11/23

KEF11-B C1S DIAG
CJKDGA0

AH-F975A-MC
FICHE 1 OF 3

MAY 1980

IDENTIFICATION

PRODUCT CODE: AC-F972A-MC

PRODUCT NAME: CJKDGA0 KEF11-B CIS DIAG.

PRODUCT DATE: FEBRUARY 1980

MAINTAINER: DIAGNOSTIC ENGINEERING

HISTORY

REVISION	DATE	REASONS/CHANGES
A	DEC 1979	FIRST RELEASE

TABLE OF CONTENTS

1.0 GENERAL PROGRAM INFORMATION

1.1 ABSTRACT

THIS DIAGNOSTIC VERIFIES THE FUNCTIONALITY OF THE KEF11-BA (CIS - COMMERCIAL INSTRUCTION SET) OPTION. IT ALLOWS THE USER TO CHECK OUT ANY COMBINATION OF CIS CHIPS. IN VIRTUALLY ALL CASES, FAULT ISOLATION IS TO THE CIS CHIP LEVEL. THE DIAGNOSTIC CAN BE RUN UNDER XXDP, ACT, AND APT MONITORS. THE SOFTWARE SWITCH REGISTER (LOCATION 176) IS USED.

THE CIS OPTION CONSISTS OF SIX MOS/LSI CONTROL CHIPS CONTAINED IN THREE 40-PIN HYBRID CARRIERS. ALL CIS INSTRUCTIONS ARE CHIP PARTITIONED, I.E. ALL THE CODE FOR A PARTICULAR INSTRUCTION IS CONTAINED ON A PARTICULAR CONTROL CHIP. THE EXCEPTION IS THAT ALL CIS INSTRUCTIONS MUST PASS THROUGH THE FIRST CIS CHIP (CONTROL CHIP DC303-004) BEFORE REACHING THEIR DESTINATION CHIP.

1.2 SYSTEM REQUIREMENTS

A. HARDWARE REQUIREMENTS

THIS DIAGNOSTIC IS DESIGNED TO RUN ON A SYSTEM IMPLEMENTING A DCF11-AA CHIP SET. ALSO REQUIRED ARE A SERIAL LINE INTERFACE, A CONSOLE TERMINAL, AND 16K OF MEMORY. THE FIRST CIS CHIP (DC303-004) MUST BE INSTALLED. ANY (OR NONE) OF THE OTHER CIS CHIPS MAY BE PRESENT.

B. SOFTWARE REQUIREMENTS

THE SOFTWARE ENVIRONMENTS UNDER WHICH THIS DIAGNOSTIC WILL OPERATE ARE APT SCRIPT, APT STAND-ALONE, ACT Q.V., ACT AUTO-ACCEPT, ACT STAND-ALONE, XXDP CHAIN, XXDP STAND-ALONE, AND ABSOLUTE BINARY PAPER TAPE.

1.3 RELATED DOCUMENTS AND STANDARDS

THE FOLLOWING DOCUMENTS WERE USED OR REFERENCED DURING THE CREATION OF THIS DIAGNOSTIC:

DIAGNOSTIC ENGINEERING STANDARDS AND CONVENTIONS PROGRAMMING
  PRACTICES (DOC. NO. 175-003-009-02)
ACT11/XXDP PROGRAMMING SPECIFICATION (AUTOCAT-11-QZAUB-B-D)
BIC/BIN EXTENSION LIST
STANDARD APT SYSTEM TO PDP-11 DIAGNOSTIC INTERFACE
  (#APT/11-317-07-09)
DEC STD 168: PDP11 EXTENDED INSTRUCTIONS
CIS4.LIS
CIS5.LIS

CIS6.LIS
CIS7.LIS
CIS8.LIS
CIS9.LIS
CONTROL CHIP SPECIFICATION
DATA CHIP SPECIFICATION
SPMAC REFERENCE MANUAL

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

IT IS ASSUMED THAT THE CPU, MEMORY, SERIAL LINE INTERFACE, AND CONSOLE TERMINAL HAVE ALL PASSED THE PROPER DIAGNOSTICS.

1.5 ASSUMPTIONS

THE DIAGNOSTIC WILL ATTEMPT TO TEST ALL SIX CIS CHIPS UNLESS THE SOFTWARE SWR IS ALTERED TO INDICATE A SUBSET OF CIS CHIPS TO BE TESTED. SEE SECTION 2.2.

2.0 OPERATING INSTRUCTIONS

2.1 LOADING AND STARTING PROCEDURE

A. LOADING

USE STANDARD LOADING PROCEDURE FOR PDP-11 ABSOLUTE BINARY PAPER TAPES; OR XXDP MEDIA (FILES WITH .BIC OR .BIN EXTENSIONS ONLY).

B. STARTING

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200. UPON START UP (RUNNING IN NON-AUTOMATIC MODE) THE DIAGNOSTIC INITIALIZES, PRINTS OUT ITS IDENTIFICATION (FIRST TIME ONLY), AND THEN PRINTS:

''SWR = 000000   NEW = ''

THE NUMBER FOLLOWING ''SWR'' IS THE CURRENT VALUE OF THE SOFTWARE SWITCH REGISTER. IF NO CHANGES ARE DESIRED IN THE SWITCH REGISTER THEN A CARRIAGE RETURN MAY BE HIT; IF CHANGES ARE DESIRED THEN A NEW VALUE MAY BE TYPED IN FOLLOWED BY A CARRIAGE RETURN. IF NOT ALL SIX CIS CHIPS ARE TO BE TESTED THEN THE SWR WILL HAVE TO BE CHANGED. SEE NEXT SECTION FOR SWR BIT ASSIGNMENTS.

2.2 PROGRAM OPTIONS

SWITCH REGISTER SETTINGS

LOCATION 176 IS USED FOR THE SOFTWARE SWITCH REGISTER (UNLESS RUNNING UNDER APT SCRIPT MODE). THE FOLLOWING ARE THE RESULTS OF SETTING THE RESPECTIVE SWR BITS:

BIT15	-HALT ON ERROR	
BIT14	-SCOPE LOOP	
BIT13	-INHIBIT ERROR TYPEOUT	
BIT12	-NOT USED	
BIT11	-INHIBIT SUBTEST ITERATIONS	
BITS<10:6>	-NOT USED	
BIT05	-TEST CIS CONTROL CHIP 9	(DC303-009)
BIT04	-TEST CIS CONTROL CHIP 8	(DC303-008)
BIT03	-TEST CIS CONTROL CHIP 7	(DC303-007)
BIT02	-TEST CIS CONTROL CHIP 6	(DC303-006)
BIT01	-TEST CIS CONTROL CHIP 5	(DC303-005)
BIT00	-TEST CIS CONTROL CHIP 4	(DC303-004)

AS CAN BE SEEN ABOVE, SWR BITS<5:0> ALLOW THE USER TO SELECT ANY COMBINATION OF CIS CONTROL CHIP(S) TO BE TESTED. TO SELECT A CIS CONTROL CHIP FOR TESTING, ITS CORRESPONDING BIT IN THE SWITCH REGISTER MUST BE SET. NOTE, HOWEVER, THAT IF SWR BITS<5:0> ARE ALL ZERO (DEFAULT MODE) THEN THE DIAGNOSTIC WILL TEST ALL SIX CIS

CONTROL CHIPS.

THE VALUE OF THE SOFTWARE SWITCH REGISTER MAY BE CHANGED DURING THE PROGRAM RUN. TO DO THIS A CONTROL/G IS TYPED (TYPE THE 'CTRL' AND 'G' KEYS SIMULTANEOUSLY); WITHIN A FEW SECONDS THE CURRENT VALUE OF THE SWR IS TYPED OUT AND THE PROGRAM WAITS FOR NEW INPUT.

NOTE: THE PROGRAM IS NOT RUNNING ANY TESTS WHILE WAITING FOR A NEW VALUE OF SWR TO BE INPUT.

2.3 EXECUTION TIMES

ALL TIMES WERE MEASURED ON A KDF11-A, RUNNING THE FULL COMPLEMENT OF CIS CONTROL CHIPS.

A. FIRST PASS (QV)

10 SECONDS

B. LONGEST TEST

13 SECONDS

C. ADDITIONAL TIME FOR UNITS

N/A

D. FULL PASS TIME (ITERATIONS)

70 SECONDS

3.0 ERROR INFORMATION

3.1 ERROR REPORTING PROCEDURES

WHEN A CIS INSTRUCTION FAILS, THE TYPEOUT GIVES THE ERROR PC, THE CONTROL CHIP NUMBER, AND WHAT KIND OF FAILURE OCCURRED. THE ERROR PC IS THE ACTUAL LOCATION OF THE ERROR CALL IN THE FAILING SUBTEST. THE CONTROL CHIP NUMBER REFERS TO WHICH CONTROL CHIP WAS BEING TESTED WHEN THE ERROR OCCURRED. THE CONTROL CHIP NUMBER WILL APPEAR AS 23-*04, 23-*05, 23-*06, 23-*07, 23-*08, OR 23-*09. THE * SIGNIFIES THE REVISION LEVEL OF THE CHIP AND SO MAY BE ANY DIGIT. THE LAST TWO DIGITS DISTINGUISHES ONE CIS CHIP FROM ANOTHER. CURRENTLY, THE SIX CIS CONTROL CHIPS ARE PACKAGED ON THREE HYBRID CARRIERS. THE PART NUMBERS FOR THE HYBRID ASSEMBLIES ARE: 5700002-00 (CIS CHIPS 23-*04 AND 23-*06), 5700003-00 (CIS CHIPS 23-*05 AND 23-*07) AND 5700004-00 (CIS CHIPS 23-*08 AND 23-*09). THE KINDS OF FAILURES REPORTED ARE:

''CIS INSTRUCTION FAILURE''
''CIS INTERRUPT FAILURE''
''NO TRAP ON ILLEGAL CIS CLASS OPCODE''

THE ''CIS INSTRUCTION FAILURE'' IS THE MOST FREQUENTLY CALLED ERROR. IT USUALLY REFERS TO A CIS INSTRUCTION THAT PRODUCES THE WRONG CONDITION CODES, THE WRONG DESTINATION OUTPUT, OR THE WRONG GENERAL PURPOSE REGISTER CONTENTS. TO DETERMINE WHAT THE SPECIFIC FAILING INSTRUCTION IS, AND THE SPECIFIC TYPE OF FAILURE, LOOK IN THE DIAGNOSTIC AT THE CODE IN THE AREA OF THE ERROR PC.

3.2 ERROR HALTS

THREE UNEXPECTED FAULTS CAN ALSO OCCUR. THEY ARE:

''AN UNEXPECTED TIME-OUT TRAP''
''AN UNEXPECTED ILLEGAL AND RESERVED INSTRUCTION TRAP''
''POWER FAIL''

IN ALL THREE CASES THE PROGRAM HALTS IMMEDIATELY AFTER TYPING OUT THE APPROPRIATE MESSAGE. HITTING ''P'' (PROCEED) WILL CAUSE THE DIAGNOSTIC TO START OVER IF THE FAULT WAS A POWER FAIL, AND TO CONTINUE THE DIAGNOSTIC FROM THE POINT AT WHICH IT WAS INTERRUPTED FOR THE OTHER TWO FAULTS. ANY OTHER UNEXPECTED INTERRUPTS OR TRAPS WILL BE CAUGHT BY THE TRAP CATCHER, WHICH ALSO HALTS THE DIAGNOSTIC.

SETTING SWR BIT15 WILL CAUSE THE THREE ERRORS LISTED IN SECTION 3.1 TO HALT AFTER TYPING OUT THE ERROR MESSAGE. HITTING ''P'' (PROCEED) WILL CONTINUE THE DIAGNOSTIC.

4.0 PERFORMANCE AND PROGRESS REPORTS

4.1 PERFORMANCE REPORTS

N/A

4.2 PROGRESS REPORTS

AT THE END OF EACH PASS THE DIAGNOSTIC PRINTS OUT "END PASS #" FOLLOWED BY THE CURRENT PASS NUMBER.

5.0 DEVICE INFORMATION TABLES

THE CIS INSTRUCTIONS ARE PARTITIONED SUCH THAT NEARLY ALL THE MICRO-CODE FOR AN INSTRUCTION IS LOCATED ON ONE CHIP. (THE INSTRUCTIONS THAT RESIDE ON CONTROL CHIP DC303-004 ARE CONTAINED ENTIRELY ON THAT CHIP; ALL THE OTHER INSTRUCTIONS MUST FIRST PASS THROUGH CONTROL CHIP 4 SO THERE IS A SMALL AMOUNT OF MICRO-CODE FOR THE OTHER INSTRUCTIONS ON THAT CHIP.) THE PARTITIONING IS AS FOLLOWS:

```
  CONTROL CHIP DC303-004:
     L2DR        07602R        LOAD 2 DESCRIPTORS
     L3DR        07606R        LOAD 3 DESCRIPTORS
     MOVC        076030        MOVE CHARACTER
     MOVCR       076031        MOVE REVERSE JUSTIFIED CHARACTER
     MOVTC       076032        MOVE TRANSLATED CHARACTER
     LOCC        076040        LOCATE CHARACTER
     SKPC        076041        SKIP CHARACTER
     SCANC       076042        SCAN CHARACTER
     SPANC       076043        SPAN CHARACTER
     CMPC        076044        COMPARE CHARACTER
     MATC        076045        MATCH CHARACTER
  CONTROL CHIP DC303-005:
     CVTNL       076053        CONVERT NUMERIC TO LONG
     CVTPN       076054        CONVERT PACKED TO NUMERIC
     CVTNP       076055        CONVERT NUMERIC TO PACKED
     CVTLN       076057        CONVERT LONG TO NUMERIC
     CVTPL       076073        CONVERT PACKED TO LONG
     CVTLP       076077        CONVERT LONG TO PACKED
  CONTROL CHIP DC303-006:
     ADDN        076050        ADD NUMERIC
     SUBN        076051        SUBTRACT NUMERIC
     CMPN        076052        COMPARE NUMERIC
     ASHN        076056        ARITHMETIC SHIFT NUMERIC
  CONTROL CHIP DC303-007:
     ADDP        076070        ADD PACKED
     SUBP        076071        SUBTRACT PACKED
     CMPP        076072        COMPARE PACKED
     ASHP        076076        ARITHMETIC SHIFT PACKED
  CONTROL CHIP DC303-008:
     MULP        076074        MULTIPLY PACKED
  CONTROL CHIP DC303-009:
     DIVP        076075        DIVIDE PACKED
```

ALL OF THE ABOVE INSTRUCTIONS EXCEPT FOR L2DR AND L3DR HAVE AN IN-LINE VERSION, TOO. THE MNEMONIC IS THE SAME EXCEPT AN "I" IS APPENDED TO IT AND THE OPCODE IS THE SAME EXCEPT BIT06 IS SET. FOR EXAMPLE, THE IN-LINE VERSION OF CVTNP (076055) IS CVTNPI (076155).

6.0 PROGRAM DESCRIPTION

THIS PROGRAM WAS WRITTEN IN MODULES. THE FIRST MODULE INCLUDES START UP AND INITIALIZATION ROUTINES, BASIC DEFINITIONS, VARIABLE DEFINITIONS, THE TRAP CATCHER, AND ACT AND APT INFORMATION. THE SECOND MODULE CONTAINS THE TESTS FOR THE CONTROL CHIP DC303-004 INSTRUCTIONS, THE TEST DATA FOR THOSE INSTRUCTIONS, AN ILLEGAL OPCODE TEST, AND AN INTERRUPTABILITY TEST. THE THIRD MODULE CONTAINS THE TESTS AND TEST DATA FOR CONTROL CHIP DC303-005 INSTRUCTIONS, A SUBROUTINE TO CONVERT LONG INTEGER TO AN INTERMEDIATE FORM, AND A SUBROUTINE TO CONVERT FROM THE INTERMEDIATE FORM TO LONG INTEGER. THE FOURTH MODULE CONTAINS THE TESTS FOR CONTROL CHIP DC303-006 INSTRUCTIONS. THE TESTS FOR CONTROL CHIP DC303-007 ARE IN THE FIFTH MODULE. THE SIXTH MODULE HAS THE TESTS AND TEST DATA FOR CONTROL CHIPS DC303-008 AND DC303-009. FINALLY, THE SEVENTH MODULE CONTAINS END OF PASS, SCOPE, ALL THE OTHER COMMON SUBROUTINES, ASCII MESSAGES, BUFFERS, TABLES, AND TEST DATA FOR CONTROL CHIPS DC303-006 AND DC303-007.

6.1 PROGRAM EXECUTION CHARACTERISTICS

6.2 SUBTEST SUMMARIES

THERE IS ONE SUBTEST FOR EACH CIS INSTRUCTION. FIRST, THE REGISTER FORM OF THE INSTRUCTION IS TESTED WITH SEVERAL SETS OF DATA. THEN ONE CASE OF THE IN-LINE VERSION IS TESTED. THE TEST DATA FOR THE REGISTER FORM IS IN TABLES. THE FIRST WORD OF EACH TABLE IS THE NUMBER OF TEST CASES CONTAINED IN THE TABLE. THE FORMAT OF THE TEST DATA IS DIFFERENT FOR DIFFERENT INSTRUCTIONS; THE FIRST TEST CASE IN EACH TABLE HAS COMMENTS IDENTIFYING EACH ELEMENT IN THE TEST CASE.

THE FOLLOWING IS A SUMMARY OF EACH SUBTEST.

MOVC - THE TABLE OF TEST CASES CONTAINS:

<SOURCE LENGTH>
<SOURCE ADDRESS>
<DESTINATION LENGTH>
<DESTINATION ADDRESS>
<FILL CHARACTER>
<SOURCE BUFFER STATE>
<DESTINATION BUFFER STATE>

THE SOURCE AND DESTINATION BUFFER STATES DESIGNATE WHAT THOSE BUFFERS WILL BE FILLED WITH BEFORE EXECUTION OF THE MOVC INSTRUCTION. A '0' INDICATES EACH BYTE WILL CONTAIN 000, A '-1' INDICATES 377, AND A '1' INDICATES 252 (ALTERNATING 1'S AND 0'S BIT PATTERN). AN EXPECTED DESTINATION RESULT IS COMPUTED, AS WELL AS EXPECTED CONDITION CODES AND VALUES OF R0-R5. THEN THE MOVC INSTRUCTION IS EXECUTED AND THE ACTUAL RESULTS ARE COMPARED WITH THE EXPECTED RESULTS. DISAGREEMENTS ARE FLAGGED WITH AN ERROR CALL, WHICH PRINTS OUT 'CIS

INSTRUCTION FAILURE', THE PC OF THE ERROR CALL AND THE CONTROL CHIP NUMBER (IN THIS CASE, CONTROL CHIP NUMBER DC303-004). THIS WHOLE PROCEDURE IS REPEATED FOR EACH TEST CASE IN THE TABLE. THEN ONE SIMPLE IN-LINE CASE IS TESTED. THE DATA FOR THE IN-LINE CASE FOLLOWS THE TABLE OF TEST CASES FOR THE REGISTER FORM OF MOVC, AND IT CONTAINS ONLY: SOURCE LENGTH, SOURCE ADDRESS, DESTINATION LENGTH, AND DESTINATION ADDRESS.

MOVRC - SAME AS MOVC

MOVTC - SAME AS MOVC,
EXCEPT THAT A TRANSLATION TABLE, LOCATED AT 'TRANS', IS USED. PRIOR TO THE EXECUTION OF THE MOVTC INSTRUCTION, THE TRANSLATION TABLE IS CLEARED. THEN BYTE LOCATION TRANS+0 GETS A 63, TRANS+252 GETS A 314, AND TRANS+377 GETS A 125 (ALL NUMBERS OCTAL).

LOCC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>
<CHARACTER SEARCHED FOR>
<OFFSET>
THE SEARCH BUFFER (BUFF1) IS FILLED WITH ZEROES, THEN AT BYTE LOCATION 'BUFF1+OFFSET' THE 'CHARACTER SEARCHED FOR' IS INSERTED. EXPECTED RESULTS FOR THE CONDITION CODES AND R0-R5 ARE COMPUTED. THE LOCC INSTRUCTION IS EXECUTED AND EXPECTED RESULTS ARE COMPARED WITH ACTUAL RESULTS. DISAGREEMENTS ARE FLAGGED WITH ERROR CALLS.

SKPC - SIMILAR TO LOCC,
EXCEPT THAT THE TEST CASES HAVE A 'NOT SEARCHED FOR CHARACTER' IN PLACE OF A 'CHARACTER SEARCHED FOR'. THE SEARCH BUFFER (BUFF1) IS FILLED WITH SEARCHED-FOR CHARACTERS, THEN AT BYTE LOCATION 'BUFF1+OFFSET' THE 'NOT SEARCHED FOR' CHARACTER IS INSERTED.

SCANC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>
<OFFSET>
BUFF1 IS FILLED WITH ZEROES, THAN AT BYTE LOCATION 'BUFF1+OFFSET' A 125 IS INSERTED. THE TABLE 'CHRSET IS CLEARED, THEN A 1 IS INSERTED AT BYTE LOCATION 'CHRSET+125', TO DENOTE MEMBERSHIP IN THE CHARACTER SET. EXPECTED CONDITION CODES AND R0-R5 VALUES ARE COMPUTED, THE SCANC INSTRUCTION IS EXECUTED, AND DISAGREEMENTS BETWEEN ACTUAL AND EXPECTED RESULTS CAUSE ERROR CALLS.

SPANC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>

<OFFSET>
BUFF1 IS FILLED WITH ZEROES, THEN A 252 IS INSERTED AT BYTE LOCATION 'BUFF1+OFFSET'. CHRSET IS FILLED WITH ZEROES, THEN BYTE LOCATION 'CHRSET+0' GETS A 40 SO THAT A 0 IN THE SOURCE BUFFER WILL BE CONSIDERED A MEMBER OF THE CHARACTER SET AND A 252 WILL NOT. EXPECTED CONDITION CODES AND R0-R5 VALUES ARE COMPUTED, SCANC IS EXECUTED, EXPECTED RESULTS ARE COMPARED WITH ACTUAL RESULTS, AND DISAGREEMENTS CAUSE ERROR CALLS.

CMPC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE1 LENGTH>
<SOURCE2 LENGTH>
BOTH SOURCE STRINGS ARE FILLED WITH 377'S AND THE FILL CHARACTER IS SET EQUAL TO 377. THEN IN THE LONGER STRING, AT 'SRC.ADR+OFFSET', A BYTE IS CLEARED. THIS BYTE WILL BE THE INEQUALITY BETWEEN THE TWO STRINGS WHICH WILL TERMINATE THE CMPC COMPARISON. ACTUAL RESULTS WILL BE COMPARED WITH PREVIOUSLY COMPUTED EXPECTED RESULTS (CONDITION CODES AND R0-R5 VALUES).

MATC - THE TABLE OF TEST CASES CONTAINS:
<OBJECT LENGTH>
<OFFSET>
THE SOURCE STRING IS THE FIRST 70 BYTES OF BUFF1. BUFF1 IS FIRST FILLED WITH 377'S AND THEN CLEARED FROM 'BUFF1+OFFSET' TO THE END OF BUFF1. THE OBJECT STRING STARTS AT BUFF2, IS OF LENGTH 'OBJECT LENGTH' FROM THE TABLE OF TEST CASES, AND IS ALL ZEROES. EXPECTED VALUES OF CONDITION CODES AND R0-R5 ARE COMPUTED, MATC IS EXECUTED, EXPECTED RESULTS AND ACTUAL RESULTS ARE COMPARED, AND ERROR CALLS ARE MADE FOR DISAGREEMENTS.

CVTLP - THE TABLE OF TEST CASES CONTAINS:
<DESTINATION DATA TYPE AND LENGTH>
<LONG INTEGER HIGH, AND SIGN>
<LONG INTEGER LOW>
THE LONG INTEGER IN THE TEST CASE IS CONVERTED TO PACKED AND PLACED INTO BUFFER 'DS.EXP' (DECIMAL STRING EXPECTED) ACCORDING TO THE DESTINATION TYPE AND LENGTH SPECIFIED IN THE TABLE. THE EXPECTED VALUES OF THE CONDITION CODES AND R0-R5 ARE ALSO COMPUTED. THE CVTLP INSTRUCTION IS EXECUTED AND EXPECTED RESULTS ARE COMPARED WITH ACTUAL RESULTS. DISAGREEMENTS WILL CAUSE ERROR CALLS.

CVTLN - SAME AS THE CVTLP TEST, EXCEPT THE LONG INTEGER IS CONVERTED TO A NUMERIC DECIMAL FORM, ACCORDING TO THE SPECIFICATION IN THE TEST CASE.

CVTPL - THE TABLE OF TEST CASES CONTAINS:

```
            <SOURCE DATA TYPE AND LENGTH>
            <POINTER TO PACKED DECIMAL STRING>
            <A PACKED DECIMAL STRING>
      THE PACKED DECIMAL STRING IS CONVERTED TO A LONG  INTEGER
      AND   THE  RESULT  IS  PUT  INTO  'R2.EXP'  AND  'R3.EXP'
      (EXPECTED RESULTS FOR R2 AND R3).   THE EXPECTED  RESULTS
      FOR  THE OTHER GENERAL PURPOSE REGISTER AND THE CONDITION
      CODES  ARE  ALSO  COMPUTED.  THE  CVTPL  INSTRUCTION   IS
      EXECUTED,  ACTUAL  RESULTS  ARE  COMPARED  WITH  EXPECTED
      RESULTS, AND DISAGREEMENTS ARE FLAGGED BY ERROR CALLS.


CVTNL - SAME AS THE CVTNL TEST,
      EXCEPT THAT NUMERIC DECIMAL STRINGS ARE CONVERTED INSTEAD
      OF   PACKED   DECIMAL   STRINGS.  ALSO,   A   TABLE   FOR
      INTERPRETING  ACCEPTABLE  SIGN/DIGIT   COMBINATIONS   FOR
      OVERPUNCH IS INCLUDED.


CVTPN - THE TABLE OF TEST CASES CONTAINS:
            <SOURCE DATA TYPE AND LENGTH>
            <POINTER TO A PACKED SOURCE STRING>
            <DESTINATION LENGTH>
      EACH PACKED DECIMAL STRING IS CONVERTED INTO EACH OF  THE
      SIX  NUMERIC DECIMAL DATA TYPES.  THUS, EACH TEST CASE IS
      USED SIX TIMES BEFORE GOING ON  TO  THE  NEXT  ONE.  EACH
      TIME,  THE  EXPECTED CONDITION CODES AND R0-R5 VALUES ARE
      ALSO  COMPUTED.  THE  CVTPN  INSTRUCTION   IS   EXECUTED,
      EXPECTED  RESULTS  ARE  COMPARED WITH ACTUAL RESULTS, AND
      DISAGREEMENTS ARE FLAGGED BY ERROR CALLS.


CVTNP - THE TABLE OF TEST CASES CONTAINS:
            <SOURCE DATA TYPE AND LENGTH>
            <POINTER TO A SOURCE STRING>
            <DESTINATION DATA TYPE AND LENGTH>
            <A SOURCE STRING>
      THE SOURCE STRING  IS  IN  AN  INTERMEDIATE  FORMAT.  THE
      FIRST  WORD  INDICATES  THE  SIGN (0 FOR POSITIVE, -1 FOR
      NEGATIVE).  FOLLOWING  THAT   IS   THE   MAGNITUDE,   ONE
      BINARY-CODED-DECIMAL   DIGIT  PER  BYTE.  THE  SOURCE  IS
      CONVERTED  TO  A  PACKED  DECIMAL  STRING  AND  PUT  INTO
      'DS.EXP',  AND THE EXPECTED VALUES OF THE CONDITION CODES
      AND  R0-R5  ARE  COMPUTED.  THE  CVTNP   INSTRUCTION   IS
      EXECUTED,  ACTUAL RESULTS COMPARED WITH EXPECTED RESULTS,
      AND DISAGREEMENTS FLAGGED BY ERROR CALLS.


ADDN - THE TABLE OF TEST CASES CONTAINS:
            <SOURCE1 LENGTH>
            <SOURCE1 POINTER>
            <SOURCE2 LENGTH>
            <SOURCE2 POINTER>
            <DESTINATION LENGTH>
            <DESTINATION POINTER (SUM)>
```

<EXPECTED CONDITION CODES>
THE SOURCE1, SOURCE2, AND DESTINATION STRINGS ARE IN AN INTERMEDIATE FORMAT. EACH ONE IS TESTED IN FIVE OF THE SIX DATA TYPE FORMATS (UNSIGNED ZONED IS TESTED IN THE INLINE CASE ONLY). THIS GIVES A TOTAL OF 125 TESTS PERFORMED ON EACH TEST CASE, IN ORDER TO TEST ALL COMBINATIONS OF THE FIVE DATA TYPES. SOURCE1 AND SOURCE2 ARE ADDED TOGETHER BY THE ADDN INSTRUCTION AND THE ANSWER IS COMPARED TO THE EXPECTED ANSWER WHICH IS SUPPLIED IN THE TEST TABLE (POINTED TO BY THE DESTINATION POINTER). EXPECTED CONDITION CODES ARE ALSO SUPPLIED IN THE TEST CASE TABLE AND IS COMPARED WITH THE ACTUAL CONDITION CODES. THE EXPECTED GENERAL PURPOSE REGISTER VALUES (R0-R5) ARE THE ONLY EXPECTED RESULTS THAT ARE ACTUALLY CALCULATED BY THE DIAGNOSTIC, AND THESE TOO ARE COMPARED WITH THE ACTUAL RESULTS. ANY DISAGREEMENTS BETWEEN ACTUAL AND EXPECTED RESULTS ARE FLAGGED BY AN ERROR CALL.

SUBN - THE SAME AS ADDN,
EXCEPT THAT THE TEST CASES HAVE THE EXPECTED DESTINATION STRING (IN AN INTERMEDIATE FORMAT) AND EXPECTED CONDITION CODES FOR A SUBTRACT OPERATION INSTEAD OF AN ADD OPERATION. THE SOURCE1 LENGTH AND POINTER, THE SOURCE2 LENGTH AND POINTER, AND THE DESTINATION LENGTH ARE IDENTICAL TO THOSE USED IN THE ADDN INSTRUCTION. THE TEST OPERATES IN EXACTLY THE SAME MANNER AS THE ADDN TEST.

CMPN - THE TABLE OF TEST CASES CONTAINS:
<SOURCE1 LENGTH>
<SOURCE1 POINTER>
<SOURCE2 LENGTH>
<SOURCE2 POINTER>
THE TWO SOURCE STRINGS ARE IN AN INTERMEDIATE FORMAT. EACH ONE IS TESTED IN FIVE OF THE SIX NUMERIC DATA TYPE FORMATS (UNSIGNED ZONED IS TESTED IN THE INLINE CASE ONLY). THIS GIVES A TOTAL OF 25 TESTS PERFORMED ON EACH TEST CASE. IN EACH TEST, SOURCE1 IS ARITHMETICALLY COMPARED WITH SOURCE2 AND THE CONDITIONS ARE UPDATED TO REFLECT THE RESULTS. THE EXPECTED CONDITION CODES ARE COMPARED WITH THE ACTUAL CONDITION CODES, AND R0-R5 ARE TESTED TO SEE THAT THEY ARE CLEAR. ANY DISCREPANCIES ARE FLAGGED BY ERROR CALLS.

ASHN - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>
<DESTINATION LENGTH>
<SHIFT COUNT>
<ROUNDING DIGIT>
THE SOURCE STRING IS ALWAYS A STRING OF '4'"S STARTING AT DSBUF1 AND OF THE LENGTH SPECIFIED BY THE TEST

CASE. EACH TIME, THE EXPECTED RESULTS ARE CALCULATED AND PUT INTO DS.EXP AND CC.EXP. ACTUAL RESULTS ARE COMPARED WITH EXPECTED RESULTS AND DISAGREEMENTS ARE FLAGGED BY ERROR CALLS.

ADDP - SAME AS THE ADDN TEST,
EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR ADDN IS USED HERE.

SUBP - SAME AS THE SUBN TEST,
EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR SUBN IS USED HERE.

CMPP - SAME AS THE CMPN TEST,
EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR CMPN IS USED HERE.

ASHP - SAME AS THE ASHN TEST,
EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR ASHN IS USED HERE.

MULP - THE TABLE OF TEST CASES CONTAINS:

<SOURCE1 LENGTH>
<SOURCE1 POINTER>
<SOURCE2 LENGTH>
<SOURCE2 POINTER>
<DESTINATION LENGTH>
<DESTINATION POINTER (PRODUCT)>
<CC.EXP (PRODUCT)>

THE TWO SOURCES (MULTIPLIER AND MULTIPLICAND) AND EXPECTED DESTINATION (PRODUCT) ARE IN THE TABLE OF TEST CASES, IN INTERMEDIATE FORMAT. THE TWO SOURCES ARE MULTIPLIED TOGETHER (IN SIGNED PACKED FORMAT) AND THE EXPECTED PRODUCT IS COMPARED WITH THE ACTUAL RESULT. ALSO, THE EXPECTED VALUES OF R0-R5 AND THE CONDITION CODES ARE COMPARED WITH THE ACTUAL RESULTS. ANY DISCREPANCIES ARE FLAGGED BY ERROR CALLS. UNSIGNED PACKED FORMAT IS TESTED IN THE INLINE CASE ONLY.

DIVP - SAME AS THE MULP TEST,

EXCEPT THAT A DIVP IS EXECUTED AND THE TABLE OF TEST CASES CONTAINS QUOTIENT RESULTS FOR THE LAST TWO TABLE ENTRIES (DESTINATION POINTER AND CC.EXP).

