112570  177002                                  177002          ;ACF=01         ED=0  PLF=176
112572  177412                                  177412          ;ACF=01         ED=1  PLF=177
112574  177402                                  177402          ;ACF=01         ED=0  PLF=177
```

```
112576  100012                    100012          ;ACF=01         ED=1  PLF=0

112600  177004                    177004          ;ACF=10         ED=0  PLF=176
112602  177414                    177414          ;ACF=10         ED=1  PLF=177
112604  177404                    177404          ;ACF=10         ED=0  PLF=177
112606  100014                    100014          ;ACF=10         ED=1  PLF=0

112610  177006                    177006          ;ACF=11         ED=0  PLF=176
112612  177416                    177416          ;ACF=11         ED=1  PLF=177
112614  000000                    0



        120000            .=120000
                          .SBTTL          CIS INST EXECUTION STACK
                          ;CIS INSTRUCTION EXECUTION STACK
                          ;
120000  000200                    .BLKW ^D128
120400  111111            PRECSK: .WORD 111111
120402  000100                    .BLKW ^D64
120602                    CSTACK:                         ;NOTE THIS STACK AREA IS INITIALIZED TO
                                                          ;    055555 PRIOR TO EACH TEST.
120602  111111            PSTCSK: .WORD 111111
120604  000000            SAVKCC: .WORD 0
                          .SBTTL          TRANSLATION TABLES FOR MOVTC
                          ;TRANSLATION TABLES FOR MOVTC
                          ;
120606  000400            XLTBL1: .BLKB ^D256
121206                    ELTBL:


                                  .EVEN
        000001            .END
```

```
AADDN    007554           8160#    15058
AADDP    007660           8168#    15114
AASHN    007637           8166#    15100
AASHP    007741           8174#    15156
ABASE =  000000           6405
ABUFO    011446           8202#    14299
ACASZ    067664          10969     14932#
ACCOCT   065102          10803     10808    10813    14387    14391    14410#
ACCSEE   016111           8271#    10802
ACDW1 =  000000           6405
ACDW2 =  000000           6405
ACINST   002462           6779#    10970    14908    14912    14915    14932*   14933*   14934*   14935    14947
ACMPC    007534           8158#    15046
ACMPN    007574           8162#    15072
ACMPP    007700           8170#    15128
ACOUT    011334           8196#    14273    14288
ACPUOP=  000000           6405
ACVTLN   007647           8167#    15107
ACVTLP   007751           8175#    15163
ACVTNL   007604           8163#    15079
ACVTNP   007626           8165#    15093
ACVTPL   007710           8171#    15135
ACVTPN   007615           8164#    15086
ADDHDR   013755           8229#    14314
ADDW0 =  000000           6405
ADDW1 =  000000           6405
ADDW10=  000000           6405
ADDW11=  000000           6405
ADDW12=  000000           6405
ADDW13=  000000           6405
ADDW14=  000000           6405
ADDW15=  000000           6405
ADDW2 =  000000           6405
ADDW3 =  000000           6405
ADDW4 =  000000           6405
ADDW5 =  000000           6405
ADDW6 =  000000           6405
ADDW7 =  000000           6405
ADDW8 =  000000           6405
ADDW9 =  000000           6405
ADEVCT=  000000           6405
ADEVM =  000000           6405
ADIQ     040272          10904     10914    10933#
ADIVP    007731           8173#    15149
ADJEOP   046152          11978     11984    11989    12000#
ADJI     050344          12308     12324#
ADJR     051264          12309     12314    12318    12322    12329    12458#
AEADR    002174           6660#    12399*   14299
AEDTA    002176           6661#    12401*   14299
AENV  =  000000           6405
AENVM =  000000           6405
AFATAL=  000000           6405
ALOCC    007472           8154#    15022
AL2D     007762           8176#    15170
```

```
AL3D     007774          8177#   15176
AMADR1= 000000           6405
AMADR2= 000000           6405
AMADR3= 000000           6405
AMADR4= 000000           6405
AMAMS1= 000000           6405
AMAMS2= 000000           6405
AMAMS3= 000000           6405
AMAMS4= 000000           6405
AMATCH   007544          8159#   15052
AMOVC    007440          8151#   15004
AMOVRC   007450          8152#   15010
AMOVTC   007461          8153#   15016
AMSGAD= 000000           6405
AMSGLG= 000000           6405
AMSGTY= 000000           6405
AMTYP1= 000000           6405
AMTYP2= 000000           6405
AMTYP3= 000000           6405
AMTYP4= 000000           6405
AMULP    007721          8172#   15142
ANIB     067536         14874*   14875    14879#
APASS  = 000000          6405
APRIOR= 000000           6405
APTCSU= 000040           6406#   20690
APTENV= 000001           6406#   20690
APTSIZ= 000200           6406#   10765    10774
APTSPO= 000100           6406#   20690
ARMQ     040336         10886    10888    10889    10921    10927    10931    10936    10938    10939    10946#
ASCANC   007512          8156#   15034
ASK      012412          8214#   10968
ASKDI    013217          8221#   10933
ASKINT   012721          8218#   10884
ASKMM    012613          8217#   10958
ASKMOD   012527          8216#   10955
ASKPC    007502          8155#   15028
ASKRM    012461          8215#   10946
ASKSRC   013104          8220#   10891
ASKST    013034          8219#   12229
ASPANC   007523          8157#   15040
AST      013703          8227#   14311
ASUBN    007564          8161#   15065
ASUBP    007670          8169#   15121
ASWREG= 000000           6405
ASZINS   004450          7309#   14905
ATESTN= 000000           6405
AUNIT  = 000000          6405
AUSWR  = 000000          6405
AVECT1= 000000           6405
AVECT2= 000000           6405
A3X      043160         11468    11486#
BAD      002226          6673#   14317    14467*
BIT0   = 000001          6356#
BIT00  = 000001          6356#
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BIT01 = 000002          6356#
BIT02 = 000004          6356#
BIT03 = 000010          6356#
BIT04 = 000020          6356#
BIT05 = 000040          6356#
BIT06 = 000100          6356#
BIT07 = 000200          6356#
BIT08 = 000400          6356#
BIT09 = 001000          6356#
BIT1  = 000002          6356#
BIT10 = 002000          6356#
BIT11 = 004000          6356#
BIT12 = 010000          6356#
BIT13 = 020000          6356#
BIT14 = 040000          6356#
BIT15 = 100000          6356#
BIT2  = 000004          6356#
BIT3  = 000010          6356#
BIT4  = 000020          6356#
BIT5  = 000040          6356#
BIT6  = 000100          6356#
BIT7  = 000200          6356#
BIT8  = 000400          6356#
BIT9  = 001000          6356#
BPTVEC= 000014          6356#
BS    = 000010          6565#
BSNULL= 177777   G      6370#   7551    7552    7553    7554    7555    7556    7557    7664    7665    7696    7697    7717
                        7718
BS0   = 170000   G      6359#   7732
BS00  = 100000   G      6360#
BS128 = 177740   G      6367#   7624    7631    7645    7656    7680    7683    7685    7704    7707    7729    7733    11923
                        14077
BS16  = 177400   G      6364#
BS2   = 174000   G      6361#   7520    7522    7523    7539    7541    7569    7570    7584    7585    7594    7606    7607
                        7647    7658
BS256 = 177760   G      6368#
BS32  = 177600   G      6365#
BS4   = 176000   G      6362#   7521    7540    7605    7626    7706    7731    14110
BS512 = 177770   G      6369#
BS64  = 177700   G      6366#
BS8   = 177000   G      6363#   7604    7682
BUFCK   050546          12356   12358#
BUFERR  050722          12383   12396#
BUFSR1  003041          6787    6856#
BUFSR2  003102          6789    6858#
BY    = 177400   G      6371#   7531    7550    7576    7591    7592    7615    7666    7715
CACHVE= 000114          6356#
CCCK    050370          12306   12313   12317   12321   12323   12328   12332#
CCREC   004016          7120#   14959
CFINL   052600          12504   12531   12539   12587   12653   12684   12690#
CISERR  051026          12406   12408   12410   12412   12418#
CISQ    012007          8206#   13528
CKUREG  055172          12282   13183#
COMST   037320          10771   10782#  10791   12872
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CONTRL= 177746              6356#
CONVN   067506             14828    14834    14854    14858    14870#
CPUERR= 177766              6356#
CR    = 000015              6356#    6562#    8203     8227     8259     8260     8261     8263     8268     8269     8270     8273     8278
                            8279     8280     8281     8288     8293     8294     8295     8296     8297
CRLF  = 000200              6356#   14521
CSCC    050046             12265    12267#
CSTACK  120602             12155    12156    13799    13802    13835    13838    20985#
CTACT   001762              6589#   14196*   15191    15217*
CTLC    042040             11249#   11257
DASH    016477              8285#   12441
DBLK    066336             14635    14656    14664#
DDISP = 177570              6356#    6575
DECINS  002440              6767#   11047*   11271*   11367    11498    11549    12492
DECPRT  067164             14736    14749    14762    14777    14791    14804#
DECTTB  004264              7215     7217#
DECTYP  004262              7215#   11143
DECZO   022230              8844     8851     8899     8926#
DEN     002162              6654#   10840*   10965*   13215    13323*   13327*   13332*   13335    13397    13426    13450    13473    13506
                           13533    13549    15207
DENS    001746              6583#   10763*   10773*   10818*   10862
DESTBU  003162              6878     6879#
DI      061174             10835*   10940*   13745#
DIC     061152             13632    13742#
DIGTBL  067542             14829    14835    14855    14859    14885#
DISPLA  001740              6575#   10765*   10774*   11203*
DISPRE  000174              6384#   10765    10774
DIVDD   003156              6877#   13636    13940
DIVDS   003152              6875#   13634    13635    13938    13939
DIVPI = 076175   G          6358#   13633    13937
DN      066776             14725    14729    14764#
DONE    053354             12811    12827#   20728    20903