6.3 SPECIAL SUBROUTINE DESCRIPTION

7.0 LISTING

```
                        ;*COPYRIGHT (C) 1980
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY RICHARD KIMBALL  &  DONALD SOBIK
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING SPMAC
                        ;*
                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 776 ***
        000776          STACK=  776
                        .EQUIV  EMT,ERROR               ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  IOT,SCOPE               ;;BASIC DEFINITION OF SCOPE CALL

                        ;*MISCELLANEOUS DEFINITIONS
        000011          HT=     11                      ;;CODE FOR HORIZONTAL TAB
        000012          LF=     12                      ;;CODE FOR LINE FEED
        000015          CR=     15                      ;;CODE FOR CARRIAGE RETURN
        000200          CRLF=   200                     ;;CODE FOR CARRIAGE RETURN-LINE FEED
        177776          PS=     177776                  ;;PROCESSOR STATUS WORD
                        .EQUIV  PS,PSW
        177774          STKLMT= 177774                  ;;STACK LIMIT REGISTER
        177546          LKS=    177546                  ;;LINE CLOCK STATUS REGISTER
        000100          BUFLEN= 100                     ;LENGTH OF BUFF1 AND BUFF2

                        ;*CONSOLE REGISTER DEFINITIONS
        177560          TKS=    177560
        177562          TKB=    177562
        177564          TPS=    177564
        177566          TPB=    177566

                        ;*GENERAL PURPOSE REGISTER DEFINITIONS
        000000          R0=     %0                      ;;GENERAL REGISTER
        000001          R1=     %1                      ;;GENERAL REGISTER
        000002          R2=     %2                      ;;GENERAL REGISTER
        000003          R3=     %3                      ;;GENERAL REGISTER
        000004          R4=     %4                      ;;GENERAL REGISTER
        000005          R5=     %5                      ;;GENERAL REGISTER
        000006          R6=     %6                      ;;GENERAL REGISTER
        000007          R7=     %7                      ;;GENERAL REGISTER
        000006          SP=     %6                      ;;STACK POINTER
        000007          PC=     %7                      ;;PROGRAM COUNTER

                        ;*PRIORITY LEVEL DEFINITIONS
        000000          PR0=    0                       ;;PRIORITY LEVEL 0
        000040          PR1=    40                      ;;PRIORITY LEVEL 1
        000100          PR2=    100                     ;;PRIORITY LEVEL 2
        000140          PR3=    140                     ;;PRIORITY LEVEL 3
        000200          PR4=    200                     ;;PRIORITY LEVEL 4
        000240          PR5=    240                     ;;PRIORITY LEVEL 5
        000300          PR6=    300                     ;;PRIORITY LEVEL 6
        000340          PR7=    340                     ;;PRIORITY LEVEL 7

                        ;*CONDITION CODE EQUATES
        000010          NBIT=   10
```

```
        000004          ZBIT=   4
        000002          VBIT=   2
        000001          CBIT=   1

                        ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
        100000          SW15=   100000
        040000          SW14=   40000
        020000          SW13=   20000
        010000          SW12=   10000
        004000          SW11=   4000
        002000          SW10=   2000
        001000          SW09=   1000
        000400          SW08=   400
        000200          SW07=   200
        000100          SW06=   100
        000040          SW05=   40
        000020          SW04=   20
        000010          SW03=   10
        000004          SW02=   4
        000002          SW01=   2
        000001          SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                        .EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
        100000          BIT15=  100000
        040000          BIT14=  40000
        020000          BIT13=  20000
        010000          BIT12=  10000
        004000          BIT11=  4000
        002000          BIT10=  2000
        001000          BIT09=  1000
        000400          BIT08=  400
        000200          BIT07=  200
        000100          BIT06=  100
        000040          BIT05=  40
        000020          BIT04=  20
        000010          BIT03=  10
        000004          BIT02=  4
        000002          BIT01=  2
        000001          BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
```

```
                                .EQUIV  BIT02,BIT2
                                .EQUIV  BIT01,BIT1
                                .EQUIV  BIT00,BIT0

                                ;*BASIC ''CPU'' TRAP VECTOR ADDRESSES
        000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
        000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
        000014                  TBITVEC=14              ;;''T'' BIT
        000014                  TRTVEC= 14              ;;TRACE TRAP
        000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
        000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
        000024                  PWRVEC= 24              ;;POWER FAIL
        000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT)
        000034                  TRAPVEC=34              ;;''TRAP'' TRAP
        000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
        000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
        000100                  LTCVEC= 100             ;;LTC VECTOR
        000000                  ASWREG  =0              ;INITIAL APT SOFTWARE SWR VALUE


                                ;*EQUATES FOR ROUTINE CALLS THAT USE TRAP INSTRUCTION
        104401                  TYPE=   104401          ;TTY TYPEOUT ROUTINE
        104402                  TYPOC=  104402          ;TYPE OCTAL NUMBER (WITH LEADING ZEROES) ROUTINE
        104403                  TYPOS=  104403          ;TYPE OCTAL NUMBER (NO LEADING ZEROES) ROUTINE
        104404                  TYPON=  104404          ;TYPE OCTAL NUMBER (AS PER LAST CALL) ROUTINE
        104405                  GTSWR=  104405          ;GET SOFT-SWR SETTING ROUTINE
        104406                  CKSWR=  104406          ;TEST FOR CHANGE IN SOFT-SWR ROUTINE
        100407                  RDCHR=  100407          ;TTY TYPEIN CHARACTER ROUTINE
        104410                  RDLIN=  104410          ;TTY TYPEIN STRING ROUTINE

                                ;;*****************************************************************
                                ;       *** COMMERCIAL INSTRUCTION SET OPCODE EQUATES ***
                                ;
        000007                  MFPT    =000007                         ;MOVE FROM PROCESSOR TYPE

                                ;       COMMERCIAL LOAD DESCRIPTORS
        076020                  L2D0    =76020                          ;LOAD 2 DESCRIPTORS @(R0)+
        076021                  L2D1    =76021                          ;LOAD 2 DESCRIPTORS @(R1)+
        076022                  L2D2    =76022                          ;LOAD 2 DESCRIPTORS @(R2)+
        076023                  L2D3    =76023                          ;LOAD 2 DESCRIPTORS @(R3)+
        076024                  L2D4    =76024                          ;LOAD 2 DESCRIPTORS @(R4)+
        076025                  L2D5    =76025                          ;LOAD 2 DESCRIPTORS @(R5)+
        076026                  L2D6    =76026                          ;LOAD 2 DESCRIPTORS @(R6)+
        076027                  L2D7    =76027                          ;LOAD 2 DESCRIPTORS @(R7)+

        076060                  L3D0    =76060                          ;LOAD 3 DESCRIPTORS @(R0)+
        076061                  L3D1    =76061                          ;LOAD 3 DESCRIPTORS @(R1)+
        076062                  L3D2    =76062                          ;LOAD 3 DESCRIPTORS @(R2)+
        076063                  L3D3    =76063                          ;LOAD 3 DESCRIPTORS @(R3)+
        076064                  L3D4    =76064                          ;LOAD 3 DESCRIPTORS @(R4)+
        076065                  L3D5    =76065                          ;LOAD 3 DESCRIPTORS @(R5)+
        076066                  L3D6    =76066                          ;LOAD 3 DESCRIPTORS @(R6)+
        076067                  L3D7    =76067                          ;LOAD 3 DESCRIPTORS @(R7)+


                                ;       CHARACTER STRING INSTRUCTIONS
```

```
        076030          MOVC    =76030                  ;MOVE CHARACTER
        076031          MOVRC   =76031                  ;MOVE REVERSE CHARACTER
        076032          MOVTC   =76032                  ;MOVE TRANSLATED CHARACTER
        076040          LOCC    =76040                  ;LOCATE CHARACTER
        076041          SKPC    =76041                  ;SKIP CHARACTER
        076042          SCANC   =76042                  ;SCAN CHARACTER
        076043          SPANC   =76043                  ;SPAN CHARACTER
        076044          CMPC    =76044                  ;COMPARE CHARACTER
        076045          MATC    =76045                  ;MATCH CHARACTER

        076130          MOVCI   =76130                  ;IN-LINE VERSION OF MOVE CHARACTER
        076131          MOVRCI  =76131                  ;IN-LINE VERSION
        076132          MOVTCI  =76132                  ;        ..
        076140          LOCCI   =76140                  ;        ..
        076141          SKPCI   =76141                  ;        ..
        076142          SCANCI  =76142                  ;        ..
        076143          SPANCI  =76143                  ;        ..
        076144          CMPCI   =76144                  ;        ..
        076145          MATCI   =76145                  ;


                        ;       NUMERIC STRING INSTRUCTIONS
        076050          ADDN    =76050                  ;ADD NUMERIC
        076051          SUBN    =76051                  ;SUBTRACT NUMERIC
        076052          CMPN    =76052                  ;COMPARE NUMERIC
        076053          CVTNL   =76053                  ;CONVERT NUMERIC TO LONG
        076054          CVTPN   =76054                  ;CONVERT PACKED TO NUMERIC
        076055          CVTNP   =76055                  ;CONVERT NUMERIC TO PACKED
        076056          ASHN    =76056                  ;ARITHMETIC SHIFT NUMERIC
        076057          CVTLN   =76057                  ;CONVERT LONG TO NUMERIC

        076150          ADDNI   =76150                  ;IN-LINE VERSION OF ADD NUMERIC
        076151          SUBNI   =76151                  ;IN-LINE VERSION
        076152          CMPNI   =76152                  ;        ..
        076153          CVTNLI  =76153                  ;        ..
        076154          CVTPNI  =76154                  ;        ..
        076155          CVTNPI  =76155                  ;        ..
        076156          ASHNI   =76156                  ;        ..
        076157          CVTLNI  =76157                  ;


                        ;       PACKED STRING INSTRUCTIONS
        076070          ADDP    =76070                  ;ADD PACKED
        076071          SUBP    =76071                  ;SUBTRACT PACKED
        076072          CMPP    =76072                  ;COMPARE PACKED
        076073          CVTPL   =76073                  ;CONVERT PACKED TO LONG
        076074          MULP    =76074                  ;MULTIPLY PACKED
        076075          DIVP    =76075                  ;DIVIDE PACKED
        076076          ASHP    =76076                  ;ARITHMETIC SHIFT PACKED
        076077          CVTLP   =76077                  ;CONVERT LONG TO PACKED

        076170          ADDPI   =76170                  ;IN-LINE VERSION OF ADD PACKED
        076171          SUBPI   =76171                  ;IN-LINE VERSION
        076172          CMPPI   =76172                  ;        ..
        076173          CVTPLI  =76173                  ;        ..
        076174          MULPI   =76174                  ;        ..
```

```
                076175                   DIVPI   =76175                           ;          ::
                076176                   ASHPI   =76176                           ;          ::
                076177                   CVTLPI  =76177                           ;          ::
                                         ;       CIS CLASS ILLEGAL OPCODE
                076033                   ILLOP   =76033                           ;ILLEGAL OPCODE
                                         ;;*****************************************************************
                                         .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
                000100                           .=100           ;HANDLE EVENT LINE INTERRUPT
        000100  000102                           .WORD   102
        000102  000002                           .WORD   2
                000200                   .=200
        000200  000137  001200                   JMP     START                    ;STARTING LOCATION FOR PROGRAM
                000300                   .=300
                                         .SBTTL  ACT11 HOOKS
                                         ;;*****************************************************************
                                         ;HOOKS REQUIRED BY ACT11
                000300                           $SVPC=.                    ;SAVE PC
                000046                           .=46
        000046  055214                           $ENDAD                     ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                000052                           .=52
        000052  000000                           .WORD   0                  ;;2)SET LOC.52 TO ZERO
                000300                           .=$SVPC                    ;; RESTORE PC
                                         .SBTTL  APT PARAMETER BLOCK
                                         ;;*****************************************************************
                                         ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                         ;;*****************************************************************
                000300                           .$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  000300                           $APTHDR ;;POINT TO APT HEADER BLOCK
                000300                           .=.$X   ;;RESET LOCATION COUNTER
                                         ;;*****************************************************************
                                         ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
```

```
                                  ;INTERFACE SPEC.

        000300                    $APTHD:
        000300  000000            $HIBTS: .WORD   0         ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
        000302  000630            $MBADR: .WORD   $MAIL     ;;ADDRESS OF APT MAILBOX (BITS 0-15)
        000304  000300            $TSTM:  .WORD   300       ;;RUN TIM OF LONGEST TEST
        000306  000300            $PASTM: .WORD   300       ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
        000310  000000            $UNITM: .WORD             ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
        000312  177707                    .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
                                  .SBTTL  COMMON TAGS

                                  ;;*****************************************************************
                                  ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                  ;*USED IN THE PROGRAM.

                000400                    .=400
        000400                    $CMTAG:                           ;;START OF COMMON TAGS
        000400  000000                    .WORD   0
        000402  000000            $TSTNM: .WORD   0                 ;;CONTAINS THE TEST NUMBER
        000404  000000            $TIMES: .WORD   0                 ;;CONTAINS NUMBER OF ITERATIONS DESIRED
        000406  000000            $ICNT:  .WORD   0                 ;;CONTAINS SUBTEST ITERATION COUNT
        000410  000000            $LPADR: .WORD   0                 ;;CONTAINS SCOPE LOOP ADDRESS
        000412  000000            $LPERR: .WORD   0                 ;;CONTAINS SCOPE RETURN FOR ERRORS
        000414  000000            $ERTTL: .WORD   0                 ;;CONTAINS TOTAL ERRORS DETECTED
        000416     001            $ERMAX: .BYTE   1                 ;;CONTAINS MAX. ERRORS PER TEST
                000420            .EVEN
        000420  000000            $ERRPC: .WORD   0                 ;;CONTAINS PC OF LAST ERROR INSTRUCTION
        000422     000            $AUTOB: .BYTE   0                 ;;AUTOMATIC MODE INDICATOR
        000423     000            $INTAG: .BYTE   0                 ;;INTERRUPT MODE INDICATOR
        000424  000000                    .WORD   0
        000426  000176            SWR:    .WORD   SWREG             ;;ADDRESS OF SWITCH REGISTER
        000430  000174            DISPLAY: .WORD  DISPREG           ;;ADDRESS OF DISPLAY REGISTER
        000432     000            $NULL:  .BYTE   0                 ;;CONTAINS NULL CHARACTER FOR FILLS
        000433     002            $FILLS: .BYTE   2                 ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
        000434     012            $FILLC: .BYTE   12                ;;INSERT FILL CHARS. AFTER A "LINE FEED"
        000435     000            $TPFLG: .BYTE   0                 ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
        000436  177607  000377    $BELL:  .ASCIZ  <207><377><377>   ;;CODE FOR BELL
        000442     077            $QUES:  .ASCII  /?/               ;;QUESTION MARK
        000443     015            $CRLF:  .ASCII  <15>              ;;CARRIAGE RETURN
        000444  000012            $LF:    .ASCIZ  <12>              ;;LINE FEED

        000446                    $ETEND:

        000446  000000            SIGN0:  .WORD   0                 ;SIGN FLAG:  0 FOR +, -1 FOR -
        000450  000000            SIGN1:  .WORD   0                 ;      ''
        000452  000000            SIGN2:  .WORD   0                 ;      ''
        000454  000000            ERRFLG: .WORD   0                 ;ERROR FLAG
        000456  000000            INTFLG: .WORD   0                 ;INTERRUPT FLAG
        000460  000000            INTPAS: .WORD   0                 ;FLAGS FIRST PASS OF INTERRUPT TEST
        000462  000000            DATTYP: .WORD   0                 ;DECIMAL STRING DATA TYPE FLAG
        000464  000000            XXDP:   .WORD   0                 ;IF NOT 0 THEN WE ARE IN XXDP CHAIN MODE
        000466  000000            COUNT:  .WORD   0                 ;TEMPORARY COUNTER
        000470  000000            DELAY:  .WORD   0                 ;TIME-DELAY COUNT STORED HERE
        000472  000000            ERRTMP: .WORD   0
        000474  000000            TEMP0:  .WORD   0                 ;TEMPORARY VARIABLE
        000476  000000            TEMP1:  .WORD   0                 ;TEMPORARY VARIABLE
```

```
000500  000000          TEMP2:   .WORD   0              ;TEMPORARY VARIABLE
000502  000000          TEMP3:   .WORD   0              ;TEMPORARY VARIABLE
000504  000000          TEMP4:   .WORD   0              ;TEMPORARY VARIABLE
000506  000000          TEMP5:   .WORD   0              ;TEMPORARY VARIABLE
000510  000000          OFFSET:  .WORD   0
000512  000000          DSLEN1:  .WORD   0              ;FIRST DECIMAL STRING LENGTH
000514  000000          DSLEN2:  .WORD   0              ;SECOND DECIMAL STRING LENGTH
000516  000000          CC:      .WORD   0              ;CONDITION CODES MAY BE SAVED HERE
000520  000000          CC.EXP:  .WORD   0              ;EXPECTED CONDITION CODES
000522  000000          R0.EXP:  .WORD   0              ;EXPECTED VALUE OF R0
000524  000000          R1.EXP:  .WORD   0              ;                  R1
000526  000000          R2.EXP:  .WORD   0              ;                  R2
000530  000000          R3.EXP:  .WORD   0              ;                  R3
000532  000000          R4.EXP:  .WORD   0              ;                  R4
000534  000000          R5.EXP:  .WORD   0              ;                  R5
000536  000000          BF.EXP:  .WORD   0              ;EXPECTED BUFFER DATA
000540  000000          BFADRS:  .WORD   0              ;BUFFER POINTER
000542  000000          TSTCAS:  .WORD   0              ;POINTER TO CURRENT TEST CASE IN TEST TABLE
000544  000000          CTL:     .WORD   0              ;CONTROL CHIP NUMBER
000546  000000          MSGADR:  .WORD   0              ;ADDRESS OF THE ASCII TO BE PRINTED
000550  000000          ERR:     .WORD   0              ;ERROR TYPE NUMBER
000552     000          DSTMP0:  .BYTE   0              ;DECIMAL STRING TEMPORARY
000553     000          DSTMP1:  .BYTE   0              ;DECIMAL STRING TEMPORARY
000554     000          DSTMP2:  .BYTE   0              ;DECIMAL STRING TEMPORARY
000555     000          DSTMP3:  .BYTE   0              ;DECIMAL STRING TEMPORARY
000556     000          DSTMP4:  .BYTE   0              ;DECIMAL STRING TEMPORARY
000557     000          DSTMP5:  .BYTE   0              ;DECIMAL STRING TEMPORARY
000560  000000          DATA00:  .WORD   0              ;TEST DATA GETS LOADED HERE
000562  000000          DATA01:  .WORD   0              ;
000564  000000          DATA02:  .WORD   0              ;
000566  000000          DATA03:  .WORD   0              ;
000570  000000          DATA04:  .WORD   0              ;
000572  000000          DATA05:  .WORD   0              ;
000574  000000          DATA06:  .WORD   0              ;

000576  000000          SAVR0:   .WORD   0              ;GENERAL PURPOSE REGISTERS MAY BE SAVED HERE
000600  000000          SAVR1:   .WORD   0              ;
000602  000000          SAVR2:   .WORD   0              ;
000604  000000          SAVR3:   .WORD   0              ;
000606  000000          SAVR4:   .WORD   0              ;
000610  000000          SAVR5:   .WORD   0              ;
000612  000000          SAVPSW:  .WORD   0              ;PSW MAY BE SAVED HERE
000614  000000          DESCR0:  .WORD   0              ;TEMPS FOR DS DESCRIPTORS
000616  000000          DESCR1:  .WORD   0
000620  000000          DESCR2:  .WORD   0
000622  000000          DESCR3:  .WORD   0
000624  000000          DESCR4:  .WORD   0
000626  000000          DESCR5:  .WORD   0


                        ;;*****************************************************************
                        .SBTTL  APT MAILBOX-ETABLE

                        ;;*****************************************************************
                        ;
                        ;
```

```


                                              .EVEN
     000630                                   $MAIL:                          ;;APT MAILBOX
     000630  000000                           $MSGTY: .WORD   000000          ;;MESSAGE TYPE CODE
     000632  000000                           $FATAL: .WORD   000000          ;;FATAL ERROR NUMBER
     000634  000000                           $TESTN: .WORD   000000          ;;TEST NUMBER
     000636  000000                           $PASS:  .WORD   000000          ;;PASS COUNT
     000640  000000                           $DEVCT: .WORD   000000          ;;DEVICE COUNT
     000642  000000                           $UNIT:  .WORD   000000          ;;I/O UNIT NUMBER
     000644  000000                           $MSGAD: .WORD   000000          ;;MESSAGE ADDRESS
     000646  000000                           $MSGLG: .WORD   000000          ;;MESSAGE LENGTH
     000650                                   $ETABLE:                        ;;APT ENVIRONMENT TABLE
     000650     000                           $ENV:   .BYTE   000             ;;ENVIRONMENT BYTE
     000651     000                           $ENVM:  .BYTE   000             ;;ENVIRONMENT MODE BITS
     000652  000000                           $SWREG: .WORD   000000          ;;APT SWITCH REGISTER
     000654  000000                           $USWR:  .WORD   000000          ;;USER SWITCHES
     000656  000000                           $CPUOP: .WORD   000000          ;;CPU TYPE,OPTIONS
                                              ;*                              BITS 15-11=CPU TYPE
                                              ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
                                              ;*                                      11/70=06,PDQ=07,Q=10
                                              ;*                              BIT 10=REAL TIME CLOCK
                                              ;*                              BIT  9=FLOATING POINT PROCESSOR
                                              ;*                              BIT  8=MEMORY MANAGEMENT
     000660     000                           $MAMS1: .BYTE   000             ;;HIGH ADDRESS,M.S. BYTE
             000662                           .EVEN



                                              ;;*******************************************************************
                                              .SBTTL  START UP AND INITIALIZATION ROUTINES
                                              ;;*******************************************************************
             001200                           .=1200
     001200                                   START:

                                              .SBTTL  INITIALIZE THE COMMON TAGS
                                              ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
     001200  012706  000400                           MOV     #$CMTAG,R6              ;;FIRST LOCATION TO BE CLEARED
     001204  005026                                   CLR     (R6)+                   ;;CLEAR MEMORY LOCATION
     001206  022706  000426                           CMP     #SWR,R6 ;;DONE?
     001212  001374                                   BNE     .-6                     ;;LOOP BACK IF NO
     001214  012706  001100                           MOV     #1100,SP                ;;SETUP THE STACK POINTER
                                              ;;INITIALIZE A FEW VECTORS
     001220  012737  055300  000004                   MOV     #TIMOUT,@#ERRVEC                ;TIME-OUT VECTOR
     001226  012737  000340  000006                   MOV     #340,@#ERRVEC+2                 ;LEVEL 7
     001234  012737  055314  000010                   MOV     #ILLRES,@#RESVEC                ;ILLEGAL/RESERVED INSTR. VECTOR
     001242  012737  000340  000012                   MOV     #340,@#RESVEC+2                 ;LEVEL 7
     001250  012737  055770  000020                   MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
     001256  012737  000340  000022                   MOV     #340,@#IOTVEC+2 ;;LEVEL 7
     001264  012737  060356  000034                   MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
     001272  012737  000340  000036                   MOV     #340,@#TRAPVEC+2;LEVEL 7
     001300  012737  056110  000024                   MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
     001306  012737  000340  000026                   MOV     #340,@#PWRVEC+2 ;;LEVEL 7
     001314  013737  055232  055230                   MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
     001322  012737  001322  000410                   MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
     001330  012737  000102  000100                   MOV     #102,@#LTCVEC                   ;GO TO 102
     001336  012737  000002  000102                   MOV     #2,@#102                        ;RTI
```

```
                                                ;;SET UP SOFTWARE SWITCH REGISTER
001344  012737  000176  000426  65$:     MOV    #SWREG,SWR         ;;POINT TO SOFTWARE SWR
001352  012737  000174  000430           MOV    #DISPREG,DISPLAY

001360  005037  000636                   CLR    $PASS              ;;CLEAR PASS COUNT
001364  132737  000200  000651           BITB   #APTSIZE,$ENVM     ;;TEST USER SIZE UNDER APT
001372  001403                           BEQ    67$                ;;YES,USE NON-APT SWITCH
001374  012737  000652  000426           MOV    #$SWREG,SWR        ;;NO,USE APT SWITCH REGISTER
001402                          67$:



                                        ;DETERMINE OPERATING ENVIRONMENT
001402  005737  000042                   TST    @#42               ;ARE WE IN ACT/XXDP AUTO MODE?
001406  001410                           BEQ    1$                 ;BRANCH IF NO
001410  023737  000042  000046           CMP    @#42,@#46          ;IS IT ACT AUTO MODE?
001416  001410                           BEQ    2$                 ;BRANCH IF YES
001420  012737  177777  000464           MOV    #-1,XXDP           ;SET XXDP CHAIN MODE INDICATOR
001426  000404                           BR     2$                 ;
001430  123727  000650  000001  1$:      CMPB   $ENV,#1            ;ARE WE IN APT AUTO MODE?
001436  001003                           BNE    3$                 ;BRANCH IF NO
001440  112737  000001  000422  2$:      MOVB   #1,$AUTOB          ;SET AUTO MODE INDICATOR
                                        ;PRINT TITLE IF NOT IN ACT OR APT AUTO MODE
001446  005227  177777          3$:      INC    #-1                ;FIRST TIME?
001452  001012                           BNE    5$                 ;SKIP TITLE IF NOT
001454  005737  000422                   TST    $AUTOB             ;ARE WE IN AUTO MODE?
001460  001403                           BEQ    4$                 ;BRANCH TO TITLE TYPEOUT IF NOT
001462  005737  000464                   TST    XXDP               ;IS THE AUTO MODE UNDER XXDP?
001466  001404                           BEQ    5$                 ;SKIP TITLE IF NOT
001470  012737  060434  000546  4$:      MOV    #TITLE,MSGADR
001476  104401                           TYPE                      ;PRINT OUT THE TITLE
                                        ;GET THE VALUE IN THE SOFTWARE SWITCH REGISTER
001500  005737  000422          5$:      TST    $AUTOB             ;ARE WE IN AN AUTOMATIC MODE?
001504  001001                           BNE    BEGIN              ;BRANCH IF YES
001506  104405                           GTSWR                     ;ASK FOR SWR INPUT FROM THE CONSOLE TERMINAL

001510                          BEGIN:
```

```
                                   ;;*****************************************************************
                                   ;;*****************************************************************
                                   ;++
                                   ;            C I S 4    M O D U L E
                                   ;
                                   ;  THIS MODULE TESTS THE LOAD DESCRIPTOR INSTRUCTIONS AND THE CHARACTER
                                   ;  INSTRUCTIONS:  L2DR, L3DR, MOVC, MOVRC, MOVTC, LOCC, SKPC, SCANC,
                                   ;  SPANC, CMPC, AND MATC.
                                   ;--
                                   ;;*****************************************************************
                                   ;;*****************************************************************




                                   .SBTTL  CIS4 INITIALIZATION
                                   ;;*****************************************************************
                                   ;
                                   ;  CIS4 INITIALIZATION
                                   ;
                                   ;;*****************************************************************

                                   ;IF SWR<5:0> ARE CLEARED OR IF SWR<0> IS SET THEN EXECUTE
                                   ;  THE CIS4 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

001510                             INLINE   <SCOPE>
001510  000004                                                                      SCOPE

001512                             LET TEMPO := @SWR CLR.BY #177700
001512  017737  176710  000474                                                       MOV     @SWR,TEMPO
001520  042737  177700  000474                                                       BIC     #177700,TEMPO
001526                             IF TEMPO NE #0 THEN
001526  005737  000474                                                               TST     TEMPO
001532  001406                                                                       BEQ     $50000
001534                                 IF #BIT0 NOTSETIN TEMPO THEN
001534  032737  000001  000474                                                       BIT     #BIT0,TEMPO
001542  001002                                                                       BNE     $50001
001544                                     INLINE   <JMP   CIS4END>
001544  000137  015716                                                               JMP   CIS4END
001550                                 ENDIF
001550                                                                     $50001:
001550                             ENDIF
001550                                                                     $50000:

001550                             LET CTL := #4            ;CONTROL CHIP NUMBER
001550  012737  000004  000544                                                       MOV     #4,CTL
001556                             LET ERRFLG := #0         ;INITIALIZE ERROR FLAG
001556  005037  000454                                                               CLR     ERRFLG
001562                             LET PSW := #340
001562  012737  000340  177776                                                       MOV     #340,PSW
```

```
                                    .SBTTL  L2DR
                                    ;;*****************************************************************
                                    ;
                                    ;       L2DR TEST
                                    ; THIS TEST USES L2D0, L2D4, AND L2D7 TO TEST L2DR.
                                    ;
                                    ;;*****************************************************************

001570                              INLINE  <XL2DR:>
001570                                                                          XL2DR:
001570                                INLINE  <SCOPE>
001570  000004                                                                  SCOPE
001572                                LET $TIMES := #20             ;ITERATION COUNT
001572  012737  000020  000404                                                  MOV     #20,$TIMES
001600                                LET COUNT := #2
001600  012737  000002  000466                                                  MOV     #2,COUNT
001606                                REPEAT
001606                                                                  $50002:

                                            ;+
                                            ; SET UP THE GPR'S AND DO
                                            ; THE CIS INSTRUCTION
                                            ;-

001606                                      CALL CLRREG             ;CLEAR R0-R5
001606  004737  055330                                                          JSR     PC,CLRREG
001612                                      IF COUNT EQ #2 THEN
001612  023727  000466  000002                                                  CMP     COUNT,#2
001620  001005                                                                  BNE     $50003
001622                                         LET R0 := #ADR.A
001622  012700  002172                                                          MOV     #ADR.A,R0
001626                                         INLINE  <CCC>
001626  000257                                                                  CCC
001630                                         INLINE  <L2D0>
001630  076020                                                                  L2D0
001632                                      ELSE
001632  000404                                                                  BR      $50004
001634                                                                  $50003:
001634                                         LET R4 := #ADR.A
001634  012704  002172                                                          MOV     #ADR.A,R4
001640                                         INLINE  <SCC>
001640  000277                                                                  SCC
001642                                         INLINE  <L2D4>
001642  076024                                                                  L2D4
001644                                      ENDIF
001644                                                                  $50004:
001644                                      LET CC := PSW
001644  013737  177776  000516                                                  MOV     PSW,CC
001652                                      LET CC := CC CLR.BY #177760
001652  042737  177760  000516                                                  BIC     #177760,CC
001660                                      LET ERR  := #1          ;CODE FOR INSTRUCTION FAILURE
001660  012737  000001  000550                                                  MOV     #1,ERR

                                            ;+
                                            ;  CHECK RESULTS AND REPORT ERRORS
                                            ;-
```

```

001666                                   IF COUNT EQ #2 THEN
001666  023727  000466  000002                                                     CMP     COUNT,#2
001674  001006                                                                     BNE     $50005
001676                                       IF CC NE #0 THEN
001676  005737  000516                                                             TST     CC
001702  001402                                                                     BEQ     $50006
001704                                           CALL ERROR
001704  004737  056274                                                             JSR     PC,ERROR
001710                                       ENDIF
001710                                                                  $50006:
001710                                   ELSE
001710  000406                                                                     BR      $50007
001712                                                                  $50005:
001712                                       IF CC NE #17 THEN
001712  023727  000516  000017                                                     CMP     CC,#17
001720  001402                                                                     BEQ     $50010
001722                                           CALL ERROR
001722  004737  056274                                                             JSR     PC,ERROR
001726                                       ENDIF
001726                                                                  $50010:
001726                                   ENDIF
001726                                                                  $50007:
001726                                   IF R0 NE ALPHA THEN
001726  020037  002200                                                             CMP     R0,ALPHA
001732  001402                                                                     BEQ     $50011
001734                                       CALL ERROR
001734  004737  056274                                                             JSR     PC,ERROR
001740                                   ENDIF
001740                                                                  $50011:
001740                                   IF R1 NE ALPHA+2 THEN
001740  020137  002202                                                             CMP     R1,ALPHA+2
001744  001402                                                                     BEQ     $50012
001746                                       CALL ERROR
001746  004737  056274                                                             JSR     PC,ERROR
001752                                   ENDIF
001752                                                                  $50012:
001752                                   IF R2 NE BETA THEN
001752  020237  002204                                                             CMP     R2,BETA
001756  001402                                                                     BEQ     $50013
001760                                       CALL ERROR
001760  004737  056274                                                             JSR     PC,ERROR
001764                                   ENDIF
001764                                                                  $50013:
001764                                   IF R3 NE BETA+2 THEN
001764  020337  002206                                                             CMP     R3,BETA+2
001770  001402                                                                     BEQ     $50014
001772                                       CALL ERROR
001772  004737  056274                                                             JSR     PC,ERROR
001776                                   ENDIF
001776                                                                  $50014:
001776                                   IF R5 NE #0 THEN
001776  005705                                                                     TST     R5
002000  001402                                                                     BEQ     $50015
002002                                       CALL ERROR
002002  004737  056274                                                             JSR     PC,ERROR
```

```
002006                                  ENDIF
002006                                                                  $50015:
002006                                  IF COUNT EQ #2 THEN
002006  023727  000466  000002                                                  CMP     COUNT,#2
002014  001005                                                                  BNE     $50016
002016                                      IF R4 NE #0 THEN
002016  005704                                                                  TST     R4
002020  001402                                                                  BEQ     $50017
002022                                          CALL ERROR
002022  004737  056274                                                          JSR     PC,ERROR
002026                                      ENDIF
002026                                                                  $50017:
002026                                  ELSE
002026  000405                                                                  BR      $50020
002030                                                                  $50016:
002030                                      IF R4 NE #ADR.A+4 THEN
002030  020427  002176                                                          CMP     R4,#ADR.A+4
002034  001402                                                                  BEQ     $50021
002036                                          CALL ERROR
002036  004737  056274                                                          JSR     PC,ERROR
002042                                      ENDIF
002042                                                                  $50021:
002042                                  ENDIF
002042                                                                  $50020:
002042                                  LET COUNT := COUNT - #1
002042  005337  000466                                                          DEC     COUNT
002046                          UNTIL COUNT EQ #0
002046  005737  000466                                                          TST     COUNT
002052  001255                                                                  BNE     $50002


                                ;+
                                ; TEST THE SPECIAL CASE OF USING R7
                                ;-

002054                          LET R4 := #0
002054  005004                                                                  CLR     R4
002056                          LET R5 := #0
002056  005005                                                                  CLR     R5
002060                          INLINE  <L2D7>
002060  076027                                                                  L2D7
002062                          INLINE  <.WORD  240>            ;NOP
002062  000240                                                                  .WORD   240
002064                          INLINE  <.WORD  402>            ;BR TO ERROR CALL
002064  000402                                                                  .WORD   402
002066                          INLINE  <.WORD  403>            ;BR OVER ERROR CALL
002066  000403                                                                  .WORD   403
002070                          INLINE  <.WORD  240>            ;NOP
002070  000240                                                                  .WORD   240
002072                          CALL ERROR
002072  004737  056274                                                          JSR     PC,ERROR
002076                          IF R0 NE @#240 THEN
002076  020037  000240                                                          CMP     R0,@#240
002102  001402                                                                  BEQ     $50022
002104                                  CALL ERROR
002104  004737  056274                                                          JSR     PC,ERROR
002110                          ENDIF
```

```
002110                                                                  $50022:
002110                          IF R1 NE @#242 THEN
002110  020137  000242                                                          CMP     R1,@#242
002114  001402                                                                  BEQ     $50023
002116                                  CALL ERROR
002116  004737  056274                                                          JSR     PC,ERROR
002122                          ENDIF
002122                                                                  $50023:
002122                          IF R2 NE @#402 THEN
002122  020237  000402                                                          CMP     R2,@#402
002126  001402                                                                  BEQ     $50024
002130                                  CALL ERROR
002130  004737  056274                                                          JSR     PC,ERROR
002134                          ENDIF
002134                                                                  $50024:
002134                          IF R3 NE @#404 THEN
002134  020337  000404                                                          CMP     R3,@#404
002140  001402                                                                  BEQ     $50025
002142                                  CALL ERROR
002142  004737  056274                                                          JSR     PC,ERROR
002146                          ENDIF
002146                                                                  $50025:
002146                          IF R4 NE #0 THEN
002146  005704                                                                  TST     R4
002150  001402                                                                  BEQ     $50026
002152                                  CALL ERROR
002152  004737  056274                                                          JSR     PC,ERROR
002156                          ENDIF
002156                                                                  $50026:
002156                          IF R5 NE #0 THEN
002156  005705                                                                  TST     R5
002160  001402                                                                  BEQ     $50027
002162                                  CALL ERROR
002162  004737  056274                                                          JSR     PC,ERROR
002166                          ENDIF
002166                                                                  $50027:
002166                          INLINE  <JMP    XL3DR>
002166  000137  002214                                                          JMP     XL3DR

                        ;+
                        ; TEST TABLE FOR L2DR AND L3DR
                        ;-

002172  002200          ADR.A:  .WORD   ALPHA
002174  002204                  .WORD   BETA
002176  002210                  .WORD   GAMMA
002200  177777          ALPHA:  .WORD    177777         ;ALPHA.LEN
002202  052525                  .WORD    052525         ;ALPHA.ADR
002204  125252          BETA:   .WORD    125252         ;BETA.LEN
002206  177777                  .WORD    177777         ;BETA.ADR
002210  107070          GAMMA:  .WORD    107070         ;GAMMA.LEN
002212  070707                  .WORD    070707         ;GAMMA.ADR
```

```
                                   .SBTTL  L3DR
                                   ;;*************************************************************
                                   ;
                                   ;        L3DR TEST
                                   ; THIS TEST USES L3D3, L3D5, AND L3D7 TO TEST L3DR.
                                   ;
                                   ;;*************************************************************

002214                             INLINE  <XL3DR:>
002214                                                                         XL3DR:
002214                               INLINE  <SCOPE>
002214  000004                                                                 SCOPE
002216                               LET $TIMES := #20          ;ITERATION COUNT
002216  012737  000020  000404                                                 MOV     #20,$TIMES
002224                               LET COUNT := #2
002224  012737  000002  000466                                                 MOV     #2,COUNT
002232                               REPEAT
002232                                                                 $50030:

                                           ;+
                                           ; SET UP THE GPR'S AND DO
                                           ; THE CIS INSTRUCTION
                                           ;-

002232                                     CALL CLRREG
002232  004737  055330                                                         JSR     PC,CLRREG
002236                                     IF COUNT EQ #2 THEN
002236  023727  000466  000002                                                 CMP     COUNT,#2
002244  001005                                                                 BNE     $50031
002246                                        LET R3 := #ADR.A
002246  012703  002172                                                         MOV     #ADR.A,R3
002252                                        INLINE  <CCC>
002252  000257                                                                 CCC
002254                                        INLINE  <L3D3>
002254  076063                                                                 L3D3
002256                                     ELSE
002256  000404                                                                 BR      $50032
002260                                                                 $50031:
002260                                        LET R5 := #ADR.A
002260  012705  002172                                                         MOV     #ADR.A,R5
002264                                        INLINE  <SCC>
002264  000277                                                                 SCC
002266                                        INLINE  <L3D5>
002266  076065                                                                 L3D5
002270                                     ENDIF
002270                                                                 $50032:
002270                                     LET CC := PSW
002270  013737  177776  000516                                                 MOV     PSW,CC
002276                                     LET CC := CC CLR.BY #177760
002276  042737  177760  000516                                                 BIC     #177760,CC
002304                                     LET ERR := #1        ;CODE FOR INSTRUCTION FAILURE
002304  012737  000001  000550                                                 MOV     #1,ERR

                                           ;+
                                           ; CHECK RESULTS AND REPORT ERRORS
                                           ;-
```

```

002312                                  IF COUNT EQ #2 THEN
002312  023727  000466  000002                                                  CMP     COUNT,#2
002320  001006                                                                  BNE     $50033
002322                                    IF CC NE #0 THEN
002322  005737  000516                                                          TST     CC
002326  001402                                                                  BEQ     $50034
002330                                      CALL ERROR
002330  004737  056274                                                          JSR     PC,ERROR
002334                                    ENDIF
002334                                                                  $50034:
002334                                  ELSE
002334  000406                                                                  BR      $50035
002336                                                                  $50033:
002336                                    IF CC NE #17 THEN
002336  023727  000516  000017                                                  CMP     CC,#17
002344  001402                                                                  BEQ     $50036
002346                                      CALL ERROR
002346  004737  056274                                                          JSR     PC,ERROR
002352                                    ENDIF
002352                                                                  $50036:
002352                                  ENDIF
002352                                                                  $50035:
002352                                  IF R0 NE ALPHA THEN
002352  020037  002200                                                          CMP     R0,ALPHA
002356  001402                                                                  BEQ     $50037
002360                                    CALL ERROR
002360  004737  056274                                                          JSR     PC,ERROR
002364                                  ENDIF
002364                                                                  $50037:
002364                                  IF R1 NE ALPHA+2 THEN
002364  020137  002202                                                          CMP     R1,ALPHA+2
002370  001402                                                                  BEQ     $50040
002372                                    CALL ERROR
002372  004737  056274                                                          JSR     PC,ERROR
002376                                  ENDIF
002376                                                                  $50040:
002376                                  IF R2 NE BETA THEN
002376  020237  002204                                                          CMP     R2,BETA
002402  001402                                                                  BEQ     $50041
002404                                    CALL ERROR
002404  004737  056274                                                          JSR     PC,ERROR
002410                                  ENDIF
002410                                                                  $50041:
002410                                  IF R3 NE BETA+2 THEN
002410  020337  002206                                                          CMP     R3,BETA+2
002414  001402                                                                  BEQ     $50042
002416                                    CALL ERROR
002416  004737  056274                                                          JSR     PC,ERROR
002422                                  ENDIF
002422                                                                  $50042:
002422                                  IF R4 NE GAMMA THEN
002422  020437  002210                                                          CMP     R4,GAMMA
002426  001402                                                                  BEQ     $50043
002430                                    CALL ERROR
002430  004737  056274                                                          JSR     PC,ERROR
```

```
002434                                ENDIF
002434                                                                   $50043:
002434                                IF R5 NE GAMMA+2 THEN
002434  020537  002212                                                           CMP     R5,GAMMA+2
002440  001402                                                                   BEQ     $50044
002442                                    CALL ERROR
002442  004737  056274                                                           JSR     PC,ERROR
002446                                ENDIF
002446                                                                   $50044:
002446                                LET COUNT := COUNT - #1
002446  005337  000466                                                           DEC     COUNT
002452                          UNTIL COUNT EQ #0
002452  005737  000466                                                           TST     COUNT
002456  001265                                                                   BNE     $50030

                          ;+
                          ; TEST THE SPECIAL CASE OF USING R7
                          ;-

002460                          INLINE  <L3D7>
002460  076067                                                                   L3D7
002462                          INLINE  <.WORD  240>    ;NOP
002462  000240                                                                   .WORD   240
002464                          INLINE  <.WORD  240>    ;NOP
002464  000240                                                                   .WORD   240
002466                          INLINE  <.WORD  402>    ;BR TO ERROR CALL
002466  000402                                                                   .WORD   402
002470                          INLINE  <.WORD  403>    ;BR OVER ERROR CALL
002470  000403                                                                   .WORD   403
002472                          INLINE  <.WORD  240>    ;NOP
002472  000240                                                                   .WORD   240
002474                          CALL ERROR
002474  004737  056274                                                           JSR     PC,ERROR
002500                          IF R0 NE @#240 THEN
002500  020037  000240                                                           CMP     R0,@#240
002504  001402                                                                   BEQ     $50045
002506                                CALL ERROR
002506  004737  056274                                                           JSR     PC,ERROR
002512                          ENDIF
002512                                                                   $50045:
002512                          IF R1 NE @#242 THEN
002512  020137  000242                                                           CMP     R1,@#242
002516  001402                                                                   BEQ     $50046
002520                                CALL ERROR
002520  004737  056274                                                           JSR     PC,ERROR
002524                          ENDIF
002524                                                                   $50046:
002524                          IF R2 NE @#240 THEN
002524  020237  000240                                                           CMP     R2,@#240
002530  001402                                                                   BEQ     $50047
002532                                CALL ERROR
002532  004737  056274                                                           JSR     PC,ERROR
002536                          ENDIF
002536                                                                   $50047:
002536                          IF R3 NE @#242 THEN
002536  020337  000242                                                           CMP     R3,@#242
```

```
002542  001402                                                            BEQ     $50050
002544                                  CALL ERROR
002544  004737  056274                                                    JSR     PC,ERROR
002550                          ENDIF
002550                                                            $50050:
002550                          IF R3 NE @#242 THEN
002550  020337  000242                                                    CMP     R3,@#242
002554  001402                                                            BEQ     $50051
002556                                  CALL ERROR
002556  004737  056274                                                    JSR     PC,ERROR
002562                          ENDIF
002562                                                            $50051:
002562                          IF R4 NE @#402 THEN
002562  020437  000402                                                    CMP     R4,@#402
002566  001402                                                            BEQ     $50052
002570                                  CALL ERROR
002570  004737  056274                                                    JSR     PC,ERROR
002574                          ENDIF
002574                                                            $50052:
002574                          IF R5 NE @#404 THEN
002574  020537  000404                                                    CMP     R5,@#404
002600  001402                                                            BEQ     $50053
002602                                  CALL ERROR
002602  004737  056274                                                    JSR     PC,ERROR
002606                          ENDIF
002606                                                            $50053:
002606                          INLINE  <JMP    XMOVC>
002606  000137  002612                                                    JMP     XMOVC
```

```
                                      .SBTTL  MOVC
                                      ;;*******************************************************************
                                      ;
                                      ;  MOVC TEST
                                      ;
                                      ;;*******************************************************************

002612                                INLINE  <XMOVC:>
002612                                                                                      XMOVC:
002612                                INLINE  <SCOPE>
002612  000004                                                                              SCOPE
002614                                LET $TIMES := #20                  ;ITERATION COUNT
002614  012737  000020  000404                                                              MOV     #20,$TIMES
002622                                LET COUNT := TMOVC                 ;GET TEST COUNT
002622  013737  004134  000466                                                              MOV     TMOVC,COUNT
002630                                LET TSTCAS := #TMOVC+2             ;POINT TO FIRST TEST CASE
002630  012737  004136  000542                                                              MOV     #TMOVC+2,TSTCAS
                                      ;REPEAT
002636                                INLINE  <$5030:>
002636                                                                                      $5030:

                                              ;+
                                              ; GET TEST DATA FROM TABLE
                                              ;-

002636                                        LET R0 := TSTCAS
002636  013700  000542                                                                      MOV     TSTCAS,R0
002642                                        LET DATA00 := (R0)+              ;SRC.LEN
002642  012037  000560                                                                      MOV     (R0)+,DATA00
002646                                        LET DATA01 := (R0)+              ;SRC.ADR
002646  012037  000562                                                                      MOV     (R0)+,DATA01
002652                                        LET DATA02 := (R0)+              ;DST.LEN
002652  012037  000564                                                                      MOV     (R0)+,DATA02
002656                                        LET DATA03 := (R0)+              ;DST.ADR
002656  012037  000566                                                                      MOV     (R0)+,DATA03
002662                                        LET DATA04 := (R0)+              ;FILL CHAR.
002662  012037  000570                                                                      MOV     (R0)+,DATA04
002666                                        LET DATA05 := (R0)+              ;SRC.BUFF.STATE
002666  012037  000572                                                                      MOV     (R0)+,DATA05
002672                                        LET DATA06 := (R0)               ;DST.BUFF.STATE
002672  011037  000574                                                                      MOV     (R0),DATA06

                                              ;+
                                              ;  SET UP THE GPR'S
                                              ;  EXPECTED GPR'S AND CONDITION CODES,
                                              ;  AND BUFFERS.
                                              ;-

002676                                        LET R0 := DATA00
002676  013700  000560                                                                      MOV     DATA00,R0
002702                                        LET R1 := DATA01
002702  013701  000562                                                                      MOV     DATA01,R1
002706                                        LET R2 := DATA02
002706  013702  000564                                                                      MOV     DATA02,R2
002712                                        LET R3 := DATA03
002712  013703  000566                                                                      MOV     DATA03,R3
```

```
002716                             LET R4 := DATA04
002716  013704  000570                                                           MOV     DATA04,R4
002722                             IF #1 SETIN COUNT THEN
002722  032737  000001  000466                                                   BIT     #1,COUNT
002730  001403                                                                   BEQ     $50054
002732                                 LET R5 := #177777
002732  012705  177777                                                           MOV     #177777,R5
002736                             ELSE
002736  000401                                                                   BR      $50055
002740                                                                $50054:
002740                                 LET R5 := #0
002740  005005                                                                   CLR     R5
002742                             ENDIF
002742                                                                $50055:
002742                             INLINE  <CMP    R0,R2>
002742  020002                                                                   CMP     R0,R2
002744                             LET CC.EXP := PSW
002744  013737  177776  000520                                                   MOV     PSW,CC.EXP
002752                             LET CC.EXP := CC.EXP CLR.BY #177760
002752  042737  177760  000520                                                   BIC     #177760,CC.EXP
002760                             IF #CBIT SETIN CC.EXP OR #ZBIT SETIN CC.EXP THEN
002760  032737  000001  000520                                                   BIT     #CBIT,CC.EXP
002766  001004                                                                   BNE     $50056
002770  032737  000004  000520                                                   BIT     #ZBIT,CC.EXP
002776  001403                                                                   BEQ     $50057
003000                                                                $50056:
003000                                 LET R0.EXP := #0
003000  005037  000522                                                           CLR     R0.EXP
003004                             ELSE
003004  000404                                                                   BR      $50060
003006                                                                $50057:
003006                                 LET R0.EXP := R0 - R2                 ;SRC.LEN - DST.LEN
003006  010037  000522                                                           MOV     R0,R0.EXP
003012  160237  000522                                                           SUB     R2,R0.EXP
003016                             ENDIF
003016                                                                $50060:
003016                             LET R1.EXP := #0
003016  005037  000524                                                           CLR     R1.EXP
003022                             LET R2.EXP := #0
003022  005037  000526                                                           CLR     R2.EXP
003026                             LET R3.EXP := #0
003026  005037  000530                                                           CLR     R3.EXP
003032                             LET R4.EXP := R4
003032  010437  000532                                                           MOV     R4,R4.EXP
003036                             LET R5.EXP := R5
003036  010537  000534                                                           MOV     R5,R5.EXP
003042                             LET BFADRS := R1                          ;SRC.ADR
003042  010137  000540                                                           MOV     R1,BFADRS
003046                             IF DATA05 EQ #0 THEN
003046  005737  000572                                                           TST     DATA05
003052  001003                                                                   BNE     $50061
003054                                 CALL CLRBUF
003054  004737  055346                                                           JSR     PC,CLRBUF
003060                             ELSE
003060  000411                                                                   BR      $50062
003062                                                                $50061:
```

```
003062                                     IF DATA05 EQ #177777 THEN
003062  023727  000572  177777                                                          CMP     DATA05,#177777
003070  001003                                                                          BNE     $50063
003072                                       CALL SETBUF
003072  004737  055410                                                                  JSR     PC,SETBUF
003076                                     ELSE
003076  000402                                                                          BR      $50064
003100                                                                        $50063:
003100                                       CALL ALTBUF
003100  004737  055454                                                                  JSR     PC,ALTBUF
003104                                     ENDIF
003104                                                                        $50064:
003104                                   ENDIF
003104                                                                        $50062:
003104                                   LET BFADRS := R3                  ;DST.ADR
003104  010337  000540                                                                  MOV     R3,BFADRS
003110                                   IF DATA06 EQ #0 THEN
003110  005737  000574                                                                  TST     DATA06
003114  001003                                                                          BNE     $50065
003116                                     CALL CLRBUF
003116  004737  055346                                                                  JSR     PC,CLRBUF
003122                                   ELSE
003122  000411                                                                          BR      $50066
003124                                                                        $50065:
003124                                     IF DATA06 EQ #177777 THEN
003124  023727  000574  177777                                                          CMP     DATA06,#177777
003132  001003                                                                          BNE     $50067
003134                                       CALL SETBUF
003134  004737  055410                                                                  JSR     PC,SETBUF
003140                                     ELSE
003140  000402                                                                          BR      $50070
003142                                                                        $50067:
003142                                       CALL ALTBUF
003142  004737  055454                                                                  JSR     PC,ALTBUF
003146                                     ENDIF
003146                                                                        $50070:
003146                                   ENDIF
003146                                                                        $50066:
003146                                   IF DATA02 EQ #0 THEN
003146  005737  000564                                                                  TST     DATA02
003152  001003                                                                          BNE     $50071
003154                                     LET BF.EXP := (R3)
003154  011337  000536                                                                  MOV     (R3),BF.EXP
003160                                   ELSE
003160  000402                                                                          BR      $50072
003162                                                                        $50071:
003162                                     LET BF.EXP := (R1)
003162  011137  000536                                                                  MOV     (R1),BF.EXP
003166                                   ENDIF
003166                                                                        $50072:

                                         ;+
                                         ; DO THE CIS INSTRUCTION
                                         ;-

003166                                   INLINE  <MOVC>
```

```
003166  076030                                                   MOVC


                                 ;+
                                 ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                 ;-

003170                           LET CC := PSW
003170  013737  177776  000516                                   MOV     PSW,CC
003176                           LET CC := CC CLR.BY #177760
003176  042737  177760  000516                                   BIC     #177760,CC
003204                           IF CC NE CC.EXP THEN
003204  023737  000516  000520                                   CMP     CC,CC.EXP
003212  001402                                                   BEQ     $50073
003214                               CALL ERROR
003214  004737  056274                                           JSR     PC,ERROR
003220                           ENDIF
003220                                                   $50073:
003220                           IF R0 NE R0.EXP THEN
003220  020037  000522                                           CMP     R0,R0.EXP
003224  001402                                                   BEQ     $50074
003226                               CALL ERROR
003226  004737  056274                                           JSR     PC,ERROR
003232                           ENDIF
003232                                                   $50074:
003232                           IF R1 NE R1.EXP THEN
003232  020137  000524                                           CMP     R1,R1.EXP
003236  001402                                                   BEQ     $50075
003240                               CALL ERROR
003240  004737  056274                                           JSR     PC,ERROR
003244                           ENDIF
003244                                                   $50075:
003244                           IF R2 NE R2.EXP THEN
003244  020237  000526                                           CMP     R2,R2.EXP
003250  001402                                                   BEQ     $50076
003252                               CALL ERROR
003252  004737  056274                                           JSR     PC,ERROR
003256                           ENDIF
003256                                                   $50076:
003256                           IF R3 NE R3.EXP THEN
003256  020337  000530                                           CMP     R3,R3.EXP
003262  001402                                                   BEQ     $50077
003264                               CALL ERROR
003264  004737  056274                                           JSR     PC,ERROR
003270                           ENDIF
003270                                                   $50077:
003270                           IF R4 NE R4.EXP THEN
003270  020437  000532                                           CMP     R4,R4.EXP
003274  001402                                                   BEQ     $50100
003276                               CALL ERROR
003276  004737  056274                                           JSR     PC,ERROR
003302                           ENDIF
003302                                                   $50100:
003302                           IF R5 NE R5.EXP THEN
003302  020537  000534                                           CMP     R5,R5.EXP
003306  001402                                                   BEQ     $50101
003310                               CALL ERROR
```

```
003310  004737  056274                                                          JSR     PC,ERROR
003314                                  ENDIF
003314                                                                  $50101:

                                        ;+
                                        ; CHECK ENTIRE DEST NATION BUFFER FOR CORRECT RESULTS
                                        ;-

003314                                  LET R0 := DATA01              ;SRC.ADR
003314  013700  000562                                                          MOV     DATA01,R0
003320                                  LET R1 := DATA03              ;DST.ADR
003320  013701  000566                                                          MOV     DATA03,R1
003324                                  LET ERRFLG := #0
003324  005037  000454                                                          CLR     ERRFLG
003330                                  IF DATA00 HIS DATA02    THEN
003330  023737  000560  000564                                                  CMP     DATA00,DATA02
003336  103417                                                                  BLO     $50102
003340                                     LET R3 := DATA02
003340  013703  000564                                                          MOV     DATA02,R3
003344                                     WHILE R3 NE #0 AND ERRFLG EQ #0 DO
003344                                                                  $50103:
003344  005703                                                                  TST     R3
003346  001412                                                                  BEQ     $50104
003350  005737  000454                                                          TST     ERRFLG
003354  001007                                                                  BNE     $50104
003356                                        IFB BF.EXP NE (R1)+ THEN
003356  123721  000536                                                          CMPB    BF.EXP,(R1)+
003362  001402                                                                  BEQ     $50105
003364                                           CALL ERROR
003364  004737  056274                                                          JSR     PC,ERROR
003370                                        ENDIF
003370                                                                  $50105:
003370                                        LET R3 := R3 - #1
003370  005303                                                                  DEC     R3
003372                                     ENDDO
003372  000764                                                                  BR      $50103
003374                                                                  $50104:
003374                                  ELSE
003374  000441                                                                  BR      $50106
003376                                                                  $50102:
003376                                     LET R3 := DATA00                   ;SRC.LEN
003376  013703  000560                                                          MOV     DATA00,R3
003402                                     WHILE R3 NE #0 AND ERRFLG EQ #0 DO
003402                                                                  $50107:
003402  005703                                                                  TST     R3
003404  001412                                                                  BEQ     $50110
003406  005737  000454                                                          TST     ERRFLG
003412  001007                                                                  BNE     $50110
003414                                        IFB BF.EXP NE (R1)+ THEN
003414  123721  000536                                                          CMPB    BF.EXP,(R1)+
003420  001402                                                                  BEQ     $50111
003422                                           CALL ERROR
003422  004737  056274                                                          JSR     PC,ERROR
003426                                        ENDIF
003426                                                                  $50111:
003426                                        LET R3 := R3 - #1
```

```
003426  005303                                                        DEC     R3
003430                          ENDDO
003430  000764                                                        BR      $50107
003432                                                      $50110:
003432                          LET R3 := DATA02  -  DATA00
003432  013703  000564                                                MOV     DATA02,R3
003436  163703  000560                                                SUB     DATA00,R3
003442                          LET R1 := DATA03  +  DATA00
003442  013701  000566                                                MOV     DATA03,R1
003446  063701  000560                                                ADD     DATA00,R1
003452                          REPEAT
003452                                                      $50112:
003452                            IFB (R1)+ NE DATA04 THEN
003452  122137  000570                                                CMPB    (R1)+,DATA04
003456  001402                                                        BEQ     $50113
003460                               CALL ERROR
003460  004737  056274                                                JSR     PC,ERROR
003464                            ENDIF
003464                                                      $50113:
003464                            LET R3 := R3 - #1
003464  005303                                                        DEC     R3
003466                          UNTIL R3 EQ #0 OR ERRFLG NE #0
003466  005703                                                        TST     R3
003470  001403                                                        BEQ     $50114
003472  005737  000454                                                TST     ERRFLG
003476  001765                                                        BEQ     $50112
003500                                                      $50114:
003500                        ENDIF
003500                                                      $50106:
003500                        LET ERRFLG := #0
003500  005037  000454                                                CLR     ERRFLG
003504                        IF DATA02 LO #BUFLEN THEN
003504  023727  000564  000100                                        CMP     DATA02,#BUFLEN
003512  103040                                                        BHIS    $50115
003514                          IF DATA06 EQ #1 THEN
003514  023727  000574  000001                                        CMP     DATA06,#1
003522  001004                                                        BNE     $50116
003524                            LET BF.EXP := #125252
003524  012737  125252  000536                                        MOV     #125252,BF.EXP
003532                          ELSE
003532  000403                                                        BR      $50117
003534                                                      $50116:
003534                            LET BF.EXP := DATA06
003534  013737  000574  000536                                        MOV     DATA06,BF.EXP
003542                          ENDIF
003542                                                      $50117:
003542                          LET R0 := DATA02 + DATA03
003542  013700  000564                                                MOV     DATA02,R0
003546  063700  000566                                                ADD     DATA03,R0
003552                          LET TEMP0 := DATA03 + #BUFLEN
003552  013737  000566  000474                                        MOV     DATA03,TEMP0
003560  062737  000100  000474                                        ADD     #BUFLEN,TEMP0
003566                          REPEAT
003566                                                      $50120:
003566                            IFB (R0)+ NE BF.EXP THEN
003566  122037  000536                                                CMPB    (R0)+,BF.EXP
```

```
003572  001402                                                                              BEQ     $50121
003574                                                  CALL ERROR
003574  004737  056274                                                                      JSR     PC,ERROR
003600                                           ENDIF
003600                                                                          $50121:
003600                                      UNTIL R0 EQ TEMPO OR ERRFLG NE #0
003600  020037  000474                                                                      CMP     R0,TEMPO
003604  001403                                                                              BEQ     $50122
003606  005737  000454                                                                      TST     ERRFLG
003612  001765                                                                              BEQ     $50120
003614                                                                          $50122:
003614                               ENDIF
003614                                                                          $50115:
003614                               LET TSTCAS := TSTCAS + #16
003614  062737  000016  000542                                                              ADD     #16,TSTCAS
003622                               LET COUNT := COUNT - #1
003622  005337  000466                                                                      DEC     COUNT

003626                      ;UNTIL COUNT EQ #0
                            IF COUNT NE #0 THEN
003626  005737  000466                                                                      TST     COUNT
003632  001402                                                                              BEQ     $50123
003634                          INLINE  <JMP        $5030>
003634  000137  002636                                                                      JMP     $5030
003640                      ENDIF
003640                                                                          $50123:



                            ;+
                            ; DO ONE IN-LINE CASE - MOVCI
                            ;-

003640                      LET BFADRS := #BUFF1
003640  012737  061166  000540                                                              MOV     #BUFF1,BFADRS
003646                      CALL SETBUF
003646  004737  055410                                                                      JSR     PC,SETBUF
003652                      LET BFADRS := #BUFF2
003652  012737  061266  000540                                                              MOV     #BUFF2,BFADRS
003660                      CALL CLRBUF
003660  004737  055346                                                                      JSR     PC,CLRBUF
003664                      LET R0 := #125252
003664  012700  125252                                                                      MOV     #125252,R0
003670                      LET R1 := #125252
003670  012701  125252                                                                      MOV     #125252,R1
003674                      LET R2 := #125252
003674  012702  125252                                                                      MOV     #125252,R2
003700                      LET R3 := #125252
003700  012703  125252                                                                      MOV     #125252,R3
003704                      LET R4 := #125252
003704  012704  125252                                                                      MOV     #125252,R4
003710                      LET R5 := #125252
003710  012705  125252                                                                      MOV     #125252,R5
003714                      LET ERRFLG := #0
003714  005037  000454                                                                      CLR     ERRFLG
003720                      INLINE  <MOVCI>
003720  076130                                                                              MOVCI
003722                      INLINE  <.WORD  TMOVCI>                         ;SRC.DSCR.PTR
```

```
003722  004460                                                            .WORD   TMOVCI
003724                          INLINE  <.WORD  TMOVCI+4>     ;DST.DSCR.PTR
003724  004464                                                            .WORD   TMOVCI+4
003726                          INLINE  <.WORD  40>           ;FILL CHARACTER
003726  000040                                                            .WORD   40
003730                          IFCOND CS THEN
003730  103003                                                            BCC     $50124
003732                             IFCOND EQ THEN
003732  001002                                                            BNE     $50125
003734                                  CALL ERROR
003734  004737  056274                                                    JSR     PC,ERROR
003740                             ENDIF
003740                                                            $50125:
003740                          ENDIF
003740                                                            $50124:
003740                          IF R0 NE #125252 THEN
003740  020027  125252                                                    CMP     R0,#125252
003744  001402                                                            BEQ     $50126
003746                             CALL ERROR
003746  004737  056274                                                    JSR     PC,ERROR
003752                          ENDIF
003752                                                            $50126:
003752                          IF R1 NE #125252 THEN
003752  020127  125252                                                    CMP     R1,#125252
003756  001402                                                            BEQ     $50127
003760                             CALL ERROR
003760  004737  056274                                                    JSR     PC,ERROR
003764                          ENDIF
003764                                                            $50127:
003764                          IF R2 NE #125252 THEN
003764  020227  125252                                                    CMP     R2,#125252
003770  001402                                                            BEQ     $50130
003772                             CALL ERROR
003772  004737  056274                                                    JSR     PC,ERROR
003776                          ENDIF
003776                                                            $50130:
003776                          IF R3 NE #125252 THEN
003776  020327  125252                                                    CMP     R3,#125252
004002  001402                                                            BEQ     $50131
004004                             CALL ERROR
004004  004737  056274                                                    JSR     PC,ERROR
004010                          ENDIF
004010                                                            $50131:
004010                          IF R4 NE #125252 THEN
004010  020427  125252                                                    CMP     R4,#125252
004014  001402                                                            BEQ     $50132
004016                             CALL ERROR
004016  004737  056274                                                    JSR     PC,ERROR
004022                          ENDIF
004022                                                            $50132:
004022                          IF R5 NE #125252 THEN
004022  020527  125252                                                    CMP     R5,#125252
004026  001402                                                            BEQ     $50133
004030                             CALL ERROR
004030  004737  056274                                                    JSR     PC,ERROR
004034                          ENDIF
```

```
004034                                                                    $50133:
004034                           IF BUFF2 NE #177777 THEN
004034  023727  061266  177777                                                    CMP     BUFF2,#177777
004042  001402                                                                    BEQ     $50134
004044                              CALL ERROR
004044  004737  056274                                                            JSR     PC,ERROR
004050                           ENDIF
004050                                                                    $50134:
004050                           IF BUFF2+2 NE #20040 THEN
004050  023727  061270  020040                                                    CMP     BUFF2+2,#20040
004056  001402                                                                    BEQ     $50135
004060                              CALL ERROR
004060  004737  056274                                                            JSR     PC,ERROR
004064                           ENDIF
004064                                                                    $50135:
004064                           LET R0 := #BUFF2+4
004064  012700  061272                                                            MOV     #BUFF2+4,R0
004070                           LET TEMP0 := #BUFF2 + #BUFLEN-2
004070  012737  061266  000474                                                    MOV     #BUFF2,TEMP0
004076  062737  000076  000474                                                    ADD     #BUFLEN-2,TEMP0
004104                           REPEAT
004104                                                                    $50136:
004104                             IF (R0)+ NE #0 THEN
004104  005720                                                                    TST     (R0)+
004106  001402                                                                    BEQ     $50137
004110                                CALL ERROR
004110  004737  056274                                                            JSR     PC,ERROR
004114                             ENDIF
004114                                                                    $50137:
004114                           UNTIL R0 EQ TEMP0 OR ERRFLG NE #0
004114  020037  000474                                                            CMP     R0,TEMP0
004120  001403                                                                    BEQ     $50140
004122  005737  000454                                                            TST     ERRFLG
004126  001766                                                                    BEQ     $50136
004130                                                                    $50140:
004130                           INLINE  <JMP    XMOVRC>
004130  000137  004470                                                            JMP     XMOVRC

                                 ;+
                                 ; TABLE OF TEST CASES FOR MOVC
                                 ;-

004134  000017                   TMOVC:  .WORD  15.            ;# OF TEST CASES FOR MOVC

004136  000040                           .WORD   40                    ;SRC.LEN
004140  061266                           .WORD  BUFF2                  ;SRC.ADR
004142  000000                           .WORD  0                      ;DST.LEN
004144  061166                           .WORD  BUFF1                  ;DST.ADR
004146  000040                           .WORD  40                     ;FILL CHAR.
004150  000000                           .WORD   0                     ;SRC.BUFF.STATE
004152  177777                           .WORD  -1                     ;DST.BUFF.STATE

004154  000050                           .WORD  50             ;TEST CASE NUMBER 2
004156  061266                           .WORD  BUFF2
004160  000020                           .WORD  20
004162  061166                           .WORD  BUFF1
```

```
004164  000100          .WORD   100
004166  177777          .WORD   -1
004170  000000          .WORD    0

004172  000045          .WORD   45              ;TEST CASE NUMBER 3
004174  061266          .WORD   BUFF2
004176  000030          .WORD   30
004200  061166          .WORD   BUFF1
004202  000007          .WORD    7
004204  000000          .WORD    0
004206  000001          .WORD    1

004210  000000          .WORD    0              ;TEST CASE NUMBER 4
004212  061266          .WORD   BUFF2
004214  000060          .WORD   60
004216  061166          .WORD   BUFF1
004220  000010          .WORD   10
004222  000001          .WORD    1
004224  000000          .WORD    0

004226  000046          .WORD   46              ;TEST CASE NUMBER 5
004230  061266          .WORD   BUFF2
004232  000132          .WORD   BUFLEN+32
004234  061166          .WORD   BUFF1
004236  000077          .WORD   77
004240  177777          .WORD   -1
004242  000001          .WORD    1

004244  000000          .WORD    0              ;TEST CASE NUMBER 6
004246  061266          .WORD   BUFF2
004250  000015          .WORD   15
004252  061166          .WORD   BUFF1
004254  000060          .WORD   60
004256  000001          .WORD    1
004260  177777          .WORD   -1

004262  000043          .WORD   43              ;TEST CASE NUMBER 7
004264  061266          .WORD   BUFF2
004266  000070          .WORD   70
004270  061166          .WORD   BUFF1
004272  000370          .WORD   370
004274  000000          .WORD    0
004276  177777          .WORD   -1

004300  000060          .WORD   60              ;TEST CASE NUMBER 8
004302  061166          .WORD   BUFF1
004304  000000          .WORD    0
004306  061266          .WORD   BUFF2
004310  000200          .WORD   200
004312  177777          .WORD   -1
004314  000000          .WORD    0

004316  000120          .WORD   BUFLEN+20       ;TEST CASE NUMBER 9
004320  061166          .WORD   BUFF1
004322  000100          .WORD   100
004324  061266          .WORD   BUFF2
```

```
004326  000002                  .WORD   2
004330  000000                  .WORD   0
004332  000001                  .WORD   1

004334  000015                  .WORD   15              ;TEST CASE NUMBER 10
004336  061166                  .WORD   BUFF1
004340  000000                  .WORD   0
004342  061266                  .WORD   BUFF2
004344  000016                  .WORD   16
004346  000001                  .WORD   1
004350  000000                  .WORD   0

004352  000077                  .WORD   77              ;TEST CASE NUMBER 11
004354  061166                  .WORD   BUFF1
004356  000021                  .WORD   21
004360  061266                  .WORD   BUFF2
004362  000300                  .WORD   300
004364  177777                  .WORD   -1
004366  000001                  .WORD   1

004370  000000                  .WORD   0               ;TEST CASE NUMBER 12
004372  061166                  .WORD   BUFF1
004374  000050                  .WORD   50
004376  061266                  .WORD   BUFF2
004400  000003                  .WORD   3
004402  000001                  .WORD   1
004404  177777                  .WORD   -1

004406  000014                  .WORD   14              ;TEST CASE NUMBER 13
004410  061166                  .WORD   BUFF1
004412  000042                  .WORD   42
004414  061266                  .WORD   BUFF2
004416  000030                  .WORD   30
004420  000000                  .WORD   0
004422  177777                  .WORD   -1

004424  000000                  .WORD   0               ;TEST CASE NUMBER 14
004426  061166                  .WORD   BUFF1
004430  000053                  .WORD   53
004432  061266                  .WORD   BUFF2
004434  000012                  .WORD   12
004436  000001                  .WORD   1
004440  000000                  .WORD   0

004442  000027                  .WORD   27              ;TEST CASE NUMBER 15
004444  061166                  .WORD   BUFF1
004446  000060                  .WORD   60
004450  061266                  .WORD   BUFF2
004452  000014                  .WORD   14
004454  177777                  .WORD   -1
004456  000001                  .WORD   1


004460  000002          TMOVCI: .WORD   2               ;TEST CASE FOR IN-LINE
004462  061166                  .WORD   BUFF1
004464  000004                  .WORD   4
```

```
1567 004466 061266                    .WORD   BUFF2
```

```
                                    .SBTTL  MOVRC
                                    ;;*************************************************************
                                    ;
                                    ;   MOVRC TEST
                                    ;
                                    ;;*************************************************************

004470                              INLINE  <XMOVRC:>
004470                                                                               XMOVRC:
004470                              INLINE  <SCOPE>
004470  000004                                                                       SCOPE
004472                              LET $TIMES := #20              ;ITERATION COUNT
004472  012737  000020  000404                                                       MOV     #20,$TIMES
004500                              LET COUNT := TMOVRC            ;GET TEST COUNT
004500  013737  006000  000466                                                       MOV     TMOVRC,COUNT
004506                              LET TSTCAS := #TMOVRC+2        ;POINT TO FIRST TEST CASE
004506  012737  006002  000542                                                       MOV     #TMOVRC+2,TSTCAS
                                    ;REPEAT
004514                              INLINE  <$5031:>
004514                                                                               $5031:

                                          ;+
                                          ; GET TEST DATA FROM TABLE
                                          ;-

004514                                    LET R0 := TSTCAS
004514  013700  000542                                                               MOV     TSTCAS,R0
004520                                    LET DATA00 := (R0)+          ;SRC.LEN
004520  012037  000560                                                               MOV     (R0)+,DATA00
004524                                    LET DATA01 := (R0)+          ;SRC.ADR
004524  012037  000562                                                               MOV     (R0)+,DATA01
004530                                    LET DATA02 := (R0)+          ;DST.LEN
004530  012037  000564                                                               MOV     (R0)+,DATA02
004534                                    LET DATA03 := (R0)+          ;DST.ADR
004534  012037  000566                                                               MOV     (R0)+,DATA03
004540                                    LET DATA04 := (R0)+          ;FILL CHAR.
004540  012037  000570                                                               MOV     (R0)+,DATA04
004544                                    LET DATA05 := (R0)+          ;SRC.BUFF.STATE
004544  012037  000572                                                               MOV     (R0)+,DATA05
004550                                    LET DATA06 := (R0)           ;DST.BUFF.STATE
004550  011037  000574                                                               MOV     (R0),DATA06

                                          ;+
                                          ; SET UP GPR'S, EXPECTED GPR'S AND
                                          ; CONDITION CODES, AND BUFFERS.
                                          ;-

004554                                    LET R0 := DATA00
004554  013700  000560                                                               MOV     DATA00,R0
004560                                    LET R1 := DATA01
004560  013701  000562                                                               MOV     DATA01,R1
004564                                    LET R2 := DATA02
004564  013702  000564                                                               MOV     DATA02,R2
004570                                    LET R3 := DATA03
004570  013703  000566                                                               MOV     DATA03,R3
004574                                    LET R4 := DATA04
```

```
004574  013704  000570                                                                  MOV     DATA04,R4
004600                          IF #1 SETIN COUNT THEN
004600  032737  000001  000466                                                          BIT     #1,COUNT
004606  001403                                                                          BEQ     $50141
004610                             LET R5 := #177777
004610  012705  177777                                                                  MOV     #177777,R5
004614                          ELSE
004614  000401                                                                          BR      $50142
004616                                                                        $50141:
004616                             LET R5 := #0
004616  005005                                                                          CLR     R5
004620                          ENDIF
004620                                                                        $50142:
004620                          INLINE  <CMP    R0,R2>
004620  020002                                                                          CMP     R0,R2
004622                          LET CC.EXP := PSW
004622  013737  177776  000520                                                          MOV     PSW,CC.EXP
004630                          LET CC.EXP := CC.EXP  CLR.BY  #177760
004630  042737  177760  000520                                                          BIC     #177760,CC.EXP
004636                          IF #CBIT SETIN CC.EXP OR #ZBIT SETIN CC.EXP THEN
004636  032737  000001  000520                                                          BIT     #CBIT,CC.EXP
004644  001004                                                                          BNE     $50143
004646  032737  000004  000520                                                          BIT     #ZBIT,CC.EXP
004654  001403                                                                          BEQ     $50144
004656                                                                        $50143:
004656                             LET R0.EXP := #0
004656  005037  000522                                                                  CLR     R0.EXP
004662                          ELSE
004662  000404                                                                          BR      $50145
004664                                                                        $50144:
004664                             LET R0.EXP := R0 - R2
004664  010037  000522                                                                  MOV     R0,R0.EXP
004670  160237  000522                                                                  SUB     R2,R0.EXP
004674                          ENDIF
004674                                                                        $50145:
004674                          LET R1.EXP := #0
004674  005037  000524                                                                  CLR     R1.EXP
004700                          LET R2.EXP := #0
004700  005037  000526                                                                  CLR     R2.EXP
004704                          LET R3.EXP := #0
004704  005037  000530                                                                  CLR     R3.EXP
004710                          LET R4.EXP := R4
004710  010437  000532                                                                  MOV     R4,R4.EXP
004714                          LET R5.EXP := R5
004714  010537  000534                                                                  MOV     R5,R5.EXP
004720                          LET BFADRS := DATA01
004720  013737  000562  000540                                                          MOV     DATA01,BFADRS
004726                          IF DATA05 EQ #0 THEN
004726  005737  000572                                                                  TST     DATA05
004732  001003                                                                          BNE     $50146
004734                             CALL CLRBUF
004734  004737  055346                                                                  JSR     PC,CLRBUF
004740                          ELSE
004740  000411                                                                          BR      $50147
004742                                                                        $50146:
004742                             IF DATA05 EQ #177777 THEN
```

```
004742  023727  000572  177777                                              CMP     DATA05,#177777
004750  001003                                                              BNE     $50150
004752                                      CALL SETBUF
004752  004737  055410                                                      JSR     PC,SETBUF
004756                                  ELSE
004756  000402                                                              BR      $50151
004760                                                              $50150:
004760                                      CALL ALTBUF
004760  004737  055454                                                      JSR     PC,ALTBUF
004764                                  ENDIF
004764                                                              $50151:
004764                              ENDIF
004764                                                              $50147:
004764                              LET BFADRS := DATA03
004764  013737  000566  000540                                              MOV     DATA03,BFADRS
004772                              IF DATA06 EQ #0 THEN
004772  005737  000574                                                      TST     DATA06
004776  001003                                                              BNE     $50152
005000                                  CALL CLRBUF
005000  004737  055346                                                      JSR     PC,CLRBUF
005004                              ELSE
005004  000411                                                              BR      $50153
005006                                                              $50152:
005006                                  IF DATA06 EQ #177777 THEN
005006  023727  000574  177777                                              CMP     DATA06,#177777
005014  001003                                                              BNE     $50154
005016                                      CALL SETBUF
005016  004737  055410                                                      JSR     PC,SETBUF
005022                                  ELSE
005022  000402                                                              BR      $50155
005024                                                              $50154:
005024                                      CALL ALTBUF
005024  004737  055454                                                      JSR     PC,ALTBUF
005030                                  ENDIF
005030                                                              $50155:
005030                              ENDIF
005030                                                              $50153:
005030                              LET BF.EXP := @DATA03
005030  017737  173532  000536                                              MOV     @DATA03,BF.EXP

                                    ;+
                                    ; DO THE CIS INSTRUCTION
                                    ;-

005036                              INLINE  <MOVRC>
005036  076031                                                              MOVRC

                                    ;+
                                    ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                    ;-

005040                              LET CC := PSW
005040  013737  177776  000516                                              MOV     PSW,CC
005046                              LET CC := CC CLR.BY #177760
005046  042737  177760  000516                                              BIC     #177760,CC
005054                              IF CC NE CC.EXP THEN
```

```
005054  023737  000516  000520                                          CMP     CC,CC.EXP
005062  001402                                                          BEQ     $50156
005064                                     CALL ERROR
005064  004737  056274                                                  JSR     PC,ERROR
005070                              ENDIF
005070                                                         $50156:
005070                              IF R0 NE R0.EXP THEN
005070  020037  000522                                                  CMP     R0,R0.EXP
005074  001402                                                          BEQ     $50157
005076                                     CALL ERROR
005076  004737  056274                                                  JSR     PC,ERROR
005102                              ENDIF
005102                                                         $50157:
005102                              IF R1 NE R1.EXP THEN
005102  020137  000524                                                  CMP     R1,R1.EXP
005106  001402                                                          BEQ     $50160
005110                                     CALL ERROR
005110  004737  056274                                                  JSR     PC,ERROR
005114                              ENDIF
005114                                                         $50160:
005114                              IF R2 NE R2.EXP THEN
005114  020237  000526                                                  CMP     R2,R2.EXP
005120  001402                                                          BEQ     $50161
005122                                     CALL ERROR
005122  004737  056274                                                  JSR     PC,ERROR
005126                              ENDIF
005126                                                         $50161:
005126                              IF R3 NE R3.EXP THEN
005126  020337  000530                                                  CMP     R3,R3.EXP
005132  001402                                                          BEQ     $50162
005134                                     CALL ERROR
005134  004737  056274                                                  JSR     PC,ERROR
005140                              ENDIF
005140                                                         $50162:
005140                              IF R4 NE R4.EXP THEN
005140  020437  000532                                                  CMP     R4,R4.EXP
005144  001402                                                          BEQ     $50163
005146                                     CALL ERROR
005146  004737  056274                                                  JSR     PC,ERROR
005152                              ENDIF
005152                                                         $50163:
005152                              IF R5 NE R5.EXP THEN
005152  020537  000534                                                  CMP     R5,R5.EXP
005156  001402                                                          BEQ     $50164
005160                                     CALL ERROR
005160  004737  056274                                                  JSR     PC,ERROR
005164                              ENDIF
005164                                                         $50164:

                              ;+
                              ; CHECK ENTIRE DESTINATION BUFFER FOR CORRECT RESULTS
                              ;-

005164                              LET ERRFLG := #0
005164  005037  000454                                                  CLR     ERRFLG
005170                              LET R1 := DATA03
```

```
005170  013701  000566                                                              MOV     DATA03,R1
005174                                 IF DATA00 HIS DATA02 THEN
005174  023737  000560  000564                                                      CMP     DATA00,DATA02
005202  103424                                                                      BLO     $50165
005204                                   LET R3 := DATA02
005204  013703  000564                                                              MOV     DATA02,R3
005210                                   LET R0 := DATA01 + DATA00 - DATA02
005210  013700  000562                                                              MOV     DATA01,R0
005214  063700  000560                                                              ADD     DATA00,R0
005220  163700  000564                                                              SUB     DATA02,R0
005224                                   WHILE R3 NE #0 AND ERRFLG EQ #0 DO
005224                                                                    $50166:
005224  005703                                                                      TST     R3
005226  001411                                                                      BEQ     $50167
005230  005737  000454                                                              TST     ERRFLG
005234  001006                                                                      BNE     $50167
005236                                     IFB (R0)+ NE (R1)+ THEN
005236  122021                                                                      CMPB    (R0)+,(R1)+
005240  001402                                                                      BEQ     $50170
005242                                             CALL ERROR
005242  004737  056274                                                              JSR     PC,ERROR
005246                                     ENDIF
005246                                                                    $50170:
005246                                     LET R3 := R3 - #1
005246  005303                                                                      DEC     R3
005250                                   ENDDO
005250  000765                                                                      BR      $50166
005252                                                                    $50167:
005252                                 ELSE
005252  000455                                                                      BR      $50171
005254                                                                    $50165:
005254                                   REPEAT
005254                                                                    $50172:
005254                                         IFB (R1)+ NE DATA04 THEN
005254  122137  000570                                                              CMPB    (R1)+,DATA04
005260  001402                                                                      BEQ     $50173
005262                                               CALL ERROR
005262  004737  056274                                                              JSR     PC,ERROR
005266                                         ENDIF
005266                                                                    $50173:
005266                                   LET TEMP0 := DATA03 + DATA02 - DATA00
005266  013737  000566  000474                                                      MOV     DATA03,TEMP0
005274  063737  000564  000474                                                      ADD     DATA02,TEMP0
005302  163737  000560  000474                                                      SUB     DATA00,TEMP0
005310                                   UNTIL R1 EQ TEMP0 OR ERRFLG NE #0
005310  020137  000474                                                              CMP     R1,TEMP0
005314  001403                                                                      BEQ     $50174
005316  005737  000454                                                              TST     ERRFLG
005322  001754                                                                      BEQ     $50172
005324                                                                    $50174:
005324                                   LET R0 := DATA01
005324  013700  000562                                                              MOV     DATA01,R0
005330                                   LET R1 := DATA03 + DATA02 - DATA00
005330  013701  000566                                                              MOV     DATA03,R1
005334  063701  000564                                                              ADD     DATA02,R1
005340  163701  000560                                                              SUB     DATA00,R1
```

```
005344                                   LET TEMPO := DATA03 + DATA02
005344  013737  000566  000474                                                        MOV     DATA03,TEMPO
005352  063737  000564  000474                                                        ADD     DATA02,TEMPO
005360                                   WHILE R1 NE TEMPO AND ERRFLG NE #0 DO
005360                                                                       $50175:
005360  020137  000474                                                                CMP     R1,TEMPO
005364  001410                                                                        BEQ     $50176
005366  005737  000454                                                                TST     ERRFLG
005372  001405                                                                        BEQ     $50176
005374                                       IFB (R0)+ NE (R1)+ THEN
005374  122021                                                                        CMPB    (R0)+,(R1)+
005376  001402                                                                        BEQ     $50177
005400                                            CALL ERROR
005400  004737  056274                                                                JSR     PC,ERROR
005404                                       ENDIF
005404                                                                       $50177:
005404                                   ENDDO
005404  000765                                                                        BR      $50175
005406                                                                       $50176:
005406                                ENDIF
005406                                                                       $50171:
005406                                IF DATA02 LO #BUFLEN THEN
005406  023727  000564  000100                                                        CMP     DATA02,#BUFLEN
005414  103025                                                                        BHIS    $50200
005416                                   LET R0 := DATA03 + DATA02
005416  013700  000566                                                                MOV     DATA03,R0
005422  063700  000564                                                                ADD     DATA02,R0
005426                                   REPEAT
005426                                                                       $50201:
005426                                     IFB (R0)+ NE BF.EXP THEN
005426  122037  000536                                                                CMPB    (R0)+,BF.EXP
005432  001402                                                                        BEQ     $50202
005434                                        CALL ERROR
005434  004737  056274                                                                JSR     PC,ERROR
005440                                     ENDIF
005440                                                                       $50202:
005440                                   LET TEMPO := DATA03 + #BUFLEN
005440  013737  000566  000474                                                        MOV     DATA03,TEMPO
005446  062737  000100  000474                                                        ADD     #BUFLEN,TEMPO
005454                                   UNTIL R0 EQ TEMPO OR ERRFLG NE #0
005454  020037  000474                                                                CMP     R0,TEMPO
005460  001403                                                                        BEQ     $50203
005462  005737  000454                                                                TST     ERRFLG
005466  001757                                                                        BEQ     $50201
005470                                                                       $50203:
005470                                ENDIF
005470                                                                       $50200:
005470                                LET TSTCAS := TSTCAS + #16
005470  062737  000016  000542                                                        ADD     #16,TSTCAS
005476                                LET COUNT := COUNT - #1
005476  005337  000466                                                                DEC     COUNT
                               ;UNTIL COUNT EQ #0
005502                         IF COUNT NE #0 THEN
005502  005737  000466                                                                TST     COUNT
005506  001402                                                                        BEQ     $50204
005510                              INLINE  <JMP        $5031>
```

```
005510  000137  004514                                                    JMP     $5031
005514                        ENDIF
005514                                                          $50204:



                              ;+
                              ; DO ONE INLINE CASE - MOVRCI
                              ;-

005514                        LET BFADRS := #BUFF1
005514  012737  061166  000540                                            MOV     #BUFF1,BFADRS
005522                        CALL SETBUF
005522  004737  055410                                                    JSR     PC,SETBUF
005526                        LET BFADRS := #BUFF2
005526  012737  061266  000540                                            MOV     #BUFF2,BFADRS
005534                        CALL CLRBUF
005534  004737  055346                                                    JSR     PC,CLRBUF
005540                        LET R0 := #125252
005540  012700  125252                                                    MOV     #125252,R0
005544                        LET R1 := #125252
005544  012701  125252                                                    MOV     #125252,R1
005550                        LET R2 := #125252
005550  012702  125252                                                    MOV     #125252,R2
005554                        LET R3 := #125252
005554  012703  125252                                                    MOV     #125252,R3
005560                        LET R4 := #125252
005560  012704  125252                                                    MOV     #125252,R4
005564                        LET R5 := #125252
005564  012705  125252                                                    MOV     #125252,R5
005570                        LET ERRFLG := #0
005570  005037  000454                                                    CLR     ERRFLG
005574                        INLINE  <MOVRCI>
005574  076131                                                            MOVRCI
005576                        INLINE  <.WORD  TMVRCI>          ;SRC.DSCR.PTR
005576  006072                                                            .WORD   TMVRCI
005600                        INLINE  <.WORD  TMVRCI+4>        ;DST.DSCR.PTR
005600  006076                                                            .WORD   TMVRCI+4
005602                        INLINE  <.WORD  40>              ;FILL CHARACTER
005602  000040                                                            .WORD   40
005604                        IFCOND CS THEN
005604  103003                                                            BCC     $50205
005606                           IFCOND EQ THEN
005606  001002                                                            BNE     $50206
005610                              CALL ERROR
005610  004737  056274                                                    JSR     PC,ERROR
005614                           ENDIF
005614                                                          $50206:
005614                        ENDIF
005614                                                          $50205:
005614                        IF R0 NE #125252 THEN
005614  020027  125252                                                    CMP     R0,#125252
005620  001402                                                            BEQ     $50207
005622                           CALL ERROR
005622  004737  056274                                                    JSR     PC,ERROR
005626                        ENDIF
005626                                                          $50207:
```

```
005626                          IF R1 NE #125252 THEN
005626  020127  125252                                                  CMP     R1,#125252
005632  001402                                                          BEQ     $50210
005634                              CALL ERROR
005634  004737  056274                                                  JSR     PC,ERROR
005640                          ENDIF
005640                                                          $50210:
005640                          IF R2 NE #125252 THEN
005640  020227  125252                                                  CMP     R2,#125252
005644  001402                                                          BEQ     $50211
005646                              CALL ERROR
005646  004737  056274                                                  JSR     PC,ERROR
005652                          ENDIF
005652                                                          $50211:
005652                          IF R3 NE #125252 THEN
005652  020327  125252                                                  CMP     R3,#125252
005656  001402                                                          BEQ     $50212
005660                              CALL ERROR
005660  004737  056274                                                  JSR     PC,ERROR
005664                          ENDIF
005664                                                          $50212:
005664                          IF R4 NE #125252 THEN
005664  020427  125252                                                  CMP     R4,#125252
005670  001402                                                          BEQ     $50213
005672                              CALL ERROR
005672  004737  056274                                                  JSR     PC,ERROR
005676                          ENDIF
005676                                                          $50213:
005676                          IF R5 NE #125252 THEN
005676  020527  125252                                                  CMP     R5,#125252
005702  001402                                                          BEQ     $50214
005704                              CALL ERROR
005704  004737  056274                                                  JSR     PC,ERROR
005710                          ENDIF
005710                                                          $50214:
005710                          IF BUFF2 NE #20040 THEN
005710  023727  061266  020040                                          CMP     BUFF2,#20040
005716  001402                                                          BEQ     $50215
005720                              CALL ERROR
005720  004737  056274                                                  JSR     PC,ERROR
005724                          ENDIF
005724                                                          $50215:
005724                          IF BUFF2+2 NE #177777 THEN
005724  023727  061270  177777                                          CMP     BUFF2+2,#177777
005732  001402                                                          BEQ     $50216
005734                              CALL ERROR
005734  004737  056274                                                  JSR     PC,ERROR
0C5740                          ENDIF
005740                                                          $50216:
005740                          LET ERRFLG := #0
005740  005037  000454                                                  CLR     ERRFLG
005744                          LET R0 := #BUFF2+4
005744  012700  061272                                                  MOV     #BUFF2+4,R0
005750                          REPEAT
005750                                                          $50217:
005750                              IF (R0)+ NE #0 THEN
```

```
005750  005720                                                                          TST     (R0)+
005752  001402                                                                          BEQ     $50220
005754                          CALL ERROR
005754  004737  056274                                                                  JSR     PC,ERROR
005760                       ENDIF
005760                                                                      $50220:
005760                    UNTIL R0 EQ #BUFF2+BUFLEN-2 OR ERRFLG NE #0
005760  020027  061364                                                                  CMP     R0,#BUFF2+BUFLEN
005764  001403                                                                          BEQ     $50221
005766  005737  000454                                                                  TST     ERRFLG
005772  001766                                                                          BEQ     $50217
005774                                                                      $50221:
005774                    INLINE  <JMP    XMOVTC>
005774  000137  006102                                                                  JMP     XMOVTC

                          ;+
                          ;TABLE OF TEST CASES FOR MOVRC
                          ;-

006000  000004            TMOVRC: .WORD   4                 ;#OF TEST CASES FOR MOVRC

006002  000060                    .WORD   60                        ;SRC.LEN
006004  061266                    .WORD   BUFF2                     ;SRC.ADR
006006  000025                    .WORD   25                        ;DST.LEN
006010  061166                    .WORD   BUFF1                     ;DST.ADR
006012  000040                    .WORD   40                        ;FILL CHAR.
006014  000000                    .WORD   0                         ;SRC.BUFF.STATE
006016  000001                    .WORD   1                         ;DST.BUFF.STATE

006020  000017                    .WORD   17                ;TEST CASE NUMBER 2
006022  061266                    .WORD   BUFF2
006024  000050                    .WORD   50
006026  061166                    .WORD   BUFF1
006030  000100                    .WORD   100
006032  000001                    .WORD   1
006034  000000                    .WORD   0

006036  000030                    .WORD   30                ;TEST CASE NUMBER 3
006040  061166                    .WORD   BUFF1
006042  000012                    .WORD   12
006044  061266                    .WORD   BUFF2
006046  000077                    .WORD   77
006050  000000                    .WORD   0
006052  177777                    .WORD   -1

006054  000022                    .WORD   22                ;TEST CASE NUMBER 4
006056  061166                    .WORD   BUFF1
006060  000037                    .WORD   37
006062  061166                    .WORD   BUFF1
006064  000020                    .WORD   20
006066  177777                    .WORD   -1
006070  000001                    .WORD   1

006072  000002            TMVRCI: .WORD   2                 ;TEST CASE FOR IN-LINE
006074  061166                    .WORD   BUFF1
006076  000004                    .WORD   4
```

```
2072 006100 061266                    .WORD   BUFF2
```

```
                                  .SBTTL  MOVTC
                                  ;;*******************************************************************
                                  ;
                                  ;  MOVTC TEST
                                  ;
                                  ;;*******************************************************************
006102                            INLINE  <XMOVTC:>
006102                                                                                  XMOVTC:
006102                            INLINE  <SCOPE>
006102  000004                                                                          SCOPE
006104                            LET $TIMES := #20                 ;ITERATION COUNT
006104  012737  000020  000404                                                          MOV     #20,$TIMES
006112                            LET COUNT := TMOVTC               ;GET TEST COUNT
006112  013737  007436  000466                                                          MOV     TMOVTC,COUNT
006120                            LET TSTCAS := #TMOVTC+2           ;POINT TO FIRST TEST CASE
006120  012737  007440  000542                                                          MOV     #TMOVTC+2,TSTCAS
                                  ;REPEAT
006126                            INLINE  <$5032:>
006126                                                                                  $5032:

                                          ;+
                                          ; GET TEST DATA FROM TABLE
                                          ;-

006126                                    LET R0 := TSTCAS
006126  013700  000542                                                                  MOV     TSTCAS,R0
006132                                    LET DATA00 := (R0)+               ;SRC.LEN
006132  012037  000560                                                                  MOV     (R0)+,DATA00
006136                                    LET DATA01 := (R0)+               ;SRC.ADR
006136  012037  000562                                                                  MOV     (R0)+,DATA01
006142                                    LET DATA02 := (R0)+               ;DST.LEN
006142  012037  000564                                                                  MOV     (R0)+,DATA02
006146                                    LET DATA03 := (R0)+               ;DST.ADR
006146  012037  000566                                                                  MOV     (R0)+,DATA03
006152                                    LET DATA04 := (R0)+               ;FILL CHAR.
006152  012037  000570                                                                  MOV     (R0)+,DATA04
006156                                    LET DATA05 := (R0)+               ;SRC.BUFF.STATE
006156  012037  000572                                                                  MOV     (R0)+,DATA05
006162                                    LET DATA06 := (R0)                ;DST.BUFF.STATE
006162  011037  000574                                                                  MOV     (R0),DATA06

                                          ;+
                                          ; SET UP GPR'S,
                                          ; EXPECTED GPR'S AND CONDITION CODES,
                                          ; AND BUFFERS.
                                          ;-

006166                                    LET R0 := DATA00
006166  013700  000560                                                                  MOV     DATA00,R0
006172                                    LET R1 := DATA01
006172  013701  000562                                                                  MOV     DATA01,R1
006176                                    LET R2 := DATA02
006176  013702  000564                                                                  MOV     DATA02,R2
006202                                    LET R3 := DATA03
006202  013703  000566                                                                  MOV     DATA03,R3
006206                                    LET R4 := DATA04
```

```
006206  013704  000570                                                                MOV     DATA04,R4
006212                          LET R5 := #TRANS
006212  012705  061366                                                                MOV     #TRANS,R5
006216                          INLINE  <CMP    R0,R2>
006216  020002                                                                        CMP     R0,R2
006220                          LET CC.EXP := PSW
006220  013737  177776  000520                                                        MOV     PSW,CC.EXP
006226                          LET CC.EXP := CC.EXP  CLR.BY  #177760
006226  042737  177760  000520                                                        BIC     #177760,CC.EXP
006234                          IF #CBIT SETIN CC.EXP OR #ZBIT SETIN CC.EXP THEN
006234  032737  000001  000520                                                        BIT     #CBIT,CC.EXP
006242  001004                                                                        BNE     $50222
006244  032737  000004  000520                                                        BIT     #ZBIT,CC.EXP
006252  001403                                                                        BEQ     $50223
006254                                                                        $50222:
006254                             LET R0.EXP := #0
006254  005037  000522                                                                CLR     R0.EXP
006260                          ELSE
006260  000404                                                                        BR      $50224
006262                                                                        $50223:
006262                             LET R0.EXP := R0 - R2
006262  010037  000522                                                                MOV     R0,R0.EXP
006266  160237  000522                                                                SUB     R2,R0.EXP
006272                          ENDIF
006272                                                                        $50224:
006272                          LET R1.EXP := #0
006272  005037  000524                                                                CLR     R1.EXP
006276                          LET R2.EXP := #0
006276  005037  000526                                                                CLR     R2.EXP
006302                          LET R3.EXP := #0
006302  005037  000530                                                                CLR     R3.EXP
006306                          LET R4.EXP := R4
006306  010437  000532                                                                MOV     R4,R4.EXP
006312                          LET R5.EXP := R5
006312  010537  000534                                                                MOV     R5,R5.EXP
006316                          LET BFADRS := DATA01
006316  013737  000562  000540                                                        MOV     DATA01,BFADRS
006324                          IF DATA05 EQ #0 THEN
006324  005737  000572                                                                TST     DATA05
006330  001003                                                                        BNE     $50225
006332                             CALL CLRBUF
006332  004737  055346                                                                JSR     PC,CLRBUF
006336                          ELSE
006336  000411                                                                        BR      $50226
006340                                                                        $50225:
006340                             IF DATA05 EQ #177777 THEN
006340  023727  000572  177777                                                        CMP     DATA05,#177777
006346  001003                                                                        BNE     $50227
006350                                CALL SETBUF
006350  004737  055410                                                                JSR     PC,SETBUF
006354                             ELSE
006354  000402                                                                        BR      $50230
006356                                                                        $50227:
006356                                CALL ALTBUF
006356  004737  055454                                                                JSR     PC,ALTBUF
006362                             ENDIF
```

```
006362                                                                 $50230:
006362                              ENDIF
006362                                                                 $50226:
006362                              LET BFADRS := DATA03
006362  013737  000566  000540                                                   MOV     DATA03,BFADRS
006370                              IF DATA06 EQ #0 THEN
006370  005737  000574                                                           TST     DATA06
006374  001003                                                                   BNE     $50231
006376                                    CALL CLRBUF
006376  004737  055346                                                           JSR     PC,CLRBUF
006402                              ELSE
006402  000411                                                                   BR      $50232
006404                                                                 $50231:
006404                                    IF DATA06 EQ #177777 THEN
006404  023727  000574  177777                                                   CMP     DATA06,#177777
006412  001003                                                                   BNE     $50233
006414                                      CALL SETBUF
006414  004737  055410                                                           JSR     PC,SETBUF
006420                                    ELSE
006420  000402                                                                   BR      $50234
006422                                                                 $50233:
006422                                      CALL ALTBUF
006422  004737  055454                                                           JSR     PC,ALTBUF
006426                                    ENDIF
006426                                                                 $50234:
006426                              ENDIF
006426                                                                 $50232:
006426                              LET BF.EXP := @DATA03
006426  017737  172134  000536                                                   MOV     @DATA03,BF.EXP

                              ;+
                              ; SET UP THE TRANSLATION TABLE
                              ;-

006434                              DECR TEMPO FROM #200 TO #1 BY #1
006434  012737  000200  000474                                                   MOV     #200,TEMPO
006442  000402                                                                   BR      $50235
006444                                                                 $50236:
006444  005337  000474                                                           DEC     TEMPO
006450                                                                 $50235:
006450  023727  000474  000001                                                   CMP     TEMPO,#1
006456  002402                                                                   BLT     $50237
006460                                LET (R5)+ := #0
006460  005025                                                                   CLR     (R5)+
006462                              ENDDEC
006462  000770                                                                   BR      $50236
006464                                                                 $50237:
006464                              LET R5 := #TRANS
006464  012705  061366                                                           MOV     #TRANS,R5
006470                              LET (R5) :B= #63
006470  112715  000063                                                           MOVB    #63,(R5)
006474                              LET 252(R5) :B= #314
006474  112765  000314  000252                                                   MOVB    #314,252(R5)
006502                              LET 377(R5) :B= #125
006502  112765  000125  000377                                                   MOVB    #125,377(R5)
```

```
                                     ;+
                                     ; DO THE CIS INSTRUCTION
                                     ;-

006510                               INLINE  <MOVTC>
006510  076032                                                                    MOVTC

                                     ;+
                                     ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                     ;-

006512                               LET CC := PSW
006512  013737  177776  000516                                                    MOV     PSW,CC
006520                               LET CC := CC CLR.BY #177760
006520  042737  177760  000516                                                    BIC     #177760,CC
006526                               IF CC NE CC.EXP THEN
006526  023737  000516  000520                                                    CMP     CC,CC.EXP
006534  001402                                                                    BEQ     $50240
006536                                   CALL ERROR
006536  004737  056274                                                            JSR     PC,ERROR
006542                               ENDIF
006542                                                                  $50240:
006542                               IF R0 NE R0.EXP THEN
006542  020037  000522                                                            CMP     R0,R0.EXP
006546  001402                                                                    BEQ     $50241
006550                                   CALL ERROR
006550  004737  056274                                                            JSR     PC,ERROR
006554                               ENDIF
006554                                                                  $50241:
006554                               IF R1 NE R1.EXP THEN
006554  020137  000524                                                            CMP     R1,R1.EXP
006560  001402                                                                    BEQ     $50242
006562                                   CALL ERROR
006562  004737  056274                                                            JSR     PC,ERROR
006566                               ENDIF
006566                                                                  $50242:
006566                               IF R2 NE R2.EXP THEN
006566  020237  000526                                                            CMP     R2,R2.EXP
006572  001402                                                                    BEQ     $50243
006574                                   CALL ERROR
006574  004737  056274                                                            JSR     PC,ERROR
006600                               ENDIF
006600                                                                  $50243:
006600                               IF R3 NE R3.EXP THEN
006600  020337  000530                                                            CMP     R3,R3.EXP
006604  001402                                                                    BEQ     $50244
006606                                   CALL ERROR
006606  004737  056274                                                            JSR     PC,ERROR
006612                               ENDIF
006612                                                                  $50244:
006612                               IF R4 NE R4.EXP THEN
006612  020437  000532                                                            CMP     R4,R4.EXP
006616  001402                                                                    BEQ     $50245
006620                                   CALL ERROR
006620  004737  056274                                                            JSR     PC,ERROR
006624                               ENDIF
```

```
006624                                                                          $50245:
006624                            IF R5 NE R5.EXP THEN
006624  020537  000534                                                                  CMP     R5,R5.EXP
006630  001402                                                                          BEQ     $50246
006632                                 CALL ERROR
006632  004737  056274                                                                  JSR     PC,ERROR
006636                            ENDIF
006636                                                                          $50246:


                                  ;+
                                  ; CHECK ENTIRE DESTINATION BUFFER FOR CORRECT RESULTS
                                  ;-

006636                            LET R0 := DATA03
006636  013700  000566                                                                  MOV     DATA03,R0
006642                            LET R2 :B= @DATA01
006642  117702  171714                                                                  MOVB    @DATA01,R2
006646                            LET R2 := R2 CLR.BY #177400
006646  042702  177400                                                                  BIC     #177400,R2
006652                            LET R1 :B= TRANS(R2)
006652  116201  061366                                                                  MOVB    TRANS(R2),R1
006656                            LET ERRFLG := #0
006656  005037  000454                                                                  CLR     ERRFLG
006662                            IF DATA00 HIS DATA02 THEN
006662  023737  000560  000564                                                          CMP     DATA00,DATA02
006670  103416                                                                          BLO     $50247
006672                               LET R3 := DATA02
006672  013703  000564                                                                  MOV     DATA02,R3
006676                               WHILE R3 NE #0 AND ERRFLG EQ #0 DO
006676                                                                          $50250:
006676  005703                                                                          TST     R3
006700  001411                                                                          BEQ     $50251
006702  005737  000454                                                                  TST     ERRFLG
006706  001006                                                                          BNE     $50251
006710                                  IFB (R0)+ NE R1 THEN
006710  122001                                                                          CMPB    (R0)+,R1
006712  001402                                                                          BEQ     $50252
006714                                     CALL ERROR
006714  004737  056274                                                                  JSR     PC,ERROR
006720                                  ENDIF
006720                                                                          $50252:
006720                                  LET R3 := R3 - #1
006720  005303                                                                          DEC     R3
006722                               ENDDO