DSCPIR= 152525   G          6382#    7638     7663     7695     7698     7716     7719     7742    14101
DSTYP0  043474             11532    11548#
DSTYP1  043540             11534    11561#
DSTYP2  043576             11536    11571#
DSTYP3  043676             11538    11592#
DSTYP4  044574             11545    11747#   11918
DSTYP5  045642             11546    11916#
DST.PT  112452             20802    20842    20884    20920#
DSWR  = 177570              6356#    6574
DTBL    066326             14637    14660#
DVTST   037154              6386    10752    10772#   11251    12454    12889
EADAD   024242              9209     9256#
EADAD1  024250              9252     9255     9257#
EADDN   023412              8445     9153#
EADDP   023402              8461     9151#   10303    10379    10579
EADIT   024526              9290     9309#
EADSB1  023740              9202     9205#
EADSUB  023472              9152     9154     9159     9161     9164#
EADSUM  025104              9146*    9257*    9380#
EAIS    024206              9219     9245     9250#
EANEG   025056              9206*    9253*    9282     9369#
EAODD   025114              9164*    9172*    9182     9227     9296     9384#
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EASH    030722     9909    9911    9913#
EASHN   030716     8451    9912#
EASHP   030642     8467    9902#   10367   10394   10425   10517   10526   10543   10557   10586   10606
EASHR   031064     9929    9945#
EBACK   017764     8492#
EBADR   001646     6522#   11950   12006   12061   12090   12361   12386   12471
EBIS    024224     9246    9253#
EBLEN   001650     6523#
EBNEG   025060     9207*   9250*   9286    9370#
EBODD   025116     9165*   9175*   9198    9238    9302    9385#
EBUFO   011411     8201#   14298
ECARRY  025066     9129    9131    9136*   9140*   9145*   9264*   9317    9373#   9466*   9480    9916*   9970*   9972*
                   9984    9988*   9990*   10135   10144*
ECCR    003724     7083#   11997   12158   12332*  12336*  12338   14270   14960   14961
ECHAR   064760     13561   14369   14373#  14374   14437   14458   14946   14950
ECMOUT  020660     8638#   8651    8657    8659    8665
ECMP    032320     10156   10158   10161#
ECMPC   020600     8443    8622#
ECMPN   032314     8447    10159#
ECMPP   032240     8463    10149#  10434   10443
ECNSD   032514     10198#
ECODD   025120     9166*   9178*   9331    9342    9386#
ECOUN   027530     9654*   9656*   9658    9660    9663*   9744#
ECRID   031540     10042#
ECVT    025204     9423    9425#
ECVTLN  025170     8452    9422#
ECVTLP  025176     8468    9424#
ECVTNL  026766     8448    9627#
ECVTNP  030144     8450    9815#
ECVTPL  026774     8464    9629#
ECVTPN  027532     8449    9747#
EC05    042614     11390   11398   11403   11405#
EC11    046132     11977   11983   11988   11991#
EDCAD   023256     9128#   9309    9476    9486
EDCOPA  025070     9128    9270*   9273*   9284*   9285*   9374#   9427*   9474*   9484*   9751*   9759*   9763    9819*
                   9827*   9831
EDCOPB  025072     9128*   9133*   9135*   9137    9139*   9141    9143*   9144*   9146    9278*   9281*   9288*   9289*
                   9311    9314    9375#   9428*   9475*   9477    9485*   9487    9752*   9766*   9773    9820*   9834*
                   9841
EDETSN  031360     9934    9976    10004#  10146
EDID    036054     10546   10550   10595   10598#
EDIVL   035534     10552#  10593
EDIVP   035142     8466    10496#
EFILL   020020     8495    8500    8503#   8506
EFILLZ  032152     10003   10130#  10145
EFILZ   031354     9955    9959    9978    10003#
EFINDA  025074     8793*   8794*   8795*   8796*   8797    9011*   9012*   9013    9376#
EFINDT  021414     8783    8787#   9765    9780
EFLO    027526     9630*   9669*   9676*   9681*   9687*   9690*   9695*   9708*   9710    9743#
EFMSD   030554     9757    9825    9882#
EFNDTZ  021616     8781    8828#   9833    9848
EFORWD  020004     8491    8498#
EGS1S   032774     10228   10239   10258#
EGS2S   033026     10233   10241   10265#
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EGTOPA  024442          9272     9293#
EGTOPB  024474          9280     9301#
EINST   017354          8343*    8352     8374#
EINSTR  046136         11129*   11994#   20624*   20675*
EIRSTK  017356          8344*    8358     8375#
EIRT2   034224         10285    10418#   10499
EISP    033450         10325    10336#
EISTG   045740          6759    11559    11569    11590    11700    11745    11898    11904    11908    11912    11914    11940#
ELISTA  017404          8348     8354     8386#
ELISTB  017530          8355     8428#
ELOCC   021246          8439     8725#
ELSD    025130          8807     8830     8832     8840*    8841     8859*    8862     9015     9055     9063     9181*    9197*    9226*
                        9237*    9297*    9305*    9332*    9337*    9390#    9494*    9522*    9641*    9657*    9764*    9774*    9779*
                        9796*    9832*    9842*    9847*    9868*    9886*    9937*    9962*    9981*    9993*   10012*   10026*   10038*
                       10057*   10063*   10066*   10067*   10102*   10136*   10171*   10186*   10210*   10216*   10260*   10267*   10315*
                       10348*   14810*   14824*   14837
ELS1M   033072         10165*   10177*   10206    10277#
ELS2M   033074         10166*   10192*   10207    10278#
ELTBL   121206         10984    20993#
EL2     036222         10629#   10648    10652    10656    10661    10666
EL2D0   036216          8428    10628#
EL2D1   036322          8429    10646#
EL2D2   036330          8430    10650#
EL2D3   036336          8431    10654#
EL2D4   036344          8432    10658#
EL2D5   036360          8433    10663#
EL2D6   036374          8434    10668#
EL2D7   036440          8435    10679#
EL2324  001710          6556#   13039
EL3     036504         10691#   10704    10708    10712    10716    10720
EL3D0   036500          8453    10690#
EL3D1   036554          8454    10702#
EL3D2   036562          8455    10706#
EL3D3   036570          8456    10710#
EL3D4   036576          8457    10714#
EL3D5   036604          8458    10718#
EL3D6   036612          8459    10722#
EL3D7   036672          8460    10736#
EL44    001706          6555#   13060
EL74    001704          6554#   13041
EMADR   002200          6662#   12400*   14298
EMASK   025106          9028*    9035*    9036     9381#
EMATOT  020664          8640#    8692
EMDTA   002202          6663#   12402*   14298
EMID    034022         10334    10346    10386#
EMOUT   011146          8193#   14269
EMOVC   017652          8436     8471#
EMOVRC  020356          8437     8574#
EMOVTC  020074          8438     8519#
EMPTR   002142          6645#   11031*   11232*   12817*   14198    14262
EMRBKD  020472          8595#
EMRFIL  020520          8598     8602     8605#
EMRFWD  020510          8594     8601#    8604
EMSDP   030636          9784     9802     9852     9862     9883*    9894*    9898#
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EMS2D     035056        10343*  10345*  10349   10475#
EMTBCK    020206         8540#
EMTCHC    021002         8444    8668#
EMTFIL    020302         8543    8551    8557#   8560
EMTFRD    020246         8539    8549#
EMTVEC= 000030           6356#
EMULAT    017144         8335#  11993
EMULP     033100         8465   10283#
EMVBR     035130        10284*  10369*  10370*  10381*  10395   10488#
ENCC      032144         9913*  10126#
ENDA      020712         8629    8648#   8655
ENDAD     053424         6397   10828   10992   12852#
ENDB      020752         8631    8658#   8663
ENDP      015575         8263#  12839
ENDQP     015665         8268#  12835
ENOA      025064         9266*   9269*   9276    9372#
ENULL     026316         9489*   9504*   9532    9552#   9634*   9664*   9749*   9771*   9787    9802    9817*   9839*   9855
                         9862
ENZI      032146         9316*   9330*   9345    9914*  10043*  10073*  10081   10127#
EODD      025112         8790    9008    9038    9157*   9160*   9182*   9198*   9227*   9238*   9296*   9302*   9331*   9342*
                         9383#   9425*   9432*   9631*   9637*   9753*   9756*   9821*   9824*   9939*   9964*   9982*   9994*
                        10013*  10028*  10039*  10058*  10101*  10137*  10172*  10187*  10211*  10217*  10261*  10268*  10310*
                        10312*  10339*  10341*  10342   10344*  14806*  14809*  14825*
EODDD     032140         9904*   9910*  10058   10124#
EODDS     032136         9903*   9907*   9964    9982   10013   10028   10123#
EODDS1    033066        10150*  10154*  10172   10211   10261   10275#
EODDS2    033070        10151*  10157*  10187   10217   10268   10276#
EOPA      025046         9220*   9232*   9244    9365#
EOPB      025050         9221*   9243*   9244    9366#
EOPSW     017362         8346*   8377#   8515*   8569*   8618*   8633*   8650*   8653*   8661*   8691*   8753*   9344*   9349*
                         9351*   9354*   9531*   9536*   9538*   9541*   9709*   9712*   9717*   9729*   9730    9734*   9750*
                         9761*   9789*   9793*   9801*   9804*   9818*   9829*   9857*   9861*   9864*   9872*  10080*  10083*
                        10087*  10110*  10199*  10246*  10248*  10302*  10366*  10378*  10393*  10395*  10409   10424*  10433*
                        10442*  10536   10568   10605*  10609*  10610*  10643*
EORSTK    017360         8345*   8376#   8485*   8489*   8507    8533*   8537*   8561    8588*   8592*   8610    8640    8745
                         9355    9542    9735    9805    9873   10111   10249   10301*  10365*  10377*  10392*  10398   10408
                        10423*  10432*  10441*  10604*  10635
EOT     = 125252  G      6375#   7532    7559    7577    7599    7616    7639    7652    7667    7699    7720    7743   14099
EPAK      026322         8779    8996    9151*   9153*   9155*   9162*   9422*   9424*   9554#   9627*   9629*   9747*   9816*
                         9902*   9912*   9919   10045   10059   10097   10149*  10159*  14702*  14712*  14724*  14728*  14821
EPMID     033446        10288   10291   10334#
EPOPS     026320         9495*   9496*   9507    9553#
EPOSD     035526        10537   10549#
EPOSS1    035366        10529#  10545
EPSW    = 177776         8331#   8515    8569    8618    8633    8650    8653    8661    8691    8753