006722  000765                                                                          BR      $50250
006724                                                                          $50251:
006724                            ELSE
006724  000440                                                                          BR      $50253
006726                                                                          $50247:
006726                               LET R3 := DATA00
006726  013703  000560                                                                  MOV     DATA00,R3
006732                               WHILE R3 NE #0 AND ERRFLG EQ #0 DO
006732                                                                          $50254:
006732  005703                                                                          TST     R3
006734  001411                                                                          BEQ     $50255
006736  005737  000454                                                                  TST     ERRFLG
```

```
006742  001006                                                              BNE     $50255
006744                                IFB (R0)+ NE R1 THEN
006744  122001                                                              CMPB    (R0)+,R1
006746  001402                                                              BEQ     $50256
006750                                    CALL ERROR
006750  004737  056274                                                      JSR     PC,ERROR

006754                                ENDIF
006754                                                           $50256:
006754                                LET R3 := R3 - #1
006754  005303                                                              DEC     R3
006756                              ENDDO
006756  000765                                                              BR      $50254
006760                                                           $50255:
006760                              LET R0 := DATA03 + DATA00
006760  013700  000566                                                      MOV     DATA03,R0
006764  063700  000560                                                      ADD     DATA00,R0
006770                              LET R3 := DATA02 - DATA00
006770  013703  000564                                                      MOV     DATA02,R3
006774  163703  000560                                                      SUB     DATA00,R3
007000                              REPEAT
007000                                                           $50257:
007000                                  IFB (R0)+ NE DATA04 THEN
007000  122037  000570                                                      CMPB    (R0)+,DATA04
007004  001402                                                              BEQ     $50260
007006                                      CALL ERROR
007006  004737  056274                                                      JSR     PC,ERROR
007012                                  ENDIF
007012                                                           $50260:
007012                                  LET R3 := R3 - #1
007012  005303                                                              DEC     R3
007014                              UNTIL R3 EQ #0 OR ERRFLG NE #0
007014  005703                                                              TST     R3
007016  001403                                                              BEQ     $50261
007020  005737  000454                                                      TST     ERRFLG
007024  001765                                                              BEQ     $50257
007026                                                           $50261:
007026                          ENDIF
007026                                                           $50253:
007026                          IF DATA02 LO #BUFLEN THEN
007026  023727  000564  000100                                              CMP     DATA02,#BUFLEN
007034  103027                                                              BHIS    $50262
007036                                  LET TEMP0 := DATA03 + #BUFLEN - #1
007036  013737  000566  000474                                              MOV     DATA03,TEMP0
007044  062737  000100  000474                                              ADD     #BUFLEN,TEMP0
007052  005337  000474                                                      DEC     TEMP0
007056                                  LET R0 := DATA03 + DATA02
007056  013700  000566                                                      MOV     DATA03,R0
007062  063700  000564                                                      ADD     DATA02,R0
007066                                  REPEAT
007066                                                           $50263:
007066                                      IFB (R0)+ NE BF.EXP THEN
007066  122037  000536                                                      CMPB    (R0)+,BF.EXP
007072  001402                                                              BEQ     $50264
007074                                          CALL ERROR
007074  004737  056274                                                      JSR     PC,ERROR
```

```
007100                                           ENDIF
007100                                                                        $50264:
007100                                        UNTIL R0 EQ TEMPO OR ERRFLG NE #0
007100  020037  000474                                                                   CMP     R0,TEMPO
007104  001403                                                                           BEQ     $50265
007106  005737  000454                                                                   TST     ERRFLG
007112  001765                                                                           BEQ     $50263
007114                                                                        $50265:
007114                                   ENDIF
007114                                                                        $50262:
007114                                   LET TSTCAS := TSTCAS + #16
007114  062737  000016  000542                                                           ADD     #16,TSTCAS
007122                                   LET COUNT := COUNT - #1
007122  005337  000466                                                                   DEC     COUNT
                             ;UNTIL COUNT EQ #0
007126                       IF COUNT NE #0 THEN
007126  005737  000466                                                                   TST     COUNT
007132  001402                                                                           BEQ     $50266
007134                                   INLINE  <JMP     $5032>
007134  000137  006126                                                                   JMP     $5032
007140                       ENDIF
007140                                                                        $50266:



                             ;+
                             ; DO ONE INLINE CASE - MOVTCI
                             ;-

007140                       LET BFADRS := #BUFF1
007140  012737  061166  000540                                                           MOV     #BUFF1,BFADRS
007146                       CALL CLRBUF
007146  004737  055346                                                                   JSR     PC,CLRBUF
007152                       LET BFADRS := #BUFF2
007152  012737  061266  000540                                                           MOV     #BUFF2,BFADRS
007160                       CALL SETBUF
007160  004737  055410                                                                   JSR     PC,SETBUF
007164                       LET R0 := #125252
007164  012700  125252                                                                   MOV     #125252,R0
007170                       LET R1 := #125252
007170  012701  125252                                                                   MOV     #125252,R1
007174                       LET R2 := #125252
007174  012702  125252                                                                   MOV     #125252,R2
007200                       LET R3 := #125252
007200  012703  125252                                                                   MOV     #125252,R3
007204                       LET R4 := #125252
007204  012704  125252                                                                   MOV     #125252,R4
007210                       LET R5 := #125252
007210  012705  125252                                                                   MOV     #125252,R5
007214                       LET TRANS := #70707
007214  012737  070707  061366                                                           MOV     #70707,TRANS
007222                       INLINE  <MOVTCI>
007222  076132                                                                           MOVTCI
007224                       INLINE  <.WORD  TMVTCI>
007224  007530                                                                           .WORD   TMVTCI
007226                       INLINE  <.WORD  TMVTCI+4>
007226  007534                                                                           .WORD   TMVTCI+4
```

```
007230                        INLINE  <.WORD  40>
007230  000040                                                  .WORD   40
007232                        INLINE  <.WORD  TRANS>
007232  061366                                                  .WORD   TRANS
007234                        IFCOND CS THEN
007234  103003                                                  BCC     $50267
007236                                IFCOND EQ THEN
007236  001002                                                  BNE     $50270
007240                                    CALL ERROR
007240  004737  056274                                          JSR     PC,ERROR
007244                                ENDIF
007244                                                  $50270:
007244                        ENDIF
007244                                                  $50267:
007244                        IF R0 NE #125252 THEN
007244  020027  125252                                          CMP     R0,#125252
007250  001402                                                  BEQ     $50271
007252                                CALL ERROR
007252  004737  056274                                          JSR     PC,ERROR
007256                        ENDIF
007256                                                  $50271:
007256                        IF R1 NE #125252 THEN
007256  020127  125252                                          CMP     R1,#125252
007262  001402                                                  BEQ     $50272
007264                                CALL ERROR
007264  004737  056274                                          JSR     PC,ERROR
007270                        ENDIF
007270                                                  $50272:
007270                        IF R2 NE #125252 THEN
007270  020227  125252                                          CMP     R2,#125252
007274  001402                                                  BEQ     $50273
007276                                CALL ERROR
007276  004737  056274                                          JSR     PC,ERROR
007302                        ENDIF
007302                                                  $50273:
007302                        IF R3 NE #125252 THEN
007302  020327  125252                                          CMP     R3,#125252
007306  001402                                                  BEQ     $50274
007310                                CALL ERROR
007310  004737  056274                                          JSR     PC,ERROR
007314                        ENDIF
007314                                                  $50274:
007314                        IF R4 NE #125252 THEN
007314  020427  125252                                          CMP     R4,#125252
007320  001402                                                  BEQ     $50275
007322                                CALL ERROR
007322  004737  056274                                          JSR     PC,ERROR
007326                        ENDIF
007326                                                  $50275:
007326                        IF R5 NE #125252 THEN
007326  020527  125252                                          CMP     R5,#125252
007332  001402                                                  BEQ     $50276
007334                                CALL ERROR
007334  004737  056274                                          JSR     PC,ERROR
007340                        ENDIF
007340                                                  $50276:
```

```
007340                              IF BUFF2 NE #143707 THEN
007340  023727  061266  143707                                                  CMP     BUFF2,#143707
007346  001402                                                                  BEQ     $50277
007350                                      CALL ERROR
007350  004737  056274                                                          JSR     PC,ERROR
007354                              ENDIF
007354                                                                  $50277:
007354                              IF BUFF2+2 NE #20040 THEN
007354  023727  061270  020040                                                  CMP     BUFF2+2,#20040
007362  001402                                                                  BEQ     $50300
007364                                      CALL ERROR
007364  004737  056274                                                          JSR     PC,ERROR
007370                              ENDIF
007370                                                                  $50300:
007370                              LET R0 := #BUFF2 + #4
007370  012700  061266                                                          MOV     #BUFF2,R0
007374  062700  000004                                                          ADD     #4,R0
007400                              LET ERRFLG := #0
007400  005037  000454                                                          CLR     ERRFLG
007404                              REPEAT
007404                                                                  $50301:
007404                                      IF (R0)+ NE #177777 THEN
007404  022027  177777                                                          CMP     (R0)+,#177777
007410  001402                                                                  BEQ     $50302
007412                                         CALL ERROR
007412  004737  056274                                                          JSR     PC,ERROR
007416                                      ENDIF
007416                                                                  $50302:
007416                              UNTIL R0 EQ #BUFF2+BUFLEN OR ERRFLG NE #0
007416  020027  061366                                                          CMP     R0,#BUFF2+BUFLEN
007422  001403                                                                  BEQ     $50303
007424  005737  000454                                                          TST     ERRFLG
007430  001765                                                                  BEQ     $50301
007432                                                                  $50303:
007432                              INLINE  <JMP    XLOCC>
007432  000137  007540                                                          JMP     XLOCC

                                    ;+
                                    ; TABLE OF TEST CASES FOR MOVTC
                                    ;-

007436  000004                      TMOVTC: .WORD   4               ;#OF TEST CASES FOR MOVTC

007440  000061                              .WORD   61                      ;SRC.LEN
007442  061266                              .WORD   BUFF2                   ;SRC.ADR
007444  000027                              .WORD   27                      ;DST.LEN
007446  061166                              .WORD   BUFF1                   ;DST.ADR
007450  000040                              .WORD   40                      ;FILL CHARACTER
007452  000000                              .WORD   0                       ;SRC.BUFF.STATE
007454  000001                              .WORD   1                       ;DST.BUFF.STATE

007456  000055                              .WORD   55              ;TEST CASE NUMBER 2
007460  061266                              .WORD   BUFF2
007462  000075                              .WORD   75
007464  061166                              .WORD   BUFF1
007466  000100                              .WORD   100
```

```
007470  000001                    .WORD   1
007472  000000                    .WORD   0

007474  000032                    .WORD   32              ;TEST CASE NUMBER 3
007476  061166                    .WORD   BUFF1
007500  000031                    .WORD   31
007502  061266                    .WORD   BUFF2
007504  000073                    .WORD   73
007506  000000                    .WORD   0
007510  177777                    .WORD   -1

007512  000005                    .WORD   5               ;TEST CASE NUMBER 4
007514  061166                    .WORD   BUFF1
007516  000026                    .WORD   26
007520  061266                    .WORD   BUFF2
007522  000020                    .WORD   20
007524  177777                    .WORD   -1
007526  000001                    .WORD   1

007530  000002           TMVTCI:  .WORD   2               ;TEST CASE FOR INLINE
007532  061166                    .WORD   BUFF1
007534  000004                    .WORD   4
007536  061266                    .WORD   BUFF2
```

```
                                        .SBTTL  LOCC
                                        ;;*************************************************************
                                        ;
                                        ;  LOCC TEST
                                        ;
                                        ;;*************************************************************
        007540                          INLINE  <XLOCC:>
        007540                                                                                  XLOCC:
        007540                          INLINE  <SCOPE>
        007540  000004                                                                          SCOPE
        007542                          LET $TIMES := #20                   ;ITERATION COUNT
        007542  012737  000020  000404                                                          MOV     #20,$TIMES
        007550                          LET COUNT := TLOCC                  ;GET TEST COUNT
        007550  013737  010372  000466                                                          MOV     TLOCC,COUNT
        007556                          LET TSTCAS := #TLOCC+2              ;POINT TO FIRST TEST CASE
        007556  012737  010374  000542                                                          MOV     #TLOCC+2,TSTCAS
                                        ;REPEAT
        007564                          INLINE  <$5040:>
        007564                                                                                  $5040:

                                                ;+
                                                ; GET TEST DATA FROM TABLE
                                                ;
        007564                                  LET R0 := TSTCAS
        007564  013700  000542                                                                  MOV     TSTCAS,R0
        007570                                  LET DATA00 := (R0)+             ;SRC.LEN
        007570  012037  000560                                                                  MOV     (R0)+,DATA00
        007574                                  LET DATA01 := (R0)+             ;CHAR.SEARCHED FOR
        007574  012037  000562                                                                  MOV     (R0)+,DATA01
        007600                                  LET DATA02 := (R0)              ;OFFSET
        007600  011037  000564                                                                  MOV     (R0),DATA02
                                                ;+
                                                ; SET UP GPR'S,
                                                ; EXPECTED GPR'S AND CONDITION CODES,
                                                ; AND SOURCE BUFFER.
                                                ;-

        007604                                  LET R0 := DATA00
        007604  013700  000560                                                                  MOV     DATA00,R0
        007610                                  LET R1 := #BUFF1
        007610  012701  061166                                                                  MOV     #BUFF1,R1
        007614                                  LET R4 := DATA01
        007614  013704  000562                                                                  MOV     DATA01,R4
        007620                                  INLINE  <BIT   #BIT00,COUNT>
        007620  032737  000001  000466                                                          BIT     #BIT00,COUNT
        007626                                  IFCOND EQ THEN
        007626  001004                                                                          BNE     $50304
        007630                                      LET R2 := #0
        007630  005002                                                                          CLR     R2
        007632                                      LET R3 := #0
        007632  005003                                                                          CLR     R3
        007634                                      LET R5 := #0
        007634  005005                                                                          CLR     R5
        007636                                  ELSE
        007636  000406                                                                          BR      $50305
        007640                                                                          $50304:
```

```
007640                                  LET R2 := #177777
007640  012702  177777                                                  MOV     #177777,R2
007644                                  LET R3 := #177777
007644  012703  177777                                                  MOV     #177777,R3
007650                                  LET R5 := #177777
007650  012705  177777                                                  MOV     #177777,R5
007654                              ENDIF
007654                                                          $50305:
007654                              IF DATA02 HI DATA00 THEN
007654  023737  000564  000560                                          CMP     DATA02,DATA00
007662  101411                                                          BLOS    $50306
007664                                  LET R0.EXP := #0
007664  005037  000522                                                  CLR     R0.EXP
007670                                  LET R1.EXP := #BUFF1 + DATA00
007670  012737  061166  000524                                          MOV     #BUFF1,R1.EXP
007676  063737  000560  000524                                          ADD     DATA00,R1.EXP
007704                              ELSE
007704  000414                                                          BR      $50307
007706                                                          $50306:
007706                                  LET R0.EXP := DATA00 - DATA02
007706  013737  000560  000522                                          MOV     DATA00,R0.EXP
007714  163737  000564  000522                                          SUB     DATA02,R0.EXP
007722                                  LET R1.EXP := #BUFF1 + DATA02
007722  012737  061166  000524                                          MOV     #BUFF1,R1.EXP
007730  063737  000564  000524                                          ADD     DATA02,R1.EXP
007736                              ENDIF
007736                                                          $50307:
007736                              LET R2.EXP := R2
007736  010237  000526                                                  MOV     R2,R2.EXP
007742                              LET R3.EXP := R3
007742  010337  000530                                                  MOV     R3,R3.EXP
007746                              LET R4.EXP := R4
007746  010437  000532                                                  MOV     R4,R4.EXP
007752                              LET R5.EXP := R5
007752  010537  000534                                                  MOV     R5,R5.EXP
007756                              INLINE  <TST   R0.EXP>
007756  005737  000522                                                  TST   R0.EXP
007762                              LET CC.EXP := PSW
007762  013737  177776  000520                                          MOV     PSW,CC.EXP
007770                              LET CC.EXP := CC.EXP CLR.BY #177760
007770  042737  177760  000520                                          BIC     #177760,CC.EXP
007776                              LET BFADRS := #BUFF1
007776  012737  061166  000540                                          MOV     #BUFF1,BFADRS
010004                              CALL CLRBUF
010004  004737  055346                                                  JSR     PC,CLRBUF
010010                              LET TEMP0 := #BUFF1 + DATA02
010010  012737  061166  000474                                          MOV     #BUFF1,TEMP0
010016  063737  000564  000474                                          ADD     DATA02,TEMP0
010024                              LET @TEMP0 :B= DATA01
010024  113777  000562  170442                                          MOVB    DATA01,@TEMP0

                                    ;+
                                    ; DO THE CIS INSTRUCTION.
                                    ;-

010032                              INLINE  <LOCC>
```

```
010032  076040                                                                LOCC

                                        ;+
                                        ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                        ;-
010034                                  LET CC := PSW
010034  013737  177776  000516                                                MOV     PSW,CC
010042                                  LET CC := CC CLR.BY #177760
010042  042737  177760  000516                                                BIC     #177760,CC
010050                                  IF CC NE CC.EXP THEN
010050  023737  000516  000520                                                CMP     CC,CC.EXP
010056  001402                                                                BEQ     $50310
010060                                      CALL ERROR
010060  004737  056274                                                        JSR     PC,ERROR
010064                                  ENDIF
010064                                                                $50310:
010064                                  IF R0 NE R0.EXP THEN
010064  020037  000522                                                        CMP     R0,R0.EXP
010070  001402                                                                BEQ     $50311
010072                                      CALL ERROR
010072  004737  056274                                                        JSR     PC,ERROR
010076                                  ENDIF
010076                                                                $50311:
010076                                  IF R1 NE R1.EXP THEN
010076  020137  000524                                                        CMP     R1,R1.EXP
010102  001402                                                                BEQ     $50312
010104                                      CALL ERROR
010104  004737  056274                                                        JSR     PC,ERROR
010110                                  ENDIF
010110                                                                $50312:
010110                                  IF R2 NE R2.EXP THEN
010110  020237  000526                                                        CMP     R2,R2.EXP
010114  001402                                                                BEQ     $50313
010116                                      CALL ERROR
010116  004737  056274                                                        JSR     PC,ERROR
010122                                  ENDIF
010122                                                                $50313:
010122                                  IF R3 NE R3.EXP THEN
010122  020337  000530                                                        CMP     R3,R3.EXP
010126  001402                                                                BEQ     $50314
010130                                      CALL ERROR
010130  004737  056274                                                        JSR     PC,ERROR
010134                                  ENDIF
010134                                                                $50314:
010134                                  IF R4 NE R4.EXP THEN
010134  020437  000532                                                        CMP     R4,R4.EXP
010140  001402                                                                BEQ     $50315
010142                                      CALL ERROR
010142  004737  056274                                                        JSR     PC,ERROR
010146                                  ENDIF
010146                                                                $50315:
010146                                  IF R5 NE R5.EXP THEN
010146  020537  000534                                                        CMP     R5,R5.EXP
010152  001402                                                                BEQ     $50316
010154                                      CALL ERROR
```

```
010154  004737  056274                                                                   JSR     PC,ERROR
010160                                     ENDIF
010160                                                                           $50316:
010160                                     LET TSTCAS := TSTCAS + #6
010160  062737  000006  000542                                                           ADD     #6,TSTCAS
010166                                     LET COUNT := COUNT - #1
010166  005337  000466                                                                   DEC     COUNT
                               ;UNTIL COUNT EQ #0
010172                         IF COUNT NE #0 THEN
010172  005737  000466                                                                   TST     COUNT
010176  001402                                                                           BEQ     $50317
010200                             INLINE  <JMP        $5040>
010200  000137  007564                                                                   JMP     $5040
010204                         ENDIF
010204                                                                           $50317:



                               ;+
                               ; DO ONE INLINE CASE - LOCCI
                               ;-

010204                         LET BFADRS := #BUFF1
010204  012737  061166  000540                                                           MOV     #BUFF1,BFADRS
010212                         CALL SETBUF
010212  004737  055410                                                                   JSR     PC,SETBUF
010216                         CALL CLRREG                         ;CLEAR R0 - R5
010216  004737  055330                                                                   JSR     PC,CLRREG
010222                         LET TEMP0 := #BUFF1 + #25
010222  012737  061166  000474                                                           MOV     #BUFF1,TEMP0
010230  062737  000025  000474                                                           ADD     #25,TEMP0
010236                         LET @TEMP0 :B= #40                  ;SEARCH CHARACTER
010236  112777  000040  170230                                                           MOVB    #40,@TEMP0
010244                         INLINE  <LOCCI>
010244  076140                                                                           LOCCI
010246                         INLINE  <.WORD  TLOCCI>
010246  010416                                                                           .WORD   TLOCCI
010250                         INLINE  <.WORD  40>
010250  000040                                                                           .WORD   40
010252                         LET TEMP0 := PSW
010252  013737  177776  000474                                                           MOV     PSW,TEMP0
010260                         INLINE  <BIT    #17,TEMP0>
010260  032737  000017  000474                                                           BIT     #17,TEMP0
010266                         IFCOND NE THEN
010266  001402                                                                           BEQ     $50320
010270                                     CALL ERROR
010270  004737  056274                                                                   JSR     PC,ERROR
010274                         ENDIF
010274                                                                           $50320:
010274                         LET TEMP0 := #BUFLEN-25
010274  012737  000053  000474                                                           MOV     #BUFLEN-25,TEMP0
010302                         IF R0 NE TEMP0 THEN
010302  020037  000474                                                                   CMP     R0,TEMP0
010306  001402                                                                           BEQ     $50321
010310                                     CALL ERROR
010310  004737  056274                                                                   JSR     PC,ERROR
010314                         ENDIF
```

```
010314                                                            $50321:
010314                         IF R1 NE #BUFF1+25 THEN
010314  020127  061213                                                    CMP     R1,#BUFF1+25
010320  001402                                                            BEQ     $50322
010322                                 CALL ERROR
010322  004737  056274                                                    JSR     PC,ERROR
010326                         ENDIF
010326                                                            $50322:
010326                         IF R2 NE #0 THEN
010326  005702                                                            TST     R2
010330  001402                                                            BEQ     $50323
010332                                 CALL ERROR
010332  004737  056274                                                    JSR     PC,ERROR
010336                         ENDIF
010336                                                            $50323:
010336                         IF R3 NE #0 THEN
010336  005703                                                            TST     R3
010340  001402                                                            BEQ     $50324
010342                                 CALL ERROR
010342  004737  056274                                                    JSR     PC,ERROR
010346                         ENDIF
010346                                                            $50324:
010346                         IF R4 NE #0 THEN
010346  005704                                                            TST     R4
010350  001402                                                            BEQ     $50325
010352                                 CALL ERROR
010352  004737  056274                                                    JSR     PC,ERROR
010356                         ENDIF
010356                                                            $50325:
010356                         IF R5 NE #0 THEN
010356  005705                                                            TST     R5
010360  001402                                                            BEQ     $50326
010362                                 CALL ERROR
010362  004737  056274                                                    JSR     PC,ERROR
010366                         ENDIF
010366                                                            $50326:
010366                         INLINE  <JMP    XSKPC>
010366  000137  010422                                                    JMP     XSKPC

                               ;+
                               ; TABLE OF TEST CASES FOR LOCC.
                               ;-

010372  000003                 TLOCC:  .WORD   3               ;# OF TEST CASES FOR LOCC

010374  000000                         .WORD   0                       ;SRC.LEN
010376  000101                         .WORD   101                     ;CHAR.SEARCHED FOR
010400  000041                         .WORD   41                      ;OFFSET

010402  000060                         .WORD   60              ;TEST CASE NUMBER 2
010404  000040                         .WORD   40
010406  000026                         .WORD   26

010410  000034                         .WORD   34              ;TEST CASE NUMBER 3
010412  000077                         .WORD   77
010414  000040                         .WORD   40
```

```
010416  000100          TLOCCI: .WORD   BUFLEN          ;TEST CASE FOR INLINE
010420  061166                  .WORD   BUFF1
```

```
                                  .SBTTL  SKPC
                                  ;;*******************************************************************
                                  ;
                                  ;  SKPC TEST
                                  ;
                                  ;;*******************************************************************
010422                            INLINE  <XSKPC:>
010422                                                                              XSKPC:
010422                            INLINE  <SCOPE>
010422  000004                                                                      SCOPE
010424                            LET $TIMES := #20               ;ITERATION COUNT
010424  012737  000020  000404                                                      MOV     #20,$TIMES
010432                            LET COUNT := TSKPC              ;GET TEST COUNT
010432  013737  011262  000466                                                      MOV     TSKPC,COUNT
010440                            LET TSTCAS := #TSKPC+2          ;POINT TO FIRST TEST CASE
010440  012737  011264  000542                                                      MOV     #TSKPC+2,TSTCAS
                                  ;REPEAT
010446                            INLINE  <$5041:>
010446                                                                              $5041:

                                          ;+
                                          ; GET TEST DATA FROM TABLE
                                          ;-

010446                                    LET R0 := TSTCAS
010446  013700  000542                                                              MOV     TSTCAS,R0
010452                                    LET DATA00 := (R0)+           ;SRC.LEN
010452  012037  000560                                                              MOV     (R0)+,DATA00
010456                                    LET DATA01 := (R0)+           ;NON-SEARCH CHAR
010456  012037  000562                                                              MOV     (R0)+,DATA01
010462                                    LET DATA02 := (R0)            ;OFFSET
010462  011037  000564                                                              MOV     (R0),DATA02

                                          ;+
                                          ; SET UP GPR'S
                                          ; EXPECTED GPR'S AND CONDITION CODES,
                                          ; AND SOURCE BUFFER.
                                          ;-

010466                                    LET R0 := DATA00
010466  013700  000560                                                              MOV     DATA00,R0
010472                                    LET R1 := #BUFF1
010472  012701  061166                                                              MOV     #BUFF1,R1
010476                                    LET R4 := #377
010476  012704  000377                                                              MOV     #377,R4
010502                                    INLINE  <BIT   #BIT00,COUNT>
010502  032737  000001  000466                                                      BIT     #BIT00,COUNT
010510                                    IFCOND EQ THEN
010510  001004                                                                      BNE     $50327
010512                                       LET R2 := #0
010512  005002                                                                      CLR     R2
010514                                       LET R3 := #0
010514  005003                                                                      CLR     R3
010516                                       LET R5 := #0
010516  005005                                                                      CLR     R5
010520                                    ELSE
```

```
010520  000406                                                              BR      $50330
010522                                                             $50327:
010522                                      LET R2 := #177777
010522  012702  177777                                                      MOV     #177777,R2
010526                                      LET R3 := #177777
010526  012703  177777                                                      MOV     #177777,R3
010532                                      LET R5 := #177777
010532  012705  177777                                                      MOV     #177777,R5
010536                                   ENDIF
010536                                                             $50330:
010536                                   IF DATA02 HI DATA00 THEN
010536  023737  000564  000560                                              CMP     DATA02,DATA00
010544  101411                                                              BLOS    $50331
010546                                      LET R0.EXP := #0
010546  005037  000522                                                      CLR     R0.EXP
010552                                      LET R1.EXP := #BUFF1 + DATA00
010552  012737  061166  000524                                              MOV     #BUFF1,R1.EXP
010560  063737  000560  000524                                              ADD     DATA00,R1.EXP
010566                                   ELSE
010566  000414                                                              BR      $50332
010570                                                             $50331:
010570                                      LET R0.EXP := DATA00 - DATA02
010570  013737  000560  000522                                              MOV     DATA00,R0.EXP
010576  163737  000564  000522                                              SUB     DATA02,R0.EXP
010604                                      LET R1.EXP := #BUFF1 + DATA02
010604  012737  061166  000524                                              MOV     #BUFF1,R1.EXP
010612  063737  000564  000524                                              ADD     DATA02,R1.EXP
010620                                   ENDIF
010620                                                             $50332:
010620                                   LET R2.EXP := R2
010620  010237  000526                                                      MOV     R2,R2.EXP
010624                                   LET R3.EXP := R3
010624  010337  000530                                                      MOV     R3,R3.EXP
010630                                   LET R4.EXP := R4
010630  010437  000532                                                      MOV     R4,R4.EXP
010634                                   LET R5.EXP := R5
010634  010537  000534                                                      MOV     R5,R5.EXP
010640                                   INLINE  <TST    R0.EXP>
010640  005737  000522                                                      TST     R0.EXP
010644                                   LET CC.EXP := PSW
010644  013737  177776  000520                                              MOV     PSW,CC.EXP
010652                                   LET CC.EXP := CC.EXP CLR.BY #177760
010652  042737  177760  000520                                              BIC     #177760,CC.EXP
010660                                   LET BFADRS := #BUFF1
010660  012737  061166  000540                                              MOV     #BUFF1,BFADRS
010666                                   CALL SETBUF              ;FILL BUFFER WITH SEARCH CHAR
010666  004737  055410                                                      JSR     PC,SETBUF
010672                                   LET TEMP0 := #BUFF1 + DATA02
010672  012737  061166  000474                                              MOV     #BUFF1,TEMP0
010700  063737  000564  000474                                              ADD     DATA02,TEMP0
010706                                   LET @TEMP0 :B= DATA01
010706  113777  000562  167560                                              MOVB    DATA01,@TEMP0

                                         ;+
                                         ; DO THE CIS INSTRUCTION
                                         ;-
```

```
010714                              INLINE  <SKPC>
010714  076041                                                          SKPC

                                    ;+
                                    ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                    ;-

010716                              LET CC := PSW
010716  013737  177776  000516                                          MOV     PSW,CC
010724                              LET CC := CC CLR.BY #177760
010724  042737  177760  000516                                          BIC     #177760,CC
010732                              IF CC NE CC.EXP THEN
010732  023737  000516  000520                                          CMP     CC,CC.EXP
010740  001402                                                          BEQ     $50333
010742                                  CALL ERROR
010742  004737  056274                                                  JSR     PC,ERROR
010746                              ENDIF
010746                                                         $50333:
010746                              IF R0 NE R0.EXP THEN
010746  020037  000522                                                  CMP     R0,R0.EXP
010752  001402                                                          BEQ     $50334
010754                                  CALL ERROR
010754  004737  056274                                                  JSR     PC,ERROR
010760                              ENDIF
010760                                                         $50334:
010760                              IF R1 NE R1.EXP THEN
010760  020137  000524                                                  CMP     R1,R1.EXP
010764  001402                                                          BEQ     $50335
010766                                  CALL ERROR
010766  004737  056274                                                  JSR     PC,ERROR
010772                              ENDIF
010772                                                         $50335:
010772                              IF R2 NE R2.EXP THEN
010772  020237  000526                                                  CMP     R2,R2.EXP
010776  001402                                                          BEQ     $50336
011000                                  CALL ERROR
011000  004737  056274                                                  JSR     PC,ERROR
011004                              ENDIF
011004                                                         $50336:
011004                              IF R3 NE R3.EXP THEN
011004  020337  000530                                                  CMP     R3,R3.EXP
011010  001402                                                          BEQ     $50337
011012                                  CALL ERROR
011012  004737  056274                                                  JSR     PC,ERROR
011016                              ENDIF
011016                                                         $50337:
011016                              IF R4 NE R4.EXP THEN
011016  020437  000532                                                  CMP     R4,R4.EXP
011022  001402                                                          BEQ     $50340
011024                                  CALL ERROR
011024  004737  056274                                                  JSR     PC,ERROR
011030                              ENDIF
011030                                                         $50340:
011030                              IF R5 NE R5.EXP THEN
011030  020537  000534                                                  CMP     R5,R5.EXP
```

```
011034  001402                                                          BEQ     $50341
011036                                  CALL ERROR
011036  004737  056274                                                  JSR     PC,ERROR
011042                          ENDIF
011042                                                          $50341:
011042                          LET TSTCAS := TSTCAS + #6
011042  062737  000006  000542                                          ADD     #6,TSTCAS
011050                          LET COUNT := COUNT - #1
011050  005337  000466                                                  DEC     COUNT
                :UNTIL COUNT EQ #0
011054          IF COUNT NE #0 THEN
011054  005737  000466                                                  TST     COUNT
011060  001402                                                          BEQ     $50342
011062              INLINE  <JMP        $5041>
011062  000137  010446                                                  JMP     $5041
011066          ENDIF
011066                                                          $50342:


                ;+
                ;DO ONE INLINE CASE - SKPCI
                ;-

011066          LET BFADRS := #BUFF1
011066  012737  061166  000540                                          MOV     #BUFF1,BFADRS
011074          CALL SETBUF
011074  004737  055410                                                  JSR     PC,SETBUF
011100          CALL CLRREG
011100  004737  055330                                                  JSR     PC,CLRREG
011104          LET TEMPO := #BUFF1 + #25
011104  012737  061166  000474                                          MOV     #BUFF1,TEMPO
011112  062737  000025  000474                                          ADD     #25,TEMPO
011120          LET @TEMPO :B= #40
011120  112777  000040  167346                                          MOVB    #40,@TEMPO
011126          INLINE  <SKPCI>
011126  076141                                                          SKPCI
011130          INLINE  <.WORD  TSKPCI>
011130  011300                                                          .WORD   TSKPCI
011132          INLINE  <.WORD  377>
011132  000377                                                          .WORD   377
011134          LET TEMPO := PSW
011134  013737  177776  000474                                          MOV     PSW,TEMPO
011142          INLINE  <BIT    #17,TEMPO>
011142  032737  000017  000474                                          BIT     #17,TEMPO
011150          IFCOND NE THEN
011150  001402                                                          BEQ     $50343
011152                          CALL ERROR
011152  004737  056274                                                  JSR     PC,ERROR
011156          ENDIF
011156                                                          $50343:
011156          LET TEMPO := #BUFLEN - #25
011156  012737  000100  000474                                          MOV     #BUFLEN,TEMPO
011164  162737  000025  000474                                          SUB     #25,TEMPO
011172          IF RO NE TEMPO THEN
011172  020037  000474                                                  CMP     RO,TEMPO
011176  001402                                                          BEQ     $50344
```

```
011200                                    CALL ERROR
011200  004737  056274                                                          JSR     PC,ERROR
011204                         ENDIF
011204                                                                  $50344:
011204                         IF R1 NE #BUFF1+25 THEN
011204  020127  061213                                                          CMP     R1,#BUFF1+25
011210  001402                                                                  BEQ     $50345
011212                                    CALL ERROR
011212  004737  056274                                                          JSR     PC,ERROR
011216                         ENDIF
011216                                                                  $50345:
011216                         IF R2 NE #0 THEN
011216  005702                                                                  TST     R2
011220  001402                                                                  BEQ     $50346
011222                                    CALL ERROR
011222  004737  056274                                                          JSR     PC,ERROR
011226                         ENDIF
011226                                                                  $50346:
011226                         IF R3 NE #0 THEN
011226  005703                                                                  TST     R3
011230  001402                                                                  BEQ     $50347
011232                                    CALL ERROR
011232  004737  056274                                                          JSR     PC,ERROR
011236                         ENDIF
011236                                                                  $50347:
011236                         IF R4 NE #0 THEN
011236  005704                                                                  TST     R4
011240  001402                                                                  BEQ     $50350
011242                                    CALL ERROR
011242  004737  056274                                                          JSR     PC,ERROR
011246                         ENDIF
011246                                                                  $50350:
011246                         IF R5 NE #0 THEN
011246  005705                                                                  TST     R5
011250  001402                                                                  BEQ     $50351
011252                                    CALL ERROR
011252  004737  056274                                                          JSR     PC,ERROR
011256                         ENDIF
011256                                                                  $50351:
011256                         INLINE   <JMP    XSCANC>
011256  000137  011304                                                          JMP     XSCANC

                               ;+
                               ; TABLE OF TEST CASES FOR SKPC.
                               ;-

011262  000002                 TSKPC:  .WORD   2               ;# OF TEST CASES FOR SKPC

011264  000040                         .WORD   40                      ;SRC.LEN
011266  000100                         .WORD   100                     ;NON-SEARCH CHAR.
011270  000060                         .WORD   60                      ;OFFSET

011272  000050                         .WORD   50              ;TEST CASE NUMBER 2
011274  000077                         .WORD   77
011276  000030                         .WORD   30
```

```
011300  000100          TSKPCI: .WORD   BUFLEN          ;TEST CASE FOR INLINE
011302  061166                  .WORD   BUFF1
```

```
                                        .SBTTL  SCANC
                                        ;;*******************************************************************
                                        ;
                                        ;  SCANC TEST
                                        ;
                                        ;;*******************************************************************
011304                                  INLINE  <XSCANC:>
011304                                                                                  XSCANC:
011304                                  INLINE  <SCOPE>
011304  000004                                                                          SCOPE
011306                                  LET $TIMES := #20               ;ITERATION COUNT
011306  012737  000020  000404                                                          MOV     #20,$TIMES
011314                                  LET COUNT := TSCANC             ;GET TEST COUNT
011314  013737  012230  000466                                                          MOV     TSCANC,COUNT
011322                                  LET TSTCAS := #TSCANC+2         ;POINT TO FIRST TEST CASE
011322  012737  012232  000542                                                          MOV     #TSCANC+2,TSTCAS
                                        ;REPEAT
011330                                  INLINE  <$5042:>
011330                                                                                  $5042:

                                                ;+
                                                ; GET TEST DATA FROM TABLE
                                                ;-

011330                                          LET R0 := TSTCAS
011330  013700  000542                                                                  MOV     TSTCAS,R0
011334                                          LET DATA00 := (R0)+             ;SRC.LEN
011334  012037  000560                                                                  MOV     (R0)+,DATA00
011340                                          LET DATA01 := (R0)              ;OFFSET
011340  011037  000562                                                                  MOV     (R0),DATA01

                                                ;+
                                                ; SET UP GPR'S,
                                                ; EXPECTED GPR'S AND CONDITION CODES
                                                ; SOURCE BUFFER, AND CHARACTER SET TABLE.
                                                ;-

011344                                          LET R0 := DATA00
011344  013700  000560                                                                  MOV     DATA00,R0
011350                                          LET R1 := #BUFF1
011350  012701  061166                                                                  MOV     #BUFF1,R1
011354                                          LET R4 := #1                    ;MASK
011354  012704  000001                                                                  MOV     #1,R4
011360                                          LET R5 := #CHRSET
011360  012705  061766                                                                  MOV     #CHRSET,R5
011364                                          INLINE  <BIT    #BIT00,COUNT>
011364  032737  000001  000466                                                          BIT     #BIT00,COUNT
011372                                          IFCOND EQ THEN
011372  001003                                                                          BNE     $50352
011374                                              LET R2 := #0
011374  005002                                                                          CLR     R2
011376                                              LET R3 := #0
011376  005003                                                                          CLR     R3
011400                                          ELSE
011400  000404                                                                          BR      $50353
011402                                                                          $50352:
```

```
011402                                     LET R2 := #177777
011402  012702  177777                                                              MOV     #177777,R2
011406                                     LET R3 := #177777
011406  012703  177777                                                              MOV     #177777,R3
011412                                 ENDIF
011412                                                                    $50353:
011412                                 IF DATA01 HI DATA00 THEN
011412  023737  000562  000560                                                      CMP     DATA01,DATA00
011420  101411                                                                      BLOS    $50354
011422                                     LET R0.EXP := #0
011422  005037  000522                                                              CLR     R0.EXP
011426                                     LET R1.EXP := #BUFF1 + DATA00
011426  012737  061166  000524                                                      MOV     #BUFF1,R1.EXP
011434  063737  000560  000524                                                      ADD     DATA00,R1.EXP
011442                                 ELSE
011442  000414                                                                      BR      $50355
011444                                                                    $50354:
011444                                     LET R0.EXP := DATA00 - DATA01
011444  013737  000560  000522                                                      MOV     DATA00,R0.EXP
011452  163737  000562  000522                                                      SUB     DATA01,R0.EXP
011460                                     LET R1.EXP := #BUFF1 + DATA01
011460  012737  061166  000524                                                      MOV     #BUFF1,R1.EXP
011466  063737  000562  000524                                                      ADD     DATA01,R1.EXP
011474                                 ENDIF
011474                                                                    $50355:
011474                                 LET R2.EXP := R2
011474  010237  000526                                                              MOV     R2,R2.EXP
011500                                 LET R3.EXP := R3
011500  010337  000530                                                              MOV     R3,R3.EXP
011504                                 LET R4.EXP := R4
011504  010437  000532                                                              MOV     R4,R4.EXP
011510                                 LET R5.EXP := R5
011510  010537  000534                                                              MOV     R5,R5.EXP
011514                                 INLINE  <TST   R0.EXP>
011514  005737  000522                                                              TST   R0.EXP
011520                                 LET CC.EXP := PSW
011520  013737  177776  000520                                                      MOV     PSW,CC.EXP
011526                                 LET CC.EXP := CC.EXP CLR.BY #177760
011526  042737  177760  000520                                                      BIC     #177760,CC.EXP
011534                                 LET BFADRS := #BUFF1
011534  012737  061166  000540                                                      MOV     #BUFF1,BFADRS
011542                                 CALL CLRBUF
011542  004737  055346                                                              JSR     PC,CLRBUF
011546                                 LET TEMP0 := #BUFF1 + DATA01
011546  012737  061166  000474                                                      MOV     #BUFF1,TEMP0
011554  063737  000562  000474                                                      ADD     DATA01,TEMP0
011562                                 LET @TEMP0 :B= #125
011562  112777  000125  166704                                                      MOVB    #125,@TEMP0
011570                                 WHILE R5 LO #CHRSET+400 DO
011570                                                                    $50356:
011570  020527  062366                                                              CMP     R5,#CHRSET+400
011574  103002                                                                      BHIS    $50357
011576                                   INLINE  <CLR (R5)+>        ;CLEAR CHAR SET TABLE
011576  005025                                                                      CLR     (R5)+
011600                                 ENDDO
011600  000773                                                                      BR      $50356
```

```
011602                                                                      $50357:
011602                                LET R5 := #CHRSET                      ;RESTORE R5
011602  012705  061766                                                               MOV     #CHRSET,R5
011606                                LET TEMPO := #CHRSET + #125
011606  012737  061766  000474                                                       MOV     #CHRSET,TEMPO
011614  062737  000125  000474                                                       ADD     #125,TEMPO
011622                                LET @TEMPO :B= #1                      ;SET MASK IN CHAR SET TABLE
011622  112777  000001  166644                                                       MOVB    #1,@TEMPO

                                      ;+
                                      ; DO THE CIS INSTRUCTION
                                      ;-

011630                                INLINE  <SCANC>
011630  076042                                                                       SCANC

                                      ;+
                                      ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                      ;-

011632                                LET CC := PSW
011632  013737  177776  000516                                                       MOV     PSW,CC
011640                                LET CC := CC CLR.BY #177760
011640  042737  177760  000516                                                       BIC     #177760,CC
011646                                IF CC NE CC.EXP THEN
011646  023737  000516  000520                                                       CMP     CC,CC.EXP
011654  001402                                                                       BEQ     $50360
011656                                    CALL ERROR
011656  004737  056274                                                               JSR     PC,ERROR
011662                                ENDIF
011662                                                                      $50360:
011662                                IF R0 NE R0.EXP THEN
011662  020037  000522                                                               CMP     R0,R0.EXP
011666  001402                                                                       BEQ     $50361
011670                                    CALL ERROR
011670  004737  056274                                                               JSR     PC,ERROR
011674                                ENDIF
011674                                                                      $50361:
011674                                IF R1 NE R1.EXP THEN
011674  020137  000524                                                               CMP     R1,R1.EXP
011700  001402                                                                       BEQ     $50362
011702                                    CALL ERROR
011702  004737  056274                                                               JSR     PC,ERROR
011706                                ENDIF
011706                                                                      $50362:
011706                                IF R2 NE R2.EXP THEN
011706  020237  000526                                                               CMP     R2,R2.EXP
011712  001402                                                                       BEQ     $50363
011714                                    CALL ERROR
011714  004737  056274                                                               JSR     PC,ERROR
011720                                ENDIF
011720                                                                      $50363:
011720                                IF R3 NE R3.EXP THEN
011720  020337  000530                                                               CMP     R3,R3.EXP
011724  001402                                                                       BEQ     $50364
011726                                    CALL ERROR
```

```
011726  004737  056274                                                  JSR     PC,ERROR
011732                          ENDIF
011732                                                          $50364:
011732                          IF R4 NE R4.EXP THEN
011732  020437  000532                                                  CMP     R4,R4.EXP
011736  001402                                                          BEQ     $50365
011740                              CALL ERROR
011740  004737  056274                                                  JSR     PC,ERROR
011744                          ENDIF
011744                                                          $50365:
011744                          IF R5 NE R5.EXP THEN
011744  020537  000534                                                  CMP     R5,R5.EXP
011750  001402                                                          BEQ     $50366
011752                              CALL ERROR
011752  004737  056274                                                  JSR     PC,ERROR
011756                          ENDIF
011756                                                          $50366:
011756                          LET TSTCAS := TSTCAS + #4
011756  062737  000004  000542                                          ADD     #4,TSTCAS
011764                          LET COUNT := COUNT - #1
011764  005337  000466                                                  DEC     COUNT
                        ;UNTIL COUNT EQ #0
011770                  IF COUNT NE #0 THEN
011770  005737  000466                                                  TST     COUNT
011774  001402                                                          BEQ     $50367
011776                      INLINE  <JMP        $5042>
011776  000137  011330                                                  JMP     $5042
012002                  ENDIF
012002                                                          $50367:



                        ;+
                        ; DO ONE INLINE CASE - SCANCI.
                        ;-

012002                  LET BFADRS := #BUFF1
012002  012737  061166  000540                                          MOV     #BUFF1,BFADRS
012010                  CALL CLRBUF
012010  004737  055346                                                  JSR     PC,CLRBUF
012014                  LET TEMPO := #BUFF1 + #50
012014  012737  061166  000474                                          MOV     #BUFF1,TEMPO
012022  062737  000050  000474                                          ADD     #50,TEMPO
012030                  LET @TEMPO :B= #27
012030  112777  000027  166436                                          MOVB    #27,@TEMPO
012036                  LET R0 := #CHRSET
012036  012700  061766                                                  MOV     #CHRSET,R0
012042                  WHILE R0 LO #CHRSET+400 DO
012042                                                          $50370:
012042  020027  062366                                                  CMP     R0,#CHRSET+400
012046  103002                                                          BHIS    $50371
012050                      INLINE  <CLR      (R0)+>          ;CLEAR CHAR.SET TABLE
012050  005020                                                          CLR     (R0)+
012052                  ENDDO
012052  000773                                                          BR      $50370
012054                                                          $50371:
012054                  LET TEMPO := #CHRSET + #27
```

```
012054 012737 061766 000474                                                   MOV     #CHRSET,TEMPO
012062 062737 000027 000474                                                   ADD     #27,TEMPO
012070                       LET @TEMPO :B= #10                   ;SET MASK IN CHAR SET TABLE
012070 112777 000010 166376                                                   MOVB    #10,@TEMPO
012076                       CALL CLRREG
012076 004737 055330                                                          JSR     PC,CLRREG
012102                       INLINE  <SCANCI>
012102 076142                                                                 SCANCI
012104                       INLINE  <.WORD  TSCNCI>
012104 012246                                                                 .WORD   TSCNCI
012106                       INLINE  <.WORD  TSCNCI+4>
012106 012252                                                                 .WORD   TSCNCI+4
012110                       LET TEMPO := PSW
012110 013737 177776 000474                                                   MOV     PSW,TEMPO
012116                       INLINE  <BIT    #17,TEMPO>
012116 032737 000017 000474                                                   BIT     #17,TEMPO
012124                       IFCOND NE THEN
012124 001402                                                                 BEQ     $50372
012126                               CALL ERROR
012126 004737 056274                                                          JSR     PC,ERROR
012132                       ENDIF
012132                                                             $50372:
012132                       LET TEMPO := #BUFLEN-50
012132 012737 000030 000474                                                   MOV     #BUFLEN-50,TEMPO
012140                       IF R0 NE TEMPO THEN
012140 020037 000474                                                          CMP     R0,TEMPO
012144 001402                                                                 BEQ     $50373
012146                               CALL ERROR
012146 004737 056274                                                          JSR     PC,ERROR
012152                       ENDIF
012152                                                             $50373:
012152                       IF R1 NE #BUFF1+50 THEN
012152 020127 061236                                                          CMP     R1,#BUFF1+50
012156 001402                                                                 BEQ     $50374
012160                               CALL ERROR
012160 004737 056274                                                          JSR     PC,ERROR
012164                       ENDIF
012164                                                             $50374:
012164                       IF R2 NE #0 THEN
012164 005702                                                                 TST     R2
012166 001402                                                                 BEQ     $50375
012170                               CALL ERROR
012170 004737 056274                                                          JSR     PC,ERROR
012174                       ENDIF
012174                                                             $50375:
012174                       IF R3 NE #0 THEN
012174 005703                                                                 TST     R3
012176 001402                                                                 BEQ     $50376
012200                               CALL ERROR
012200 004737 056274                                                          JSR     PC,ERROR
012204                       ENDIF
012204                                                             $50376:
012204                       IF R4 NE #0 THEN
012204 005704                                                                 TST     R4
012206 001402                                                                 BEQ     $50377
012210                               CALL ERROR
```

```
012210  004737  056274                                                              JSR     PC,ERROR
012214                          ENDIF
012214                                                                   $50377:
012214                          IF R5 NE #0 THEN
012214  005705                                                                      TST     R5
012216  001402                                                                      BEQ     $50400
012220                                  CALL ERROR
012220  004737  056274                                                              JSR     PC,ERROR
012224                          ENDIF
012224                                                                   $50400:
012224                          INLINE  <JMP    XSPANC>
012224  000137  012256                                                              JMP     XSPANC

                                ;+
                                ; TABLE OF TEST CASES FOR SCANC.
                                ;-

012230  000003                  TSCANC: .WORD   3               ;#OF TEST CASES FOR SCANC

012232  000000                          .WORD   0                       ;SRC.LEN
012234  000020                          .WORD   20                      ;OFFSET

012236  000100                          .WORD   BUFLEN          ;TEST CASE NUMBER 2
012240  000030                          .WORD   30

012242  000100                          .WORD   BUFLEN          ;TEST CASE NUMBER 3
012244  000110                          .WORD   BUFLEN+10


012246  000100                  TSCNCI: .WORD   BUFLEN          ;TEST CASE FOR INLINE
012250  061166                          .WORD   BUFF1
012252  000010                          .WORD   10
012254  061766                          .WORD   CHRSET
```

```
                                        .SBTTL  SPANC
                                        ;;*****************************************************************
                                        ;
                                        ;  SPANC TEST
                                        ;
                                        ;;*****************************************************************
012256                                  INLINE  <XSPANC:>
012256                                                                                  XSPANC:
012256                                  INLINE  <SCOPE>
012256  000004                                                                          SCOPE
012260                                  LET $TIMES := #20              ;ITERATION COUNT
012260  012737  000020  000404                                                          MOV     #20,$TIMES
012266                                  LET COUNT := TSPANC            ;GET TEST COUNT
012266  013737  013152  000466                                                          MOV     TSPANC,COUNT
012274                                  LET TSTCAS := #TSPANC+2        ;POINT TO FIRST TEST CASE
012274  012737  013154  000542                                                          MOV     #TSPANC+2,TSTCAS
                                        ;REPEAT
012302                                  INLINE  <$5043:>
012302                                                                                  $5043:

                                                ;+
                                                ; GET TEST DATA FROM TABLE
                                                ;-

012302                                          LET R0 := TSTCAS
012302  013700  000542                                                                  MOV     TSTCAS,R0
012306                                          LET DATA00 := (R0)+             ;SRC.LEN
012306  012037  000560                                                                  MOV     (R0)+,DATA00
012312                                          LET DATA01 := (R0)              ;OFFSET
012312  011037  000562                                                                  MOV     (R0),DATA01

                                                ;+
                                                ; SET UP GPR'S,
                                                ; EXPECTED GPR'S AND CONDITION CODES,
                                                ; SOURCE BUFFER, AND CHARACTER SET TABLE.
                                                ;-

012316                                          LET R0 := DATA00
012316  013700  000560                                                                  MOV     DATA00,R0
012322                                          LET R1 := #BUFF1
012322  012701  061166                                                                  MOV     #BUFF1,R1
012326                                          LET R4 := #40                   ;MASK
012326  012704  000040                                                                  MOV     #40,R4
012332                                          LET R5 := #CHRSET
012332  012705  061766                                                                  MOV     #CHRSET,R5
012336                                          INLINE  <BIT    #BIT00,COUNT>
012336  032737  000001  000466                                                          BIT     #BIT00,COUNT
012344                                          IFCOND EQ THEN
012344  001003                                                                          BNE     $50401
012346                                              LET R2 := #0
012346  005002                                                                          CLR     R2
012350                                              LET R3 := #0
012350  005003                                                                          CLR     R3
012352                                          ELSE
012352  000404                                                                          BR      $50402
012354                                                                          $50401:
```

```
012354                                   LET R2 := #177777
012354  012702  177777                                                            MOV     #177777,R2
012360                                   LET R3 := #177777
012360  012703  177777                                                            MOV     #177777,R3
012364                               ENDIF
012364                                                                     $50402:
012364                               IF DATA01 HI DATA00 THEN
012364  023737  000562  000560                                                    CMP     DATA01,DATA00
012372  101411                                                                    BLOS    $50403
012374                                   LET R0.EXP := #0
012374  005037  000522                                                            CLR     R0.EXP
012400                                   LET R1.EXP := #BUFF1 + DATA00
012400  012737  061166  000524                                                    MOV     #BUFF1,R1.EXP
012406  063737  000560  000524                                                    ADD     DATA00,R1.EXP
012414                               ELSE
012414  000414                                                                    BR      $50404
012416                                                                     $50403:
012416                                   LET R0.EXP := DATA00 - DATA01
012416  013737  000560  000522                                                    MOV     DATA00,R0.EXP
012424  163737  000562  000522                                                    SUB     DATA01,R0.EXP
012432                                   LET R1.EXP := #BUFF1 + DATA01
012432  012737  061166  000524                                                    MOV     #BUFF1,R1.EXP
012440  063737  000562  000524                                                    ADD     DATA01,R1.EXP
012446                               ENDIF
012446                                                                     $50404:
012446                               LET R2.EXP := R2
012446  010237  000526                                                            MOV     R2,R2.EXP
012452                               LET R3.EXP := R3
012452  010337  000530                                                            MOV     R3,R3.EXP
012456                               LET R4.EXP := R4
012456  010437  000532                                                            MOV     R4,R4.EXP
012462                               LET R5.EXP := R5
012462  010537  000534                                                            MOV     R5,R5.EXP
012466                               INLINE  <TST    R0.EXP>
012466  005737  000522                                                            TST     R0.EXP
012472                               LET CC.EXP := PSW
012472  013737  177776  000520                                                    MOV     PSW,CC.EXP
012500                               LET CC.EXP := CC.EXP CLR.BY #177760
012500  042737  177760  000520                                                    BIC     #177760,CC.EXP
012506                               LET BFADRS := #BUFF1
012506  012737  061166  000540                                                    MOV     #BUFF1,BFADRS
012514                               CALL CLRBUF
012514  004737  055346                                                            JSR     PC,CLRBUF
012520                               LET TEMP0 := #BUFF1 + DATA01
012520  012737  061166  000474                                                    MOV     #BUFF1,TEMP0
012526  063737  000562  000474                                                    ADD     DATA01,TEMP0
012534                               LET @TEMP0 :B= #252
012534  112777  000252  165732                                                    MOVB    #252,@TEMP0
012542                               WHILE R5 LO #CHRSET+400 DO
012542                                                                     $50405:
012542  020527  062366                                                            CMP     R5,#CHRSET+400
012546  103002                                                                    BHIS    $50406
012550                                   INLINE  <CLR        (R5)+>        ;CLEAR CHAR. SET TABLE
012550  005025                                                                    CLR     (R5)+
012552                               ENDDO
012552  000773                                                                    BR      $50405
```

```
012554                                                                  $50406:
012554                                  LET R5 := #CHRSET               ;RESTORE R5
012554  012705  061766                                                          MOV     #CHRSET,R5
012560                                  LET CHRSET :B= #40              ;SET MASK IN CHAR. SET
012560  112737  000040  061766                                                  MOVB    #40,CHRSET

                                        ;+
                                        ; DO THE CIS INSTRUCTION
                                        ;-

012566                                  INLINE  <SPANC>
012566  076043                                                                  SPANC

                                        ;+
                                        ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                        ;-

012570                                  LET CC := PSW
012570  013737  177776  000516                                                  MOV     PSW,CC
012576                                  LET CC := CC CLR.BY #177760
012576  042737  177760  000516                                                  BIC     #177760,CC
012604                                  IF CC NE CC.EXP THEN
012604  023737  000516  000520                                                  CMP     CC,CC.EXP
012612  001402                                                                  BEQ     $50407
012614                                      CALL ERROR
012614  004737  056274                                                          JSR     PC,ERROR
012620                                  ENDIF
012620                                                                  $50407:
012620                                  IF R0 NE R0.EXP THEN
012620  020037  000522                                                          CMP     R0,R0.EXP
012624  001402                                                                  BEQ     $50410
012626                                      CALL ERROR
012626  004737  056274                                                          JSR     PC,ERROR
012632                                  ENDIF
012632                                                                  $50410:
012632                                  IF R1 NE R1.EXP THEN
012632  020137  000524                                                          CMP     R1,R1.EXP
012636  001402                                                                  BEQ     $50411
012640                                      CALL ERROR
012640  004737  056274                                                          JSR     PC,ERROR
012644                                  ENDIF
012644                                                                  $50411:
012644                                  IF R2 NE R2.EXP THEN
012644  020237  000526                                                          CMP     R2,R2.EXP
012650  001402                                                                  BEQ     $50412
012652                                      CALL ERROR
012652  004737  056274                                                          JSR     PC,ERROR
012656                                  ENDIF
012656                                                                  $50412:
012656                                  IF R3 NE R3.EXP THEN
012656  020337  000530                                                          CMP     R3,R3.EXP
012662  001402                                                                  BEQ     $50413
012664                                      CALL ERROR
012664  004737  056274                                                          JSR     PC,ERROR
012670                                  ENDIF
012670                                                                  $50413:
```

```
012670                                  IF R4 NE R4.EXP THEN
012670  020437  000532                                                          CMP     R4,R4.EXP
012674  001402                                                                  BEQ     $50414
012676                                      CALL ERROR
012676  004737  056274                                                          JSR     PC,ERROR
012702                                  ENDIF
012702                                                                  $50414:
012702                                  IF R5 NE R5.EXP THEN
012702  020537  000534                                                          CMP     R5,R5.EXP
012706  001402                                                                  BEQ     $50415
012710                                      CALL ERROR
012710  004737  056274                                                          JSR     PC,ERROR
012714                                  ENDIF
012714                                                                  $50415:
012714                                  LET TSTCAS := TSTCAS + #4
012714  062737  000004  000542                                                  ADD     #4,TSTCAS
012722                                  LET COUNT := COUNT - #1
012722  005337  000466                                                          DEC     COUNT
                              ;UNTIL COUNT EQ #0
012726                        IF COUNT NE #0 THEN
012726  005737  000466                                                          TST     COUNT
012732  001402                                                                  BEQ     $50416
012734                                  INLINE  <JMP    $5043>
012734  000137  012302                                                          JMP     $5043
012740                        ENDIF
012740                                                                  $50416:



                              ;+
                              ; DO ONE INLINE CASE - SPANCI
                              ;-

012740                        LET BFADRS := #BUFF1
012740  012737  061166  000540                                                  MOV     #BUFF1,BFADRS
012746                        CALL CLRBUF
012746  004737  055346                                                          JSR     PC,CLRBUF
012752                        LET TEMPO := #BUFF1 + #50
012752  012737  061166  000474                                                  MOV     #BUFF1,TEMPO
012760  062737  000050  000474                                                  ADD     #50,TEMPO
012766                        LET @TEMPO :B= #27
012766  112777  000027  165500                                                  MOVB    #27,@TEMPO
012774                        LET R0 := #CHRSET
012774  012700  061766                                                          MOV     #CHRSET,R0
013000                        WHILE R0 LO #CHRSET+400 DO
013000                                                                  $50417:
013000  020027  062366                                                          CMP     R0,#CHRSET+400
013004  103002                                                                  BHIS    $50420
013006                                  LET (R0)+ := #0         ;CLEAR CHAR. SET TABLE
013006  005020                                                                  CLR     (R0)+
013010                        ENDDO
013010  000773                                                                  BR      $50417
013012                                                                  $50420:
013012                        CALL CLRREG
013012  004737  055330                                                          JSR     PC,CLRREG
013016                        LET CHRSET :B= #10
013016  112737  000010  061766                                                  MOVB    #10,CHRSET
```

```
013024                          INLINE  <SPANCI>
013024  076143                                                                          SPANCI
013026                          INLINE  <.WORD  TSPNCI>
013026  013170                                                                          .WORD   TSPNCI
013030                          INLINE  <.WORD  TSPNCI+4>
013030  013174                                                                          .WORD   TSPNCI+4
013032                          LET TEMPO := PSW
013032  013737  177776  000474                                                          MOV     PSW,TEMPO
013040                          INLINE  <BIT    #17,TEMPO>
013040  032737  000017  000474                                                          BIT     #17,TEMPO
013046                          IFCOND NE THEN
013046  001402                                                                          BEQ     $50421
013050                                  CALL ERROR
013050  004737  056274                                                                  JSR     PC,ERROR
013054                          ENDIF
013054                                                                          $50421:
013054                          LET TEMPO := #BUFLEN-50
013054  012737  000030  000474                                                          MOV     #BUFLEN-50,TEMPO
013062                          IF R0 NE TEMPO THEN
013062  020037  000474                                                                  CMP     R0,TEMPO
013066  001402                                                                          BEQ     $50422
013070                                  CALL ERROR
013070  004737  056274                                                                  JSR     PC,ERROR
013074                          ENDIF
013074                                                                          $50422:
013074                          IF R1 NE #BUFF1+50 THEN
013074  020127  061236                                                                  CMP     R1,#BUFF1+50
013100  001402                                                                          BEQ     $50423
013102                                  CALL ERROR
013102  004737  056274                                                                  JSR     PC,ERROR
013106                          ENDIF
013106                                                                          $50423:
013106                          IF R2 NE #0 THEN
013106  005702                                                                          TST     R2
013110  001402                                                                          BEQ     $50424
013112                                  CALL ERROR
013112  004737  056274                                                                  JSR     PC,ERROR
013116                          ENDIF
013116                                                                          $50424:
013116                          IF R3 NE #0 THEN
013116  005703                                                                          TST     R3
013120  001402                                                                          BEQ     $50425
013122                                  CALL ERROR
013122  004737  056274                                                                  JSR     PC,ERROR
013126                          ENDIF
013126                                                                          $50425:
013126                          IF R4 NE #0 THEN
013126  005704                                                                          TST     R4
013130  001402                                                                          BEQ     $50426
013132                                  CALL ERROR
013132  004737  056274                                                                  JSR     PC,ERROR
013136                          ENDIF
013136                                                                          $50426:
013136                          IF R5 NE #0 THEN
013136  005705                                                                          TST     R5
013140  001402                                                                          BEQ     $50427
```

```
013142                                      CALL ERROR
013142  004737  056274                                                          JSR     PC,ERROR
013146                              ENDIF
013146                                                                  $50427:
013146                              INLINE   <JMP    XCMPC>
013146  000137  013200                                                          JMP     XCMPC


                                    ;+
                                    ; TABLE OF TEST CASES FOR SPANC
                                    ;-

013152  000003                      TSPANC: .WORD    3                  ;# OF TEST CASES FOR SPANC

013154  000000                              .WORD    0                         ;SRC.LEN
013156  000030                              .WORD    30                        ;OFFSET

013160  000100                              .WORD    BUFLEN             ;TEST CASE NUMBER 2
013162  000040                              .WORD    40

013164  000100                              .WORD    BUFLEN             ;TEST CASE NUMBER 3
013166  000104                              .WORD    BUFLEN+4


013170  000100                      TSPNCI: .WORD    BUFLEN             ;TEST CASE FOR INLINE
013172  061166                              .WORD    BUFF1
013174  000010                              .WORD    10
013176  061766                              .WORD    CHRSET
```

```
                                      .SBTTL  CMPC
                                      ;;*****************************************************************
                                      ;
                                      ;   CMPC TEST
                                      ;
                                      ;;*****************************************************************
013200                                INLINE  <XCMPC:>
013200                                                                                  XCMPC:
013200                                INLINE  <SCOPE>
013200  000004                                                                          SCOPE
013202                                LET $TIMES := #20                ;ITERATION COUNT
013202  012737  000020  000404                                                          MOV     #20,$TIMES
013210                                LET COUNT := TCMPC               ;GET TEST COUNT
013210  013737  014152  000466                                                          MOV     TCMPC,COUNT
013216                                LET TSTCAS := #TCMPC+2           ;POINT TO FIRST TEST CASE
013216  012737  014154  000542                                                          MOV     #TCMPC+2,TSTCAS
                                      ;REPEAT
013224                                INLINE  <$5044:>
013224                                                                                  $5044:

                                              ;+
                                              ; GET TEST DATA FROM TABLE
                                              ;-

013224                                        LET R0 := TSTCAS
013224  013700  000542                                                                  MOV     TSTCAS,R0
013230                                        LET DATA00 := (R0)+      ;SRC1.LEN
013230  012037  000560                                                                  MOV     (R0)+,DATA00
013234                                        LET DATA01 := (R0)+      ;SRC2.LEN
013234  012037  000562                                                                  MOV     (R0)+,DATA01
013240                                        LET DATA02 := (R0)       ;OFFSET
013240  011037  000564                                                                  MOV     (R0),DATA02

                                              ;+
                                              ; SET UP GPR'S
                                              ;-

013244                                        LET R0 := DATA00         ;SRC1
013244  013700  000560                                                                  MOV     DATA00,R0
013250                                        LET R1 := #BUFF1
013250  012701  061166                                                                  MOV     #BUFF1,R1
013254                                        LET R2 := DATA01         ;SRC2
013254  013702  000562                                                                  MOV     DATA01,R2
013260                                        LET R3 := #BUFF2
013260  012703  061266                                                                  MOV     #BUFF2,R3
013264                                        LET R4 := #377           ;FILL CHARACTER
013264  012704  000377                                                                  MOV     #377,R4
013270                                        LET OFFSET := DATA02     ;OFFSET
013270  013737  000564  000510                                                          MOV     DATA02,OFFSET
013276                                        INLINE  <BIT    #BIT00,COUNT>
013276  032737  000001  000466                                                          BIT     #BIT00,COUNT
013304                                        IFCOND EQ THEN
013304  001002                                                                          BNE     $50430
013306                                            LET R5 := #0
013306  005005                                                                          CLR     R5
013310                                        ELSE
```

```
013310  000402                                                          BR      $50431
013312                                                          $50430:
013312                              LET R5 := #177777
013312  012705  177777                                                  MOV     #177777,R5
013316                          ENDIF
013316                                                          $50431:


                                ;+
                                ; SET UP BUFFERS
                                ;-

013316                          LET BFADRS := #BUFF1
013316  012737  061166  000540                                          MOV     #BUFF1,BFADRS
013324                          CALL SETBUF
013324  004737  055410                                                  JSR     PC,SETBUF
013330                          LET BFADRS := #BUFF2
013330  012737  061266  000540                                          MOV     #BUFF2,BFADRS
013336                          CALL SETBUF
013336  004737  055410                                                  JSR     PC,SETBUF
013342                          IF DATA00 HI DATA01 THEN
013342  023737  000560  000562                                          CMP     DATA00,DATA01
013350  101412                                                          BLOS    $50432
013352                              LET TEMP0 := OFFSET + #BUFF1
013352  013737  000510  000474                                          MOV     OFFSET,TEMP0
013360  062737  061166  000474                                          ADD     #BUFF1,TEMP0
013366                              LET CC.EXP := #1
013366  012737  000001  000520                                          MOV     #1,CC.EXP
013374                          ELSE
013374  000411                                                          BR      $50433
013376                                                          $50432:
013376                              LET TEMP0 := OFFSET + #BUFF2
013376  013737  000510  000474                                          MOV     OFFSET,TEMP0
013404  062737  061266  000474                                          ADD     #BUFF2,TEMP0
013412                              LET CC.EXP := #10
013412  012737  000010  000520                                          MOV     #10,CC.EXP
013420                          ENDIF
013420                                                          $50433:
013420                          LET @TEMP0 :B= #0
013420  105077  165050                                                  CLRB    @TEMP0


                                ;+
                                ; SET UP EXPECTED GPR'S AND CONDITION CODES
                                ;-

013424                          LET R0.EXP := R0 - DATA02
013424  010037  000522                                                  MOV     R0,R0.EXP
013430  163737  000564  000522                                          SUB     DATA02,R0.EXP
013436                          LET R1.EXP := R1 + DATA02
013436  010137  000524                                                  MOV     R1,R1.EXP
013442  063737  000564  000524                                          ADD     DATA02,R1.EXP
013450                          LET R2.EXP := R2 - DATA02
013450  010237  000526                                                  MOV     R2,R2.EXP
013454  163737  000564  000526                                          SUB     DATA02,R2.EXP
013462                          LET R3.EXP := R3 + DATA02
013462  010337  000530                                                  MOV     R3,R3.EXP
013466  063737  000564  000530                                          ADD     DATA02,R3.EXP
```

```
013474                           LET R4.EXP := R4
013474  010437  000532                                                          MOV     R4,R4.EXP
013500                           LET R5.EXP := R5
013500  010537  000534                                                          MOV     R5,R5.EXP
013504                           IF DATA02 HIS DATA00 THEN
013504  023737  000564  000560                                                  CMP     DATA02,DATA00
013512  103406                                                                  BLO     $50434
013514                               LET R0.EXP := #0
013514  005037  000522                                                          CLR     R0.EXP
013520                               LET R1.EXP := R1 + R0
013520  010137  000524                                                          MOV     R1,R1.EXP
013524  060037  000524                                                          ADD     R0,R1.EXP
013530                           ENDIF
013530                                                                  $50434:
013530                           IF DATA02 HIS DATA01 THEN
013530  023737  000564  000562                                                  CMP     DATA02,DATA01
013536  103406                                                                  BLO     $50435
013540                               LET R2.EXP := #0
013540  005037  000526                                                          CLR     R2.EXP
013544                               LET R3.EXP := R3 + R2
013544  010337  000530                                                          MOV     R3,R3.EXP
013550  060237  000530                                                          ADD     R2,R3.EXP
013554                           ENDIF
013554                                                                  $50435:
013554                           IF DATA02 HIS DATA00 AND DATA02 HIS DATA01 THEN
013554  023737  000564  000560                                                  CMP     DATA02,DATA00
013562  103407                                                                  BLO     $50436
013564  023737  000564  000562                                                  CMP     DATA02,DATA01
013572  103403                                                                  BLO     $50436
013574                               LET CC.EXP := #4
013574  012737  000004  000520                                                  MOV     #4,CC.EXP
013602                           ENDIF
013602                                                                  $50436:

                                 ;+
                                 ; DO THE CIS INSTRUCTION
                                 ;-

013602                           INLINE  <CMPC>
013602  076044                                                                  CMPC

                                 ;+
                                 ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                 ;-

013604                           LET CC := PSW
013604  013737  177776  000516                                                  MOV     PSW,CC
013612                           LET CC := CC CLR.BY #177760
013612  042737  177760  000516                                                  BIC     #177760,CC
013620                           IF CC NE CC.EXP THEN
013620  023737  000516  000520                                                  CMP     CC,CC.EXP
013626  001402                                                                  BEQ     $50437
013630                               CALL ERROR
013630  004737  056274                                                          JSR     PC,ERROR
013634                           ENDIF
013634                                                                  $50437:
```

```
013634                                  IF R0 NE R0.EXP THEN
013634  020037  000522                                                  CMP     R0,R0.EXP
013640  001402                                                          BEQ     $50440
013642                                          CALL ERROR
013642  004737  056274                                                  JSR     PC,ERROR
013646                                  ENDIF
013646                                                          $50440:
013646                                  IF R1 NE R1.EXP THEN
013646  020137  000524                                                  CMP     R1,R1.EXP
013652  001402                                                          BEQ     $50441
013654                                          CALL ERROR
013654  004737  056274                                                  JSR     PC,ERROR
013660                                  ENDIF
013660                                                          $50441:
013660                                  IF R2 NE R2.EXP THEN
013660  020237  000526                                                  CMP     R2,R2.EXP
013664  001402                                                          BEQ     $50442
013666                                          CALL ERROR
013666  004737  056274                                                  JSR     PC,ERROR
013672                                  ENDIF
013672                                                          $50442:
013672                                  IF R3 NE R3.EXP THEN
013672  020337  000530                                                  CMP     R3,R3.EXP
013676  001402                                                          BEQ     $50443
013700                                          CALL ERROR
013700  004737  056274                                                  JSR     PC,ERROR
013704                                  ENDIF
013704                                                          $50443:
013704                                  IF R4 NE R4.EXP THEN
013704  020437  000532                                                  CMP     R4,R4.EXP
013710  001402                                                          BEQ     $50444
013712                                          CALL ERROR
013712  004737  056274                                                  JSR     PC,ERROR
013716                                  ENDIF
013716                                                          $50444:
013716                                  IF R5 NE R5.EXP THEN
013716  020537  000534                                                  CMP     R5,R5.EXP
013722  001402                                                          BEQ     $50445
013724                                          CALL ERROR
013724  004737  056274                                                  JSR     PC,ERROR
013730                                  ENDIF
013730                                                          $50445:
013730                                  LET TSTCAS := TSTCAS + #6
013730  062737  000006  000542                                          ADD     #6,TSTCAS
013736                                  LET COUNT := COUNT - #1
013736  005337  000466                                                  DEC     COUNT
                                ;UNTIL COUNT EQ #0
013742                          IF COUNT NE #0 THEN
013742  005737  000466                                                  TST     COUNT
013746  001402                                                          BEQ     $50446
013750                                  INLINE  <JMP    $5044>
013750  000137  013224                                                  JMP     $5044
013754                          ENDIF
013754                                                          $50446:
```

```
                                      ;+
                                      ; DO ONE INLINE CASE - CMPCI
                                      ;-

013754                                LET BFADRS := #BUFF1
013754  012737  061166  000540                                                    MOV     #BUFF1,BFADRS
013762                                CALL CLRBUF
013762  004737  055346                                                            JSR     PC,CLRBUF
013766                                LET BFADRS := #BUFF2
013766  012737  061266  000540                                                    MOV     #BUFF2,BFADRS
013774                                CALL CLRBUF
013774  004737  055346                                                            JSR     PC,CLRBUF
014000                                CALL CLRREG
014000  004737  055330                                                            JSR     PC,CLRREG
014004                                LET TEMPO := #BUFF1 + #40
014004  012737  061166  000474                                                    MOV     #BUFF1,TEMPO
014012  062737  000040  000474                                                    ADD     #40,TEMPO
014020                                LET @TEMPO :B= #377
014020  112777  000377  164446                                                    MOVB    #377,@TEMPO
014026                                INLINE  <CMPCI>
014026  076144                                                                    CMPCI
014030                                INLINE  <.WORD  TCMPCI>
014030  014234                                                                    .WORD   TCMPCI
014032                                INLINE  <.WORD  TCMPCI+4>
014032  014240                                                                    .WORD   TCMPCI+4
014034                                INLINE  <.WORD  0>
014034  000000                                                                    .WORD   0
014036                                LET TEMPO := PSW
014036  013737  177776  000474                                                    MOV     PSW,TEMPO
014044                                LET TEMPO := TEMPO CLR.BY #177760
014044  042737  177760  000474                                                    BIC     #177760,TEMPO
014052                                IF TEMPO NE #10 THEN
014052  023727  000474  000010                                                    CMP     TEMPO,#10
014060  001402                                                                    BEQ     $50447
014062                                        CALL ERROR
014062  004737  056274                                                            JSR     PC,ERROR
014066                                ENDIF
014066                                                                  $50447:
014066                                IF R0 NE #0 THEN
014066  005700                                                                    TST     R0
014070  001402                                                                    BEQ     $50450
014072                                        CALL ERROR
014072  004737  056274                                                            JSR     PC,ERROR
014076                                ENDIF
014076                                                                  $50450:
014076                                IF R1 NE #0 THEN
014076  005701                                                                    TST     R1
014100  001402                                                                    BEQ     $50451
014102                                        CALL ERROR
014102  004737  056274                                                            JSR     PC,ERROR
014106                                ENDIF
014106                                                                  $50451:
014106                                IF R2 NE #0 THEN
014106  005702                                                                    TST     R2
014110  001402                                                                    BEQ     $50452
014112                                        CALL ERROR
```

```
014112  004737  056274                                          JSR     PC,ERROR
014116                          ENDIF
014116                                                  $50452:
014116                          IF R3 NE #0 THEN
014116  005703                                                  TST     R3
014120  001402                                                  BEQ     $50453
014122                                  CALL ERROR
014122  004737  056274                                          JSR     PC,ERROR
014126                          ENDIF
014126                                                  $50453:
014126                          IF R4 NE #0 THEN
014126  005704                                                  TST     R4
014130  001402                                                  BEQ     $50454
014132                                  CALL ERROR
014132  004737  056274                                          JSR     PC,ERROR
014136                          ENDIF
014136                                                  $50454:
014136                          IF R5 NE #0 THEN
014136  005705                                                  TST     R5
014140  001402                                                  BEQ     $50455
014142                                  CALL ERROR
014142  004737  056274                                          JSR     PC,ERROR
014146                          ENDIF
014146                                                  $50455:
014146                          INLINE  <JMP    XMATC>
014146  000137  014244                                          JMP     XMATC


                        ;+
                        ; TABLE OF TEST CASES FOR CMPC
                        ;-

014152  000010          TCMPC:  .WORD   8.              ;# OF TEST CASES FOR CMPC

014154  000000                  .WORD   0                       ;SRC1.LEN
014156  000020                  .WORD   20                      ;SRC2.LEN
014160  000040                  .WORD   40                      ;OFFSET

014162  000010                  .WORD   10              ;TEST CASE NUMBER 2
014164  000030                  .WORD   30
014166  000007                  .WORD   7

014170  000044                  .WORD   44              ;TEST CASE NUMBER 3
014172  000070                  .WORD   70
014174  000060                  .WORD   60

014176  000030                  .WORD   30              ;TEST CASE NUMBER 4
014200  000050                  .WORD   50
014202  000060                  .WORD   60

014204  000000                  .WORD   0               ;TEST CASE NUMBER 5
014206  000000                  .WORD   0
014210  000010                  .WORD   10

014212  000060                  .WORD   60              ;TEST CASE NUMBER 6
014214  000040                  .WORD   40
014216  000030                  .WORD   30
```

```
014220  000057                    .WORD   57              ;TEST CASE NUMBER 7
014222  000033                    .WORD   33
014224  000045                    .WORD   45

014226  000020                    .WORD   20              ;TEST CASE NUMBER 8
014230  000011                    .WORD   11
014232  000023                    .WORD   23


014234  000060           TCMPCI:  .WORD   60              ;TEST CASE FOR INLINE
014236  061166                    .WORD   BUFF1
014240  000060                    .WORD   60
014242  061266                    .WORD   BUFF2
```

```
                                          .SBTTL  MATC
                                          ;;*****************************************************************
                                          ;
                                          ;  MATC TEST
                                          ;
                                          ;;*****************************************************************
014244                                    INLINE  <XMATC:>
014244                                                                                  XMATC:
014244                                    INLINE  <SCOPE>
014244  000004                                                                          SCOPE
014246                                    LET $TIMES := #20             ;ITERATION COUNT
014246  012737  000020  000404                                                          MOV     #20,$TIMES
014254                                    LET COUNT := TMATC            ;GET TEST COUNT
014254  013737  015150  000466                                                          MOV     TMATC,COUNT
014262                                    LET TSTCAS := #TMATC+2        ;POINT TO FIRST TEST CASE
014262  012737  015152  000542                                                          MOV     #TMATC+2,TSTCAS
                                          ;REPEAT
014270                                    INLINE  <$5045:>
014270                                                                                  $5045:

                                              ;+
                                              ; GET TEST DATA FROM TABLE
                                              ;-

014270                                        LET R0 := TSTCAS
014270  013700  000542                                                                  MOV     TSTCAS,R0
014274                                        LET DATA00 := (R0)+               ;OBJ.LEN
014274  012037  000560                                                                  MOV     (R0)+,DATA00
014300                                        LET DATA01 := (R0)                ;OFFSET
014300  011037  000562                                                                  MOV     (R0),DATA01

                                              ;+
                                              ; SET UP THE GPR'S
                                              ;-

014304                                        LET R0 := #70                     ;SRC.LEN
014304  012700  000070                                                                  MOV     #70,R0
014310                                        LET R1 := #BUFF1                  ;SRC.ADR
014310  012701  061166                                                                  MOV     #BUFF1,R1
014314                                        LET R2 := DATA00
014314  013702  000560                                                                  MOV     DATA00,R2
014320                                        LET R3 := #BUFF2                  ;OBJ.LEN
014320  012703  061266                                                                  MOV     #BUFF2,R3
014324                                        INLINE  <BIT        #BIT00,COUNT>
014324  032737  000001  000466                                                          BIT     #BIT00,COUNT
014332                                        IFCOND EQ THEN
014332  001003                                                                          BNE     $50456
014334                                            LET R4 := #0
014334  005004                                                                          CLR     R4
014336                                            LET R5 := #0
014336  005005                                                                          CLR     R5
014340                                        ELSE
014340  000404                                                                          BR      $50457
014342                                                                          $50456:
014342                                            LET R4 := #177777
014342  012704  177777                                                                  MOV     #177777,R4
```

```
014346                                  LET R5 := #177777
014346  012705  177777                                                      MOV     #177777,R5
014352                          ENDIF
014352                                                              $50457:


                                ;+
                                ; SET UP THE BUFFERS
                                ;-

014352                          LET BFADRS := #BUFF1
014352  012737  061166  000540                                              MOV     #BUFF1,BFADRS
014360                          CALL SETBUF
014360  004737  055410                                                      JSR     PC,SETBUF
014364                          LET BFADRS := #BUFF2
014364  012737  061266  000540                                              MOV     #BUFF2,BFADRS
014372                          CALL CLRBUF
014372  004737  055346                                                      JSR     PC,CLRBUF
014376                          IF DATA01 LO #70 THEN
014376  023727  000562  000070                                              CMP     DATA01,#70
014404  103015                                                              BHIS    $50460
014406                                  LET R1 := R1 + DATA01
014406  063701  000562                                                      ADD     DATA01,R1
014412                                  REPEAT
014412                                                              $50461:
014412                                          INLINE  <CLRB       (R1)+>
014412  105021                                                              CLRB    (R1)+
014414                                          LET TEMPO := #BUFF1 + R0
014414  012737  061166  000474                                              MOV     #BUFF1,TEMPO
014422  060037  000474                                                      ADD     R0,TEMPO
014426                                  UNTIL R1 EQ TEMPO
014426  020137  000474                                                      CMP     R1,TEMPO
014432  001367                                                              BNE     $50461
014434                                  LET R1 := #BUFF1                ;RESTORE R1
014434  012701  061166                                                      MOV     #BUFF1,R1
014440                          ENDIF
014440                                                              $50460:


                                ;+
                                ; SET UP EXPECTED GPR'S AND CONDITION CODES
                                ;-

014440                          LET R0.EXP := R0
014440  010037  000522                                                      MOV     R0,R0.EXP
014444                          LET R1.EXP := R1
014444  010137  000524                                                      MOV     R1,R1.EXP
014450                          LET R2.EXP := R2
014450  010237  000526                                                      MOV     R2,R2.EXP
014454                          LET R3.EXP := R3
014454  010337  000530                                                      MOV     R3,R3.EXP
014460                          LET R4.EXP := R4
014460  010437  000532                                                      MOV     R4,R4.EXP
014464                          LET R5.EXP := R5
014464  010537  000534                                                      MOV     R5,R5.EXP
014470                          IF DATA00 HI #0 THEN
014470  005737  000560                                                      TST     DATA00
014474  101432                                                              BLOS    $50462
```

```
014476                                  LET TEMPO := R0 - DATA01
014476  010037  000474                                                          MOV     R0,TEMPO
014502  163737  000562  000474                                                  SUB     DATA01,TEMPO
014510                                  IF TEMPO LO DATA00 THEN
014510  023737  000474  000560                                                  CMP     TEMPO,DATA00
014516  103007                                                                  BHIS    $50463
014520                                      LET R0.EXP := #0
014520  005037  000522                                                          CLR     R0.EXP
014524                                      LET R1.EXP := R0 + R1
014524  010037  000524                                                          MOV     R0,R1.EXP
014530  060137  000524                                                          ADD     R1,R1.EXP
014534                                  ELSE
014534  000412                                                                  BR      $50464
014536                                                                  $50463:
014536                                      LET R0.EXP := R0 - DATA01
014536  010037  000522                                                          MOV     R0,R0.EXP
014542  163737  000562  000522                                                  SUB     DATA01,R0.EXP
014550                                      LET R1.EXP := R1 + DATA01
014550  010137  000524                                                          MOV     R1,R1.EXP
014554  063737  000562  000524                                                  ADD     DATA01,R1.EXP
014562                                  ENDIF
014562                                                                  $50464:
014562                              ENDIF
014562                                                                  $50462:
014562                              INLINE  <TST        R0.EXP>
014562  005737  000522                                                          TST     R0.EXP
014566                              LET CC.EXP := PSW
014566  013737  177776  000520                                                  MOV     PSW,CC.EXP
014574                              LET CC.EXP := CC.EXP CLR.BY #177760
014574  042737  177760  000520                                                  BIC     #177760,CC.EXP

                            ;+
                            ; DO THE CIS INSTRUCTION
                            ;-

014602                              INLINE  <MATC>
014602  076045                                                                  MATC

                            ;+
                            ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                            ;-

014604                              LET CC := PSW
014604  013737  177776  000516                                                  MOV     PSW,CC
014612                              LET CC := CC CLR.BY #177760
014612  042737  177760  000516                                                  BIC     #177760,CC
014620                              IF CC NE CC.EXP THEN
014620  023737  000516  000520                                                  CMP     CC,CC.EXP
014626  001402                                                                  BEQ     $50465
014630                                  CALL ERROR
014630  004737  056274                                                          JSR     PC,ERROR
014634                              ENDIF
014634                                                                  $50465:
014634                              IF R0 NE R0.EXP THEN
014634  020037  000522                                                          CMP     R0,R0.EXP
014640  001402                                                                  BEQ     $50466
```

```
014642                                  CALL ERROR
014642  004737  056274                                                          JSR     PC,ERROR
014646                              ENDIF
014646                                                                  $50466:
014646                              IF R1 NE R1.EXP THEN
014646  020137  000524                                                          CMP     R1,R1.EXP
014652  001402                                                                  BEQ     $50467
014654                                  CALL ERROR
014654  004737  056274                                                          JSR     PC,ERROR
014660                              ENDIF
014660                                                                  $50467:
014660                              IF R2 NE R2.EXP THEN
014660  020237  000526                                                          CMP     R2,R2.EXP
014664  001402                                                                  BEQ     $50470
014666                                  CALL ERROR
014666  004737  056274                                                          JSR     PC,ERROR
014672                              ENDIF
014672                                                                  $50470:
014672                              IF R3 NE R3.EXP THEN
014672  020337  000530                                                          CMP     R3,R3.EXP
014676  001402                                                                  BEQ     $50471
014700                                  CALL ERROR
014700  004737  056274                                                          JSR     PC,ERROR
014704                              ENDIF
014704                                                                  $50471:
014704                              IF R4 NE R4.EXP THEN
014704  020437  000532                                                          CMP     R4,R4.EXP
014710  001402                                                                  BEQ     $50472
014712                                  CALL ERROR
014712  004737  056274                                                          JSR     PC,ERROR
014716                              ENDIF
014716                                                                  $50472:
014716                              IF R5 NE R5.EXP THEN
014716  020537  000534                                                          CMP     R5,R5.EXP
014722  001402                                                                  BEQ     $50473
014724                                  CALL ERROR
014724  004737  056274                                                          JSR     PC,ERROR
014730                              ENDIF
014730                                                                  $50473:
014730                              LET TSTCAS := TSTCAS + #4
014730  062737  000004  000542                                                  ADD     #4,TSTCAS
014736                              LET COUNT := COUNT - #1
014736  005337  000466                                                          DEC     COUNT
                                ;UNTIL COUNT EQ #0
014742                          IF COUNT NE #0 THEN
014742  005737  000466                                                          TST     COUNT
014746  001402                                                                  BEQ     $50474
014750                                  INLINE  <JMP    $5045>
014750  000137  014270                                                          JMP     $5045
014754                          ENDIF
014754                                                                  $50474:


                                ;+
                                ; DO ONE INLINE CASE - MATCI
                                ;-
```

```
014754                       LET BFADRS := #BUFF1
014754  012737 061166 000540                                                MOV     #BUFF1,BFADRS
014762                       CALL SETBUF
014762  004737 055410                                                       JSR     PC,SETBUF
014766                       LET BFADRS := #BUFF2
014766  012737 061266 000540                                                MOV     #BUFF2,BFADRS
014774                       CALL SETBUF
014774  004737 055410                                                       JSR     PC,SETBUF
015000                       LET R0 := #BUFF1
015000  012700 061166                                                       MOV     #BUFF1,R0
015004                       REPEAT
015004                                                             $50475:
015004                           INLINE  <CLRB      (R0)+>
015004  105020                                                              CLRB    (R0)+
015006                       UNTIL R0 EQ #BUFF1+#40
015006  020027 061226                                                       CMP     R0,#BUFF1+#40
015012  001374                                                              BNE     $50475
015014                       CALL CLRREG
015014  004737 055330                                                       JSR     PC,CLRREG
015020                       INLINE  <MATCI>
015020  076145                                                              MATCI
015022                       INLINE  <.WORD  TMATCI>
015022  015172                                                              .WORD   TMATCI
015024                       INLINE  <.WORD  TMATCI+4>
015024  015176                                                              .WORD   TMATCI+4
015026                       LET CC := PSW
015026  013737 177776 000516                                                MOV     PSW,CC
015034                       INLINE  <BIT    #17,CC>
015034  032737 000017 000516                                                BIT     #17,CC
015042                       IFCOND NE THEN
015042  001402                                                              BEQ     $50476
015044                           CALL ERROR
015044  004737 056274                                                       JSR     PC,ERROR
015050                       ENDIF
015050                                                             $50476:
015050                       IF R0 NE #30 THEN              ;SRC.LEN - 40
015050  020027 000030                                                       CMP     R0,#30
015054  001402                                                              BEQ     $50477
015056                           CALL ERROR
015056  004737 056274                                                       JSR     PC,ERROR
015062                       ENDIF
015062                                                             $50477:
015062                       IF R1 NE #BUFF1+#40 THEN
015062  020127 061226                                                       CMP     R1,#BUFF1+#40
015066  001402                                                              BEQ     $50500
015070                           CALL ERROR
015070  004737 056274                                                       JSR     PC,ERROR
015074                       ENDIF
015074                                                             $50500:
015074                       IF R2 NE #0 THEN
015074  005702                                                              TST     R2
015076  001402                                                              BEQ     $50501
015100                           CALL ERROR
015100  004737 056274                                                       JSR     PC,ERROR
015104                       ENDIF
```

```
015104                                                            $50501:
015104                    IF R3 NE #0 THEN
015104  005703                                                            TST     R3
015106  001402                                                            BEQ     $50502
015110                        CALL ERROR
015110  004737  056274                                                    JSR     PC,ERROR
015114                    ENDIF
015114                                                            $50502:
015114                    IF R4 NE #0 THEN
015114  005704                                                            TST     R4
015116  001402                                                            BEQ     $50503
015120                        CALL ERROR
015120  004737  056274                                                    JSR     PC,ERROR
015124                    ENDIF
015124                                                            $50503:
015124                    IF R5 NE #0 THEN
015124  005705                                                            TST     R5
015126  001402                                                            BEQ     $50504
015130                        CALL ERROR
015130  004737  056274                                                    JSR     PC,ERROR
015134                    ENDIF
015134                                                            $50504:
015134                    IF R2 NE #0 THEN
015134  005702                                                            TST     R2
015136  001402                                                            BEQ     $50505
015140                        CALL ERROR
015140  004737  056274                                                    JSR     PC,ERROR
015144                    ENDIF
015144                                                            $50505:
015144                    INLINE  <JMP    INTST>
015144  000137  015202                                                    JMP     INTST

                          ;+
                          ; TABLE OF TEST DATA FOR MATC
                          ;-

015150  000004            TMATC:  .WORD   4                 ;# OF TEST CASES FOR MATC

015152  000000                    .WORD   0                         ;OBJ.LEN
015154  000010                    .WORD   10                        ;OFFSET

015156  000074                    .WORD   74                ;TEST CASE NUMBER 2
015160  000010                    .WORD   10

015162  000040                    .WORD   40                ;TEST CASE NUMBER 3
015164  000020                    .WORD   20

015166  000040                    .WORD   40                ;TEST CASE NUMBER 4
015170  000050                    .WORD   50


015172  000070            TMATCI: .WORD   70                ;TEST CASE FOR INLINE
015174  061166                    .WORD   BUFF1
015176  000010                    .WORD   10
015200  061266                    .WORD   BUFF2
```

```
                                        ;;*****************************************************************
                                        .SBTTL  INTERRUPTABILITY SUBTEST
                                        ;;*****************************************************************

                                        ;+
                                        ;       THIS SUBTEST VERIFIES THAT A CIS INSTRUCTION CAN BE
                                        ;       SUSPENDED (USING CONSOLE TERMINAL PRINTER INTERRUPT).
                                        ;-

015202                                  INLINE  <INTST:>
015202                                                                                  INTST:
015202                                  INLINE  <SCOPE>
015202  000004                                                                          SCOPE
015204                                  LET $TIMES := #1                ;ITERATION COUNT
015204  012737  000001  000404                                                          MOV     #1,$TIMES
015212                                  LET ERR := #2                   ;SET UP FOR ERROR MSG
015212  012737  000002  000550                                                          MOV     #2,ERR
015220                                  LET SAVPSW := PSW
015220  013737  177776  000612                                                          MOV     PSW,SAVPSW
015226                                  LET PSW := #PR7
015226  012737  000340  177776                                                          MOV     #PR7,PSW
015234                                  LET TEMP0 := #0                 ;SUSPENDED FLAG,1=INST SUSPENDED
015234  005037  000474                                                                  CLR     TEMP0
015240                                  IF INTPAS EQ #0 THEN
015240  005737  000460                                                                  TST     INTPAS
015244  001006                                                                          BNE     $50506
015246                                    LET DELAY := #13000
015246  012737  013000  000470                                                          MOV     #13000,DELAY
015254                                    LET INTPAS := #1
015254  012737  000001  000460                                                          MOV     #1,INTPAS
015262                                  ENDIF
015262                                                                          $50506:
015262                                  LET TEMP4 := DELAY
015262  013737  000470  000504                                                          MOV     DELAY,TEMP4

                                        ;+
                                        ;       SET UP TP VECTOR
                                        ;-

015270                                  LET TPS := #0                   ;MAKE SURE INTERRUPT ENABLE IS OFF
015270  005037  177564                                                                  CLR     TPS
015274                                  LET TPVEC := #TPSRVC
015274  012737  015532  000064                                                          MOV     #TPSRVC,TPVEC
015302                                  LET TPVEC+2 := #PR7
015302  012737  000340  000066                                                          MOV     #PR7,TPVEC+2

                                        ;+
                                        ;       SET UP FOR MOVTC INST
                                        ;-

015310                                  CALL SAVREG                     ;SAVE R0-R5
015310  004737  055562                                                                  JSR     PC,SAVREG
015314                                  REPEAT
015314                                                                          $50507:
015314                                    LET TEMP1 := TEMP4
015314  013737  000504  000476                                                          MOV     TEMP4,TEMP1
```

```
015322                          LET R0 := #2000
015322  012700  002000                                                          MOV     #2000,R0
015326                          LET R2 := R0
015326  010002                                                                  MOV     R0,R2
015330                          LET R1 := #SPACE
015330  012701  064102                                                          MOV     #SPACE,R1
015334                          LET R3 := R1
015334  010103                                                                  MOV     R1,R3
015336                          LET R4 := #0            ;NO FILL REQUIRED
015336  005004                                                                  CLR     R4
015340                          LET R5 := #TRANS
015340  012705  061366                                                          MOV     #TRANS,R5
015344                          WHILE #BIT07 NOTSETIN TPS DO
015344                                                                  $50510:
015344  032737  000200  177564                                                  BIT     #BIT07,TPS
015352  001001                                                                  BNE     $50511
015354                          ENDDO
015354  000773                                                                  BR      $50510
015356                                                                  $50511:
015356                          LET TPB := #0           ;SEND CHARACTER TO THE XMIT BUFFER
015356  005037  177566                                                          CLR     TPB
015362                          LET TPB := #0           ;ALLOW FOR DOUBLE BUFFERING
015362  005037  177566                                                          CLR     TPB
015366                          LET TPS := #BIT6        ;SET INTERRUPT ENABLE
015366  012737  000100  177564                                                  MOV     #BIT6,TPS
015374                          LET PSW := #PR0         ;ALLOW INTERRUPTS
015374  012737  000000  177776                                                  MOV     #PR0,PSW
015402                          INLINE  <LOOP2:>        ;DELAY...
015402                                                                          LOOP2:
015402                          INLINE  <DEC @#TEMP1>
015402  005337  000476                                                          DEC     @#TEMP1
015406                          INLINE  <BNE LOOP2>
015406  001375                                                                  BNE     LOOP2
015410                          INLINE  <MOVTC>
015410  076032                                                                  MOVTC
015412                        UNTIL TEMP0 EQ #1 OR TEMP4 LT #40
015412  023727  000474  000001                                                  CMP     TEMP0,#1
015420  001404                                                                  BEQ     $50512
015422  023727  000504  000040                                                  CMP     TEMP4,#40
015430  002331                                                                  BGE     $50507
015432                                                                  $50512:
015432                        IF TEMP0 NE #1 THEN
015432  023727  000474  000001                                                  CMP     TEMP0,#1
015440  001403                                                                  BEQ     $50513
015442                            CALL ERROR            ;PSW BIT08 DID NOT GET SET
015442  004737  056274                                                          JSR     PC,ERROR
015446                        ELSE
015446  000411                                                                  BR      $50514
015450                                                                  $50513:
015450                          IF $PASS EQ #0 THEN
015450  005737  000636                                                          TST     $PASS
015454  001006                                                                  BNE     $50515
015456                            LET DELAY := TEMP4 + #1000
015456  013737  000504  000470                                                  MOV     TEMP4,DELAY
015464  062737  001000  000470                                                  ADD     #1000,DELAY
015472                          ENDIF
```

```
015472                                                                              $50515:
015472                             ENDIF
015472                                                                              $50514:
015472                             LET PSW := #PR7
015472  012737  000340  177776                                                          MOV     #PR7,PSW
015500                             LET TPVEC := #TPVEC+2
015500  012737  000066  000064                                                          MOV     #TPVEC+2,TPVEC
015506                             LET TPVEC+2 := #0           ;RESTORE CONSOLE TRAP CATCHER
015506  005037  000066                                                                  CLR     TPVEC+2
015512                             LET TPS := #0               ;MAKE SURE INTERRUPT ENABLE IS OFF
015512  005037  177564                                                                  CLR     TPS
015516                             CALL RESREG
015516  004737  055614                                                                  JSR     PC,RESREG
015522                             LET PSW := SAVPSW
015522  013737  000612  177776                                                          MOV     SAVPSW,PSW
015530                             INLINE  <BR     ILLTST>     ;BR AROUND INT SERVICE RTN
015530  000421                                                                          BR      ILLTST

                                   ;+
                                   ;       TP INTERRUPT SERVICE ROUTINE
                                   ;-

015532                             INLINE  <TPSRVC:>
015532                                                                              TPSRVC:
015532                             LET TPS := #0               ;TURN OFF INTERRUPT ENABLE
015532  005037  177564                                                                  CLR     TPS
015536                             LET TEMP5 := 2(SP)
015536  016637  000002  000506                                                          MOV     2(SP),TEMP5
015544                             IF #BIT8 SETIN TEMP5 THEN
015544  032737  000400  000506                                                          BIT     #BIT8,TEMP5
015552  001404                                                                          BEQ     $50516
015554                               LET TEMP0 := #1           ;INST WAS SUSPENDED
015554  012737  000001  000474                                                          MOV     #1,TEMP0
015562                             ELSE
015562  000403                                                                          BR      $50517
015564                                                                              $50516:
015564                               LET TEMP4 := TEMP4 - #30  ;DECREMENT DELAY COUNTER AND TRY AGAIN
015564  162737  000030  000504                                                          SUB     #30,TEMP4
015572                             ENDIF
015572                                                                              $50517:
015572                             INLINE  <RTI>
015572  000002                                                                          RTI
```

```
                                    ;;*******************************************************************
                                    .SBTTL  ILLEGAL OPCODE SUBTEST
                                    ;;*******************************************************************

                                    ;+
                                    ;       THIS SUBTEST VERIFIES THAT AN ILLEGAL CIS CLASS OPCODE
                                    ;       (ILLOP=76033) CAUSES A RESERVED INSTRUCTION TRAP (TRAP 10)
                                    ;-

015574                              INLINE  <ILLTST:>
015574                                                                                      ILLTST:
015574                              INLINE  <SCOPE>
015574  000004                                                                              SCOPE
015576                              LET $TIMES := #20                ;ITERATION COUNT
015576  012737  000020  000404                                                              MOV     #20,$TIMES
015604                              LET ERRFLG := #0                 ;RESET ERROR FLAG