EPUDTZ    022716         8998    9049#   9775    9798
EPUSH     022440         8996#   9333    9343    9506    9527    9530    9940    9995   10040   10070   10138
EPUTDT    022462         9000    9004#   9843    9869
EPZE      027726         9767    9777#
EPZ1      027612         9755    9757#   9776
ERMDON    064540        14302   14325   14327#
ERN       003670         7061#  11995   12003
ERNR      003706         7072#  11996   12097   12134   12470
EROUT     017352         8356*   8362    8373#
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ERRBUF   002150          6648#   12301*  12396*  12409   14296
ERRCC    002144          6646#   12299*  12340*  12404   14286   14291
ERRCT    002054          6618#   10839*  12419*  12438   14353*
ERRREG   002146          6647#   12300*  12357*  12407   14271
ERRS     002056          6619#   12403*  12423*  12436
ERRSTK   002152          6649#   11218*  12292*  12411
ERRVEC=  000004          6356#   10825*  10826*  13099*  13102*  13105*  13127*
ERSAV    034142         10283    10408#  10496
ERSNEG   025062          8809*    8816*   8884*   8888*   8936*   8938*   8946*   8952*   8966*   8970*   9020*   9022    9071*
                         9075     9096    9113    9187    9191    9201    9251*   9254*   9256*   9258    9336*   9340*   9347
                         9371#    9490*   9529*   9534    9645    9782    9794*   9799    9850    9867*   9870   10020*  10034*
                        10085    10229   10234   10240   10242   10317   14842
ERT1     034420         10364    10374   10449#  10534
ERT2     034442         10372    10376   10387   10422   10450#  10582   10585   10591*  10596*  10599
ERT3     034464         10451#   10516   10518*  10530   10539   10542   10553   10556   10562   10574
ERT4     034506         10452#   10525   10527*  10532   10564   10566   10576   10578
ERT5     034530         10453#
ER0      003670          7062#   11963*  14268   14767
ER0R     003706          7073#   12115   12122*  12343   14270   14275
ER1      003672          7063#   11964*  14268   14768
ER1R     003710          7074#   12116   12123*  12345   14270
ER2      003674          7064#   11965*  14268   14772
ER2R     003712          7075#   12117   12124*  12347   14270
ER3      003676          7065#   11966*  14268   14773
ER3R     003714          7076#   12118   12125*  12349   14270
ER4      003700          7066#   11967*  14268   14775
ER4R     003716          7077#   12119   12126*  12351   14270
ER5      003702          7067#   11968*  14268   14776
ER5R     003720          7078#   12120   12127*  12353   14270
ER6      003704          7068#   11969*
ER6R     003722          7079#   12155*  12355   14270
ESBTD    035670         10569    10573#
ESCC     031730         10075    10079#
ESCF     026330          9429*    9449*   9509    9520    9557#
ESCNC    021170          8441     8710#
ESDC     030640          9882*    9891*   9894    9899#
ESEED    001744          6582#   10751*  10800   10819*
ESGN     032142         10125#
ESGNA    025076          9377#
ESGNB    025100          9378#
ESGNC    025102          9379#
ESISRC   031214          9932     9971    9974#  10001
ESKPC    021300          8440     8736#
ESLSD    025122          8830*    8859    9387#
ESNK     021372          8779#    9183    9199    9231    9242    9298    9306    9643    9662    9890    9965    9983   10014
                        10029    10064   10103   10173   10188   10212   10218   10262   10269   10316   10350   14833   14839
ESOPSW   034572         10393    10409*  10457#  10605   10609
ESOSTK   034570         10392    10408*  10456#  10604
ESPNC    021112          8442     8695#
ESPND    021326          8699     8707    8714    8722    8729    8733    8740    8744#
ESPOS    035054         10336*   10362   10383*  10474#  10498*  10544*  10549   10592*
ESR0     034574         10297    10410*  10430   10458#  10511   10617
ESR1     034576         10298    10411*  10431   10459#  10512   10615
ESR2     034600         10308    10314   10315   10337   10343   10348   10412*  10439   10460#  10520
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ESR3     034602     10313   10347   10413*  10440   10461#  10521
ESR4     034604     10390   10414*  10462#  10602
ESR5     034606     10391   10415*  10463#  10603
ESS1SN   035136     10491#  10504*  10594
ESS2SN   035134     10490#  10509*  10594
ESTORE   0173[illegible]      8335*   8336*   8337*   8338*   8339*   8340*   8363    8364    8365    8366    8367    8368    8372#
ESUBCT   035140     10492#  10559*  10570*  10587*  10588*  10589*  10590*  10591
ESUBF    025124      9156*   9163*   9185    9362*   9388#
ESUBN    023460      8446    9162#
ESUBP    023420      8462    9155#  10535   10567
ES1      025052      9184*   9189*   9208    9251    9256    9367#   9644*   9647*   9706    9719    9732    9781*   9786*
                     9791    9794    9849*   9854*   9859    9867
ES1D     033060     10213*  10219   10272#
ES1NSD   033062     10181*  10200   10203   10223   10273#
ES2      025054      9200*   9203*   9208    9254    9368#
ES2NSD   033064     10196*  10200   10274#
ETLSD    033076      9926*   9937    9993   10037   10038   10102   10136   10279#
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                     9073    9088    9091    9104    9110    9120   10121#
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ETNZI    032150      9915*   9998*  10016   10128#  10142*
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                    10442   10464#  10501   10503*  10504   10506   10508*  10509
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ETSTS2   034350     10289   10437#  10505
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                    10047   10051   10094   10133
EVRTAD   025416      9463    9466#
EVTABA   026334      9469    9559#
EVTPAS   026326      9265*   9310*   9313    9320*   9321    9456*   9457    9464*   9468    9556#
EVTSGN   026324      9439*   9442*   9490    9555#
EVTSSV   026332      9205*   9313*   9321*   9338    9352    9426*   9473*   9483*   9539    9558#   9748*   9768*   9771
                     9815*   9836*   9839
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EVTXT    025666      9511    9513    9517#
EVXTBP   035126     10295*  10300   10306   10324   10329   10330*  10357*  10358*  10359*  10361   10487#
EVXTVB   035124     10296*  10305*  10331*  10354*  10355*  10356*  10370   10486#
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EXMD     034110     10398#  10607
EXT      024560      9277    9316#
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EXZD     036140     10547   10609#
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EZDBEG   036212     10615*  10623#  12389
EZDEND   036214     10617*  10618*  10619*  10624#  12391   12392
EZDF     036210      8341*  10497*  10612*  10622#  12333   12341   14693
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E01     026531      9560    9591#
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                    9215    9237    9239    9274*   9304    9434    9752    9774    9795    9796    9808    9820    9822
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E27      026720         9586     9617#
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                        10603*   10634*   10639    10655    10675*   10685*   10696*   10711    10729*   10742*
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E30      026753         9589     9620#
E4       017374         8382#    8505     8512     8559     8566     8608     8615     8645     8652     8654     8660     8662     8704
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E5       017376         8383#    8513     8546     8554     8567     8616     8646     8702     8717     8751     9325     9341     9361
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E6       017400         8360     8384#    10642    10669    10676*   10723    10733*
E6XT     034744         10470#   10481
E7XT     034766         10471#   10482
E8XT     035010         10472#   10483
E9XT     035032         10324    10473#   10484
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FC13     050226         6480     12296#
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FC15     054234         6482     13020#
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FILLS2   002274         6692#    11215*   11472    11478*   14295*
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FORM12   011016            8190#  15110   15166
FORM13   011174            8194#  14268
FORM14   011254            8195#  14270
FORM15   011362            8197#  14279
FORM16   011371            8198#  14281
FORM17   011375            8199#  14289
FORM18   011405            8200#  14293
FORM19   013716            8228#  14317
FORM2    010066            8180#  15019
FORM20   014041            8230#  14318
FORM21   014074            8231#  14197   15214   15216
FORM22   014077            8232#  14733
FORM23   014114            8233#  14746   14757
FORM24   014132            8234#  14744   14759
FORM25   014150            8235#  14764
FORM26   014173            8236#  14778
FORM27   014216            8237#  14816
FORM3    010154            8181#  15025   15031
FORM30   014222            8238#  15190
FORM31   014252            8239#  15189
FORM32   014256            8240#  14847
FORM33   014276            8241#  14860
FORM34   014302            8242#  14844
FORM35   014307            8243#  14846
FORM36   014314            8244#  11058   12428
FORM37   014376            8245#  12438
FORM38   014415            8246#  13209
FORM39   014474            8247#  13210
FORM4    010222            8182#  15037   15043
FORM40   014567            8248#  15193
FORM41   014647            8250#  15173   15179
FORM42   014745            8251#  13624   13930
FORM43   015034            8252#  13625   13931
FORM44   015115            8253#  13673
FORM45   015170            8254#  13674
FORM46   015247            8255#  13675
FORM47   015320            8256#  13707
FORM48   015401            8257#  13696
FORM49   015457            8258#  13697
FORM5    010276            8183#  15049
FORM6    010362            8184#  15055
FORM7    010434            8185#  15061   15068   15117   15124   15145   15152