015604  005037  000454                                                                      CLR     ERRFLG
015610                              LET ERR := #3                    ;ERROR MSG #
015610  012737  000003  000550                                                              MOV     #3,ERR
015616                              LET SAVPSW := PSW
015616  013737  177776  000612                                                              MOV     PSW,SAVPSW
015624                              LET PSW := #PR7                  ;LOCK OUT INTERRUPTS
015624  012737  000340  177776                                                              MOV     #PR7,PSW
015632                              LET RESVEC := #RESRTN
015632  012737  015660  000010                                                              MOV     #RESRTN,RESVEC
015640                              INLINE  <ILLOP>                  ;DO ILLEGAL CODE
015640  076033                                                                              ILLOP
015642                              CALL ERROR                       ;DIDNT TRAP, ERROR
015642  004737  056274                                                                      JSR     PC,ERROR
015646                              LET RESVEC := #ILLRES            ;RESTORE RESERVED INSTRUCTION TRAP VECTOR
015646  012737  055314  000010                                                              MOV     #ILLRES,RESVEC
015654                              INLINE  <JMP    CIS4END>         ;MODULE EXIT
015654  000137  015716                                                                      JMP     CIS4END

                                    ;+
                                    ;       TRAP HANDLER
                                    ;-

015660                              INLINE  <RESRTN:>
015660                                                                                      RESRTN:
015660                              IF ERRFLG EQ #0 THEN
015660  005737  000454                                                                      TST     ERRFLG
015664  001004                                                                              BNE     $50520
015666                                POP TEMPO,TEMPO                ;REMOVE PC,PSW PUSHED BY TRAP
015666  012637  000474                                                                      MOV     (SP)+,TEMPO
015672  012637  000474                                                                      MOV     (SP)+,TEMPO
015676                              ENDIF
015676                                                                              $50520:
015676                              LET ERRFLG := #0                 ;ENSURE ERROR FLAG IS RESET
015676  005037  000454                                                                      CLR     ERRFLG
015702                              LET PSW := SAVPSW
015702  013737  000612  177776                                                              MOV     SAVPSW,PSW
015710                              LET RESVEC := #ILLRES            ;RESTORE RESERVED INSTRUCTION TRAP VECTOR
015710  012737  055314  000010                                                              MOV     #ILLRES,RESVEC
```

```
4685
4686 015716                    INLINE  <CIS4END:>
4687 015716                                                          CIS4END:
4688
4689
```

```
                                   ;;*******************************************************************
                                   ;;*******************************************************************
                                   ;++
                                   ;             C I S 5     M O D U L E
                                   ;
                                   ;  THIS MODULE TESTS THE ARITHMETIC CONVERT INSTRUCTIONS FOR
                                   ;  PACKED, NUMERIC, AND LONG INTEGER DATA TYPES: CVTLP, CVTLN,
                                   ;  CVTPL, CVTNL, CVTPN, AND CVTNP.
                                   ;--
                                   ;;*******************************************************************
                                   ;;*******************************************************************





                                   .SBTTL  CIS5 INITIALIZATION
                                   ;;*******************************************************************
                                   ;
                                   ;  CIS5 INITIALIZATION
                                   ;
                                   ;;*******************************************************************

                                   ;IF SWR<5:0> ARE CLEARED OR IF SWR<1> IS SET THEN EXECUTE
                                   ;  THE CIS5 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

015716                             INLINE   <SCOPE>
015716  000004                                                                      SCOPE

015720                             LET TEMPO := @SWR CLR.BY #177700
015720  017737  162502  000474                                                      MOV     @SWR,TEMPO
015726  042737  177700  000474                                                      BIC     #177700,TEMPO
015734                             IF TEMPO NE #0 THEN
015734  005737  000474                                                              TST     TEMPO
015740  001406                                                                      BEQ     $50521
015742                               IF #BIT1 NOTSETIN TEMPO THEN
015742  032737  000002  000474                                                      BIT     #BIT1,TEMPO
015750  001002                                                                      BNE     $50522
015752                                 INLINE   <JMP   CIS5END>
015752  000137  031700                                                              JMP   CIS5END
015756                               ENDIF
015756                                                                      $50522:
015756                             ENDIF
015756                                                                      $50521:
015756                             LET CTL := #5                  ;CONTROL CHIP NUMBER
015756  012737  000005  000544                                                      MOV     #5,CTL
015764                             LET ERRFLG := #0               ;INITIALIZE ERROR FLAG
015764  005037  000454                                                              CLR     ERRFLG
015770                             LET PSW := #340
015770  012737  000340  177776                                                      MOV     #340,PSW
015776                             LET ERR := #1
015776  012737  000001  000550                                                      MOV     #1,ERR
```

```
                                        .SBTTL  CVTLP
                                        ;;******************************************************************
                                        ;
                                        ;   CVTLP TEST
                                        ;
                                        ;;******************************************************************
016004                                  INLINE  <XCVTLP:>
016004                                                                                  XCVTLP:
016004                                  INLINE  <SCOPE>
016004  000004                                                                          SCOPE
016006                                  LET $TIMES := #20               ;ITERATION COUNT
016006  012737  000020  000404                                                          MOV     #20,$TIMES
016014                                  LET COUNT := TCVTLP             ;GET TEST COUNT
016014  013737  017314  000466                                                          MOV     TCVTLP,COUNT
016022                                  LET TSTCAS := #TCVTLP+2         ;POINT TO FIRST TEST CASE
016022  012737  017316  000542                                                          MOV     #TCVTLP+2,TSTCAS
                                        ;REPEAT
016030                                  INLINE  <$5077:>
016030                                                                                  $5077:

                                            ;+
                                            ; GET TEST DATA FROM TABLE
                                            ;-

016030                                      LET R0 := TSTCAS
016030  013700  000542                                                                  MOV     TSTCAS,R0
016034                                      LET DATA00 := (R0)+             ;DST.DSCR
016034  012037  000560                                                                  MOV     (R0)+,DATA00
016040                                      LET DATA01 := (R0)+             ;LONG INTEGER HI
016040  012037  000562                                                                  MOV     (R0)+,DATA01
016044                                      LET DATA02 := (R0)+             ;LONG INTEGER LO
016044  012037  000564                                                                  MOV     (R0)+,DATA02

                                            ;+
                                            ; PUT EXPECTED RESULTS INTO DS.EXP AND CC.EXP
                                            ;-

016050                                      CALL CLRDSB                 ;CLEAR DECIMAL STRING BUFFER AREAS
016050  004737  055520                                                                  JSR     PC,CLRDSB
016054                                      LET R2 := DATA01
016054  013702  000562                                                                  MOV     DATA01,R2
016060                                      LET R3 := DATA02
016060  013703  000564                                                                  MOV     DATA02,R3
016064                                      CALL CVTLI                  ;CONVERT LONG INTEGER TO AN INTERMEDIATE FORM
016064  004737  030362                                                                  JSR     PC,CVTLI
016070                                      LET CC.EXP := #0
016070  005037  000520                                                                  CLR     CC.EXP
016074                                      LET DSLEN2 := DATA00 CLR.BY #177740         ;GET DST.LEN
016074  013737  000560  000514                                                          MOV     DATA00,DSLEN2
016102  042737  177740  000514                                                          BIC     #177740,DSLEN2
016110                                      IF DSLEN2 EQ #0 THEN                        ;DST.LEN = 0
016110  005737  000514                                                                  TST     DSLEN2
016114  001014                                                                          BNE     $50523
016116                                          LET CC.EXP := CC.EXP SET.BY #ZBIT
016116  052737  000004  000520                                                          BIS     #ZBIT,CC.EXP
016124                                          LET DS.EXP :B= #14
```

```
016124  112737  000014  062536                                                               MOVB    #14,DS.EXP
016132                                  IF DSLEN1 HI #0 THEN
016132  005737  000512                                                                       TST     DSLEN1
016136  101403                                                                               BLOS    $50524
016140                                    LET CC.EXP := CC.EXP SET.BY #VBIT
016140  052737  000002  000520                                                               BIS     #VBIT,CC.EXP
016146                                  ENDIF
016146                                                                               $50524:
016146                             ENDIF
016146                                                                               $50523:
016146                             IF DSLEN2 NE #0 THEN                     ;DST.LEN > 0
016146  005737  000514                                                                       TST     DSLEN2
016152  001577                                                                               BEQ     $50525
016154                                  IF DSLEN1 EQ #0 THEN                 ;SRC.LEN = 0
016154  005737  000512                                                                       TST     DSLEN1
016160  001017                                                                               BNE     $50526
016162                                       LET TEMPO := DSLEN2
016162  013737  000514  000474                                                               MOV     DSLEN2,TEMPO
016170                                       INLINE  <ASR  TEMPO>
016170  006237  000474                                                                       ASR  TEMPO
016174                                       LET RO := #DS.EXP + TEMPO
016174  012700  062536                                                                       MOV     #DS.EXP,RO
016200  063700  000474                                                                       ADD     TEMPO,RO
016204                                       LET (RO) :B= #14
016204  112710  000014                                                                       MOVB    #14,(RO)
016210                                       LET CC.EXP := CC.EXP SET.BY #ZBIT
016210  052737  000004  000520                                                               BIS     #ZBIT,CC.EXP
016216                                  ELSE
016216  000555                                                                               BR      $50527
016220                                                                               $50526:
016220                                       IF DSLEN2 EQ DSLEN1 THEN            ;DST.LEN = SRC.LEN > 0
016220  023737  000514  000512                                                               CMP     DSLEN2,DSLEN1
016226  001010                                                                               BNE     $50530
016230                                            LET R1 := #DSBUF1 + #10. - DSLEN1       ;SRC POINTER
016230  012701  062370                                                                       MOV     #DSBUF1,R1
016234  062701  000012                                                                       ADD     #10.,R1
016240  163701  000512                                                                       SUB     DSLEN1,R1
016244                                            LET R2 := #DS.EXP                      ;DST POINTER
016244  012702  062536                                                                       MOV     #DS.EXP,R2
016250                                       ENDIF
016250                                                                               $50530:
016250                                       IF DSLEN2 LT DSLEN1 THEN            ;DST.LEN < SRC.LEN
016250  023737  000514  000512                                                               CMP     DSLEN2,DSLEN1
016256  002016                                                                               BGE     $50531
016260                                            LET R1 := #DSBUF1 + #10. - DSLEN2
016260  012701  062370                                                                       MOV     #DSBUF1,R1
016264  062701  000012                                                                       ADD     #10.,R1
016270  163701  000514                                                                       SUB     DSLEN2,R1
016274                                            LET R2 := #DS.EXP
016274  012702  062536                                                                       MOV     #DS.EXP,R2
016300                                            LET CC.EXP := CC.EXP SET.BY #VBIT
016300  052737  000002  000520                                                               BIS     #VBIT,CC.EXP
016306                                            LET DSLEN1 := DSLEN2
016306  013737  000514  000512                                                               MOV     DSLEN2,DSLEN1
016314                                       ENDIF
016314                                                                               $50531:
```

```
016314                                 IF DSLEN2 GT DSLEN1 THEN                ;DST.LEN > SRC.LEN
016314  023737  000514  000512                                                         CMP     DSLEN2,DSLEN1
016322  003426                                                                         BLE     $50532
016324                                     LET TEMP0 := DSLEN1
016324  013737  000512  000474                                                         MOV     DSLEN1,TEMP0
016332                                     INLINE  <ASR  TEMP0>
016332  006237  000474                                                                 ASR  TEMP0
016336                                     LET TEMP1 := DSLEN2
016336  013737  000514  000476                                                         MOV     DSLEN2,TEMP1
016344                                     INLINE  <ASR  TEMP1>
016344  006237  000476                                                                 ASR  TEMP1
016350                                     LET R2 := #DS.EXP + TEMP1 - TEMP0
016350  012702  062536                                                                 MOV     #DS.EXP,R2
016354  063702  000476                                                                 ADD     TEMP1,R2
016360  163702  000474                                                                 SUB     TEMP0,R2
016364                                     LET R1 := #DSBUF1 + #10. - DSLEN1        ;SRC POINTER
016364  012701  062370                                                                 MOV     #DSBUF1,R1
016370  062701  000012                                                                 ADD     #10.,R1
016374  163701  000512                                                                 SUB     DSLEN1,R1
016400                                 ENDIF
016400                                                                         $50532:

016400                                 ;LOAD REMAINING DIGITS INTO DS.EXP
                                       IF DSLEN1 HI #1 THEN
016400  023727  000512  000001                                                         CMP     DSLEN1,#1
016406  101431                                                                         BLOS    $50533
016410                                     IF #1 NOTSETIN DSLEN1 THEN
016410  032737  000001  000512                                                         BIT     #1,DSLEN1
016416  001003                                                                         BNE     $50534
016420                                         LET (R2)+ :B= (R1)+            ;OUTPUT TO DEST. BUFFER
016420  112122                                                                         MOVB    (R1)+,(R2)+
016422                                         LET DSLEN1 := DSLEN1 - #1
016422  005337  000512                                                                 DEC     DSLEN1
016426                                     ENDIF
016426                                                                         $50534:
016426                                     LET R0 := #0                        ;USE R0 TO ASSEMBLE DATA
016426  005000                                                                         CLR     R0
016430                                     WHILE DSLEN1 HI #1 DO
016430                                                                         $50535:
016430  023727  000512  000001                                                         CMP     DSLEN1,#1
016436  101415                                                                         BLOS    $50536
016440                                         LET R0 :B= (R1)+
016440  112100                                                                         MOVB    (R1)+,R0
016442                                         INLINE <ASH  #4,R0>
016442  072027  000004                                                                 ASH  #4,R0
016446                                         LET TEMP0 :B= R0 OR (R1)+   ;OUTPUT TO DST. BUFFER
016446  110037  000474                                                                 MOVB    R0,TEMP0
016452  152137  000474                                                                 BISB    (R1)+,TEMP0
016456                                         LET (R2)+ :B= TEMP0
016456  113722  000474                                                                 MOVB    TEMP0,(R2)+
016462                                         LET DSLEN1 := DSLEN1 - #2
016462  162737  000002  000512                                                         SUB     #2,DSLEN1
016470                                     ENDDO
016470  000757                                                                         BR      $50535
016472                                                                         $50536:
016472                                 ENDIF
016472                                                                         $50533:
```

```
016472                              LET R0 :B= (R1)+
016472  112100                                                                      MOVB    (R1)+,R0
016474                              INLINE <ASH  #4,R0>
016474  072027  000004                                                              ASH  #4,R0
016500                              IF DATA00 HIS #70000 THEN                  ;*** UNSIGNED PACKED ***
016500  023727  000560  070000                                                      CMP     DATA00,#70000
016506  103404                                                                      BLO     $50537
016510                                  LET (R2) :B= R0 OR #17
016510  110012                                                                      MOVB    R0,(R2)
016512  152712  000017                                                              BISB    #17,(R2)
016516                              ELSE
016516  000415                                                                      BR      $50540
016520                                                                      $50537:
016520                                  IF SIGN0 EQ #0 THEN              ;*** SIGNED PACKED ***
016520  005737  000446                                                              TST     SIGN0
016524  001004                                                                      BNE     $50541
016526                                      LET (R2) :B= R0 OR #14         ;SIGN IS +
016526  110012                                                                      MOVB    R0,(R2)
016530  152712  000014                                                              BISB    #14,(R2)
016534                                  ELSE
016534  000406                                                                      BR      $50542
016536                                                                      $50541:
016536                                      LET (R2) :B= R0 OR #15         ;SIGN IS -
016536  110012                                                                      MOVB    R0,(R2)
016540  152712  000015                                                              BISB    #15,(R2)
016544                                      LET CC.EXP := CC.EXP SET.BY #NBIT
016544  052737  000010  000520                                                      BIS     #NBIT,CC.EXP
016552                                  ENDIF
016552                                                                      $50542:
016552                              ENDIF
016552                                                                      $50540:
016552                          ENDIF
016552                                                                      $50527:
016552                      ENDIF
016552                                                                      $50525:


                            ;+
                            ; SET UP GPR'S AND EXPECTED GPR'S.
                            ;-

016552                      LET R0 := DATA00
016552  013700  000560                                                              MOV     DATA00,R0
016556                      LET R1 := #DS.DST                        ;DST. ADR
016556  012701  062474                                                              MOV     #DS.DST,R1
016562                      LET R2 := DATA01
016562  013702  000562                                                              MOV     DATA01,R2
016566                      LET R3 := DATA02
016566  013703  000564                                                              MOV     DATA02,R3
016572                      IF #1 SETIN COUNT THEN
016572  032737  000001  000466                                                      BIT     #1,COUNT
016600  001405                                                                      BEQ     $50543
016602                          LET R4 := #177777
016602  012704  177777                                                              MOV     #177777,R4
016606                          LET R5 := #177777
016606  012705  177777                                                              MOV     #177777,R5
016612                      ELSE
```

```
016612  000402                                                                 BR      $50544
016614                                                              $50543:
016614                              LET R4 := #0
016614  005004                                                                 CLR     R4
016616                              LET R5 := #0
016616  005005                                                                 CLR     R5
016620                          ENDIF
016620                                                              $50544:
016620                          LET R0.EXP := R0
016620  010037  000522                                                         MOV     R0,R0.EXP
016624                          LET R1.EXP := R1
016624  010137  000524                                                         MOV     R1,R1.EXP
016630                          LET R2.EXP := #0
016630  005037  000526                                                         CLR     R2.EXP
016634                          LET R3.EXP := #0
016634  005037  000530                                                         CLR     R3.EXP
016640                          LET R4.EXP := R4
016640  010437  000532                                                         MOV     R4,R4.EXP
016644                          LET R5.EXP := R5
016644  010537  000534                                                         MOV     R5,R5.EXP

                                ;+
                                ; DO THE CIS INSTRUCTION
                                ;-

016650                          INLINE <CVTLP>
016650  076077                                                                 CVTLP


                                ;+
                                ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                ;-

016652                          LET CC := PSW
016652  013737  177776  000516                                                 MOV     PSW,CC
016660                          LET CC := CC CLR.BY #177760
016660  042737  177760  000516                                                 BIC     #177760,CC
016666                          IF CC NE CC.EXP THEN
016666  023737  000516  000520                                                 CMP     CC,CC.EXP
016674  001402                                                                 BEQ     $50545
016676                            CALL ERROR
016676  004737  056274                                                         JSR     PC,ERROR
016702                          ENDIF
016702                                                              $50545:
016702                          IF R0 NE R0.EXP THEN
016702  020037  000522                                                         CMP     R0,R0.EXP
016706  001402                                                                 BEQ     $50546
016710                            CALL ERROR
016710  004737  056274                                                         JSR     PC,ERROR
016714                          ENDIF
016714                                                              $50546:
016714                          IF R1 NE R1.EXP THEN
016714  020137  000524                                                         CMP     R1,R1.EXP
016720  001402                                                                 BEQ     $50547
016722                            CALL ERROR
016722  004737  056274                                                         JSR     PC,ERROR
```

```
016726                          ENDIF
016726                                                          $50547:
016726                          IF R2 NE R2.EXP THEN
016726  020237  000526                                                  CMP     R2,R2.EXP
016732  001402                                                          BEQ     $50550
016734                            CALL ERROR
016734  004737  056274                                                  JSR     PC,ERROR
016740                          ENDIF
016740                                                          $50550:
016740                          IF R3 NE R3.EXP THEN
016740  020337  000530                                                  CMP     R3,R3.EXP
016744  001402                                                          BEQ     $50551
016746                            CALL ERROR
016746  004737  056274                                                  JSR     PC,ERROR
016752                          ENDIF
016752                                                          $50551:
016752                          IF R4 NE R4.EXP THEN
016752  020437  000532                                                  CMP     R4,R4.EXP
016756  001402                                                          BEQ     $50552
016760                            CALL ERROR
016760  004737  056274                                                  JSR     PC,ERROR
016764                          ENDIF
016764                                                          $50552:
016764                          IF R5 NE R5.EXP THEN
016764  020537  000534                                                  CMP     R5,R5.EXP
016770  001402                                                          BEQ     $50553
016772                            CALL ERROR
016772  004737  056274                                                  JSR     PC,ERROR
016776                          ENDIF
016776                                                          $50553:

                                ;+
                                ; COMPARE THE EXPECTED DECIMAL STRING BUFFER
                                ; WITH ACTUAL RESULTS.
                                ;-

016776                          LET R0 := #DS.DST
016776  012700  062474                                                  MOV     #DS.DST,R0
017002                          LET R1 := #DS.EXP
017002  012701  062536                                                  MOV     #DS.EXP,R1
017006                          LET ERRFLG := #0
017006  005037  000454                                                  CLR     ERRFLG
017012                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
017012                                                          $50554:
017012  020027  062534                                                  CMP     R0,#DS.DST+40
017016  001410                                                          BEQ     $50555
017020  005737  000454                                                  TST     ERRFLG
017024  001005                                                          BNE     $50555
017026                              IFB (R0)+ NE (R1)+ THEN
017026  122021                                                          CMPB    (R0)+,(R1)+
017030  001402                                                          BEQ     $50556
017032                                CALL ERROR
017032  004737  056274                                                  JSR     PC,ERROR
017036                              ENDIF
017036                                                          $50556:
017036                          ENDDO
```

```
017036  000765                                                              BR      $50554
017040                                                              $50555:
017040                          LET TSTCAS := TSTCAS + #6
017040  062737  000006  000542                                              ADD     #6,TSTCAS
017046                          LET COUNT := COUNT - #1
017046  005337  000466                                                      DEC     COUNT
                        ;UNTIL COUNT EQ #0
017052                  IF COUNT NE #0 THEN
017052  005737  000466                                                      TST     COUNT
017056  001402                                                              BEQ     $50557
017060                          INLINE <JMP $5077>
017060  000137  016030                                                      JMP $5077
017064                  ENDIF
017064                                                              $50557:

                        ;+
                        ; DO ONE IN-LINE CASE - CVTLPI
                        ;-

017064                  CALL CLRREG
017064  004737  055330                                                      JSR     PC,CLRREG
017070                  CALL CLRDSB
017070  004737  055520                                                      JSR     PC,CLRDSB
017074                  INLINE  <CVTLPI>
017074  076177                                                              CVTLPI
017076                  INLINE  <.WORD  TCVLPI>
017076  017426                                                              .WORD   TCVLPI
017100                  INLINE  <.WORD  TCVLPI+4>
017100  017432                                                              .WORD   TCVLPI+4
017102                  LET CC := PSW
017102  013737  177776  000516                                              MOV     PSW,CC
017110                  LET CC := CC CLR.BY #177760
017110  042737  177760  000516                                              BIC     #177760,CC
017116                  IF CC NE #0 THEN
017116  005737  000516                                                      TST     CC
017122  001402                                                              BEQ     $50560
017124                          CALL ERROR
017124  004737  056274                                                      JSR     PC,ERROR
017130                  ENDIF
017130                                                              $50560:
017130                  IF R0 NE #0 THEN
017130  005700                                                              TST     R0
017132  001402                                                              BEQ     $50561
017134                          CALL ERROR
017134  004737  056274                                                      JSR     PC,ERROR
017140                  ENDIF
017140                                                              $50561:
017140                  IF R1 NE #0 THEN
017140  005701                                                              TST     R1
017142  001402                                                              BEQ     $50562
017144                          CALL ERROR
017144  004737  056274                                                      JSR     PC,ERROR
017150                  ENDIF
017150                                                              $50562:
017150                  IF R2 NE #0 THEN
017150  005702                                                              TST     R2
```

```
017152  001402                                                   BEQ     $50563
017154                                CALL ERROR
017154  004737  056274                                           JSR     PC,ERROR
017160                           ENDIF
017160                                                 $50563:
017160                           IF R3 NE #0 THEN
017160  005703                                                   TST     R3
017162  001402                                                   BEQ     $50564
017164                                CALL ERROR
017164  004737  056274                                           JSR     PC,ERROR
017170                           ENDIF
017170                                                 $50564:
017170                           IF R4 NE #0 THEN
017170  005704                                                   TST     R4
017172  001402                                                   BEQ     $50565
017174                                CALL ERROR
017174  004737  056274                                           JSR     PC,ERROR
017200                           ENDIF
017200                                                 $50565:
017200                           IF R5 NE #0 THEN
017200  005705                                                   TST     R5
017202  001402                                                   BEQ     $50566
017204                                CALL ERROR
017204  004737  056274                                           JSR     PC,ERROR
017210                           ENDIF
017210                                                 $50566:
017210                           LET R0 := #DS.DST
017210  012700  062474                                           MOV     #DS.DST,R0
017214                           IFB (R0)+ NE #1 THEN
017214  122027  000001                                           CMPB    (R0)+,#1
017220  001402                                                   BEQ     $50567
017222                                CALL ERROR
017222  004737  056274                                           JSR     PC,ERROR
017226                           ENDIF
017226                                                 $50567:
017226                           REPEAT
017226                                                 $50570:
017226                                IFB (R0)+ NE #21 THEN
017226  122027  000021                                           CMPB    (R0)+,#21
017232  001402                                                   BEQ     $50571
017234                                     CALL ERROR
017234  004737  056274                                           JSR     PC,ERROR
017240                                ENDIF
017240                                                 $50571:
017240                           UNTIL R0 EQ #DS.DST+5
017240  020027  062501                                           CMP     R0,#DS.DST+5
017244  001370                                                   BNE     $50570
017246                           IFB (R0)+ NE #37 THEN
017246  122027  000037                                           CMPB    (R0)+,#37
017252  001402                                                   BEQ     $50572
017254                                CALL ERROR
017254  004737  056274                                           JSR     PC,ERROR
017260                           ENDIF
017260                                                 $50572:
017260                           LET ERRFLG := #0
017260  005037  000454                                           CLR     ERRFLG
```

```
017264                          REPEAT
017264                                                                          $50573:
017264                              IFB (R0)+ NE #0 THEN
017264  105720                                                                          TSTB    (R0)+
017266  001402                                                                          BEQ     $50574
017270                                  CALL ERROR
017270  004737  056274                                                                  JSR     PC,ERROR
017274                              ENDIF
017274                                                                          $50574:
017274                          UNTIL R0 EQ #DS.DST+40 OR ERRFLG NE #0
017274  020027  062534                                                                  CMP     R0,#DS.DST+40
017300  001403                                                                          BEQ     $50575
017302  005737  000454                                                                  TST     ERRFLG
017306  001766                                                                          BEQ     $50573
017310                                                                          $50575:
017310                          INLINE  <JMP XCVTLN>
017310  000137  017436                                                                  JMP XCVTLN



                                ;+
                                ; TABLE OF TEST CASES FOR CVTLP
                                ;-

017314  000014                  TCVTLP: .WORD   12.             ;# OF TEST CASES FOR CVTLP

017316  060004                          .WORD   60004                   ;DST. DATA TYPE AND LENGTH
017320  000000                          .WORD   0                       ;LONG INTEGER HIGH & SIGN
017322  000000                          .WORD   0                       ;LONG INTEGER LOW

017324  060020                          .WORD   60020           ;TEST CASE NUMBER 2
017326  000000                          .WORD   0
017330  001762                          .WORD   1762

017332  060000                          .WORD   60000           ;TEST CASE NUMBER 3
017334  000000                          .WORD   0
017336  152361                          .WORD   152361

017340  060010                          .WORD   60010           ;TEST CASE NUMBER 4
017342  074377                          .WORD   74377
017344  171700                          .WORD   171700

017346  060006                          .WORD   60006           ;TEST CASE NUMBER 5
017350  000000                          .WORD   0
017352  075147                          .WORD   75147

017354  060020                          .WORD   60020           ;TEST CASE NUMBER 6
017356  077777                          .WORD   77777
017360  177777                          .WORD   177777

017362  060015                          .WORD   60015           ;TEST CASE NUMBER 7
017364  100000                          .WORD   100000
017366  000000                          .WORD   0

017370  060010                          .WORD   60010           ;TEST CASE NUMBER 8
017372  177755                          .WORD   177755
017374  130070                          .WORD   130070
```

```

017376 070010                    .WORD   70010           ;TEST CASE NUMBER 9
017400 177755                    .WORD   177755
017402 130070                    .WORD   130070

017404 060037                    .WORD   60037           ;TEST CASE NUMBER 10
017406 177777                    .WORD   177777
017410 177775                    .WORD   177775

017412 060003                    .WORD   60003           ;TEST CASE NUMBER 11
017414 000000                    .WORD   0
017416 000257                    .WORD   257

017420 060000                    .WORD   60000           ;TEST CASE NUMBER 12
017422 000000                    .WORD   0
017424 000000                    .WORD   0


017426                   TCVLPI:                         ;IN-LINE TEST CASE
017426 070012                    .WORD   70012                   ;DST TYPE = UNSIGNED PACKED, LENGTH = 12
017430 062474                    .WORD   DS.DST                  ;DST.ADDRESS
017432 032707                    .WORD   32707                   ;LONG INTEGER LOW WORD +
017434 041072                    .WORD   41072                   ;  LONG INTEGER HIGH WORD AND SIGN
                                                                 ;  = 1111111111 IN BCD,
                                                                 ;  = 1,21,21,21,21,21,37 IN PACKED BYTES
```

```
                                        .SBTTL  CVTLN
                                        ;;*************************************************************
                                        ;
                                        ;  CVTLN TEST
                                        ;
                                        ;;*************************************************************
017436                                  INLINE  <XCVTLN:>
017436                                                                                   XCVTLN:
017436                                  INLINE  <SCOPE>
017436  000004                                                                           SCOPE
017440                                  LET $TIMES := #20              ;ITERATION COUNT
017440  012737  000020  000404                                                           MOV     #20,$TIMES
017446                                  LET COUNT := TCVTLN            ;GET TEST COUNT
017446  013737  021052  000466                                                           MOV     TCVTLN,COUNT
017454                                  LET TSTCAS := #TCVTLN+2        ;POINT TO FIRST TEST CASE
017454  012737  021054  000542                                                           MOV     #TCVTLN+2,TSTCAS
                                        ;REPEAT
017462                                  INLINE  <$5057:>
017462                                                                                   $5057:

                                            ;+
                                            ; GET TEST DATA FROM TABLE
                                            ;-

017462                                      LET R0 := TSTCAS
017462  013700  000542                                                                   MOV     TSTCAS,R0
017466                                      LET DATA00 := (R0)+            ;DST. DATA TYPE AND LENGTH
017466  012037  000560                                                                   MOV     (R0)+,DATA00
017472                                      LET DATA01 := (R0)+            ;LONG INTEGER HIGH
017472  012037  000562                                                                   MOV     (R0)+,DATA01
017476                                      LET DATA02 := (R0)+            ;LONG INTEGER LOW
017476  012037  000564                                                                   MOV     (R0)+,DATA02

                                            ;+
                                            ; PUT EXPECTED RESULTS INTO DS.EXP AND CC.EXP
                                            ;-

017502                                      CALL CLRDSB                ;CLEAR DECIMAL STRING BUFFER AREA
017502  004737  055520                                                                   JSR     PC,CLRDSB
017506                                      LET R2 := DATA01
017506  013702  000562                                                                   MOV     DATA01,R2
017512                                      LET R3 := DATA02
017512  013703  000564                                                                   MOV     DATA02,R3
017516                                      CALL CVTLI                 ;CONVERT LONG INTEGER TO AN INTERMEDIATE FORM
017516  004737  030362                                                                   JSR     PC,CVTLI
017522                                      LET CC.EXP := #0
017522  005037  000520                                                                   CLR     CC.EXP
017526                                      LET DSLEN2 := DATA00 CLR.BY #177740      ;GET DST.LEN
017526  013737  000560  000514                                                           MOV     DATA00,DSLEN2
017534  042737  177740  000514                                                           BIC     #177740,DSLEN2
017542                                      LET DATTYP := DATA00 CLR.BY #107777      ;GET DATA TYPE
017542  013737  000560  000462                                                           MOV     DATA00,DATTYP
017550  042737  107777  000462                                                           BIC     #107777,DATTYP
017556                                      IF DSLEN2 EQ #0 THEN                     ;DST.LEN = 0
017556  005737  000514                                                                   TST     DSLEN2
017562  001053                                                                           BNE     $50576
```

```
017564                              LET CC.EXP := CC.EXP SET.BY #ZBIT
017564  052737  000004  000520                                                       BIS     #ZBIT,CC.EXP
017572                              IF DSLEN1 HI #0 THEN                  ;INTERMEDIATE LENGTH > 0
017572  005737  000512                                                               TST     DSLEN1
017576  101403                                                                       BLOS    $50577
017600                                  LET CC.EXP := CC.EXP SET.BY #VBIT
017600  052737  000002  000520                                                       BIS     #VBIT,CC.EXP
017606                              ENDIF
017606                                                                      $50577:
017606                              IF DATTYP EQ #40000 THEN              ;TRAILING SEPARATE
017606  023727  000462  040000                                                       CMP     DATTYP,#40000
017614  001015                                                                       BNE     $50600
017616                                  IF SIGNO EQ #0 THEN
017616  005737  000446                                                               TST     SIGNO
017622  001004                                                                       BNE     $50601
017624                                      LET DS.EXP :B= #53
017624  112737  000053  062536                                                       MOVB    #53,DS.EXP
017632                                  ELSE
017632  000406                                                                       BR      $50602
017634                                                                      $50601:
017634                                      LET DS.EXP :B= #55
017634  112737  000055  062536                                                       MOVB    #55,DS.EXP
017642                                      LET CC.EXP := CC.EXP SET.BY #NBIT
017642  052737  000010  000520                                                       BIS     #NBIT,CC.EXP
017650                                  ENDIF
017650                                                                      $50602:
017650                              ENDIF
017650                                                                      $50600:
017650                              IF DATTYP EQ #50000 THEN              ;LEADING SEPARATE
017650  023727  000462  050000                                                       CMP     DATTYP,#50000
017656  001015                                                                       BNE     $50603
017660                                  IF SIGNO EQ #0 THEN
017660  005737  000446                                                               TST     SIGNO
017664  001004                                                                       BNE     $50604
017666                                      LET DS.EXP-1 :B= #53
017666  112737  000053  062535                                                       MOVB    #53,DS.EXP-1
017674                                  ELSE
017674  000406                                                                       BR      $50605
017676                                                                      $50604:
017676                                      LET DS.EXP-1 :B= #55
017676  112737  000055  062535                                                       MOVB    #55,DS.EXP-1
017704                                      LET CC.EXP := CC.EXP SET.BY #NBIT
017704  052737  000010  000520                                                       BIS     #NBIT,CC.EXP
017712                                  ENDIF
017712                                                                      $50605:
017712                              ENDIF
017712                                                                      $50603:
017712                          ENDIF
017712                                                                      $50576:
017712                          IF DSLEN2 GT #0 AND DSLEN1 EQ #0 THEN     ;DST.LEN > 0, SRC.LEN = 0
017712  005737  000514                                                               TST     DSLEN2
017716  003420                                                                       BLE     $50606
017720  005737  000512                                                               TST     DSLEN1
017724  001015                                                                       BNE     $50606
017726                              LET R1 := #DS.EXP
017726  012701  062536                                                               MOV     #DS.EXP,R1
```

```
017732                            LET R2 := DSLEN2
017732  013702  000514                                                          MOV     DSLEN2,R2
017736                            WHILE R2 HI #0 DO
017736                                                                  $50607:
017736  005702                                                                  TST     R2
017740  101404                                                                  BLOS    $50610
017742                              LET (R1)+ :B= #60
017742  112721  000060                                                          MOVB    #60,(R1)+
017746                              LET R2 := R2 - #1
017746  005302                                                                  DEC     R2
017750                            ENDDO
017750  000772                                                                  BR      $50607
017752                                                                  $50610:
017752                            LET CC.EXP := CC.EXP SET.BY #ZBIT
017752  052737  000004  000520                                                  BIS     #ZBIT,CC.EXP
017760                         ENDIF
017760                                                                  $50606:
017760                         IF DSLEN2 GT #0 AND DSLEN1 GT #0 THEN       ;DST.LEN > 0 AND SRC.LEN > 0
017760  005737  000514                                                          TST     DSLEN2
017764  003565                                                                  BLE     $50611
017766  005737  000512                                                          TST     DSLEN1
017772  003562                                                                  BLE     $50611
017774                            LET R1 := #DSBUF1 + #10. - DSLEN1
017774  012701  062370                                                          MOV     #DSBUF1,R1
020000  062701  000012                                                          ADD     #10.,R1
020004  163701  000512                                                          SUB     DSLEN1,R1
020010                            LET R2 := #DS.EXP
020010  012702  062536                                                          MOV     #DS.EXP,R2
020014                            IF DSLEN2 GT DSLEN1 THEN                  ;DST.LEN > SRC.LEN > 0
020014  023737  000514  000512                                                  CMP     DSLEN2,DSLEN1
020022  003413                                                                  BLE     $50612
020024                               LET R2 := R2 + DSLEN2 - DSLEN1
020024  063702  000514                                                          ADD     DSLEN2,R2
020030  163702  000512                                                          SUB     DSLEN1,R2
020034                               LET R0 := #DS.EXP
020034  012700  062536                                                          MOV     #DS.EXP,R0
020040                               WHILE R0 NE R2 DO
020040                                                                  $50613:
020040  020002                                                                  CMP     R0,R2
020042  001403                                                                  BEQ     $50614
020044                                  LET (R0)+ :B= #60
020044  112720  000060                                                          MOVB    #60,(R0)+
020050                               ENDDO
020050  000773                                                                  BR      $50613
020052                                                                  $50614:
020052                            ENDIF
020052                                                                  $50612:
020052                            IF DSLEN2 LO DSLEN1 THEN                  ;SRC.LEN > DST.LEN > 0
020052  023737  000514  000512                                                  CMP     DSLEN2,DSLEN1
020060  103007                                                                  BHIS    $50615
020062                               LET R1 := R1 + DSLEN1 - DSLEN2
020062  063701  000512                                                          ADD     DSLEN1,R1
020066  163701  000514                                                          SUB     DSLEN2,R1
020072                               LET CC.EXP := CC.EXP SET.BY #VBIT
020072  052737  000002  000520                                                  BIS     #VBIT,CC.EXP
020100                            ENDIF
```

```
020100                                                                                  $50615:
020100                                       REPEAT
020100                                                                                  $50616:
020100                                           LET TEMP0 :B= (R1)+ SET.BY #60      ;TRANSFER THE DIGITS TO DS.EXP
020100  112137  000474                                                                          MOVB    (R1)+,TEMP0
020104  152737  000060  000474                                                                  BISB    #60,TEMP0
020112                                           LET (R2)+ :B= TEMP0
020112  113722  000474                                                                          MOVB    TEMP0,(R2)+
020116                                       UNTIL R1 EQ #DSBUF1+12
020116  020127  062402                                                                          CMP     R1,#DSBUF1+12
020122  001366                                                                                  BNE     $50616
020124                                       IF DATTYP EQ #0 AND SIGNO EQ #-1 THEN
020124  005737  000462                                                                          TST     DATTYP
020130  001012                                                                                  BNE     $50617
020132  023727  000446  177777                                                                  CMP     SIGNO,#-1
020140  001006                                                                                  BNE     $50617
020142                                           LET CC.EXP := CC.EXP SET.BY #NBIT
020142  052737  000010  000520                                                                  BIS     #NBIT,CC.EXP
020150                                           LET R2 := R2 - #1
020150  005302                                                                                  DEC     R2
020152                                           LET (R2) :B= (R2) SET.BY #160              ;*** SIGNED ZONE, NEGATIVE ***
020152  152712  000160                                                                          BISB    #160,(R2)
020156                                       ENDIF
020156                                                                                  $50617:
020156                                       IF DATTYP EQ #20000 OR DATTYP EQ #30000 THEN          ;*** OVERPUNCH ***
020156  023727  000462  020000                                                                  CMP     DATTYP,#20000
020164  001404                                                                                  BEQ     $50620
020166  023727  000462  030000                                                                  CMP     DATTYP,#30000
020174  001026                                                                                  BNE     $50621
020176                                                                                  $50620:
020176                                           IF DATTYP EQ #20000 THEN                               ;TRAILING
020176  023727  000462  020000                                                                  CMP     DATTYP,#20000
020204  001002                                                                                  BNE     $50622
020206                                               LET R2 := R2 - #1
020206  005302                                                                                  DEC     R2
020210                                           ELSE                                                   ;LEADING
020210  000402                                                                                  BR      $50623
020212                                                                                  $50622:
020212                                               LET R2 := #DS.EXP
020212  012702  062536                                                                          MOV     #DS.EXP,R2
020216                                           ENDIF
020216                                                                                  $50623:
020216                                           LET R0 :B= (R2) CLR.BY #60
020216  111200                                                                                  MOVB    (R2),R0
020220  142700  000060                                                                          BICB    #60,R0
020224                                           IF SIGNO EQ #-1 THEN                                   ;NEG. SIGN
020224  023727  000446  177777                                                                  CMP     SIGNO,#-1
020232  001005                                                                                  BNE     $50624
020234                                               LET R0 := R0 + #10.
020234  062700  000012                                                                          ADD     #10.,R0
020240                                               LET CC.EXP := CC.EXP SET.BY #NBIT
020240  052737  000010  000520                                                                  BIS     #NBIT,CC.EXP
020246                                           ENDIF
020246                                                                                  $50624:
020246                                           LET (R2) :B= OVPNCH(R0)                ;GET APPROPRIATE SIGN/DIGIT FROM
020246  116012  055254                                                                          MOVB    OVPNCH(R0),(R2)
```

```
020252                                     ENDIF
020252                                                                              $50621:
020252                                     IF DATTYP EQ #40000 OR DATTYP EQ #50000 THEN    ;*** SEPARATE ***
020252  023727  000462  040000                                                          CMP     DATTYP,#40000
020260  001404                                                                          BEQ     $50625
020262  023727  000462  050000                                                          CMP     DATTYP,#50000
020270  001023                                                                          BNE     $50626
020272                                                                              $50625:
020272                                         IF DA??YP EQ #50000 THEN                 ;LEADING
020272  023727  000462  050000                                                          CMP     DATTYP,#50000
020300  001003                                                                          BNE     $50627
020302                                             LET R2 := #DS.EXP - #1
020302  012702  062536                                                                  MOV     #DS.EXP,R2
020306  005302                                                                          DEC     R2
020310                                         ENDIF
020310                                                                              $50627:
020310                                         IF SIGNO EQ #-1 THEN
020310  023727  000446  177777                                                          CMP     SIGNO,#-1
020316  001006                                                                          BNE     $50630
020320                                             LET (R2) :B= #55                     ;NEGATIVE
020320  112712  000055                                                                  MOVB    #55,(R2)
020324                                             LET CC.EXP := CC.EXP SET.BY #NBIT
020324  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
020332                                         ELSE
020332  000402                                                                          BR      $50631
020334                                                                              $50630:
020334                                             LET (R2) :B= #53                     ;POSITIVE
020334  112712  000053                                                                  MOVB    #53,(R2)
020340                                         ENDIF
020340                                                                              $50631:
020340                                     ENDIF
020340                                                                              $50626:
020340                                 ENDIF
020340                                                                              $50611:

                                 ;+
                                 ; SET UP GPR'S AND EXPECTED GPR'S.
                                 ;-

020340                           LET R0 := DATA00                   ;DATA TYPE AND LENGTH
020340  013700  000560                                                                  MOV     DATA00,R0
020344                           LET R1 := #DS.DST                  ;DST. ADR
020344  012701  062474                                                                  MOV     #DS.DST,R1
020350                           LET R2 := DATA01
020350  013702  000562                                                                  MOV     DATA01,R2
020354                           LET R3 := DATA02
020354  013703  000564                                                                  MOV     DATA02,R3
020360                           IF #1 SETIN COUNT THEN
020360  032737  000001  000466                                                          BIT     #1,COUNT
020366  001405                                                                          BEQ     $50632
020370                               LET R4 := #177777
020370  012704  177777                                                                  MOV     #177777,R4
020374                               LET R5 := #177777
020374  012705  177777                                                                  MOV     #177777,R5
020400                           ELSE
020400  000402                                                                          BR      $50633
```

```
020402                                                          $50632:
020402                              LET R4 := #0
020402  005004                                                          CLR     R4
020404                              LET R5 := #0
020404  005005                                                          CLR     R5
020406                          ENDIF
020406                                                          $50633:
020406                          LET R0.EXP := R0
020406  010037  000522                                                  MOV     R0,R0.EXP
020412                          LET R1.EXP := R1
020412  010137  000524                                                  MOV     R1,R1.EXP
020416                          LET R2.EXP := #0
020416  005037  000526                                                  CLR     R2.EXP
020422                          LET R3.EXP := #0
020422  005037  000530                                                  CLR     R3.EXP
020426                          LET R4.EXP := R4
020426  010437  000532                                                  MOV     R4,R4.EXP
020432                          LET R5.EXP := R5
020432  010537  000534                                                  MOV     R5,R5.EXP

                                ;+
                                ; DO THE CIS INSTRUCTION
                                ;-

020436                          INLINE <CVTLN>
020436  076057                                                          CVTLN


                                ;+
                                ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                ;-

020440                          LET CC := PSW
020440  013737  177776  000516                                          MOV     PSW,CC
020446                          LET CC := CC CLR.BY #177760
020446  042737  177760  000516                                          BIC     #177760,CC
020454                          IF CC NE CC.EXP THEN
020454  023737  000516  000520                                          CMP     CC,CC.EXP
020462  001402                                                          BEQ     $50634
020464                            CALL ERROR
020464  004737  056274                                                  JSR     PC,ERROR
020470                          ENDIF
020470                                                          $50634:
020470                          IF R0 NE R0.EXP THEN
020470  020037  000522                                                  CMP     R0,R0.EXP
020474  001402                                                          BEQ     $50635
020476                            CALL ERROR
020476  004737  056274                                                  JSR     PC,ERROR
020502                          ENDIF
020502                                                          $50635:
020502                          IF R1 NE R1.EXP THEN
020502  020137  000524                                                  CMP     R1,R1.EXP
020506  001402                                                          BEQ     $50636
020510                            CALL ERROR
020510  004737  056274                                                  JSR     PC,ERROR
020514                          ENDIF
```

```
020514                                                             $50636:
020514                        IF R2 NE R2.EXP THEN
020514  020237  000526                                                     CMP     R2,R2.EXP
020520  001402                                                             BEQ     $50637
020522                          CALL ERROR
020522  004737  056274                                                     JSR     PC,ERROR
020526                        ENDIF
020526                                                             $50637:
020526                        IF R3 NE R3.EXP THEN
020526  020337  000530                                                     CMP     R3,R3.EXP
020532  001402                                                             BEQ     $50640
020534                          CALL ERROR
020534  004737  056274                                                     JSR     PC,ERROR
020540                        ENDIF
020540                                                             $50640:
020540                        IF R4 NE R4.EXP THEN
020540  020437  000532                                                     CMP     R4,R4.EXP
020544  001402                                                             BEQ     $50641
020546                          CALL ERROR
020546  004737  056274                                                     JSR     PC,ERROR
020552                        ENDIF
020552                                                             $50641:
020552                        IF R5 NE R5.EXP THEN
020552  020537  000534                                                     CMP     R5,R5.EXP
020556  001402                                                             BEQ     $50642
020560                          CALL ERROR
020560  004737  056274                                                     JSR     PC,ERROR
020564                        ENDIF
020564                                                             $50642:

                        ;+
                        ; COMPARE THE EXPECTED DECIMAL STRING BUFFER
                        ; WITH ACTUAL RESULTS.
                        ;-

020564                        LET R0 := #DS.DST
020564  012700  062474                                                     MOV     #DS.DST,R0
020570                        LET R1 := #DS.EXP
020570  012701  062536                                                     MOV     #DS.EXP,R1
020574                        LET ERRFLG := #0
020574  005037  000454                                                     CLR     ERRFLG
020600                        WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
020600                                                             $50643:
020600  020027  062534                                                     CMP     R0,#DS.DST+40
020604  001410                                                             BEQ     $50644
020606  005737  000454                                                     TST     ERRFLG
020612  001005                                                             BNE     $50644
020614                            IFB (R0)+ NE (R1)+ THEN
020614  122021                                                             CMPB    (R0)+,(R1)+
020616  001402                                                             BEQ     $50645
020620                              CALL ERROR
020620  004737  056274                                                     JSR     PC,ERROR
020624                            ENDIF
020624                                                             $50645:
020624                        ENDDO
020624  000765                                                             BR      $50643
```

```
020626                                                                  $50644:
020626                                  LET TSTCAS := TSTCAS + #6
020626  062737  000006  000542                                                  ADD     #6,TSTCAS
020634                                  LET COUNT := COUNT - #1
020634  005337  000466                                                          DEC     COUNT
                                ;UNTIL COUNT EQ #0
020640                          IF COUNT NE #0 THEN
020640  005737  000466                                                          TST     COUNT
020644  001402                                                                  BEQ     $50646
020646                                  INLINE <JMP $5057>
020646  000137  017462                                                          JMP $5057
020652                          ENDIF
020652                                                                  $50646:

                                ;+
                                ; DO ONE IN-LINE CASE - CVTLNI
                                ;-

020652                          CALL CLRREG
020652  004737  055330                                                          JSR     PC,CLRREG
020656                          CALL CLRDSB
020656  004737  055520                                                          JSR     PC,CLRDSB
020662                          INLINE <CVTLNI>
020662  076157                                                                  CVTLNI
020664                          INLINE  <.WORD  TCVLNI>
020664  021164                                                                  .WORD   TCVLNI
020666                          INLINE  <.WORD  TCVLNI+4>
020666  021170                                                                  .WORD   TCVLNI+4
020670                          LET CC := PSW
020670  013737  177776  000516                                                  MOV     PSW,CC
020676                          LET CC := CC CLR.BY #177760
020676  042737  177760  000516                                                  BIC     #177760,CC
020704                          IF CC NE #0 THEN
020704  005737  000516                                                          TST     CC
020710  001402                                                                  BEQ     $50647
020712                                  CALL ERROR
020712  004737  056274                                                          JSR     PC,ERROR
020716                          ENDIF
020716                                                                  $50647:
020716                          IF R0 NE #0 THEN
020716  005700                                                                  TST     R0
020720  001402                                                                  BEQ     $50650
020722                                  CALL ERROR
020722  004737  056274                                                          JSR     PC,ERROR
020726                          ENDIF
020726                                                                  $50650:
020726                          IF R1 NE #0 THEN
020726  005701                                                                  TST     R1
020730  001402                                                                  BEQ     $50651
020732                                  CALL ERROR
020732  004737  056274                                                          JSR     PC,ERROR
020736                          ENDIF
020736                                                                  $50651:
020736                          IF R2 NE #0 THEN
020736  005702                                                                  TST     R2
020740  001402                                                                  BEQ     $50652
```

```
020742                                  CALL ERROR
020742  004737  056274                                                          JSR     PC,ERROR
020746                          ENDIF
020746                                                                  $50652:
020746                          IF R3 NE #0 THEN
020746  005703                                                                  TST     R3
020750  001402                                                                  BEQ     $50653
020752                                  CALL ERROR
020752  004737  056274                                                          JSR     PC,ERROR
020756                          ENDIF
020756                                                                  $50653:
020756                          IF R4 NE #0 THEN
020756  005704                                                                  TST     R4
020760  001402                                                                  BEQ     $50654
020762                                  CALL ERROR
020762  004737  056274                                                          JSR     PC,ERROR
020766                          ENDIF
020766                                                                  $50654:
020766                          IF R5 NE #0 THEN
020766  005705                                                                  TST     R5
020770  001402                                                                  BEQ     $50655
020772                                  CALL ERROR
020772  004737  056274                                                          JSR     PC,ERROR
020776                          ENDIF
020776                                                                  $50655:
020776                          LET R0 := #DS.DST-1
020776  012700  062473                                                          MOV     #DS.DST-1,R0
021002                          IFB (R0)+ NE #53 THEN
021002  122027  000053                                                          CMPB    (R0)+,#53
021006  001402                                                                  BEQ     $50656
021010                            CALL ERROR
021010  004737  056274                                                          JSR     PC,ERROR
021014                          ENDIF
021014                                                                  $50656:
021014                          LET ERRFLG := #0
021014  005037  000454                                                          CLR     ERRFLG
021020                          REPEAT
021020                                                                  $50657:
021020                            IFB (R0)+ NE #61 THEN
021020  122027  000061                                                          CMPB    (R0)+,#61
021024  001402                                                                  BEQ     $50660
021026                                  CALL ERROR
021026  004737  056274                                                          JSR     PC,ERROR
021032                            ENDIF
021032                                                                  $50660:
021032                          UNTIL R0 EQ #DS.DST+12 OR ERRFLG NE #0
021032  020027  062506                                                          CMP     R0,#DS.DST+12
021036  001403                                                                  BEQ     $50661
021040  005737  000454                                                          TST     ERRFLG
021044  001765                                                                  BEQ     $50657
021046                                                                  $50661:
021046                          INLINE  <JMP XCVTPL>
021046  000137  021174                                                          JMP XCVTPL


                                ;+
```

```
                                    ; TABLE OF TEST CASES FOR CVTLN
                                    ;-

021052  000014                      TCVTLN: .WORD   12.             ;# OF TEST CASES FOR CVTLN

021054  000005                              .WORD   5                       ;DST. DATA TYPE AND LENGTH
021056  000000                              .WORD   0                       ;LONG INTEGER HIGH & SIGN
021060  000000                              .WORD   0                       ;LONG INTEGER LOW

021062  050006                              .WORD   50006           ;TEST CASE NUMBER 2
021064  000000                              .WORD   0
021066  000000                              .WORD   0

021070  020010                              .WORD   20010           ;TEST CASE NUMBER 3
021072  000000                              .WORD   0
021074  001751                              .WORD   1751

021076  030000                              .WORD   30000           ;TEST CASE NUMBER 4
021100  000000                              .WORD   0
021102  152361                              .WORD   152361

021104  040000                              .WORD   40000           ;TEST CASE NUMBER 5
021106  000000                              .WORD   0
021110  024137                              .WORD   24137

021112  050003                              .WORD   50003           ;TEST CASE NUMBER 6
021114  000000                              .WORD   0
021116  075147                              .WORD   75147

021120  020004                              .WORD   20004           ;TEST CASE NUMBER 7
021122  000000                              .WORD   0
021124  075147                              .WORD   75147

021126  000012                              .WORD   12              ;TEST CASE NUMBER 8
021130  077777                              .WORD   77777
021132  177777                              .WORD   177777

021134  000037                              .WORD   37              ;TEST CASE NUMBER 9
021136  100000                              .WORD   100000
021140  000000                              .WORD   0

021142  010021                              .WORD   10021           ;TEST CASE NUMBER 10
021144  100000                              .WORD   100000
021146  000000                              .WORD   0

021150  040012                              .WORD   40012           ;TEST CASE NUMBER 11
021152  074377                              .WORD   74377
021154  171700                              .WORD   171700

021156  030000                              .WORD   30000           ;TEST CASE NUMBER 12
021160  000000                              .WORD   0
021162  000000                              .WORD   0


021164                              TCVLNI:                         ;IN-LINE TEST CASE
021164  050012                              .WORD   50012                   ;DST TYPE = LEADING SEPARATE, LENGTH = 12
```

```
5831 021166 062474          .WORD   DS.DST          ;DST.ADDRESS
5832 021170 032707          .WORD   32707           ;LONG INTEGER LOW WORD +
5833 021172 041072          .WORD   41072           ;  LONG INTEGER HIGH WORD AND SIGN
5834                                                ;  = 1111111111 IN BCD
```

```
                                  .SBTTL  CVTPL
                                  ;*********************************************************************
                                  ;
                                  ;  CVTPL TEST
                                  ;
                                  ;*********************************************************************
021174                            INLINE  <XCVTPL:>
021174                                                                                    XCVTPL:
021174                            INLINE  <SCOPE>
021174  000004                                                                            SCOPE
021176                            LET $TIMES := #20                         ;ITERATION COUNT
021176  012737  000020  000404                                                            MOV     #20,$TIMES
021204                            LET COUNT := TCVTPL                       ;GET TEST COUNT
021204  013737  022216  000466                                                            MOV     TCVTPL,COUNT
021212                            LET TSTCAS := #TCVTPL+2           ;POINT TO FIRST TEST CASE
021212  012737  022220  000542                                                            MOV     #TCVTPL+2,TSTCAS
                                  ;REPEAT
021220                            INLINE  <$5073:>
021220                                                                                    $5073:

                                    ;+
                                    ; GET TEST DATA FROM TABLE
                                    ;-

021220                              LET R0 := TSTCAS
021220  013700  000542                                                                    MOV     TSTCAS,R0
021224                              LET DATA00 := (R0)+                     ;SRC. DATA TYPE AND LENGTH
021224  012037  000560                                                                    MOV     (R0)+,DATA00
021230                              LET DATA01 := (R0)                      ;SRC. POINTER
021230  011037  000562                                                                    MOV     (R0),DATA01

                                    ;+
                                    ; SET UP R0.EXP, R1.EXP, R4.EXP, R5.EXP, R4, AND R5.
                                    ;-

021234                              LET R0.EXP := #0
021234  005037  000522                                                                    CLR     R0.EXP
021240                              LET R1.EXP := #0
021240  005037  000524                                                                    CLR     R1.EXP
021244                              IF #1 SETIN COUNT THEN
021244  032737  000001  000466                                                            BIT     #1,COUNT
021252  001405                                                                            BEQ     $50662
021254                                LET R4 := #177777
021254  012704  177777                                                                    MOV     #177777,R4
021260                                LET R5 := #177777
021260  012705  177777                                                                    MOV     #177777,R5
021264                              ELSE
021264  000402                                                                            BR      $50663
021266                                                                            $50662:
021266                                LET R4 := #0
021266  005004                                                                            CLR     R4
021270                                LET R5 := #0
021270  005005                                                                            CLR     R5
021272                              ENDIF
021272                                                                            $50663:
021272                              LET R4.EXP := R4
```

```
021272  010437  000532                                                              MOV     R4,R4.EXP
021276                                LET R5.EXP := R5
021276  010537  000534                                                              MOV     R5,R5.EXP

                                      ;+
                                      ;  CONVERT PACKED NUMBER AND LOAD INTO R2.EXP AND R3.EXP
                                      ;-

021302                                CALL  CLRDSB
021302  004737  055520                                                              JSR     PC,CLRDSB
021306                                LET CC.EXP := #0
021306  005037  000520                                                              CLR     CC.EXP
021312                                LET R0 := #DSBUF1                     ;DST.POINTER
021312  012700  062370                                                              MOV     #DSBUF1,R0
021316                                LET R1 := DATA01                      ;SRC.POINTER
021316  013701  000562                                                              MOV     DATA01,R1
021322                                LET DSLEN1 := DATA00 CLR.BY #177740          ;GET SRC.LEN
021322  013737  000560  000512                                                      MOV     DATA00,DSLEN1
021330  042737  177740  000512                                                      BIC     #177740,DSLEN1
021336                                IF DSLEN1 EQ #0 THEN                  ;SRC.LEN=0
021336  005737  000512                                                              TST     DSLEN1
021342  001010                                                                      BNE     $50664
021344                                  LET CC.EXP := CC.EXP SET.BY #ZBIT
021344  052737  000004  000520                                                      BIS     #ZBIT,CC.EXP
021352                                  LET R2.EXP := #0
021352  005037  000526                                                              CLR     R2.EXP
021356                                  LET R3.EXP := #0
021356  005037  000530                                                              CLR     R3.EXP
021362                                ELSE
021362  000532                                                                      BR      $50665
021364                                                                     $50664:
021364                                  LET R0 := #DSBUF1 + #10. - DSLEN1 ;DEST. FOR INTERMEDIATE RESULTS
021364  012700  062370                                                              MOV     #DSBUF1,R0
021370  062700  000012                                                              ADD     #10.,R0
021374  163700  000512                                                              SUB     DSLEN1,R0

                                        ;LOAD UP DSBUF1 BUFFER WITH INTERMEDIATE RESULTS
021400                                  CALL CLRDSB                         ;CLEAR DECIMAL STRING BUFFERS
021400  004737  055520                                                              JSR     PC,CLRDSB
021404                                  IF #1 NOTSETIN DSLEN1 THEN
021404  032737  000001  000512                                                      BIT     #1,DSLEN1
021412  001005                                                                      BNE     $50666
021414                                    LET (R1) :B= (R1) CLR.BY #360     ;CLEAR UPPER NIBBLE
021414  142711  000360                                                              BICB    #360,(R1)
021420                                    LET (R0)+ :B= (R1)+
021420  112120                                                                      MOVB    (R1)+,(R0)+
021422                                    LET DSLEN1 := DSLEN1 - #1
021422  005337  000512                                                              DEC     DSLEN1
021426                                  ENDIF
021426                                                                     $50666:
021426                                  WHILE DSLEN1 HI #1 DO
021426                                                                     $50667:
021426  023727  000512  000001                                                      CMP     DSLEN1,#1
021434  101420                                                                      BLOS    $50670
021436                                    LET (R0) :B= (R1)
021436  111110                                                                      MOVB    (R1),(R0)
021440                                    INLINE <ASRB (R0)>
```

```
021440  106210                                                                      ASRB (R0)
021442                              INLINE <ASRB (R0)>
021442  106210                                                                      ASRB (R0)
021444                              INLINE <ASRB (R0)>
021444  106210                                                                      ASRB (R0)
021446                              INLINE <ASRB (R0)>
021446  106210                                                                      ASRB (R0)
021450                              LET (R0) :B= (R0) CLR.BY #360       ;CLEAR UPPER NIBBLE
021450  142710  000360                                                              BICB    #360,(R0)
021454                              LET R0 := R0 + #1
021454  005200                                                                      INC     R0
021456                              LET (R0) :B= (R1)+ CLR.BY #360
021456  112110                                                                      MOVB    (R1)+,(R0)
021460  142710  000360                                                              BICB    #360,(R0)
021464                              LET R0 := R0 + #1
021464  005200                                                                      INC     R0
021466                              LET DSLEN1 := DSLEN1 - #2
021466  162737  000002  000512                                                      SUB     #2,DSLEN1
021474                            ENDDO
021474  000754                                                                      BR      $50667
021476                                                                      $50670:
021476                            LET (R0) :B= (R1)                     ;GET THE LSD
021476  111110                                                                      MOVB    (R1),(R0)
021500                              INLINE <ASRB (R0)>
021500  106210                                                                      ASRB (R0)
021502                              INLINE <ASRB (R0)>
021502  106210                                                                      ASRB (R0)
021504                              INLINE <ASRB (R0)>
021504  106210                                                                      ASRB (R0)
021506                              INLINE <ASRB (R0)>
021506  106210                                                                      ASRB (R0)
021510                              LET (R0) :B= (R0) CLR.BY #360
021510  142710  000360                                                              BICB    #360,(R0)
                                    ;LOAD UP R2.EXP AND R3.EXP WITH FINAL RESULT
021514                              CALL CVTIL
021514  004737  031266                                                              JSR     PC,CVTIL
021520                              LET DATTYP := DATA00 CLR.BY #107777
021520  013737  000560  000462                                                      MOV     DATA00,DATTYP
021526  042737  107777  000462                                                      BIC     #107777,DATTYP
021534                              IF DATTYP EQ #60000 THEN            ;SIGNED PACKED
021534  023727  000462  060000                                                      CMP     DATTYP,#60000
021542  001042                                                                      BNE     $50671
021544                                 LET TEMP5 :B= (R1) CLR.BY #360   ;ISOLATE THE SIGN
021544  111137  000506                                                              MOVB    (R1),TEMP5
021550  142737  000360  000506                                                      BICB    #360,TEMP5
021556                                 IFB TEMP5 EQ #15 OR TEMP5 EQ #13 THEN
021556  123727  000506  000015                                                      CMPB    TEMP5,#15
021564  001404                                                                      BEQ     $50672
021566  023727  000506  000013                                                      CMP     TEMP5,#13
021574  001025                                                                      BNE     $50673
021576                                                                      $50672:
021576                                    LET CC.EXP := CC.EXP SET.BY #NBIT
021576  052737  000010  000520                                                      BIS     #NBIT,CC.EXP
021604                                    LET R3.EXP := NEGATE R3.EXP
021604  005437  000530                                                              NEG     R3.EXP
021610                                    LET R2.EXP := COMP R2.EXP
```

```
021610  005137  000526                                                                          COM     R2.EXP
021614                                          IF R3.EXP EQ #0 THEN
021614  005737  000530                                                                          TST     R3.EXP
021620  001002                                                                                  BNE     $50674
021622                                            LET R2.EXP := R2.EXP + #1
021622  005237  000526                                                                          INC     R2.EXP
021626                                          ENDIF
021626                                                                               $50674:
021626                                          IF R2.EXP NE #0 OR R3.EXP NE #0 THEN
021626  005737  000526                                                                          TST     R2.EXP
021632  001003                                                                                  BNE     $50675
021634  005737  000530                                                                          TST     R3.EXP
021640  001403                                                                                  BEQ     $50676
021642                                                                               $50675:
021642                                            LET CC.EXP := CC.EXP SET.BY #CBIT
021642  052737  000001  000520                                                                  BIS     #CBIT,CC.EXP
021650                                          ENDIF
021650                                                                               $50676:
021650                                      ENDIF
021650                                                                               $50673:
021650                                  ENDIF
021650                                                                               $50671:
021650                          ENDIF
021650                                                                               $50665:

                        ;+
                        ; SET UP R0 THRU R3
                        ;-

021650                  LET R0 := DATA00                   ;SRC.DSCR
021650  013700  000560                                                                          MOV     DATA00,R0
021654                  LET R1 := DATA01                   ;SRC.DSCR
021654  013701  000562                                                                          MOV     DATA01,R1
021660                  LET R2 := #0
021660  005002                                                                                  CLR     R2
021662                  LET R3 := #0
021662  005003                                                                                  CLR     R3

                        ;+
                        ; DO THE CIS INSTRUCTION
                        ;-

021664                  INLINE <CVTPL>
021664  076073                                                                                  CVTPL


                          ;+
                          ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                          ;-

021666                    LET CC := PSW
021666  013737  177776  000516                                                                  MOV     PSW,CC
021674                    LET CC := CC CLR.BY #177760
021674  042737  177760  000516                                                                  BIC     #177760,CC
021702                    IF CC NE CC.EXP THEN
021702  023737  000516  000520                                                                  CMP     CC,CC.EXP
```

```
021710 001402                                                        BEQ     $50677
021712                                CALL ERROR
021712 004737 056274                                                 JSR     PC,ERROR
021716                              ENDIF
021716                                                      $50677:
021716                              IF R0 NE R0.EXP THEN
021716 020037 000522                                                 CMP     R0,R0.EXP
021722 001402                                                        BEQ     $50700
021724                                CALL ERROR
021724 004737 056274                                                 JSR     PC,ERROR
021730                              ENDIF
021730                                                      $50700:
021730                              IF R1 NE R1.EXP THEN
021730 020137 000524                                                 CMP     R1,R1.EXP
021734 001402                                                        BEQ     $50701
021736                                CALL ERROR
021736 004737 056274                                                 JSR     PC,ERROR
021742                              ENDIF
021742                                                      $50701:
021742                              IF R2 NE R2.EXP THEN
021742 020237 000526                                                 CMP     R2,R2.EXP
021746 001402                                                        BEQ     $50702
021750                                CALL ERROR
021750 004737 056274                                                 JSR     PC,ERROR
021754                              ENDIF
021754                                                      $50702:
021754                              IF R3 NE R3.EXP THEN
021754 020337 000530                                                 CMP     R3,R3.EXP
021760 001402                                                        BEQ     $50703
021762                                CALL ERROR
021762 004737 056274                                                 JSR     PC,ERROR
021766                              ENDIF
021766                                                      $50703:
021766                              IF R4 NE R4.EXP THEN
021766 020437 000532                                                 CMP     R4,R4.EXP
021772 001402                                                        BEQ     $50704
021774                                CALL ERROR
021774 004737 056274                                                 JSR     PC,ERROR
022000                              ENDIF
022000                                                      $50704:
022000                              IF R5 NE R5.EXP THEN
022000 020537 000534                                                 CMP     R5,R5.EXP
022004 001402                                                        BEQ     $50705
022006                                CALL ERROR
022006 004737 056274                                                 JSR     PC,ERROR
022012                              ENDIF
022012                                                      $50705:

022012                            LET TSTCAS := TSTCAS + #4
022012 062737 000004 000542                                          ADD     #4,TSTCAS
022020                            LET COUNT := COUNT - #1
022020 005337 000466                                                 DEC     COUNT
                                ;UNTIL COUNT EQ #0
022024                          IF COUNT NE #0 THEN
022024 005737 000466                                                 TST     COUNT
022030 001402                                                        BEQ     $50706
```

```
022032                                 INLINE <JMP $5073>
022032  000137  021220                                                    JMP $5073
022036                              ENDIF
022036                                                            $50706:

                                    ;+
                                    ; DO ONE INLINE CASE - CVTPLI
                                    ;-

022036                              CALL CLRREG
022036  004737  055330                                                    JSR     PC,CLRREG
022042                              CALL CLRDSB
022042  004737  055520                                                    JSR     PC,CLRDSB
022046                              INLINE <CVTPLI>
022046  076173                                                            CVTPLI
022050                              INLINE  <.WORD  TCVPLI>
022050  022274                                                            .WORD   TCVPLI
022052                              INLINE  <.WORD  TCVPLI+4>
022052  022300                                                            .WORD   TCVPLI+4
022054                              LET CC := PSW
022054  013737  177776  000516                                            MOV     PSW,CC
022062                              LET CC := CC CLR.BY #177760
022062  042737  177760  000516                                            BIC     #177760,CC
022070                              IF CC NE #0 THEN
022070  005737  000516                                                    TST     CC
022074  001402                                                            BEQ     $50707
022076                                 CALL ERROR
022076  004737  056274                                                    JSR     PC,ERROR
022102                              ENDIF
022102                                                            $50707:
022102                              IF R0 NE #0 THEN
022102  005700                                                            TST     R0
022104  001402                                                            BEQ     $50710
022106                                 CALL ERROR
022106  004737  056274                                                    JSR     PC,ERROR
022112                              ENDIF
022112                                                            $50710:
022112                              IF R1 NE #0 THEN
022112  005701                                                            TST     R1
022114  001402                                                            BEQ     $50711
022116                                 CALL ERROR
022116  004737  056274                                                    JSR     PC,ERROR
022122                              ENDIF
022122                                                            $50711:
022122                              IF R2 NE #0 THEN
022122  005702                                                            TST     R2
022124  001402                                                            BEQ     $50712
022126                                 CALL ERROR
022126  004737  056274                                                    JSR     PC,ERROR
022132                              ENDIF
022132                                                            $50712:
022132                              IF R3 NE #0 THEN
022132  005703                                                            TST     R3
022134  001402                                                            BEQ     $50713
022136                                 CALL ERROR
022136  004737  056274                                                    JSR     PC,ERROR
022142                              ENDIF
```

```
022142                                                                           $50713:
022142                               IF R4 NE #0 THEN
022142  005704                                                                          TST     R4
022144  001402                                                                          BEQ     $50714
022146                                  CALL ERROR
022146  004737  056274                                                                  JSR     PC,ERROR
022152                               ENDIF
022152                                                                           $50714:
022152                               IF R5 NE #0 THEN
022152  005705                                                                          TST     R5
022154  001402                                                                          BEQ     $50715
022156                                  CALL ERROR
022156  004737  056274                                                                  JSR     PC,ERROR
022162                               ENDIF
022162                                                                           $50715:
022162                               IF TCVPLI+4 NE #32707 THEN
022162  023727  022300  032707                                                          CMP     TCVPLI+4,#32707
022170  001402                                                                          BEQ     $50716
022172                                  CALL ERROR
022172  004737  056274                                                                  JSR     PC,ERROR
022176                               ENDIF
022176                                                                           $50716:
022176                               IF TCVPLI+6 NE #41072 THEN
022176  023727  022302  041072                                                          CMP     TCVPLI+6,#41072
022204  001402                                                                          BEQ     $50717
022206                                  CALL ERROR
022206  004737  056274                                                                  JSR     PC,ERROR
022212                               ENDIF
022212                                                                           $50717:
022212                               INLINE  <JMP XCVTNL>
022212  000137  022314                                                                  JMP XCVTNL



                                     ;+
                                     ; TABLE OF TEST CASES FOR CVTPL
                                     ;-

022216  000006                       TCVTPL: .WORD   6               ;# OF TEST CASES FOR CVTPL

022220  060000                               .WORD   60000                   ;SRC. DATA TYPE AND LENGTH
022222  022250                               .WORD   CVTPL1                  ;POINTER TO PACKED DECIMAL STRING

022224  060004                               .WORD   60004           ;TEST CASE NUMBER 2
022226  022251                               .WORD   CVTPL2

022230  060004                               .WORD   60004           ;TEST CASE NUMBER 3
022232  022254                               .WORD   CVTPL3

022234  060012                               .WORD   60012           ;TEST CASE NUMBER 4
022236  022257                               .WORD   CVTPL4

022240  070007                               .WORD   70007           ;TEST CASE NUMBER 5
022242  022265                               .WORD   CVTPL5

022244  060005                               .WORD   60005           ;TEST CASE NUMBER 6
```

```
022246  022271                           .WORD   CVTPL6
022250     014                  CVTPL1:  .BYTE   014                          ;PACKED DECIMAL STRING 1
022251     001     043     114  CVTPL2:  .BYTE   001,043,114                  ;PACKED DECIMAL STRING 2
022254     001     043     115  CVTPL3:  .BYTE   001,043,115                  ;PACKED DECIMAL STRING 3
022257     002     024     164  CVTPL4:  .BYTE   002,024,164,203,144,174      ;PACKED DECIMAL STRING 4
022262     203     144     174
022265     022     000     007  CVTPL5:  .BYTE   022,000,007,055              ;PACKED DECIMAL STRING 5
022270     055
022271     061     040     174  CVTPL6:  .BYTE   061,040,174                  ;PACKED DECIMAL STRING 6
                                         .EVEN
022274                          TCVPLI:                             ;INLINE TEST CASE
022274  060012                           .WORD   60012              ;SRC. DATA TYPE = SIGNED PACKED, LENGTH = 12
022276  022304                           .WORD   PLI                ;POINTER TO SRC. STRING
022300  000000                           .WORD   0                  ;LONG INTEGER RESULT, LOW
022302  000000                           .WORD   0                  ;LONG INTEGER RESULT, HI, AND SIGN
022304     001     021     021  PLI:     .BYTE   1,21,21,21,21,21,34  ;INLINE PACKED DECIMAL SRC. STRING
022307     021     021     021
022312     034
                                                                    ;  = +1111111111 IN BCD
        022314                           .EVEN
```

```
                                   .SBTTL  CVTNL
                                   ;*************************************************************
                                   ;
                                   ;  CVTNL TEST
                                   ;
                                   ;*************************************************************
022314                             INLINE <XCVTNL:>
022314                                                                             XCVTNL:
022314                             INLINE <SCOPE>
022314  000004                                                                     SCOPE
022316                             LET $TIMES := #20             ;ITERATION COUNT
022316  012737  000020  000404                                                     MOV     #20,$TIMES
022324                             LET COUNT := TCVTNL           ;GET TEST COUNT
022324  013737  023576  000466                                                     MOV     TCVTNL,COUNT
022332                             LET TSTCAS := #TCVTNL+2       ;POINT TO FIRST TEST CASE
022332  012737  023600  000542                                                     MOV     #TCVTNL+2,TSTCAS
                                   ;REPEAT
022340                             INLINE <$5053:>
022340                                                                             $5053:

                                     ;+
                                     ; GET TEST DATA FROM TABLE
                                     ;-

022340                               LET R0 := TSTCAS
022340  013700  000542                                                             MOV     TSTCAS,R0
022344                               LET DATA00 := (R0)+         ;SRC. DATA TYPE AND LENGTH
022344  012037  000560                                                             MOV     (R0)+,DATA00
022350                               LET DATA01 := (R0)          ;SRC. POINTER
022350  011037  000562                                                             MOV     (R0),DATA01

                                     ;+
                                     ; SET UP R0.EXP, R1.EXP, R4.EXP, R5.EXP, R4, AND R5.
                                     ;-

022354                               LET R0.EXP := #0
022354  005037  000522                                                             CLR     R0.EXP
022360                               LET R1.EXP := #0
022360  005037  000524                                                             CLR     R1.EXP
022364                               IF #1 SETIN COUNT THEN
022364  032737  000001  000466                                                     BIT     #1,COUNT
022372  001405                                                                     BEQ     $50720
022374                                   LET R4 := #177777
022374  012704  177777                                                             MOV     #177777,R4
022400                                   LET R5 := #177777
022400  012705  177777                                                             MOV     #177777,R5
022404                               ELSE
022404  000402                                                                     BR      $50721
022406                                                                     $50720:
022406                                   LET R4 := #0
022406  005004                                                                     CLR     R4
022410                                   LET R5 := #0
022410  005005                                                                     CLR     R5
022412                               ENDIF
022412                                                                     $50721:
022412                               LET R4.EXP := R4
```

```
022412  010437  000532                                                             MOV     R4,R4.EXP
022416                          LET R5.EXP := R5
022416  010537  000534                                                             MOV     R5,R5.EXP

                                ;+
                                ; CONVERT NUMERIC DECIMAL STRING AND LOAD INTO R2.EXP AND R3.EXP
                                ;-

022422                          LET CC.EXP := #0
022422  005037  000520                                                             CLR     CC.EXP
022426                          LET R0 := #DSBUF1                   ;DST. POINTER
022426  012700  062370                                                             MOV     #DSBUF1,R0
022432                          LET R1 := DATA01                    ;SRC. POINTER
022432  013701  000562                                                             MOV     DATA01,R1
022436                          LET SIGNO := #0
022436  005037  000446                                                             CLR     SIGNO
022442                          LET DSLEN1 := DATA00 CLR.BY #177740         ;GET SRC.LEN
022442  013737  000560  000512                                                     MOV     DATA00,DSLEN1
022450  042737  177740  000512                                                     BIC     #177740,DSLEN1
022456                          IF DSLEN1 EQ #0 THEN                ;SRC.LEN = 0
022456  005737  000512                                                             TST     DSLEN1
022462  001010                                                                     BNE     $50722
022464                               LET CC.EXP := CC.EXP SET.BY #ZBIT
022464  052737  000004  000520                                                     BIS     #ZBIT,CC.EXP
022472                               LET R2.EXP := #0
022472  005037  000526                                                             CLR     R2.EXP
022476                               LET R3.EXP := #0
022476  005037  000530                                                             CLR     R3.EXP
022502                          ELSE                                ;SRC.LEN > 0
022502  000417                                                                     BR      $50723
022504                                                                      $50722:
022504                               LET R0 := #DSBUF1 + #10. - DSLEN1
022504  012700  062370                                                             MOV     #DSBUF1,R0
022510  062700  000012                                                             ADD     #10.,R0
022514  163700  000512                                                             SUB     DSLEN1,R0
022520                               LET TEMPO := DSLEN1
022520  013737  000512  000474                                                     MOV     DSLEN1,TEMPO
022526                               REPEAT
022526                                                                      $50724:
022526                                  LET (R0)+ :B= (R1)+         ;XFER TO INTERMEDIATE
022526  112120                                                                     MOVB    (R1)+,(R0)+
022530                                  LET TEMPO := TEMPO - #1
022530  005337  000474                                                             DEC     TEMPO
022534                               UNTIL TEMPO EQ #0
022534  005737  000474                                                             TST     TEMPO
022540  001372                                                                     BNE     $50724
022542                          ENDIF
022542                                                                      $50723:
022542                          LET DATTYP := DATA00 CLR.BY #107777
022542  013737  000560  000462                                                     MOV     DATA00,DATTYP
022550  042737  107777  000462                                                     BIC     #107777,DATTYP

                                ;GET THE SIGN OUT OF THE INTERMEDIATE RESULTS
022556                          IF DSLEN1 NE #0 THEN                ;SRC.LEN > 0
022556  005737  000512                                                             TST     DSLEN1
022562  001533                                                                     BEQ     $50725
022564                               IF DATTYP EQ #0 OR DATTYP EQ #10000 THEN        ;*** ZONED ***
```

```
022564  005737  000462                                                                          TST     DATTYP
022570  001404                                                                                  BEQ     $50726
022572  023727  000462  010000                                                                  CMP     DATTYP,#10000
022600  001020                                                                                  BNE     $50727
022602                                                                                  $50726:
022602                          LET R0 := R0 - #1                                       ;POINT TO LAST BYTE
022602  005300                                                                                  DEC     R0
022604                          LET TEMP0 :B= (R0) CLR.BY #17
022604  111037  000474                                                                          MOVB    (R0),TEMP0
022610  142737  000017  000474                                                                  BICB    #17,TEMP0
022616                          IFB TEMP0 EQ #160 THEN                                     ;NEGATIVE
022616  123727  000474  000160                                                                  CMPB    TEMP0,#160
022624  001006                                                                                  BNE     $50730
022626                             LET SIGN0 := #-1
022626  012737  177777  000446                                                                  MOV     #-1,SIGN0
022634                             LET CC.EXP := CC.EXP SET.BY #NBIT
022634  052737  000010  000520                                                                  BIS     #NBIT,CC.EXP
022642                          ENDIF
022642                                                                                  $50730:
022642                       ENDIF
022642                                                                                  $50727:
022642                       IF DATTYP EQ #20000 OR DATTYP EQ #30000 THEN               ;*** OVERPUNCH ***
022642  023727  000462  020000                                                                  CMP     DATTYP,#20000
022650  001404                                                                                  BEQ     $50731
022652  023727  000462  030000                                                                  CMP     DATTYP,#30000
022660  001044                                                                                  BNE     $50732
022662                                                                                  $50731:
022662                          IF DATTYP EQ #20000 THEN                                ;TRAILING
022662  023727  000462  020000                                                                  CMP     DATTYP,#20000
022670  001002                                                                                  BNE     $50733
022672                             LET R0 := R0 - #1
022672  005300                                                                                  DEC     R0
022674                          ELSE                                                    ;LEADING
022674  000406                                                                                  BR      $50734
022676                                                                                  $50733:
022676                             LET R0 := #DSBUF1 + #10. - DSLEN1
022676  012700  062370                                                                          MOV     #DSBUF1,R0
022702  062700  000012                                                                          ADD     #10.,R0
022706  163700  000512                                                                          SUB     DSLEN1,R0
022712                          ENDIF
022712                                                                                  $50734:
022712                          LET TEMP0 :B= (R0)                                ;GET SIGN/DIGIT
022712  111037  000474                                                                          MOVB    (R0),TEMP0
022716                          LET R1 := #SGNDGT                                 ;TABLE ADDRESS
022716  012701  023470                                                                          MOV     #SGNDGT,R1
022722                          REPEAT
022722                                                                                  $50735:
022722                              LET TEMP1 :B= (R1)+
022722  112137  000476                                                                          MOVB    (R1)+,TEMP1
022726                              LET R1 := R1 + #1                             ;SKIP OVER ONE ENTRY
022726  005201                                                                                  INC     R1
022730                          UNTIL TEMP0 EQ TEMP1
022730  023737  000474  000476                                                                  CMP     TEMP0,TEMP1
022736  001371                                                                                  BNE     $50735
022740                          LET R1 := R1 - #1                                 ;BACK UP TO CORRECT ENTRY
022740  005301                                                                                  DEC     R1
```

```
022742                                       IFB #BIT07 SETIN (R1) THEN          ;NEGATIVE
022742  132711  000200                                                                              BITB    #BIT07,(R1)
022746  001406                                                                                      BEQ     $50736
022750                                          LET CC.EXP := CC.EXP SET.BY #NBIT
022750  052737  000010  000520                                                                      BIS     #NBIT,CC.EXP
022756                                          LET SIGNO := #-1
022756  012737  177777  000446                                                                      MOV     #-1,SIGNO
022764                                       ENDIF
022764                                                                                  $50736:
022764                                       LET (R0) :B= (R1) CLR.BY #BIT07     ;PUT CORRECT DIGIT INTO INTERMEDIATE RES
022764  111110                                                                                      MOVB    (R1),(R0)
022766  142710  000200                                                                              BICB    #BIT07,(R0)
022772                                    ENDIF
022772                                                                                  $50732:
022772                                    IF DATTYP EQ #50000 THEN               ;LEADING SEPARATE
022772  023727  000462  050000                                                                      CMP     DATTYP,#50000
023000  001003                                                                                      BNE     $50737
023002                                       LET R1 := DATA01 - #1               ;POINT TO SIGN
023002  013701  000562                                                                              MOV     DATA01,R1
023006  005301                                                                                      DEC     R1
023010                                    ENDIF
023010                                                                                  $50737:
023010                                    IF DATTYP EQ #50000 OR DATTYP EQ #40000 THEN
023010  023727  000462  050000                                                                      CMP     DATTYP,#50000
023016  001404                                                                                      BEQ     $50740
023020  023727  000462  040000                                                                      CMP     DATTYP,#40000
023026  001011                                                                                      BNE     $50741
023030                                                                                  $50740:
023030                                       IFB (R1) EQ #55 THEN                               ;NEGATIVE
023030  121127  000055                                                                              CMPB    (R1),#55
023034  001006                                                                                      BNE     $50742
023036                                          LET SIGNO := #-1
023036  012737  177777  000446                                                                      MOV     #-1,SIGNO
023044                                          LET CC.EXP := CC.EXP SET.BY #NBIT
023044  052737  000010  000520                                                                      BIS     #NBIT,CC.EXP
023052                                       ENDIF
023052                                                                                  $50742:
023052                                    ENDIF
023052                                                                                  $50741:
023052                                 ENDIF
023052                                                                                  $50725:

                                       ;CLEAR OUT UPPER NIBBLE OF INTERMEDIATE RESULTS
023052                                 INCR R0 FROM #DSBUF1 TO #DSBUF1+37 BY #1
023052  012700  062370                                                                              MOV     #DSBUF1,R0
023056  000401                                                                                      BR      $50743
023060                                                                                  $50744:
023060  005200                                                                                      INC     R0
023062                                                                                  $50743:
023062  020027  062427                                                                              CMP     R0,#DSBUF1+37
023066  003003                                                                                      BGT     $50745
023070                                    LET (R0) :B= (R0) CLR.BY #360
023070  142710  000360                                                                              BICB    #360,(R0)
023074                                 ENDINC
023074  000771                                                                                      BR      $50744
023076                                                                                  $50745:
                                       ;LOAD UP R2.EXP AND R3.EXP WITH FINAL RESULT
```

```
023076                           CALL CVTIL
023076  004737  031266                                                    JSR     PC,CVTIL
023102                           IF SIGNO EQ #-1 THEN
023102  023727  000446  177777                                            CMP     SIGNO,#-1
023110  001014                                                            BNE     $50746
023112                                LET CC.EXP := CC.EXP SET.BY #NBIT
023112  052737  000010  000520                                            BIS     #NBIT,CC.EXP
023120                                IF R2.EXP NE #0 OR R3.EXP NE #0 THEN
023120  005737  000526                                                    TST     R2.EXP
023124  001003                                                            BNE     $50747
023126  005737  000530                                                    TST     R3.EXP
023132  001403                                                            BEQ     $50750
023134                                                           $50747:
023134                                  LET CC.EXP := CC.EXP SET.BY #CBIT
023134  052737  000001  000520                                            BIS     #CBIT,CC.EXP
023142                                ENDIF
023142                                                           $50750:
023142                           ENDIF
023142                                                           $50746:

                                 ;+
                                 ; SET UP R0 THRU R3
                                 ;-

023142                           LET R0 := DATA00          ;SRC.DSCR
023142  013700  000560                                                    MOV     DATA00,R0
023146                           LET R1 := DATA01          ;SRC.DSCR
023146  013701  000562                                                    MOV     DATA01,R1
023152                           LET R2 := #0
023152  005002                                                            CLR     R2
023154                           LET R3 := #0
023154  005003                                                            CLR     R3

                                 ;+
                                 ; DO THE CIS INSTRUCTION
                                 ;-

023156                           INLINE <CVTNL>
023156  076053                                                            CVTNL


                                  ;+
                                  ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                  ;-

023160                            LET CC := PSW
023160  013737  177776  000516                                            MOV     PSW,CC
023166                            LET CC := CC CLR.BY #177760
023166  042737  177760  000516                                            BIC     #177760,CC
023174                            IF CC NE CC.EXP THEN
023174  023737  000516  000520                                            CMP     CC,CC.EXP
023202  001402                                                            BEQ     $50751
023204                              CALL ERROR
023204  004737  056274                                                    JSR     PC,ERROR
023210                            ENDIF
023210                                                           $50751:
```

```
023210                                IF R0 NE R0.EXP THEN
023210  020037  000522                                                              CMP     R0,R0.EXP
023214  001402                                                                      BEQ     $50752
023216                                  CALL ERROR
023216  004737  056274                                                              JSR     PC,ERROR
023222                                ENDIF
023222                                                                      $50752:
023222                                IF R1 NE R1.EXP THEN
023222  020137  000524                                                              CMP     R1,R1.EXP
023226  001402                                                                      BEQ     $50753
023230                                  CALL ERROR
023230  004737  056274                                                              JSR     PC,ERROR
023234                                ENDIF
023234                                                                      $50753:
023234                                IF R2 NE R2.EXP THEN
023234  020237  000526                                                              CMP     R2,R2.EXP
023240  001402                                                                      BEQ     $50754
023242                                  CALL ERROR
023242  004737  056274                                                              JSR     PC,ERROR
023246                                ENDIF
023246                                                                      $50754:
023246                                IF R3 NE R3.EXP THEN
023246  020337  000530                                                              CMP     R3,R3.EXP
023252  001402                                                                      BEQ     $50755
023254                                  CALL ERROR
023254  004737  056274                                                              JSR     PC,ERROR
023260                                ENDIF
023260                                                                      $50755:
023260                                IF R4 NE R4.EXP THEN
023260  020437  000532                                                              CMP     R4,R4.EXP
023264  001402                                                                      BEQ     $50756
023266                                  CALL ERROR
023266  004737  056274                                                              JSR     PC,ERROR
023272                                ENDIF
023272                                                                      $50756:
023272                                IF R5 NE R5.EXP THEN
023272  020537  000534                                                              CMP     R5,R5.EXP
023276  001402                                                                      BEQ     $50757
023300                                  CALL ERROR
023300  004737  056274                                                              JSR     PC,ERROR
023304                                ENDIF
023304                                                                      $50757:

023304                              LET TSTCAS := TSTCAS + #4
023304  062737  000004  000542                                                      ADD     #4,TSTCAS
023312                              LET COUNT := COUNT - #1
023312  005337  000466                                                              DEC     COUNT
                            ;UNTIL COUNT EQ #0
023316                      IF COUNT NE #0 THEN
023316  005737  000466                                                              TST     COUNT
023322  001402                                                                      BEQ     $50760
023324                              INLINE <JMP $5053>
023324  000137  022340                                                              JMP $5053
023330                      ENDIF
023330                                                                      $50760:
                            ;+
```

```
                                        ; DO ONE INLINE CASE - CVTNLI
                                        ;-

023330                                  CALL    CLRREG
023330  004737  055330                                                          JSR     PC,CLRREG
023334                                  CALL    CLRDSB
023334  004737  055520                                                          JSR     PC,CLRDSB
023340                                  INLINE    <CVTNLI>
023340  076153                                                                  CVTNLI
023342                                  INLINE    <.WORD    TCVNLI>
023342  024324                                                                  .WORD   TCVNLI
023344                                  INLINE    <.WORD    TCVNLI+4>
023344  024330                                                                  .WORD   TCVNLI+4
023346                                  LET CC := PSW
023346  013737  177776  000516                                                  MOV     PSW,CC
023354                                  LET CC := CC CLR.BY #177760
023354  042737  177760  000516                                                  BIC     #177760,CC
023362                                  IF CC NE #0 THEN
023362  005737  000516                                                          TST     CC
023366  001402                                                                  BEQ     $50761
023370                                    CALL ERROR
023370  004737  056274                                                          JSR     PC,ERROR
023374                                  ENDIF
023374                                                                  $50761:
023374                                  IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
023374  005700                                                                  TST     R0
023376  001004                                                                  BNE     $50762
023400  005701                                                                  TST     R1
023402  001002                                                                  BNE     $50762
023404  005702                                                                  TST     R2
023406  001402                                                                  BEQ     $50763
023410                                                                  $50762:
023410                                    CALL ERROR
023410  004737  056274                                                          JSR     PC,ERROR
023414                                  ENDIF
023414                                                                  $50763:
023414                                  IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
023414  005703                                                                  TST     R3
023416  001004                                                                  BNE     $50764
023420  005704                                                                  TST     R4
023422  001002                                                                  BNE     $50764
023424  005705                                                                  TST     R5
023426  001402                                                                  BEQ     $50765
023430                                                                  $50764:
023430                                    CALL ERROR
023430  004737  056274                                                          JSR     PC,ERROR
023434                                  ENDIF
023434                                                                  $50765:
023434                                  IF TCVNLI+4 NE #32707 THEN
023434  023727  024330  032707                                                  CMP     TCVNLI+4,#32707
023442  001402                                                                  BEQ     $50766
023444                                    CALL ERROR
023444  004737  056274                                                          JSR     PC,ERROR
023450                                  ENDIF
023450                                                                  $50766:
023450                                  IF TCVPLI+6 NE #41072 THEN
```

```
023450  023727  022302  041072                                              CMP     TCVPLI+6,#41072
023456  001402                                                              BEQ     $50767
023460                                   CALL ERROR
023460  004737  056274                                                      JSR     PC,ERROR
023464                                  ENDIF
023464                                                              $50767:
023464                                  INLINE   <JMP    XCVTPN>
023464  000137  024346                                                      JMP    XCVTPN




                                        ;+
                                        ; TABLE FOR INTERPRETING ACCEPTABLE SIGN/DIGIT COMBINATIONS FOR OVERPUNCH
                                        ;-

023470     173     000     060  SGNDGT: .BYTE    173,0,60,0,133,0,77,0              ;+0
023473     000     133     000
023476     077     000
023500     101     001     061          .BYTE    101,1,61,1                         ;+1
023503     001
023504     102     002     062          .BYTE    102,2,62,2                         ;+2
023507     002
023510     103     003     063          .BYTE    103,3,63,3                         ;+3
023513     003
023514     104     004     064          .BYTE    104,4,64,4                         ;+4
023517     004
023520     105     005     065          .BYTE    105,5,65,5                         ;+5
023523     005
023524     106     006     066          .BYTE    106,6,66,6                         ;+6
023527     006
023530     107     007     067          .BYTE    107,7,67,7                         ;+7
023533     007
023534     110     010     070          .BYTE    110,10,70,10                       ;+8
023537     010
023540     111     011     071          .BYTE    111,11,71,11                       ;+9
023543     011
023544     175     200     135          .BYTE    175,200,135,200,41,200,72,200      ;-0
023547     200     041     200
023552     072     200
023554     112     201                  .BYTE    112,201                            ;-1
023556     113     202                  .BYTE    113,202                            ;-2
023560     114     203                  .BYTE    114,203                            ;-3
023562     115     204                  .BYTE    115,204                            ;-4
023564     116     205                  .BYTE    116,205                            ;-5
023566     117     206                  .BYTE    117,206                            ;-6
023570     120     207                  .BYTE    120,207                            ;-7
023572     121     210                  .BYTE    121,210                            ;-8
023574     122     211                  .BYTE    122,211                            ;-9






                                        ;+
                                        ; TABLE OF TEST CASES FOR CVTNL
```

```
                                    ;-

023576  000055                      TCVTNL: .WORD   45.             ;# OF TEST CASES FOR CVTNL

023600  000000                              .WORD   0                       ;SRC. DATA TYPE AND LENGTH
023602  024065                              .WORD   CVTNL1                  ;POINTER TO SRC. STRING

023604  050000                              .WORD   50000           ;TEST CASE NUMBER 2
023606  024067                              .WORD   CVTNL2

023610  040004                              .WORD   40004           ;TEST CASE NUMBER 3
023612  024071                              .WORD   CVTNL3

023614  050004                              .WORD   50004           ;TEST CASE NUMBER 4
023616  024077                              .WORD   CVTNL4

023620  030007                              .WORD   30007           ;TEST CASE NUMBER 5
023622  024104                              .WORD   CVTNL5

023624  000002                              .WORD   2               ;TEST CASE NUMBER 6
023626  024114                              .WORD   CVTNL6

023630  020005                              .WORD   20005           ;TEST CASE NUMBER 7
023632  024117                              .WORD   CVTNL7

023634  010005                              .WORD   10005           ;TEST CASE NUMBER 8
023636  024125                              .WORD   CVTNL8

023640  040004                              .WORD   40004           ;TEST CASE NUMBER 9
023642  024133                              .WORD   CVTNL9

023644  000012                              .WORD   12              ;TEST CASE NUMBER 10
023646  024141                              .WORD   CVTNLA

023650  020002                              .WORD   20002           ;TEST CASE NUMBER 11
023652  024154                              .WORD   CVTNLB

023654  020002                              .WORD   20002           ;TEST CASE NUMBER 12
023656  024157                              .WORD   CVTNLC

023660  020002                              .WORD   20002           ;TEST CASE NUMBER 13
023662  024162                              .WORD   CVTNLD

023664  020002                              .WORD   20002           ;TEST CASE NUMBER 14
023666  024165                              .WORD   CVTNLE

023670  020002                              .WORD   20002           ;TEST CASE NUMBER 15
023672  024170                              .WORD   CVTNLF

023674  020002                              .WORD   20002           ;TEST CASE NUMBER 16
023676  024173                              .WORD   CVTNLG

023700  020002                              .WORD   20002           ;TEST CASE NUMBER 17
023702  024176                              .WORD   CVTNLH

023704  020002                              .WORD   20002           ;TEST CASE NUMBER 18
```

```
023706 024201          .WORD   CVTNL$

023710 020002          .WORD   20002           ;TEST CASE NUMBER 19
023712 024204          .WORD   CVTNLJ

023714 020002          .WORD   20002           ;TEST CASE NUMBER 20
023716 024207          .WORD   CVTNLK

023720 020002          .WORD   20002           ;TEST CASE NUMBER 21
023722 024212          .WORD   CVTNLL

023724 020002          .WORD   20002           ;TEST CASE NUMBER 22
023726 024215          .WORD   CVTNLM

023730 020002          .WORD   20002           ;TEST CASE NUMBER 23
023732 024220          .WORD   CVTNLN

023734 020002          .WORD   20002           ;TEST CASE NUMBER 24
023736 024223          .WORD   CVTNLO

023740 020002          .WORD   20002           ;TEST CASE NUMBER 25
023742 024226          .WORD   CVTNLP

023744 020002          .WORD   20002           ;TEST CASE NUMBER 26
023746 024231          .WORD   CVTNLQ

023750 020002          .WORD   20002           ;TEST CASE NUMBER 27
023752 024234          .WORD   CVTNLR

023754 020002          .WORD   20002           ;TEST CASE NUMBER 28
023756 024237          .WORD   CVTNLS

023760 020002          .WORD   20002           ;TEST CASE NUMBER 29
023762 024242          .WORD   CVTNLT

023764 020002          .WORD   20002           ;TEST CASE NUMBER 30
023766 024245          .WORD   CVTNLU

023770 020002          .WORD   20002           ;TEST CASE NUMBER 31
023772 024250          .WORD   CVTNLV

023774 020002          .WORD   20002           ;TEST CASE NUMBER 32
023776 024253          .WORD   CVTNLW

024000 020002          .WORD   20002           ;TEST CASE NUMBER 33
024002 024256          .WORD   CVTNLX

024004 020002          .WORD   20002           ;TEST CASE NUMBER 34
024006 024261          .WORD   CVTNLY

024010 020002          .WORD   20002           ;TEST CASE NUMBER 35
024012 024264          .WORD   CVTNLZ

024014 020002          .WORD   20002           ;TEST CASE NUMBER 36
024016 024267          .WORD   CVTNAA
```

```
024020  020002                            .WORD   20002           ;TEST CASE NUMBER 37
024022  024272                            .WORD   CVTNBB

024024  020002                            .WORD   20002           ;TEST CASE NUMBER 38
024026  024275                            .WORD   CVTNCC

024030  020002                            .WORD   20002           ;TEST CASE NUMBER 39
024032  024300                            .WORD   CVTNDD

024034  020002                            .WORD   20002           ;TEST CASE NUMBER 40
024036  024303                            .WORD   CVTNEE

024040  020002                            .WORD   20002           ;TEST CASE NUMBER 41
024042  024306                            .WORD   CVTNFF

024044  020002                            .WORD   20002           ;TEST CASE NUMBER 42
024046  024311                            .WORD   CVTNGG

024050  020002                            .WORD   20002           ;TEST CASE NUMBER 43
024052  024314                            .WORD   CVTNHH

024054  020002                            .WORD   20002           ;TEST CASE NUMBER 44
024056  024317                            .WORD   CVTNII

024060  020002                            .WORD   20002           ;TEST CASE NUMBER 45
024062  024322                            .WORD   CVTNJJ

024064     000                            .BYTE                                   ;FOR LEADING SEPARATE SIGN
024065     000                  CVTNL1:   .BYTE                                   ;DECIMAL NUMERIC SRC STRING 1

024066     055                            .BYTE   055
024067     000                  CVTNL2:   .BYTE                                   ;DECIMAL NUMERIC SRC STRING 2

024070     000                            .BYTE
024071     061     060     061  CVTNL3:   .BYTE   061,060,061,060,053             ;DECIMAL NUMERIC SRC STRING 3
024074     060     053

024076     053                            .BYTE   053
024077     061     060     061  CVTNL4:   .BYTE   061,060,061,065                 ;DECIMAL NUMERIC SRC STRING 4
024102     065

024103     000                            .BYTE
024104     112     020     000  CVTNL5:   .BYTE   112,020,000,000,000,007,002     ;DECIMAL NUMERIC SRC STRING 5
024107     000     000     007
024112     002

024113     000                            .BYTE
024114     001     171          CVTNL6:   .BYTE   001,171                         ;DECIMAL NUMERIC SRC STRING 6

024116     000                            .BYTE
024117     003     001     002  CVTNL7:   .BYTE   003,001,002,000,107             ;DECIMAL NUMERIC SRC STRING 7
024122     000     107

024124     000                            .BYTE
024125     001     000     002  CVTNL8:   .BYTE   001,000,002,000,067             ;DECIMAL NUMERIC SRC STRING 8
024130     000     067
```

```

024132  000                      .BYTE
024133  061   060   061  CVTNL9: .BYTE   061,060,061,060,053             ;DECIMAL NUMERIC SRC STRING 9
024136  060   053

024140  000                      .BYTE
024141  002   001   004  CVTNLA: .BYTE   002,001,004,007,004,010,003,006,004,067   ;DECIMAL NUMERIC SRC STR A
024144  007   004   010
024147  003   006   004
024152  067

024153  000                      .BYTE
024154  061   173        CVTNLB: .BYTE   61,173          ;DECIMAL NUMERIC SRC STRING 11

024156  000                      .BYTE
024157  061   060        CVTNLC: .BYTE   61,60           ;DECIMAL NUMERIC SRC STRING 12

024161  000                      .BYTE
024162  061   133        CVTNLD: .BYTE   61,133          ;DECIMAL NUMERIC SRC STRING 13

024164  000                      .BYTE
024165  061   077        CVTNLE: .BYTE   61,77           ;DECIMAL NUMERIC SRC STRING 14

024167  000                      .BYTE
024170  061   101        CVTNLF: .BYTE   61,101          ;DECIMAL NUMERIC SRC STRING 15

024172  000                      .BYTE
024173  061   061        CVTNLG: .BYTE   61,61           ;DECIMAL NUMERIC SRC STRING 16

024175  000                      .BYTE
024176  061   102        CVTNLH: .BYTE   61,102          ;DECIMAL NUMERIC SRC STRING 17

024200  000                      .BYTE
024201  061   062        CVTNLI: .BYTE   61,62           ;DECIMAL NUMERIC SRC STRING 18

024203  000                      .BYTE
024204  061   103        CVTNLJ: .BYTE   61,103          ;DECIMAL NUMERIC SRC STRING 19

024206  000                      .BYTE
024207  061   063        CVTNLK: .BYTE   61,63           ;DECIMAL NUMERIC SRC STRING 20

024211  000                      .BYTE
024212  061   104        CVTNLL: .BYTE   61,104          ;DECIMAL NUMERIC SRC STRING 21

024214  000                      .BYTE
024215  061   064        CVTNLM: .BYTE   61,64           ;DECIMAL NUMERIC SRC STRING 22

024217  000                      .BYTE
024220  061   105        CVTNLN: .BYTE   61,105          ;DECIMAL NUMERIC SRC STRING 23

024222  000                      .BYTE
024223  061   065        CVTNLO: .BYTE   61,65           ;DECIMAL NUMERIC SRC STRING 24

024225  000                      .BYTE
024226  061   106        CVTNLP: .BYTE   61,106          ;DECIMAL NUMERIC SRC STRING 25