FORM8    010530            8186#  15075   15131
FORM9    010606            8187#  15082   15138
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HERE     053440          12846    12863#
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KDPAR4= 172370           6356#   13266*
KDPAR5= 172372           6356#   13267*
KDPAR6= 172374           6356#   13268*
KDPAR7= 172376           6356#   13269*
KDPDR0= 172320           6356#   13366    13413*
KDPDR1= 172322           6356#   13485*
KDPDR2= 172324           6356#
KDPDR3= 172326           6356#
KDPDR4= 172330           6356#
KDPDR5= 172332           6356#   13408*
KDPDR6= 172334           6356#
KDPDR7= 172336           6356#   13368    13406*
KERSTK= 001100           6356#
KHALT   001672           6549#   12056    12142    12143    12144    12145    12146    20673    20674    20678
KIPAR0= 172340           6356#   13100    13280*   20735*
KIPAR1= 172342           6356#   13281*   20736*
KIPAR2= 172344           6356#   13282*   20737*
KIPAR3= 172346           6356#   13283*   20738*
KIPAR4= 172350           6356#   13284*   20739*
KIPAR5= 172352           6356#   13285*   20740*
KIPAR6= 172354           6356#   13286*   20741*
KIPAR7= 172356           6356#   13287*   20742*
KIPDR0= 172300           6356#   13376    13392*   13394*   20766
KIPDR1= 172302           6356#   13389*
KIPDR2= 172304           6356#   13388*   20795*   20816*
KIPDR3= 172306           6356#   13386*
KIPDR4= 172310           6356#   13385*
KIPDR5= 172312           6356#   13400*
KIPDR6= 172314           6356#
KIPDR7= 172316           6356#   13378    13383*   20768
KMTSTS  111730          20787#
KNOP    001670           6548#   10940    10982    14351    14364
KNOP1   002550           6811#   13865
KNOP2   002552           6812#   13899
KNOP3   002554           6813#
KNOP4   003034           6846#   13993
KRNCON  063620          10865    14248#
KRP1    063622          10866    14249#
KRP2    063624          10867    14250#
KSORU   057462          10956    13556#
KSP    =000006           6356#
KW11L   013620           8226#   10877
LATCT   002542           6808#   13600*   13719*   13722    13734    13737
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LATEN    002544     6809#   10842*  13642   13888*
LATEND   004174     7180#   13891
LATEXC   012254     8212#   13727
LCNT     003030     6844#   10841*  12239   13972*  13975*
LDCOD    041270    11098    11104   11109   11123#
LDCON    063210    11071    14140#
LDINPT   062776    11070    14093#
LERMD    064544    14308    14328#
LF     = 000012     6356#    6563#   8203    8227    8259    8260    8261    8263    8268    8269    8270    8273    8278
                    8279     8280    8281    8288    8293    8294    8295    8296    8297
LIMSTG   001772     6593#
LKS      003026     6843#   12241*  13918*  13954*  13955*  13958*  13970*  13971*  13974*  13990   13991*
LOADRS=  177740     6356#
LODT     064312    14297    14300#  14313
LSUPR    062272    13953    13958#
LTCCNT   062312    10880    10920   13968#
LTCDLY   003036     6847#   13054*  13071*  13125*  13975
LTCINT   062340    13969    13974#
LTCIP    003024     6842#   13157*  13172*
LTCIS    062044    13082*   13914#  13959   13976
LTCIV    003022     6841#   13953*  13959*  13969*  13976*
LTCP     062366    10873    10917   13984#
LTCSUP   062250    10879    10919   12240   13952#
LTSTOP   047170    12025    12139   12148#
MADDN    006244     7195     7675#
MADDP    006244     7203     7674#
MAINT  = 177750     6356#
MAPH0  = 170202     6356#
MAPH00=  170202     6356#
MAPH01=  170206     6356#
MAPH02=  170212     6356#
MAPH03=  170216     6356#
MAPH04=  170222     6356#
MAPH05=  170226     6356#
MAPH06=  170232     6356#
MAPH07=  170236     6356#
MAPH1  = 170206     6356#
MAPH10=  170242     6356#
MAPH11=  170246     6356#
MAPH12=  170252     6356#
MAPH13=  170256     6356#
MAPH14=  170262     6356#
MAPH15=  170266     6356#
MAPH16=  170272     6356#
MAPH17=  170276     6356#
MAPH2  = 170212     6356#
MAPH20=  170302     6356#
MAPH21=  170306     6356#
MAPH22=  170312     6356#
MAPH23=  170316     6356#
MAPH24=  170320     6356#
MAPH25=  170326     6356#
MAPH26=  170332     6356#
MAPH27=  170336     6356#
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MAPH3 = 170216          6356#
MAPH30= 170342          6356#
MAPH31= 170346          6356#
MAPH32= 170352          6356#
MAPH33= 170356          6356#
MAPH34= 170362          6356#
MAPH35= 170366          6356#
MAPH36= 170372          6356#
MAPH37= 170376          6356#
MAPH4 = 170222          6356#
MAPH5 = 170226          6356#
MAPH6 = 170232          6356#
MAPH7 = 170236          6356#
MAPL0 = 170200          6356#
MAPL00= 170200          6356#
MAPL01= 170204          6356#
MAPL02= 170210          6356#
MAPL03= 170214          6356#
MAPL04= 170220          6356#
MAPL05= 170224          6356#
MAPL06= 170230          6356#
MAPL07= 170234          6356#
MAPL1 = 170204          6356#
MAPL10= 170240          6356#
MAPL11= 170244          6356#
MAPL12= 170250          6356#
MAPL13= 170254          6356#
MAPL14= 170260          6356#
MAPL15= 170264          6356#
MAPL16= 170270          6356#
MAPL17= 170274          6356#
MAPL2 = 170210          6356#
MAPL20= 170300          6356#
MAPL21= 170304          6356#
MAPL22= 170310          6356#
MAPL23= 170314          6356#
MAPL24= 170320          6356#
MAPL25= 170324          6356#
MAPL26= 170330          6356#
MAPL27= 170334          6356#
MAPL3 = 170214          6356#
MAPL30= 170340          6356#
MAPL31= 170344          6356#
MAPL32= 170350          6356#
MAPL33= 170354          6356#
MAPL34= 170360          6356#
MAPL35= 170364          6356#
MAPL36= 170370          6356#
MAPL37= 170374          6356#
MAPL4 = 170220          6356#
MAPL5 = 170224          6356#
MAPL6 = 170230          6356#
MAPL7 = 170234          6356#
MASHN   006316          7201      7728#
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MASHP   006316           7209    7727#
MAXIVL  002562           6816#  13652
MCMPC   006070           7193    7517#
MCMPN   006272           7197    7702#
MCMPP   006272           7205    7703#
MCVTLN  006214           7202    7643#
MCVTLP  006214           7210    7642#
MCVTNL  006226           7198    7656#
MCVTNP  006200           7200    7623#
MCVTPL  006226           7206    7655#
MCVTPN  006200           7199    7624#
MDIVP   006244           7208    7679#
MEMERR= 177744           6356#
MFPT  = 000007           6566#  13038
MINST   004176           7185#  14096
MIXDPZ  052262          12502   12629#
MIXDZP  052426          12505   12659#
MIXTYP  002452           6772#  12525   12557   12579   12630   12646   12660   12677
MLOCC   006140           7189    7566#
MMFLG   002156           6651#  10967*  12176   13047*  13066*  13073*  13121*  13228   13328   13645   13943   20726
MMHDLR  112434          20789   20828   20870   20908#
MMOVC   006070           7186    7516#
MMOVRC  006070           7187    7518#
MMOVTC  006104           7188    7537#
MMR0  = 177572           6356#  12253*  12266*  13499*  13517*  13545*  13595*  13604*  13647*  13914   13916*  13945*  20796*
                        20815*  20836*  20857*  20878*  20899*  20909*
MMR1  = 177574           6356#
MMR2  = 177576           6356#
MMR3  = 172516           6356#  13234*  13334*  13339*  13343*  13345*  20732*
MMSTAT  002210           6666#  13917*  13945
MMTCHC  006164           7194    7602#
MMULP   006244           7207    7678#
MMVEL = 000250           6356#  10823*  10824*  20789*  20790*  20828*  20829*  20870*  20871*
MMVIOL  057364          10823   13545#
MMVMSG  012112           8207#  13548
MNOLTC  040242          10918   10929#
MNOPC1  040242          10900   10909   10925   10930#
MNOPC2  040260          10903   10912   10932#
MODE    002160           6652#  12171   12200   12208   12212   12362   13215   13309*  13322*  13337   13341   13390   13395
                        13419   13443   13475   13477   13483   13487   13506   13533   13549   13569*  13571*  13573*  15195
                        15199
MOVCI = 076130          20700#  20800   20840   20882
MP0100= 000100   G       6378#
MP0140= 000140   G       6379#
MP020 = 000020   G       6376#
MP0200= 002000   G       6380#   7542    7684
MP0220= 022000   G       6383#   7558
MP0400= 004000   G       6373#   7633    7708    7734
MP0404= 004040   G       6381#   7686
MP0600= 006000   G       6372#
MP070 = 000070   G       6377#
MPT232  017031           8296#  13095
MPT34   016675           8293#  13119
MPT44   016760           8294#  13065
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MPT74   017002     8295#  13046
MSCANC  006150     7191    7581#
MSEED   002076     6627#  10860*  11054
MSKPC   006140     7190    7567#
MSPANC  006150     7192    7582#
MSUBN   006244     7196    7677#
MSUBP   006244     7204    7676#
MTCH    067656    14921   14925#
MTYPE   042032    11037*  11080*  11245#  11315   12703
NBLKS   002100     6628#  14811*  14813
NDESC   002456     6777#  11048*  11146*  12534   12541   12546   12589   12596   12609
NEGTAB  002334     6708#  11652
NEGTB1  002346     6718#  11650
NFS     053560    12866   12889#
NITE    040706    10990   11037#  12786   12823   12888
NMM     017064     8297#  13077
NMODES  002164     6655#  13049*  13067*  13087*  13120*  13306   13316
NOABO   013561     8225#  20806   20848   20890
NOCTC   042062    11250   11258#
NOER    051060    1[illegible]5   12424#
NOERDS  002042    [illegible]13#  10847*  12235*  12414   14175*  14180*  14188*  14324*
NOINT   013401     8223#  10882   10930
NOLAT   013330     8222#  10932
NOMTCH  067662    14907   14926#
NONOP   046274    12021   12023   12025#
NOPROG  012206     8211#  13658
NOSCHG  061600    13843   13845#
NOTREG  001702     6553#  13149   13150   13151   13152   13153   13154   13164   13165   13166   13167   13168   13169
                  13189   13191   13193   13195   13197   13199   13210
NST     036774    10763#
NTC     041324    11133#  12700   12753   12779
NTCTS   041602    11166   11185   11189#  12553
NXFLD   002232     6675#  12042*  12062*  12091*  12129*  12976*  12977   12981   12985   12989   13000*  13001   13005
                  13009   13013
NXTC    042620    11351   11384   11407#  19762   19833   20405   20481
NXTTC   052654    11334   11412   12503   12691   12697   12701#
N200M   001750     6584#  10754*  12869
OCNT    066120    14547*  14548*  14549   14574*  14592*  14597#  14606*  14620*
OCTIC   002276     6693#  11124*  11140   11443   13731   14957
OINST   003726     7088#  11128   14084
OMODE   066121    14577*  14586*  14598#  14609*  14614*
ONEBEY  002436     6766#  11765*  11807   11812   11827   11838   11847   11852
ONEINS  002470     6782#  10834*  10975*  11067   12810
OPENTB  025154     9102    9406#
OPEPTB  025142     9098    9395#
PACKED  051456    12497   12507#
PAT0    001720     6567#  12105   12122
PAT1    001722     6568#  12106   12123
PAT2    001724     6569#  12107   12124
PAT3    001726     6570#  12108   12125
PAT4    001730     6571#  12109   12126
PAT5    001732     6572#  12110   12127
PBIN    066124    14527   14606#
PBO     003142     6862#  14317   14468*
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PB1      003143          6863#  14317
PB2      003144          6864#  14317  14469*
PB3      003145          6865#  14317
PB4      003146          6866#  14318  14470*
PB5      003147          6867#  143"8
PB6      003150          6868#  143 3  14471*
PB7      003151          6869#  14318
PC     =%000007          6356#   6406*   8351*   8362*   8369*   8516*   8570*   8619*   8647*   8754*   8781*   8783*   8784*
                         8820*   8844*   8851*   8860*   8899*   8940*   8949*   8955*   8969*   8971*   8998*   9000*   9001*
                         9046*   9062*   9147*   9183*   9199*   9231*   9242*   9272*   9280*   9290*   9298*   9299*   9306*
                         9307*   9309*   9315*   9333*   9343*   9363*   9463*   9476*   9482*   9486*   9506*   9527*   9530*
                         9549*   9643*   9662*   9742*   9757*   9765*   9775*   9780*   9798*   9812*   9825*   9833*   9843*
                         9848*   9869*   9880*   9890*   9896*   9940*   9965*   9983*   9995*  10014*  10029*  10040*  10064*
                        10070*  10103*  10118*  10138*  10173*  10188*  10212*  10218*  10228*  10233*  10239*  10241*  10256*
                        10262*  10263*  10269*  10270*  10283*  10285*  10286*  10289*  10303*  10316*  10350*  10367*  10379*
                        10394*  10405*  10416*  10425*  10426*  10434*  10435*  10443*  10444*  10496*  10499*  10500*  10505*
                        10517*  10526*  10535*  10543*  10557*  10567*  10579*  10586*  10606*  10620*  10644*  10789*  10802*
                        10803*  10808*  10813*  10827*  10856*  10873*  10877*  10879*  10880*  10882*  10884*  10885*  10891*
                        10892*  10899*  10901*  10908*  10911*  10917*  10919*  10920*  10924*  10930*  10932*  10933*  10935*
                        10946*  10947*  10955*  10956*  10958*  10959*  10968*  10969*  10972*  11034*  11051*  11058*  11069*
                        11070*  11071*  11131*  11133*  11169*  11172*  11176*  11179*  11183*  11186*  11204*  11213*  11256*
                        11262*  11264*  11268*  11317*  11319*  11323*  11325*  11342*  11345*  11362*  11364*  11374*  11391*
                        11394*  11400*  11418*  11419*  11452*  11454*  11457*  11461*  11469*  11470*  11480*  11492*  11495*
                        11647*  11656*  11678*  11773*  11788*  11811*  11820*  11835*  11846*  11851*  11877*  11900*  11922*
                        11928*  11931*  11935*  11939*  11974*  11978*  11979*  11984*  11985*  11989*  11993*  12007*  12026*
                        12043*  12063*  12092*  12130*  12166*  12169*  12178*  12229*  12240*  12282*  12289*  12291*  12302*
                        12309*  12310*  12314*  12315*  12318*  12319*  12322*  12325*  12329*  12337*  12428*  12438*  12440*
                        12441*  12442*  12473*  12694*  12821*  12852*  12912*  12920*  12924*  12926*  12934*  12937*  12939*
                        12948*  12951*  12953*  12960*  12963*  12965*  12971*  12979*  12983*  12987*  12991*  12994*  13003*
                        13007*  13011*  13015*  13018*  13025*  13128*  13175*  13205*  13206*  13208*  13209*  13210*  13215*
                        13216*  13289*  13311*  13324*  13346*  13492*  13505*  13506*  13528*  13532*  13533*  13548*  13549*
                        13561*  13575*  13608*  13615*  13616*  13621*  13623*  13624*  13625*  13631*  13632*  13640*  13655*
                        13657*  13658*  13670*  13672*  13673*  13674*  13675*  13682*  13687*  13693*  13695*  13696*  13697*
                        13700*  13704*  13706*  13707*  13724*  13726*  13727*  13738*  13745*  13748*  13765*  13778*  13806*
                        13845*  13874*  13908*  13919*  13923*  13927*  13929*  13930*  13931*  13942*  13962*  13979*  14002*
                        14012*  14018*  14025*  14032*  14038*  14044*  14050*  14056*  14064*  14076*  14087*  14108*  14118*
                        14136*  14141*  14143*  14145*  14171*  14191*  14197*  14198*  14199*  14205*  14211*  14216*  14220*
                        14244*  14262*  14265*  14267*  14268*  14269*  14270*  14273*  14279*  14281*  14288*  14289*  14293*
                        14294*  14298*  14299*  14305*  14312*  14314*  14315*  14317*  14318*  14328*  14369*  14371*  14376*
                        14387*  14388*  14391*  14392*  14405*  14421*  14435*  14437*  14458*  14474*  14511*  14527*  14535*
                        14561*  14567*  14595*  14623*  14659*  14695*  14698*  14701*  14705*  14708*  14711*  14715*  14718*
                        14721*  14725*  14729*  14730*  14733*  14736*  14737*  14744*  14746*  14749*  14750*  14757*  14759*
                        14762*  14763*  14764*  14777*  14778*  14791*  14792*  14816*  14833*  14839*  14844*  14846*  14847*
                        14860*  14862*  14875*  14926*  14940*  14950*  14951*  14965*  15004*  15005*  15007*  15008*  15010*
                        15011*  15013*  15014*  15016*  15017*  15019*  15020*  15022*  15023*  15025*  15026*  15028*  15029*
                        15031*  15032*  15034*  15035*  15037*  15038*  15040*  15041*  15043*  15044*  15046*  15047*  15049*
                        15050*  15052*  15053*  15055*  15056*  15058*  15059*  15061*  15063*  15065*  15066*  15068*  15070*
                        15072*  15073*  15075*  15077*  15079*  15080*  15082*  15084*  15086*  15087*  15089*  15091*  15093*
                        15094*  15096*  15098*  15100*  15101*  15103*  15105*  15107*  15108*  15110*  15112*  15114*  15115*
                        15117*  15119*  15121*  15122*  15124*  15126*  15128*  15129*  15131*  15133*  15135*  15136*  15138*
                        15140*  15142*  15143*  15145*  15147*  15149*  15150*  15152*  15154*  15156*  15157*  15159*  15161*
                        15163*  15164*  15166*  15168*  15170*  15171*  15173*  15174*  15176*  15177*  15179*  15180*  15189*
                        15190*  15193*  15206*  15214*  15216*  15218*  19459*  19465*  19472*  19479*  19489*  19500*  19503*
                        19516*  19523*  19531*  19537*  19544*  19551*  19561*  19572*  19575*  19586*  19594*  19713*  19724*
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                            19741*  19760*  19779*  19791*  19804*  19816*  19831*  19994*  20002*  20005*  20076*  20086*  20093*
                            20199*  20207*  20215*  20377*  20387*  20403*  20436*  20444*  20455*  20469*  20476*  20625*  20676*
                            20690*  20798*  20806*  20810*  20838*  20848*  20852*  20880*  20890*  20894*  20931*  20939*
PCIS1     060134            13080*  13081*  13604#  13858
PCIS2     060110            13078*  13079*  13595#  13893
PCIS3     060100            13589#  13744
PCLK1P    002516             6797#  13156*  13171*
PCLK1V    002514             6796#  13638*  13742   13744*  13858*  13893*
PCLK2V    002526             6801#
PC1CK     061602            10899   10908   10924   13848#
PC1CSB    002522             6799#  13641*  13681*  13711*  13862*
PC1CSR    002520             6798#  10910*  10926*  12249*  13592*  13607*  13637*  13648*  13746*  13856   13859*  13860*
PC1CTR    002524             6800#
PC2CK     061716            10901   10911   13882#
PC2CSB    002532             6803#  13602*  13898*
PC2CSR    002530             6802#  10913*  12247*  13601*  13644*  13887   13894*  13896*
PC2CTR    002534             6804#  13600
PDEC      066216            14535   14630#
PDRTAB    112560            20792   20831   20873   20951#
PF1       053570            11262   11317   11323   11342   11362   11452   11469   11492   12897#  13025
PF2       053642            11495   12914#
PIRQ   =  177772             6356#
PIRQVE=   000240             6356#
PKPTW     002454             6776#  11046*  11145*  12507   12513   12519   12527*  12529   12533*  12536   12538*  12543   12550
                            12559*  12560*  12561   12565   12572   12581   12583*  12591   12598   12602*  12603   12613   12617*
                            12618   12622*  12623   12629*  12632   12634*  12635   12639   12648   12650*  12655   12659*  12662
                            12666*  12667   12671   12679   12681*  12686
PMASK     001764             6590#  14098*  14099   14101   14106   14115   14119
PNAME     016621             8288#  10833
POCT      066020            14511   14567   14574#
POSTAB    002360             6728#  11665
POSTB1    002372             6738#  11659
POSTB2    002404             6748#  11663
PRECSK    120400            11216*  11219   12285   13639*  13743   13936   13941*  20983#
PREINS    047772            10982*  12245   12248   12250#  14345*  14351*  14364*
PRNIB     066346            14294   14693#
PRNTIQ    071676            15005   15011   15017   15023   15029   15035   15041   15047   15053   15059   15066   15073   15080
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                            15177   15185#
PROBAH    111406            12825   20726#
PROGCT    002540             6807#  12222*  13618*  13662
PROGD     002044             6614#  11056   12812   14184*
PRTSGN    002304             6696#   8958   14804*  14861*
PR0    =  000000             6356#
PR1    =  000040             6356#
PR2    =  000100             6356#
PR3    =  000140             6356#
PR4    =  000200             6356#
PR5    =  000240             6356#
PR6    =  000300             6356#
PR7    =  000340             6356#  20790
PS     =  177776             6356#
PSEED     001654             6525#  10857
PSTCSK    120602            11217*  11220   12287   20987#
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PTP      001566      6491#   11100   11106   12709   12910   12918
PTPTR    002136      6643#   11266   11321   11325   11348   11371   11463   11482   11494   11504   11510   12911*  12919*
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PTP01    001570      6493#   11083   11114
PTP02    001572      6494#
PTP03    001574      6495#
PTP04    001576      6496#
PTP05    001600      6497#
PTP06    001602      6498#
PTP07    001604      6499#
PTP10    001606      6500#
PTP11    001610      6501#
PTP12    001612      6502#
PTP13    001614      6503#   20074   20084   20197   20205
PTP14    001616      6504#   19457   19463   19529   19535   19584   19592   19992   20000   20375   20385   20433   20442
PTP15    001620      6505#
PTP16    001622      6506#
PTP17    001624      6507#
PTP20    001626      6508#   19705   19711   19722   19733   19739   19747   19757   19771   19777   19798   19802   19810
                    19814    19820   19828
PTP21    001630      6509#
PTP22    001632      6510#
PTP23    001634      6511#
PTP24    001636      6512#   11086   11120
PTQV     002212      6667#   12805   13051*  13069*  13123*
PTW1     002130      6640#   12715*  12717*  12718   12720   12730*  12731*  12732   12735*  12736*  12738*  12739   12766
PTYPLO   045254      6761    11841#
PTYPLS   045300      6763    11850#
PTYPSZ   045244      6758    11837#
PTYPTA   002416      6758#   11802
PTYPIO   045106      6760    11805#
PTYPTS   045264      6762    11845#
PTYP3P   044066     11594    11631#
PT34     002154      6650#   13124*  13231   13330   13352   13519   20730
PWRVEC=  000024      6356#   10765*  10774*  20692*
PZCODE   002472      6783#   11045*  14699   14703   14706   14709   14713   14716   14719   14722   14726   14765   14770
                    14779    14784   15062*  15069*  15076*  15083*  15090*  15097*  15104*  15111*  15118*  15125*  15132*
                    15139*   15146*  15153*  15160*  15167*
QDISP    011477      8203#   14304
QRYFLG   002204      6664#   12420*  14176*  14189*  14301
QUES     015552      8259#   14395   14454
QVHDR    016032      8270#   10997
QVMODE   002206      6665#   10757*  10772*  10994   12802   12832   12867   12871*
QVST     036766      6387    10757#  12873
RANDOM   001760      6588#   10846*  10952*  11049   11165   11193   11378   11421   11441   12426   12488   12692   12784
                    12885*   13304   13466   14917
RANDSC   002510      6791#   14104
RANDTA   001770      6592#   11544*  11771   11786   11818   11875   11897   11917*
RANGE    065000     14312    14386#  14396
RCHAR    064776     13559*   13560*  13562   13564   13566   14160*  14165*  14166*  14167   14169   14173   14178   14182
                    14186    14336*  14337   14339*  14340*  14341   14343   14349   14356   14358   14360   14362   14375
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RDDEC  = 104403          12231   20691#
RDLIN  = 104402          20688   20691#
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RECLAT   061040          13615   13687   13719#
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REDTC    001424           6416#  10980*  11329*
REGCK    050442          12339   12341#
REGERR   050540          12344   12346   12348   12350   12352   12354   12357#
REGOP    047124          12024   12141#
REGSET   002052           6617#  13159*  13174*  13186   13209   15193
RESPTP   053110          12749   12755#  12774
RESR     112510          20810   20852   20894   20933#
RESVEC=  000010           6356#  10784*  10785*  10820*  10822*  13035*  13037*  13126*
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RFNITE   053174          12705   12761   12783#
RFNX     054032          12092   12130   12973#
RF1      053666          11391   11974   12302   12325   12922#  13003
RF1X     053700          12026   12924   12928#  12979
RF2      053720          11394   11979   12310   12936#  13007
RF2X     053732          12937   12941#  12983
RF3      053754          11364   11400   11454   11470   11985   12315   12950#  13011
RF3X     053766          11268   12951   12955#  12987
RF4      054004          11264   11319   11345   11374   11457   12319   12962#  13015
RF4X     054016          12963   12967#  12991
RGPR06   061264          13640   13682   13700   13770#  13942
RLL      002222           6671#  14390*  14397*  14398   14401*  14464   14466   14472*
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                         14141   14143   14205   14216   14228#
RNCON    063612          10807*  10865*  11058   14009   14015   14021*  14028   14035*  14041   14047*  14053   14059*  14231*
                         14234   14245#
RNIB     001774           6594#  11927*  11930
RPTFLG   002272           6691#  12087   12413*  14352*
RPTYPE   063464          11169   11176   11183   14204#
RP1      063614          10812*  10866*  11058   14010   14016   14023*  14030   14036*  14042   14048*  14054   14060*  14229
                         14236*  14243   14246#
RP2      063616          10817*  10867*  11058   14011   14017   14024*  14031   14037*  14043   14049*  14055   14062*  14235
                         14239   14242*  14247#
RRNGSV   062712          11418   14058#
RRNGSW   062642          11133   14046#
RRNGSX   062522          11480   14020#
RRNGSY   062572          11213   14034#
RTBLEN   001644           6521#  11380   11423
RTC      041660          11206#  12443
RTSUPV   064534          14309   14326#
RUL      002224           6672#  14398*  14400*  14402*  14403*  14464
RZTYPE   063512          11172   11179   11186   14215#  14219
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                          8562    8563*   8564*   8565*   8566*   8567*   8574*   8575*   8583    8603    8610*   8611    8612*
                          8613*   8614*   8615*   8616*   8622*   8623*   8628    8639*   8641    8658    8668*   8669*   8677
                          8689*   8690    8695*   8696*   8698    8710*   8711*   8713    8725*   8726    8727*   8728    8736*
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                                10056*  10065*  10089*  10091   10094*  10133*  10167*  10182*  10208*  10214*  10258*  10265*  10313*
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                                11661   11679   11789   11821   11878   11901   11905   11909   11923*  11924   11926*  11927   11929*
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                                20933*
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                                8526    8530    8557    8576*   8577*   8590    8597    8601    8603*   8624*   8625*   8630    8638*
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                                8721*   8726*   8728    8730    8732*   8737*   8739    8741    8743*   8744    8747    8788    8789*
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                                8898*   8905*   8909    8926    9005    9006*   9010*   9011    9029    9041*   9044*   9050    9051*
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19746*  19747*  19748   19749*  19750*  19753*  19754*  19755   19756*  19757*  19758   19767*  19768*
19769*  19770*  19771*  19772   19773*  19774*  19775*  19776*  19777*  19778   19781*  19782*  19783*
19784*  19785   19786*  19787*  19788*  19789*  19790   19796*  19797*  19798*  19799   19800*  19801*
19802*  19803   19808*  19809*  19810*  19811   19812*  19813*  19814*  19815   19818*  19819*  19820*
19821   19822*  19823*  19825*  19826   19827*  19828*  19829   19990*  19991*  19992*  19993   19998*
19999*  20000*  20001   20070*  20071*  20072*  20073*  20074*  20075   20080*  20081*  20082*  20083*
20084*  20085   20088*  20089*  20090*  20091*  20092   20195*  20196*  20197*  20198   20203*  20204*
20205*  20206   20209*  20210*  20211   20371*  20372*  20373*  20374*  20375*  20376   20381*  20382*
20383*  20384*  20385*  20386   20396*  20397*  20400*  20401*  20402   20429*  20431*  20433*  20434
20440*  20441*  20442*  20443   20452*  20453*  20454   20461*  20464*  20465   20467*  20468   20616*
20617*  20618*  20619   20620*  20621   20622*  20623   20688*  20692*  20791*  20830*  20872*  20912
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                        20926   20934*
R10     =%000000         6356#
R11     =%000001         6356#
R12     =%000002         6356#
R13     =%000003         6356#
R14     =%000004         6356#
R15     =%000005         6356#
R2      =%000002         6356#   8337    8365*   8478*   8482*   8487*   8488*   8494    8498    8503    8505*   8526*   8530*
                         8535*   8536*   8542    8549    8557    8559*   8581*   8585*   8590*   8591*   8593    8596    8601
                         8606    8626*   8628    8632    8634    8637*   8639    8642    8658    8660    8662    8664*   8672*
                         8674    8677    8679    8684*   8686*   8689    8703*   8704    8718*   8719    8745*   8746*   8747*
                         8748*   8749*   8750*   8751*   8800*   8802*   8803    8806*   8810    8812    8817*   8821*   8822*
                         8823*   8824*   8855*   8856*   8879*   8880    8881*   8882    8885*   8889*   8900*   8928*   8929
                         8930*   8931    8933*   8934    8939*   8941    8943*   8944    8947*   8948*   8950    8953*   8954*
                         8956    8962*   8963*   8964    8967*   8968*   9007    9014*   9019*   9024*   9026*   9027    9045*
                         9052    9053*   9054*   9058    9061*   9077*   9079*   9082*   9083*   9084*   9085*   9086    9094*
                         9095*   9098*   9099    9102*   9232    9243    9273    9281    9327*   9328    9355*   9356*   9357*
                         9358*   9359*   9360*   9361*   9434*   9440    9444*   9447    9454*   9455*   9460*   9500*   9503*
                         9504    9526*   9542*   9543*   9544*   9545*   9546*   9547*   9548*   9664    9691    9758*   9769
                         9805*   9806*   9807*   9808*   9809*   9810*   9811*   9826*   9837    9873*   9874*   9875*   9876*
                         9877*   9878*   9879*   9892    9938*   9967*   9968    9984*   9985    9987*   9996*   10030   10071
                        10104   10111*  10112*  10113*  10114*  10115*  10116*  10117*  10135*  10140   10174   10189   10213
                        10219   10249*  10250*  10251*  10252*  10253*  10254*  10255*  10351   10353*  10354   10357   10398*
                        10401*  10402*  10403*  10404*  10629*  10630   10631   10632*  10633   10634   10670*  10671   10672
                        10673*  10674   10675   10691*  10692   10693   10694*  10695   10696   10697*  10698   10699   10724*
                        10725   10726   10727*  10728   10729   10730*  10731   10732   10981*  10985*  10986   11083*  11084*
                        11086   11114*  11115*  11116   11118*  11119*  11120   11267*  11282*  11294*  11306*  11371*  11372*
                        11376*  11380   11382   11428*  11431   11432   11613*  11614*  11615   11625*  11626*  11627*  11628
                        11650*  11652*  11653*  11654   11659*  11663*  11665*  11800*  11801*  11802*  11803   11950*  11951*
                        12028*  12030*  12031*  12032   12033*  12037*  12039*  12047*  12048*  12050*  12052   12053*  12054
                        12056*  12060*  12072*  12075*  12078*  12081*  12083*  12133*  12135*  12136   12191*  12192   12271
                        12361*  12373*  12381   12386*  12389   12391*  12394   12398*  12400   12402   12722*  12723*  12724
                        12734*  12742*  12746*  12747*  12748   12768*  12769   12773   13151*  13166*  13193   13210   13755
                        13773*  13801*  13803*  13837*  13839   14093*  14104*  14116*  14120*  14122*  14123   14275*  14276
                        14484   14487*  14488   14490   14492   14494   14496   14498   14500   14502   14504   14508*  14509*
                        14513*  14514   14516   14518   14524*  14525*  14529*  14530*  14531   14533*  14537*  14539*  14544*
                        14545*  14546*  14549*  14552*  14559*  14563*  14564*  14575*  14576*  14577   14607*  14608*  14609
                        14633   14636*  14640*  14643*  14648   14653*  14812*  14813*  14815*  14817*  14827*  14848*  14849*
                        14850*  14851*  14852*  14853*  14856*  14857*  14873   19482*  19483*  19484   19494*  19495*  19496
                        19498   19511*  19512*  19513   19519*  19520*  19521   19554*  19555*  19556   19566*  19567*  19568
                        19570   19751*  19752*  19753   19824*  19825   20398*  20399*  20400   20462*  20463*  20464   20615*
                        20616   20619*  20621*  20623*  20662*  20663*  20664*  20665   20666*  20667   20670*  20671   20688*
                        20692*  20927   20935*
R3      =%000003         6356#   8338    8366*   8483*   8484*   8485    8492*   8496    8498*   8501*   8531*   8532*   8533
                         8540*   8544    8549*   8555*   8586*   8587*   8588    8595*   8599    8605*   8606    8608*   8627*
                         8630    8632    8634    8636*   8638    8644    8648    8652    8654    8656*   8673*   8675    8679
                         8681*   8687*   9210*   9213*   9216    9217    9263*   9314*   9319*   9322*   9327    9435*   9443*
                         9445    9452*   9461*   9632*   9667*   9670    9674*   9679*   9685*   9688*   9693*   9699    9704
                         9715    9721*   9726*   9727    9738    9917*   9918*   9946*   9948*   9949*   9952*   9953    9956
                         9958    9961    9977    9980    9999*   10055*  10067   10069   10161*  10162*  10165   10168   10169
                        10176*  10177   10180   10206*  10209   10222*  10223   12034*  12037   12040*  12061*  12073*  12076*
                        12079*  12082*  12084*  12090*  12098*  12100*  12101*  12193*  12194   12272   12708*  12709*  12748
                        12751*  12756*  12757*  12773   12775   12778*  13152*  13167*  13195   13210   13756   13774*  14483
                        14510*  14526*  14534*  14558*  14565*  14566*  14579*  14581*  14582*  14583*  14584   14611*  14638*
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                        14642*  14653   14805*  14831   20689*  20692*  20928   20936*
R4      =%000004         6356#   8339    8367*   8493*   8494    8496*   8541*   8542    8547*   8596*   8597    8599*   8640*
                         8641*   8642*   8643*   8644*   8645*   8646*   8674*   8682*   8684    8686    9214*   9216*   9218
                         9222    9225    9247*   9468*   9469*   9470    9471    9472*   9473    9478*   9491*   9493*   9501
                         9503    9505*   9633*   9666*   9671    9673*   9678*   9682*   9691*   9702    9713    9722*   9724*
                         9739    9921*   9923*   9924*   9925*   9926    9927*   9933    9936    9941*   9975    9992   10000*
                        10047*  10051*  10052*  10056   10090*  10091*  10093*  10106   10131   10134   10143*  10163*  10164*
                        10166   10183   10184   10191*  10192   10195   10207*  10215   10226*  11275*  11276*  11277*  11278*
                        11279*  11280*  11281*  11282   11287*  11288*  11289*  11290*  11291*  11292*  11293*  11294   11299*
                        11300*  11301*  11302*  11303*  11304*  11305*  11306   12195*  12196   12273   12732*  12733*  12742
                        12751   12766*  12767*  12771*  12775*  12776   12778   13153*  13168*  13197   13210   13757   13775*
                        14482   14557*  14578*  14584*  14585*  14588*  14589*  14590   14610*  14612*  14613*  14616*  14617*
                        14618   14634*  14637   14649   14650   20692*  20929   20937*
R5      =%000005         6356#   8340    8368*   9215*   9217*   9233    9236    9248*   9928*   9930    9942*  10179*  10180*
                        10181   10194*  10195*  10196   10240*  10242   11462*  11481*  11503*  11509*  11518   11521   11526
                        11940*  12197*  12198   12274   13154*  13169*  13199   13210   13758   13776*  14481   14556*  14635*
                        14648*  14655*  14828*  14834*  14854*  14858*  14872   14877*  20692*  20930   20938*
R6      =%000006         6356#
R7      =%000007         6356#
SAVKCC   120604         12264*  12267   20988#
SAVPTR   002474          6784#  11474*  11477*  11484
SAVR     112456         20798   20838   20880   20925#
SAVSA    002120          6636#  11577*  11585   11766*  11796   11870*  11885
SAVSGL   002122          6637#  11864*  11889   11892
SAVSGN   025126          9258*   9336    9389#
SAVSL    002116          6635#  11576*  11584   11730*  11731*  11767*  11795   11869*  11884
SAVSRF   002476          6785#  11440*  11467   12904*
SAVST    061316         13631   13785#
SBR      001756          6587#  12032*  12046*  12050
SCSTK    003004          6827#  13801   13837
SDASH    016577          8286#  12440
SDPAR0=  172260          6356#  13253*
SDPAR1=  172262          6356#  13254*
SDPAR2=  172264          6356#  13255*
SDPAR3=  172266          6356#  13256*
SDPAR4=  172270          6356#  13257*
SDPAR5=  172272          6356#  13258*
SDPAR6=  172274          6356#  13259*
SDPAR7=  172276          6356#  13260*
SDPDR0=  172220          6356#
SDPDR1=  172222          6356#  13489*
SDPDR2=  172224          6356#
SDPDR3=  172226          6356#
SDPDR4=  172230          6356#
SDPDR5=  172232          6356#  13437*
SDPDR6=  172234          6356#
SDPDR7=  172236          6356#  13358
SEEDST   036750          6388   10751#
SELMD    056134         12169   13301#
SELREG   054746         12166   13139#
SEODD    035132         10342*  10344   10489#
SETPAR   055446         10856   13227#
SETPDR   056360         12178   13351#
SFCI     067562         10972   14905#
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SGPR0   003004          6829#   13753*   13771    13787    13819
SGPR06  061206         13608    13752#   13919
SGPR1   003006          6830#   13754*   13772    13788    13823
SGPR2   003010          6831#   13755*   13773    13789    13825
SGPR3   003012          6832#   13756*   13774    13790    13827
SGPR4   003014          6833#   13757*   13775    13791    13829
SGPR5   003016          6834#   13758*   13776    13792    13831
SGPR6   003020          6835#   13762*   13764*   13794    13795    13817    13833
SIGN    002124          6638#   11605*   11606*   11636*   11637*   11638*   11639*   11640    11645    11674    11712*   11728*   11743*
                       11744    11775*   11776*   11777*   11778*   11779*   11780*   11823*   11825*   11834*
SIPAR0= 172240          6356#   13103    13244*   20744*
SIPAR1= 172242          6356#   13245*   20745*
SIPAR2= 172244          6356#   13246*   20746*
SIPAR3= 172246          6356#   13247*   20747*
SIPAR4= 172250          6356#   13248*   20748*
SIPAR5= 172252          6356#   13249*   20749*
SIPAR6= 172254          6356#   13250*   20750*
SIPAR7= 172256          6356#   13251*   20751*
SIPDR0= 172200          6356#   13356    20771
SIPDR1= 172202          6356#   13479*
SIPDR2= 172204          6356#   13421*   20835*   20858*
SIPDR3= 172206          6356#
SIPDR4= 172210          6356#
SIPDR5= 172212          6356#   13430*
SIPDR6= 172214          6356#
SIPDR7= 172216          6356#   20773
SIZEHI= 177762          6356#
SIZELO= 177760          6356#
SIZEPT  054252         10827    13034#
SL    = 000057          6564#    8261
SLCRLF  015571          8261#   14429
SMTSIS  112070         20817    20826#
SN      066566         14705    14715    14733#
SP    =%000006          6356#    6406*    8342     8347*   10765*   10774*   10789*   10798    10799    10802*   10807    10812    10817
                       10877*   10882*   10884*   10891*   10930*   10932*   10933*   10946*   10955*   10958*   10968*   11058*   12148
                       12151*   12156*   12157    12199    12216*   12218*   12228*   12229*   12230    12232    12277    12278    12280
                       12281*   12289*   12291*   12428*   12438*   12440*   12441*   13097    13098    13108    13109    13111    13112
                       13114    13115    13206*   13209*   13210*   13215*   13501    13503    13505*   13506*   13508    13509    13510
                       13522    13526    13528*   13530    13532*   13533*   13536    13537    13538    13546    13548*   13549*   13574*
                       13609    13611    13619    13621*   13624*   13625*   13655*   13658*   13667    13670*   13673*   13674*   13675*
                       13677*   13683    13684    13690    13693*   13696*   13697*   13701    13704*   13707*   13710*   13724*   13727*
                       13761    13762    13764    13786    13814    13844*   13851*   13853*   13867*   13869    13870    13872    13873
                       13883*   13885*   13901*   13903    13904    13906    13907    13914*   13917    13921    13925    13927*   13930*
                       13931*   13960    13961    13977    13978    13986*   13988*   13995*   13997    13998    14000    14001    14190*
                       14197*   14265*   14267*   14268*   14269*   14270*   14273*   14279*   14281*   14288*   14289*   14293*   14298*
                       14299*   14314*   14317*   14318*   14326*   14327*   14366*   14367*   14368*   14390    14397    14400    14404*
                       14411*   14414*   14415*   14416    14420*   14422    14424    14426    14430*   14431*   14432*   14433*   14434*
                       14436    14439    14441    14443*   14444*   14445*   14446*   14447*   14450*   14451*   14455*   14457    14459*
                       14473*   14554    14555*   14630*   14631*   14657    14658    14733*   14744*   14746*   14757*   14759*   14764*
                       14778*   14816*   14844*   14846*   14847*   14860*   14871*   14875*   14876    14925*   15004*   15007*   15010*
                       15013*   15016*   15019*   15022*   15025*   15028*   15031*   15034*   15037*   15040*   15043*   15046*   15049*
                       15052*   15055*   15058*   15061*   15065*   15068*   15072*   15075*   15079*   15082*   15086*   15089*   15093*
                       15096*   15100*   15103*   15107*   15110*   15114*   15117*   15121*   15124*   15128*   15131*   15135*   15138*
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                           15142*  15145*  15149*  15152*  15156*  15159*  15163*  15166*  15170*  15173*  15176*  15179*  15189*
                           15190*  15193*  15194*  15206*  15214*  15216*  19505*  19577*  19761*  19832*  20404*  20478*  20480*
                           20688*  20689*  20690*  20691*  20692*  20733   20793*  20806*  20833*  20848*  20875*  20890*  20902*
                           20910   20911
SPCV      002036            6611#  13638   13742*
SPHAND    002140            6644#  11214*  11340   11360   11450   11523   12358   12486   13026*  14696
SRC.PT    112446           20801   20841   20883   20918#
SRNGST    062452           11051   14007#
SRNGSV    062666           11419   14052#
SRNGSW    062616           11131   14040#
SRNGSX    062476           11461   14014#
SRNGSY    062546           11204   14027#
SR0     = 177572            6356#
SR1     = 177574            6356#
SR2     = 177576            6356#
SR3     = 172516            6356#
SSP     =%000006            6356#
SSTG1     003244            6886#  19961
SSTG10    003344            6929#  20552
SSTG11    003352            6933#  20572
SSTG12    003364            6939#  19839   20125   20135   20178   20411
SSTG13    003444            6966#  20253   20264   20277
SSTG14    003604            7017#  20140
SSTG15    003612            7021#  20143
SSTG16    003620            7025#  20148
SSTG2     003250            6876    6891#  20546
SSTG2A    003256            6895#  20554
SSTG2B    003264            6899#  20556
SSTG3     003272            6903#  20566
SSTG4     003304            6909#  20548
SSTG5     003312            6913#  20568
SSTG6     003324            6919#  20550
SSTG7     003332            6923#  20570
STACK   = 001100            6356#  10765   10774
START     036760            6384   10754#  12449   12861
STATCG    061434           13616   13813#  13923
STATPS    002564            6818#  12219*  13786*  13814
STATR0    002566            6819#  12188*  13787*  13819
STATR1    002570            6820#  12190*  13788*  13823
STATR2    002572            6821#  12192*  13789*  13825
STATR3    002574            6822#  12194*  13790*  13827
STATR4    002576            6823#  12196*  13791*  13829
STATR5    002600            6824#  12198*  13792*  13831
STATR6    002602            6825#  12199*  12202*  12216   13794*  13817
STGAD     002114            6634#  11527*  11552   11562   11572   11619   11669   11687   11698   11724   11763   11842   11867
                           11894
STGDIG    002306            6697#  11615*  11653   11810*
STGDS1    002106            6631#  11519*  11528   11529*  11555   11566   11574   11576   11582*  11584*  11593   11605   11607*
                           11608*  11609*  11610*  11611*  11613   11621   11712   11713   11719*  11720*  11735   11762*  11767
                           11768   11793*  11795*  11797   11868*  11869   11871   11882*  11884*  11886
STGDS2    002110            6632#  11520*  11565   11566*  11577   11580   11581*  11585*  11721*  11733   11766   11768*  11770*
                           11775   11791   11792*  11796*  11797*  11870   11871*  11880   11881*  11885*  11886*
STGLN     002112            6633#  11522*  11525*  11551*  11553   11557*  11563   11567*  11578   11587*  11596   11604*  11616
                           11622*  11623   11703   11711*  11726   11730   11736*  11737*  11738   11753   11761*  11764   11781
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                         11784   11798*  11855   11863*  11864   11865*  11866   11873   11887*
STGTYP   002310           6698#  11603*  11625   11693   11696   11710*  11741   11760*  11800   11813   11862*  11895
STG12B   003404           6948#  20181
STG12C   003424           6957#  20184
STG13B   003504           6983#  20282
STG13C   003544           7000#  20285
STHASC   061574          13816   13818   13821   13824   13826   13828   13830   13832   13840   13844#
STKLMT= 177774            6356#
STKM1    011617           8204#  12291
STKM2    011710           8205#  12289
STK1     112556          20733*  20902   20948#
STOPLA   002560           6815#  13720   13722
STOPT    002220           6670#  12232*  12233
STOPTF   002216           6669#  10843*  12225   12227*  14320   14322*
STRNC    001776           6595#  12428   14009*
STRP1    002000           6596#  12428   14010*
STRP2    002002           6597#  12428   14011*
SUHRET   050054          12268#  13511   13539
SUPSTK= 000700            6356#
SURADR   002050           6616#  11502*  11506   11512
SURLEN   002046           6615#  11494*  11505   11508   11511
SVCINS=  000000           6237#  10789   10802   10877   10882   10884   10891   10930   10932   10933   10946   10955   10958
                         10968   11058   12229   12289   12291   12428   12438   12440   12441   13206   13209   13210   13215
                         13505   13506   13528   13532   13533   13548   13549   13621   13624   13625   13655   13658   13670
                         13673   13674   13675   13693   13696   13697   13704   13707   13724   13727   13927   13930   13931
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SVRP1    002030           6608#  14054*  14060
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SW11   = 004000        6356#
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SW14   = 040000        6356#
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SW6    = 000100        6356#
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SYRP2    002016        6603#   14031*  14037
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TCCR     003666        7057#   12267*  12268*  12335*  12338   13508*  13536*  14289   14293
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                       8715*    8716*   8717*   8718    9027*   9031*   9032*   9033*   9034*   9037    9040*   9670*   9688
TEMPE    025132        9228*    9229*   9230    9239*   9240*   9241    9391#
TEMP1    025110        9382#    9671*   9682
TERR     002270        6690#   14278*  14279
TEROR    002252        6683#   12115*  12135
TER1R    002254        6684#   12116*
TER2R    002256        6685#   12117*
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TER5R     002264          6688#   12120*
TER6R     002266          6689#
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                         12142*   12143*   12144*   12145*   12146*   12149    12153    12159    12255#   12307    12368    12370    12465
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                         20634*   20639*   20644*   20645*   20650*   20655*   20656*   20661*   20665*   20667*   20668    20671*   20672*
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TKB       001712          6559#   13559    14165    14336    14414    14450    14938    20690
TKS       001666          6547#   13557    14163    14334    14412    14448    14936    20690
TKVEC   = 000060          6356#
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TOLTC     047720         10836*   12224    12234    12237#   12366    13993*
TOMM      047774         12182*   12185*   12252#
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TOPC2     047752         10837*   12237    12246#   13685    13899*
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                         13204*
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TP19C     106160         18902    20151#
TP19D     106172         18905    20157#
TP19E     106200         19241    19244    20161#
TP99      106206         18481    20165#
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TRPINF   012304      8213#  13215  13506  13533  13549
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TROR     003650      7047#  12269* 12343  14274
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20604	20606	20607	20608	20609	20612	20688	20689	20690	20692	20918	20919	20920	20921	20941
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ERRORS DETECTED: 0

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