```

```
024230   000                          .BYTE
024231   061      066       CVTNLQ:   .BYTE    61,66             ;DECIMAL NUMERIC SRC STRING 26

024233   000                          .BYTE
024234   061      107       CVTNLR:   .BYTE    61,107            ;DECIMAL NUMERIC SRC STRING 27

024236   000                          .BYTE
024237   061      067       CVTNLS:   .BYTE    61,67             ;DECIMAL NUMERIC SRC STRING 28

024241   000                          .BYTE
024242   061      110       CVTNLT:   .BYTE    61,110            ;DECIMAL NUMERIC SRC STRING 29

024244   000                          .BYTE
024245   061      070       CVTNLU:   .BYTE    61,70             ;DECIMAL NUMERIC SRC STRING 30

024247   000                          .BYTE
024250   061      111       CVTNLV:   .BYTE    61,111            ;DECIMAL NUMERIC SRC STRING 31

024252   000                          .BYTE
024253   061      071       CVTNLW:   .BYTE    61,71             ;DECIMAL NUMERIC SRC STRING 32

024255   000                          .BYTE
024256   061      175       CVTNLX:   .BYTE    61,175            ;DECIMAL NUMERIC SRC STRING 33

024260   000                          .BYTE
024261   061      135       CVTNLY:   .BYTE    61,135            ;DECIMAL NUMERIC SRC STRING 34

024263   000                          .BYTE
024264   061      041       CVTNLZ:   .BYTE    61,41             ;DECIMAL NUMERIC SRC STRING 35

024266   000                          .BYTE
024267   061      072       CVTNAA:   .BYTE    61,72             ;DECIMAL NUMERIC SRC STRING 36

024271   000                          .BYTE
024272   061      112       CVTNBB:   .BYTE    61,112            ;DECIMAL NUMERIC SRC STRING 37

024274   000                          .BYTE
024275   061      113       CVTNCC:   .BYTE    61,113            ;DECIMAL NUMERIC SRC STRING 38

024277   000                          .BYTE
024300   061      114       CVTNDD:   .BYTE    61,114            ;DECIMAL NUMERIC SRC STRING 39

024302   000                          .BYTE
024303   061      115       CVTNEE:   .BYTE    61,115            ;DECIMAL NUMERIC SRC STRING 40

024305   000                          .BYTE
024306   061      116       CVTNFF:   .BYTE    61,116            ;DECIMAL NUMERIC SRC STRING 41

024310   000                          .BYTE
024311   061      117       CVTNGG:   .BYTE    61,117            ;DECIMAL NUMERIC SRC STRING 42

024313   000                          .BYTE
024314   061      120       CVTNHH:   .BYTE    61,120            ;DECIMAL NUMERIC SRC STRING 43

024316   000                          .BYTE
024317   061      121       CVTNII:   .BYTE    61,121            ;DECIMAL NUMERIC SRC STRING 44
```

```
024321        000                                .BYTE
024322        061      122             CVTNJJ:  .BYTE    61,122                 ;DECIMAL NUMERIC SRC STRING 45

                                                .EVEN

024324                                 TCVNLI:                      ;INLINE TEST CASE
024324  000012                                  .WORD    000012                 ;DATA TYPE = SIGNED ZONED, LENGTH = 12
024326  024334                                  .WORD    NL1                    ;ADDRESS OF DECIMAL SRC STRING
024330  000000                                  .WORD    0                      ;LONG INTEGER RESULT, LOW
024332  000000                                  .WORD    0                      ;LONG INTEGER RESULT, HI, AND SIGN

024334        061      061      061    NL1:     .BYTE    61,61,61,61,61,61,61,61,61,61          ;  = +1111111111 IN BCD
024337        061      061      061
024342        061      061      061
024345        061
                                                .EVEN
```

```
                                      .SBTTL  CVTPN
                                      ;;*******************************************************************
                                      ;
                                      ;  CVTPN TEST
                                      ;
                                      ;;*******************************************************************
 024346                               INLINE  <XCVTPN:>
 024346                                                                                  XCVTPN:
 024346                               INLINE  <SCOPE>
 024346  000004                                                                          SCOPE
 024350                               LET $TIMES := 2320                ;ITERATION COUNT
 024350  013737  002320  000404                                                          MOV     2320,$TIMES
 024356                               LET COUNT := TCVTPN               ;GET TEST COUNT
 024356  013737  026262  000466                                                          MOV     TCVTPN,COUNT
 024364                               LET TSTCAS := #TCVTPN+2           ;POINT TO FIRST TEST CASE
 024364  012737  026264  000542                                                          MOV     #TCVTPN+2,TSTCAS
                                      ;REPEAT
 024372                               INLINE  <$5054:>
 024372                                                                                  $5054:

                                        ;+
                                        ; GET TEST DATA FROM TABLE
                                        ;-

 024372                                 LET R0 := TSTCAS
 024372  013700  000542                                                                  MOV     TSTCAS,R0
 024376                                 LET DATA00 := (R0)+             ;SRC DATA TYPE AND LENGTH
 024376  012037  000560                                                                  MOV     (R0)+,DATA00
 024402                                 LET DATA01 := (R0)+             ;POINTER TO PACKED SRC STRING
 024402  012037  000562                                                                  MOV     (R0)+,DATA01
 024406                                 LET DATA02 := (R0)              ;DST.LEN
 024406  011037  000564                                                                  MOV     (R0),DATA02

                                        ;+
                                        ; SET UP R0.EXP, R1.EXP, R3.EXP, R4.EXP, R5.EXP, R4, AND R5.
                                        ;-

 024412                                 LET R0.EXP := #0
 024412  005037  000522                                                                  CLR     R0.EXP
 024416                                 LET R1.EXP := #0
 024416  005037  000524                                                                  CLR     R1.EXP
 024422                                 LET R3.EXP := #DS.DST
 024422  012737  062474  000530                                                          MOV     #DS.DST,R3.EXP
 024430                                 IF #1 SETIN COUNT THEN
 024430  032737  000001  000466                                                          BIT     #1,COUNT
 024436  001405                                                                          BEQ     $50770
 024440                                   LET R4 := #-1
 024440  012704  177777                                                                  MOV     #-1,R4
 024444                                   LET R5 := #-1
 024444  012705  177777                                                                  MOV     #-1,R5
 024450                                 ELSE
 024450  000402                                                                          BR      $50771
 024452                                                                          $50770:
 024452                                   LET R4 := #0
 024452  005004                                                                          CLR     R4
 024454                                   LET R5 := #0
```

```
024454  005005                                                                          CLR     R5
024456                                  ENDIF
024456                                                                          $50771:
024456                                  LET R4.EXP := R4
024456  010437  000532                                                                  MOV     R4,R4.EXP
024462                                  LET R5.EXP := R5
024462  010537  000534                                                                  MOV     R5,R5.EXP


                                        ;+
                                        ; INITIALIZE THE DECIMAL STRING BUFFERS AND CC.EXP.
                                        ;-

024466                                  CALL CLRDSB
024466  004737  055520                                                                  JSR     PC,CLRDSB
024472                                  LET CC.EXP := #0
024472  005037  000520                                                                  CLR     CC.EXP


                                        ;+
                                        ; PUT THE SOURCE LENGTH INTO DSLEN1; PUT THE DESTINATION
                                        ; LENGTH INTO DSLEN2.
                                        ;-

024476                                  LET DSLEN1 := DATA00 CLR.BY #70000
024476  013737  000560  000512                                                          MOV     DATA00,DSLEN1
024504  042737  070000  000512                                                          BIC     #70000,DSLEN1
024512                                  LET DSLEN2 := DATA02
024512  013737  000564  000514                                                          MOV     DATA02,DSLEN2


                                        ;+
                                        ; LET SIGN0 REFLECT THE SIGN OF THE SOURCE STRING.
                                        ;-

024520                                  LET R0 := DSLEN1
024520  013700  000512                                                                  MOV     DSLEN1,R0
024524                                  INLINE    <ASR R0>
024524  006200                                                                          ASR     R0
024526                                  LET R0 := R0 + DATA01            ;POINT TO THE END OF THE STRING
024526  063700  000562                                                                  ADD     DATA01,R0
024532                                  LET R1 :B= (R0) CLR.BY #360        ;GET THE SIGN NIBBLE
024532  111001                                                                          MOVB    (R0),R1
024534  142701  000360                                                                  BICB    #360,R1
024540                                  IF DATA00 HIS #70000 OR DSLEN1 EQ #0 THEN
024540  023727  000560  070000                                                          CMP     DATA00,#70000
024546  103003                                                                          BHIS    $50772
024550  005737  000512                                                                  TST     DSLEN1
024554  001003                                                                          BNE     $50773
024556                                                                          $50772:
024556                                    LET SIGN0 := #0
024556  005037  000446                                                                  CLR     SIGN0
024562                                  ELSE
024562  000411                                                                          BR      $50774
024564                                                                          $50773:
024564                                    IF R1 EQ #14 THEN
```

```
024564  020127  000014                                                                 CMP     R1,#14
024570  001003                                                                         BNE     $50775
024572                                   LET SIGNO := #0
024572  005037  000446                                                                 CLR     SIGNO
024576                                 ELSE
024576  000403                                                                         BR      $50776
024600                                                                       $50775:
024600                                   LET SIGNO := #-1
024600  012737  177777  000446                                                         MOV     #-1,SIGNO
024606                                 ENDIF
024606                                                                       $50776:
024606                               ENDIF
024606                                                                       $50774:


                                     ;+
                                     ; CALCULATE THE NUMBER OF CHARACTERS TO BE MOVED INTO DS.EXP;
                                     ; USE R0.
                                     ;-

024606                               IF DSLEN2 HIS DSLEN1 THEN           ;DST.LEN >= SRC.LEN
024606  023737  000514  000512                                                         CMP     DSLEN2,DSLEN1
024614  103403                                                                         BLO     $50777
024616                                 LET R0 := DSLEN1
024616  013700  000512                                                                 MOV     DSLEN1,R0
024622                               ELSE                                ;SRC.LEN > DST.LEN
024622  000402                                                                         BR      $51000
024624                                                                       $50777:
024624                                 LET R0 := DSLEN2
024624  013700  000514                                                                 MOV     DSLEN2,R0
024630                               ENDIF
024630                                                                       $51000:


                                     ;+
                                     ; MAKE R1 POINT TO THE END OF THE DESTINATION IN DS.EXP;
                                     ; MAKE R2 POINT TO THE END OF THE SOURCE STRING IN THE
                                     ; TABLE OF TEST CASES.
                                     ;-

024630                               LET R1 := #DS.EXP + DATA02 - #1
024630  012701  062536                                                                 MOV     #DS.EXP,R1
024634  063701  000564                                                                 ADD     DATA02,R1
024640  005301                                                                         DEC     R1
024642                               LET R2 := DSLEN1
024642  013702  000512                                                                 MOV     DSLEN1,R2
024646                               INLINE   <ASR R2>
024646  006202                                                                         ASR     R2
024650                               LET R2 := R2 + DATA01
024650  063702  000562                                                                 ADD     DATA01,R2


                                     ;+
                                     ; MOVE THE LEAST SIGNIFICANT BCD FROM THE SOURCE STRING
                                     ; TO THE EXPECTED DESTINATION BUFFER, IN UNPACKED FORMAT.
                                     ;-
```

```

024654                              LET R3 :B= (R2)
024654  111203                                                                          MOVB    (R2),R3
024656                              INLINE    <ASH #-4,R3>
024656  072327  177774                                                                  ASH     #-4,R3
024662                              LET (R1) :B= R3 SET.BY #60 CLR.BY #300
024662  110311                                                                          MOVB    R3,(R1)
024664  152711  000060                                                                  BISB    #60,(R1)
024670  142711  000300                                                                  BICB    #300,(R1)
024674                              LET R0 := R0 - #1                   ;DECREMENT COUNT
024674  005300                                                                          DEC     R0



                                    ;+
                                    ; MOVE THE REST OF THE SOURCE TO THE EXPECTED DESTINATION
                                    ; BUFFER, IN UNPACKED FORMAT, USING R0 AS A COUNTER FOR
                                    ; THE NUMBER OF CHARACTERS TO MOVE.
                                    ;-

024676                              WHILE R0 GT #0 DO
024676                                                                        $51001:
024676  005700                                                                          TST     R0
024700  003425                                                                          BLE     $51002
024702                                LET R1 := R1 - #1                 ;DECREMENT DEST. POINTER
024702  005301                                                                          DEC     R1
024704                                LET R2 := R2 - #1                 ;DECREMENT SRC. POINTER
024704  005302                                                                          DEC     R2
024706                                LET (R1) :B= (R2) CLR.BY #300 SET.BY #60
024706  111211                                                                          MOVB    (R2),(R1)
024710  142711  000300                                                                  BICB    #300,(R1)
024714  152711  000060                                                                  BISB    #60,(R1)
024720                                LET R0 := R0 - #1                 ;DECREMENT COUNT
024720  005300                                                                          DEC     R0
024722                                IF R0 HI #0 THEN                  ;COUNT > 0
024722  005700                                                                          TST     R0
024724  101412                                                                          BLOS    $51003
024726                                  LET R1 := R1 - #1               ;DECREMENT DEST. POINTER
024726  005301                                                                          DEC     R1
024730                                  LET R3 :B= (R2)
024730  111203                                                                          MOVB    (R2),R3
024732                                  INLINE    <ASH     #-4,R3>
024732  072327  177774                                                                  ASH     #-4,R3
024736                                  LET (R1) :B= R3 CLR.BY #300 SET.BY #60
024736  110311                                                                          MOVB    R3,(R1)
024740  142711  000300                                                                  BICB    #300,(R1)
024744  152711  000060                                                                  BISB    #60,(R1)
024750                                  LET R0 := R0 - #1               ;DECREMENT COUNT
024750  005300                                                                          DEC     R0
024752                                ENDIF
024752                                                                        $51003:
024752                              ENDDO
024752  000751                                                                          BR      $51001
024754                                                                        $51002:

                                    ;+
```

```
                                        ; FILL THE REST OF THE DESTINATION WITH LEADING ZEROES (60'S).
                                        ;-

024754                                  WHILE R1 GT #DS.EXP DO
024754                                                                          $51004:
024754  020127  062536                                                                  CMP     R1,#DS.EXP
024760  003403                                                                          BLE     $51005
024762                                    LET -(R1) :B= #60
024762  112741  000060                                                                  MOVB    #60,-(R1)
024766                                  ENDDO
024766  000772                                                                          BR      $51004
024770                                                                          $51005:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE NBIT INTO CC.EXP
                                        ;-

024770                                  IF DSLEN2 HI #0 AND SIGNO EQ #-1 THEN
024770  005737  000514                                                                  TST     DSLEN2
024774  101407                                                                          BLOS    $51006
024776  023727  000446  177777                                                          CMP     SIGNO,#-1
025004  001003                                                                          BNE     $51006
025006                                    LET CC.EXP := CC.EXP SET.BY #NBIT
025006  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
025014                                  ENDIF
025014                                                                          $51006:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE ZBIT INTO CC.EXP
                                        ;-

025014                                  IF DSLEN1 EQ #0 OR DSLEN2 EQ #0 THEN
025014  005737  000512                                                                  TST     DSLEN1
025020  001403                                                                          BEQ     $51007
025022  005737  000514                                                                  TST     DSLEN2
025026  001003                                                                          BNE     $51010
025030                                                                          $51007:
025030                                    LET CC.EXP := CC.EXP SET.BY #ZBIT
025030  052737  000004  000520                                                          BIS     #ZBIT,CC.EXP
025036                                  ENDIF
025036                                                                          $51010:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE VBIT INTO CC.EXP
                                        ;-

025036                                  IF DSLEN1 HI DSLEN2 THEN          ;SRC.LEN > DST.LEN
025036  023737  000512  000514                                                          CMP     DSLEN1,DSLEN2
025044  101403                                                                          BLOS    $51011
025046                                    LET CC.EXP := CC.EXP SET.BY #VBIT
025046  052737  000002  000520                                                          BIS     #VBIT,CC.EXP
025054                                  ENDIF
```

```
025054                                                                  $51011:


                              ;+
                              ; SAVE THE FIRST AND LAST BYTES OF THE EXPECTED DESTINATION
                              ; IN DSTMP0 AND DSTMP1.
                              ;-

025054                        LET DSTMP0 := DS.EXP
025054  013737  062536  000552                                           MOV     DS.EXP,DSTMP0
025062                        LET R0 := #DS.EXP + DATA02 - #1
025062  012700  062536                                                   MOV     #DS.EXP,R0
025066  063700  000564                                                   ADD     DATA02,R0
025072  005300                                                           DEC     R0
025074                        LET DSTMP1 :B= (R0)
025074  111037  000553                                                   MOVB    (R0),DSTMP1


                              ;+
                              ; DO THE CVTPN INSTRUCTION, CONVERTING EACH PACKED SOURCE
                              ; STRING INTO ALL SIX NUMERIC DATA TYPES.  DS.EXP WILL HAVE
                              ; TO BE ALTERED FOR EACH DATA TYPE.
                              ;-

                              ;INCR DATTYP FROM #0 TO #50000 BY #10000
025100                        INLINE   <CLR DATTYP>
025100  005037  000462                                                   CLR     DATTYP
025104                        INLINE   <BR  $5402>
025104  000412                                                           BR      $5402
025106                        INLINE   <$5401:>
025106                                                                   $5401:

                              ;CLEAR THE DESTINATION BUFFER

025106                        LET R0 := #DS.DST-1
025106  012700  062473                                                   MOV     #DS.DST-1,R0
025112                        WHILE R0 LOS #DS.DST+37 DO
025112                                                          $51012:
025112  020027  062533                                                   CMP     R0,#DS.DST+37
025116  101002                                                           BHI     $51013
025120                          LET (R0)+ :B= #0
025120  105020                                                           CLRB    (R0)+
025122                        ENDDO
025122  000773                                                           BR      $51012
025124                                                          $51013:

                              ;INCREMENT DATTYP

025124                        LET DATTYP := DATTYP + #10000
025124  062737  010000  000462                                           ADD     #10000,DATTYP
025132                        INLINE   <$5402:>
025132                                                                   $5402:
025132                        IF DATTYP HI #50000 THEN
025132  023727  000462  050000                                           CMP     DATTYP,#50000
025140  101402                                                           BLOS    $51014
025142                          INLINE   <JMP      $5403>
```

```
025142  000137  026044                                                              JMP     $5403
025146                          ENDIF
025146                                                                    $51014:

                                ;RESTORE FIRST AND LAST BYTES OF DESTINATION

025146                          LET DS.EXP :B= DSTMP0
025146  113737  000552  062536                                                      MOVB    DSTMP0,DS.EXP
025154                          IF DATA02 NE #0 THEN
025154  005737  000564                                                              TST     DATA02
025160  001406                                                                      BEQ     $51015
025162                            LET R0 := #DS.EXP-1 + DATA02
025162  012700  062535                                                              MOV     #DS.EXP-1,R0
025166  063700  000564                                                              ADD     DATA02,R0
025172                            LET (R0) :B= DSTMP1
025172  113710  000553                                                              MOVB    DSTMP1,(R0)
025176                          ENDIF
025176                                                                    $51015:

                                  ;*** SIGNED ZONED ***
025176                            IF DATTYP EQ #0 THEN
025176  005737  000462                                                              TST     DATTYP
025202  001022                                                                      BNE     $51016
025204                              LET DS.EXP-1 :B= #0               ;RESTORE AFTER LEADING SEPARATE
025204  105037  062535                                                              CLRB    DS.EXP-1
025210                              IF DATA02 HI #0 THEN              ;DST.LEN > 0
025210  005737  000564                                                              TST     DATA02
025214  101415                                                                      BLOS    $51017
025216                                LET R0 := #DS.EXP-1 + DATA02
025216  012700  062535                                                              MOV     #DS.EXP-1,R0
025222  063700  000564                                                              ADD     DATA02,R0
025226                                IF #NBIT NOTSETIN CC.EXP THEN             ;SIGN IS +
025226  032737  000010  000520                                                      BIT     #NBIT,CC.EXP
025234  001003                                                                      BNE     $51020
025236                                  LET (R0) :B= (R0) SET.BY #60
025236  152710  000060                                                              BISB    #60,(R0)
025242                                ELSE                                 ;SIGN IS -
025242  000402                                                                      BR      $51021
025244                                                                    $51020:
025244                                  LET (R0) :B= (R0) SET.BY #160
025244  152710  000160                                                              BISB    #160,(R0)
025250                                ENDIF
025250                                                                    $51021:
025250                              ENDIF
025250                                                                    $51017:
025250                            ENDIF
025250                                                                    $51016:

                                  ;*** UNSIGNED ZONED ***
025250                            IF DATTYP EQ #10000 THEN
025250  023727  000462  010000                                                      CMP     DATTYP,#10000
025256  001014                                                                      BNE     $51022
025260                              IF DATA02 HI #0 THEN              ;DST.LEN > 0
025260  005737  000564                                                              TST     DATA02
025264  101406                                                                      BLOS    $51023
025266                                LET R0 := #DS.EXP-1 + DATA02
```

```
025266  012700  062535                                                                  MOV     #DS.EXP-1,R0
025272  063700  000564                                                                  ADD     DATA02,R0
025276                            LET (R0) :B= (R0) SET.BY #60        ;PUT IN UNSIGNED ''SIGN''
025276  152710  000060                                                                  BISB    #60,(R0)
025302                          ENDIF
025302                                                                       $51023:
025302                          LET CC.EXP := CC.EXP CLR.BY #NBIT
025302  042737  000010  000520                                                          BIC     #NBIT,CC.EXP
025310                        ENDIF
025310                                                                       $51022:


                              ;*** TRAILING OVERPUNCH ***
025310                        IF DATTYP EQ #20000 THEN
025310  023727  000462  020000                                                          CMP     DATTYP,#20000
025316  001047                                                                          BNE     $51024
025320                          IF DSLEN2 HI #0 AND SIGNO EQ #-1 THEN
025320  005737  000514                                                                  TST     DSLEN2
025324  101407                                                                          BLOS    $51025
025326  023727  000446  177777                                                          CMP     SIGNO,#-1
025334  001003                                                                          BNE     $51025
025336                            LET CC.EXP := CC.EXP SET.BY #NBIT
025336  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
025344                          ENDIF
025344                                                                       $51025:
025344                          IF DATA02 HI #0 THEN                  ;DST.LEN > 0
025344  005737  000564                                                                  TST     DATA02
025350  101432                                                                          BLOS    $51026
025352                            IF DSLEN1 NE #0 AND SIGNO EQ #-1 THEN
025352  005737  000512                                                                  TST     DSLEN1
025356  001407                                                                          BEQ     $51027
025360  023727  000446  177777                                                          CMP     SIGNO,#-1
025366  001003                                                                          BNE     $51027
025370                              LET CC.EXP := CC.EXP SET.BY #NBIT
025370  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
025376                            ENDIF
025376                                                                       $51027:
025376                            LET R0 := #DS.EXP-1 + DATA02          ;POINT TO LAST DST BYTE
025376  012700  062535                                                                  MOV     #DS.EXP-1,R0
025402  063700  000564                                                                  ADD     DATA02,R0
025406                            LET R1 :B= DSTMP1 CLR.BY #60                  ;GET LSD
025406  113701  000553                                                                  MOVB    DSTMP1,R1
025412  142701  000060                                                                  BICB    #60,R1
025416                            IF SIGNO EQ #-1 THEN
025416  023727  000446  177777                                                          CMP     SIGNO,#-1
025424  001002                                                                          BNE     $51030
025426                              LET R1 := R1 + #10.                 ;FORM OVPNCH TABLE OFFSET
025426  062701  000012                                                                  ADD     #10.,R1
025432                            ENDIF
025432                                                                       $51030:
025432                            LET (R0) :B= OVPNCH(R1)               ;GET CORRECT SIGN/DIGIT
025432  116110  055254                                                                  MOVB    OVPNCH(R1),(R0)
025436                          ENDIF
025436                                                                       $51026:
025436                        ENDIF
025436                                                                       $51024:
```

```
025436                              ;*** LEADING OVERPUNCH ***
025436  023727  000462  030000      IF DATTYP EQ #30000 THEN
                                                                            CMP     DATTYP,#30000
025444  001020                                                              BNE     $51031
025446                                IF DATA02 HI #0 THEN            ;DST.LEN > 0
025446  005737  000564                                                      TST     DATA02
025452  101415                                                              BLOS    $51032
025454                                  LET R1 :B= DSTMPO CLR.BY #60          ;GET MSD
025454  113701  000552                                                      MOVB    DSTMPO,R1
025460  142701  000060                                                      BICB    #60,R1
025464                                   IF #NBIT SETIN CC.EXP THEN
025464  032737  000010  000520                                              BIT     #NBIT,CC.EXP
025472  001402                                                              BEQ     $51033
025474                                     LET R1 := R1 + #10.        ;FORM OVPNCH TABLE OFFSET
025474  062701  000012                                                      ADD     #10.,R1
025500                                   ENDIF
025500                                                             $51033:
025500                                   LET DS.EXP :B= OVPNCH(R1)      ;GET CORRECT SIGN/DIGIT
025500  116137  055254  062536                                              MOVB    OVPNCH(R1),DS.EX
025506                                ENDIF
025506                                                             $51032:
025506                              ENDIF
025506                                                             $51031:


025506                              ;*** TRAILING SEPARATE ***
025506  023727  000462  040000      IF DATTYP EQ #40000 THEN
                                                                            CMP     DATTYP,#40000
025514  001015                                                              BNE     $51034
025516                                LET R0 := #DS.EXP + DATA02
025516  012700  062536                                                      MOV     #DS.EXP,R0
025522  063700  000564                                                      ADD     DATA02,R0
025526                                IF #NBIT NOTSETIN CC.EXP THEN             ;SIGN IS +
025526  032737  000010  000520                                              BIT     #NBIT,CC.EXP
025534  001003                                                              BNE     $51035
025536                                  LET (R0) :B= #53
025536  112710  000053                                                      MOVB    #53,(R0)
025542                                ELSE                            ;SIGN IS -
025542  000402                                                              BR      $51036
025544                                                             $51035:
025544                                  LET (R0) :B= #55
025544  112710  000055                                                      MOVB    #55,(R0)
025550                                ENDIF
025550                                                             $51036:
025550                              ENDIF
025550                                                             $51034:


025550                              ;*** LEADING SEPARATE ***
025550  023727  000462  050000      IF DATTYP EQ #50000 THEN
                                                                            CMP     DATTYP,#50000
025556  001020                                                              BNE     $51037
025560                                LET R0 := #DS.EXP + DATA02
025560  012700  062536                                                      MOV     #DS.EXP,R0
025564  063700  000564                                                      ADD     DATA02,R0
025570                                LET (R0) :B= #0                 ;RESTORE AFTER TRAILING SEPARATE
025570  105010                                                              CLRB    (R0)
025572                                IF #NBIT NOTSETIN CC.EXP THEN             ;SIGN = +
```

```
025572  032737  000010  000520                                                           BIT     #NBIT,CC.EXP
025600  001004                                                                           BNE     $51040
025602                                    LET DS.EXP-1 :B= #53
025602  112737  000053  062535                                                           MOVB    #53,DS.EXP-1
025610                                  ELSE                             ;SIGN = -
025610  000403                                                                           BR      $51041
025612                                                                         $51040:
025612                                    LET DS.EXP-1 :B= #55
025612  112737  000055  062535                                                           MOVB    #55,DS.EXP-1
025620                                  ENDIF
025620                                                                         $51041:
025620                                ENDIF
025620                                                                         $51037:

                                      ;+
                                      ; SET UP R2.EXP, R0, R1, R2, AND R3; DO THE INSTRUCTION.
                                      ;-

025620                                LET R0 := DATA00                  ;SRC  DATA TYPE AND LENGTH
025620  013700  000560                                                                   MOV     DATA00,R0
025624                                LET R1 := DATA01                  ;SRC  POINTER
025624  013701  000562                                                                   MOV     DATA01,R1
025630                                LET R2 := DATA02 + DATTYP         ;DST DATA TYPE AND LENGTH
025630  013702  000564                                                                   MOV     DATA02,R2
025634  063702  000462                                                                   ADD     DATTYP,R2
025640                                LET R3 := #DS.DST                 ;DST POINTER
025640  012703  062474                                                                   MOV     #DS.DST,R3
025644                                LET R2.EXP := R2
025644  010237  000526                                                                   MOV     R2,R2.EXP
025650                                INLINE  <CVTPN>
025650  076054                                                                           CVTPN

                                      ;+
                                      ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                      ;-

025652                                LET CC := PSW
025652  013737  177776  000516                                                           MOV     PSW,CC
025660                                LET CC := CC CLR.BY #177760
025660  042737  177760  000516                                                           BIC     #177760,CC
025666                                IF CC NE CC.EXP THEN
025666  023737  000516  000520                                                           CMP     CC,CC.EXP
025674  001402                                                                           BEQ     $51042
025676                                  CALL ERROR
025676  004737  056274                                                                   JSR     PC,ERROR
025702                                ENDIF
025702                                                                         $51042:
025702                                IF R0 NE R0.EXP THEN
025702  020037  000522                                                                   CMP     R0,R0.EXP
025706  001402                                                                           BEQ     $51043
025710                                  CALL ERROR
025710  004737  056274                                                                   JSR     PC,ERROR
025714                                ENDIF
025714                                                                         $51043:
025714                                IF R1 NE R1.EXP THEN
```

```
025714  020137  000524                                                  CMP     R1,R1.EXP
025720  001402                                                          BEQ     $51044
025722                              CALL ERROR
025722  004737  056274                                                  JSR     PC,ERROR
025726                            ENDIF
025726                                                          $51044:
025726                            IF R2 NE R2.EXP THEN
025726  020237  000526                                                  CMP     R2,R2.EXP
025732  001402                                                          BEQ     $51045
025734                              CALL ERROR
025734  004737  056274                                                  JSR     PC,ERROR
025740                            ENDIF
025740                                                          $51045:
025740                            IF R3 NE R3.EXP THEN
025740  020337  000530                                                  CMP     R3,R3.EXP
025744  001402                                                          BEQ     $51046
025746                              CALL ERROR
025746  004737  056274                                                  JSR     PC,ERROR
025752                            ENDIF
025752                                                          $51046:
025752                            IF R4 NE R4.EXP THEN
025752  020437  000532                                                  CMP     R4,R4.EXP
025756  001402                                                          BEQ     $51047
025760                              CALL ERROR
025760  004737  056274                                                  JSR     PC,ERROR
025764                            ENDIF
025764                                                          $51047:
025764                            IF R5 NE R5.EXP THEN
025764  020537  000534                                                  CMP     R5,R5.EXP
025770  001402                                                          BEQ     $51050
025772                              CALL ERROR
025772  004737  056274                                                  JSR     PC,ERROR
025776                            ENDIF
025776                                                          $51050:


                                  ;COMPARE DS.DST WITH DS.EXP
025776                            LET R0 := #DS.EXP-1
025776  012700  062535                                                  MOV     #DS.EXP-1,R0
026002                            LET R1 := #DS.DST-1
026002  012701  062473                                                  MOV     #DS.DST-1,R1
026006                            LET ERRFLG := #0                ;CLEAR THE ERROR FLAG
026006  005037  000454                                                  CLR     ERRFLG
026012                            WHILE R0 NE #DS.EXP+40 AND ERRFLG EQ #0 DO
026012                                                          $51051:
026012  020027  062576                                                  CMP     R0,#DS.EXP+40
026016  001410                                                          BEQ     $51052
026020  005737  000454                                                  TST     ERRFLG
026024  001005                                                          BNE     $51052
026026                              IFB (R0)+ NE (R1)+ THEN
026026  122021                                                          CMPB    (R0)+,(R1)+
026030  001402                                                          BEQ     $51053
026032                                CALL ERROR
026032  004737  056274                                                  JSR     PC,ERROR
026036                              ENDIF
026036                                                          $51053:
026036                            ENDDO
```

```
026036  000765                                                              BR      $51051
026040                                                          $51052:
                              ;ENDINC
026040                        INLINE  <JMP  $5401>
026040  000137  025106                                                      JMP  $5401
026044                        INLINE  <$5403:>
026044                                                                      $5403:

026044                        LET TSTCAS := TSTCAS + #6
026044  062737  000006  000542                                              ADD     #6,TSTCAS
026052                        LET COUNT := COUNT - #1
026052  005337  000466                                                      DEC     COUNT
                            ;UNTIL COUNT EQ #0
026056                      IF COUNT NE #0 THEN
026056  005737  000466                                                      TST     COUNT
026062  001402                                                              BEQ     $51054
026064                        INLINE  <JMP  $5054>
026064  000137  024372                                                      JMP  $5054
026070                      ENDIF
026070                                                          $51054:
                            ;+
                            ; DO ONE INLINE CASE - CVTPNI
                            ;-

026070                      CALL CLRREG
026070  004737  055330                                                      JSR     PC,CLRREG
026074                      CALL CLRDSB
026074  004737  055520                                                      JSR     PC,CLRDSB
026100                      INLINE  <CVTPNI>
026100  076154                                                              CVTPNI
026102                      INLINE  <.WORD  TCVPNI>
026102  026416                                                              .WORD  TCVPNI
026104                      INLINE  <.WORD  TCVPNI+4>
026104  026422                                                              .WORD  TCVPNI+4
026106                      LET CC := PSW
026106  013737  177776  000516                                              MOV     PSW,CC
026114                      LET CC := CC CLR.BY #177760
026114  042737  177760  000516                                              BIC     #177760,CC
026122                      IF CC NE #10 THEN
026122  023727  000516  000010                                              CMP     CC,#10
026130  001402                                                              BEQ     $51055
026132                        CALL ERROR
026132  004737  056274                                                      JSR     PC,ERROR
026136                      ENDIF
026136                                                          $51055:
026136                      IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
026136  005700                                                              TST     R0
026140  001004                                                              BNE     $51056
026142  005701                                                              TST     R1
026144  001002                                                              BNE     $51056
026146  005702                                                              TST     R2
026150  001402                                                              BEQ     $51057
026152                                                          $51056:
026152                        CALL ERROR
026152  004737  056274                                                      JSR     PC,ERROR
026156                      ENDIF
```

```
026156                                                                  $51057:
026156                          IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
026156  005703                                                                  TST     R3
026160  001004                                                                  BNE     $51060
026162  005704                                                                  TST     R4
026164  001002                                                                  BNE     $51060
026166  005705                                                                  TST     R5
026170  001402                                                                  BEQ     $51061
026172                                                                  $51060:
026172                            CALL ERROR
026172  004737  056274                                                          JSR     PC,ERROR
026176                          ENDIF
026176                                                                  $51061:
026176                          IFB DS.DST NE #61 THEN
026176  123727  062474  000061                                                  CMPB    DS.DST,#61
026204  001402                                                                  BEQ     $51062
026206                            CALL ERROR
026206  004737  056274                                                          JSR     PC,ERROR
026212                          ENDIF
026212                                                                  $51062:
026212                          IFB DS.DST+1 NE #62 THEN
026212  123727  062475  000062                                                  CMPB    DS.DST+1,#62
026220  001402                                                                  BEQ     $51063
026222                            CALL ERROR
026222  004737  056274                                                          JSR     PC,ERROR
026226                          ENDIF
026226                                                                  $51063:
026226                          IFB DS.DST+2 NE #63 THEN
026226  123727  062476  000063                                                  CMPB    DS.DST+2,#63
026234  001402                                                                  BEQ     $51064
026236                            CALL ERROR
026236  004737  056274                                                          JSR     PC,ERROR
026242                          ENDIF
026242                                                                  $51064:
026242                          IFB DS.DST+3 NE #164 THEN
026242  123727  062477  000164                                                  CMPB    DS.DST+3,#164
026250  001402                                                                  BEQ     $51065
026252                            CALL ERROR
026252  004737  056274                                                          JSR     PC,ERROR
026256                          ENDIF
026256                                                                  $51065:
026256                          INLINE  <JMP  XCVTNP>
026256  000137  026432                                                          JMP  XCVTNP



                                ;+
                                ; TABLE OF TEST CASES FOR CVTPN
                                ;-

026262  000011                  TCVTPN: .WORD   9.              ;# OF TEST CASES FOR CVTPN

026264  060000                          .WORD   60000                   ;SRC DATA TYPE AND LENGTH
026266  026352                          .WORD   CVTPN1                  ;POINTER TO PACKED SRC STRING
026270  000000                          .WORD   0                       ;DST.LEN
```

```
026272  060000                    .WORD   60000           ;TEST CASE NUMBER 2
026274  026353                    .WORD   CVTPN2
026276  000005                    .WORD   5

026300  060004                    .WORD   60004           ;TEST CASE NUMBER 3
026302  026354                    .WORD   CVTPN3
026304  000000                    .WORD   0


026306  060025                    .WORD   60025           ;TEST CASE NUMBER 4
026310  026357                    .WORD   CVTPN4
026312  000014                    .WORD   14

026314  060007                    .WORD   60007           ;TEST CASE NUMBER 5
026316  026372                    .WORD   CVTPN5
026320  000003                    .WORD   3

026322  070007                    .WORD   70007           ;TEST CASE NUMBER 6
026324  026376                    .WORD   CVTPN6
026326  000003                    .WORD   3

026330  060004                    .WORD   60004           ;TEST CASE NUMBER 7
026332  026402                    .WORD   CVTPN7
026334  000037                    .WORD   37

026336  060012                    .WORD   60012           ;TEST CASE NUMBER 8
026340  026405                    .WORD   CVTPN8
026342  000012                    .WORD   12

026344  060005                    .WORD   60005           ;TEST CASE NUMBER 9
026346  026413                    .WORD   CVTPN9
026350  000005                    .WORD   5



026352     014                CVTPN1: .BYTE   014                     ;PACKED DECIMAL STRING 1

026353     015                CVTPN2: .BYTE   015                     ;PACKED DECIMAL STRING 2

026354     001   043    114   CVTPN3: .BYTE   001,043,114             ;PACKED DECIMAL STRING 3

026357     020   043    127   CVTPN4: .BYTE   020,043,127,206,224,022,003,000,100,000,014     ;PACKED DECIMAL STRING 4
026362     206   224    022
026365     003   000    100
026370     000   014

026372     022   000    007   CVTPN5: .BYTE   022,000,007,055         ;PACKED DECIMAL STRING 5
026375     055

026376     022   000    007   CVTPN6: .BYTE   022,000,007,055         ;PACKED DECIMAL STRING 6
026401     055

026402     001   043    114   CVTPN7: .BYTE   001,043,114             ;PACKED DECIMAL STRING 7

026405     002   024    164   CVTPN8: .BYTE   002,024,164,203,144,215        ;PACKED DECIMAL STRING 8
026410     203   144    215
```

```

026413     061     040     174  CVTPN9: .BYTE   061,040,174             ;PACKED DECIMAL STRING 9



                                .EVEN

026416                          TCVPNI:                                 ;INLINE TEST CASE
026416  060004                          .WORD   060004                          ;SIGNED PACKED, LENGTH = 4
026420  026426                          .WORD   PN1                             ;POINTER TO PACKED SRC STRING
026422  000004                          .WORD   000004                          ;SIGNED ZONED, LENGTH = 4
026424  062474                          .WORD   DS.DST                          ;POINTER TO DST

026426     001     043     113  PN1:    .BYTE   1,43,113                        ;-1234
        026432                          .EVEN
```

```
                                      .SBTTL  CVTNP
                                      ;;*****************************************************************
                                      ;
                                      ;  CVTNP TEST
                                      ;
                                      ;;*****************************************************************
026432                                INLINE  <XCVTNP:>
026432                                                                                      XCVTNP:
026432                                INLINE  <SCOPE>
026432  000004                                                                              SCOPE
026434                                LET $TIMES := #20                    ;ITERATION COUNT
026434  012737  000020  000404                                                              MOV     #20,$TIMES
026442                                LET COUNT := TCVTNP                  ;GET TEST COUNT
026442  013737  030126  000466                                                              MOV     TCVTNP,COUNT
026450                                LET TSTCAS := #TCVTNP+2              ;POINT TO FIRST TEST CASE
026450  012737  030130  000542                                                              MOV     #TCVTNP+2,TSTCAS
                                      ;REPEAT
026456                                INLINE  <$5055:>
026456                                                                                      $5055:

                                        ;+
                                        ; GET TEST DATA FROM TABLE
                                        ;-

026456                                  LET R0 := TSTCAS
026456  013700  000542                                                                      MOV     TSTCAS,R0
026462                                  LET DATA00 := (R0)+                ;SRC DATA TYPE AND LENGTH
026462  012037  000560                                                                      MOV     (R0)+,DATA00
026466                                  LET DATA01 := (R0)+                ;POINTER TO INTERMEDIATE SRC STRING
026466  012037  000562                                                                      MOV     (R0)+,DATA01
026472                                  LET DATA02 := (R0)                 ;DST DATA TYPE AND LENGTH
026472  011037  000564                                                                      MOV     (R0),DATA02


                                        ;+
                                        ; INITIALIZE THE DECIMAL BUFFERS AND CC.EXP.
                                        ;-

026476                                  CALL CLRDSB
026476  004737  055520                                                                      JSR     PC,CLRDSB
026502                                  LET CC.EXP := #0
026502  005037  000520                                                                      CLR     CC.EXP


                                        ;+
                                        ; LET SIGNO REFLECT THE SIGN OF THE SOURCE STRING.
                                        ;-

026506                                  LET SIGNO := @DATA01
026506  017737  152050  000446                                                              MOV     @DATA01,SIGNO


                                        ;+
                                        ; PUT SRC MAGNITUDE INTO DSBUF1.  DSBUF1 WILL BE THE SOURCE FOR THE
                                        ; CVTNP INSTRUCTION.
                                        ;-
```

```

026514                                    CALL CLRDSB
026514  004737  055520                                                                          JSR     PC,CLRDSB
026520                                    LET R0 := DATA01                ;GET ADDRESS OF INTERMEDIATE SRC. STRING
026520  013700  000562                                                                          MOV     DATA01,R0
026524                                    LET R0 := R0 + #2               ;GET PAST THE SIGN WORD
026524  062700  000002                                                                          ADD     #2,R0
026530                                    LET R1 := #DSBUF1
026530  012701  062370                                                                          MOV     #DSBUF1,R1
026534                                    LET DSLEN1 := DATA00 CLR.BY #70000      ;GET SRC.LEN
026534  013737  000560  000512                                                                  MOV     DATA00,DSLEN1
026542  042737  070000  000512                                                                  BIC     #70000,DSLEN1
026550                                    INCR R2 FROM #1 TO DSLEN1 BY #1         ;TRANSFER THE MAGNITUDE
026550  012702  000001                                                                          MOV     #1,R2
026554  000401                                                                                  BR      $51066
026556                                                                                $51067:
026556  005202                                                                                  INC     R2
026560                                                                                $51066:
026560  020237  000512                                                                          CMP     R2,DSLEN1
026564  003002                                                                                  BGT     $51070
026566                                      LET (R1)+ :B= (R0)+
026566  112021                                                                                  MOVB    (R0)+,(R1)+
026570                                    ENDINC
026570  000772                                                                                  BR      $51067
026572                                                                                $51070:



                                          ;+
                                          ; PUT THE PROPER SIGN INTO DSBUF1, ACCORDING TO THE SOURCE DATA TYPE.
                                          ;-

026572                                    LET DATTYP := DATA00 CLR.BY #107777     ;GET SRC DATA TYPE
026572  013737  000560  000462                                                                  MOV     DATA00,DATTYP
026600  042737  107777  000462                                                                  BIC     #107777,DATTYP


                                          ;*** SIGNED ZONED ***
026606                                    IF DATTYP EQ #0 THEN
026606  005737  000462                                                                          TST     DATTYP
026612  001014                                                                                  BNE     $51071
026614                                      IF DSLEN1 HI #0 THEN                ;SRC.LEN > 0
026614  005737  000512                                                                          TST     DSLEN1
026620  101411                                                                                  BLOS    $51072
026622                                        LET R1 := R1 - #1                   ;POINT TO SIGN BYTE
026622  005301                                                                                  DEC     R1
026624                                        IF SIGN0 EQ #0 THEN                         ;SIGN IS +
026624  005737  000446                                                                          TST     SIGN0
026630  001003                                                                                  BNE     $51073
026632                                          LET (R1) :B= (R1) SET.BY #60
026632  152711  000060                                                                          BISB    #60,(R1)
026636                                        ELSE                                       ;SIGN IS -
026636  000402                                                                                  BR      $51074
026640                                                                                $51073:
026640                                          LET (R1) :B= (R1) SET.BY #160
026640  152711  000160                                                                          BISB    #160,(R1)
026644                                        ENDIF
```

```
026644                                                                  $51074:
026644                             ENDIF
026644                                                                  $51072:
026644                          ENDIF
026644                                                                  $51071:



                                ;*** UNSIGNED ZONED ***
026644                          IF DATTYP EQ #10000 THEN
026644  023727  000462  010000                                                  CMP     DATTYP,#10000
026652  001006                                                                  BNE     $51075
026654                             IF DSLEN1 HI #0 THEN
026654  005737  000512                                                          TST     DSLEN1
026660  101403                                                                  BLOS    $51076
026662                               LET R1 := R1 - #1              ;POINT TO SIGN BYTE
026662  005301                                                                  DEC     R1
026664                               LET (R1) :B= (R1) SET.BY #60
026664  152711  000060                                                          BISB    #60,(R1)
026670                             ENDIF
026670                                                                  $51076:
026670                          ENDIF
026670                                                                  $51075:



                                ;*** TRAILING OVERPUNCH ***
026670                          IF DATTYP EQ #20000 THEN
026670  023727  000462  020000                                                  CMP     DATTYP,#20000
026676  001015                                                                  BNE     $51077
026700                             IF DSLEN1 HI #0 THEN
026700  005737  000512                                                          TST     DSLEN1
026704  101412                                                                  BLOS    $51100
026706                               LET R1 := R1 - #1              ;POINT TO SIGN BYTE
026706  005301                                                                  DEC     R1
026710                                 LET R0 := (R1)
026710  011100                                                                  MOV     (R1),R0
026712                                 IF SIGN0 EQ #-1 THEN
026712  023727  000446  177777                                                  CMP     SIGN0,#-1
026720  001002                                                                  BNE     $51101
026722                                   LET R0 := R0 + #10.
026722  062700  000012                                                          ADD     #10.,R0
026726                                 ENDIF
026726                                                                  $51101:
026726                                 LET (R1) :B= OVPNCH(R0)      ;PUT IN SIGN/DIGIT COMBINATION
026726  116011  055254                                                          MOVB    OVPNCH(R0),(R1)
026732                              ENDIF
026732                                                                  $51100:
026732                          ENDIF
026732                                                                  $51077:



                                ;*** LEADING OVERPUNCH ***
026732                          IF DATTYP EQ #30000 THEN
026732  023727  000462  030000                                                  CMP     DATTYP,#30000
026740  001016                                                                  BNE     $51102
026742                             IF DSLEN1 HI #0 THEN
026742  005737  000512                                                          TST     DSLEN1
```

```
026746  101413                                                                        BLOS   $51103
026750                               LET R0 :B= DSBUF1
026750  113700  062370                                                                MOVB   DSBUF1,R0
026754                               IF SIGNO EQ #-1 THEN
026754  023727  000446  177777                                                        CMP    SIGNO,#-1
026762  001002                                                                        BNE    $51104
026764                                 LET R0 := R0 + #10.
026764  062700  000012                                                                ADD    #10.,R0
026770                               ENDIF
026770                                                                        $51104:
026770                               LET DSBUF1 :B= OVPNCH(R0)
026770  116037  055254  062370                                                        MOVB   OVPNCH(R0),DSBUF
026776                             ENDIF
026776                                                                        $51103:
026776                           ENDIF
026776                                                                        $51102:



                                 ;*** TRAILING SEPARATE ***
026776                           IF DATTYP EQ #40000 THEN
026776  023727  000462  040000                                                        CMP    DATTYP,#40000
027004  001010                                                                        BNE    $51105
027006                             IF SIGNO EQ #0 THEN                 ;SIGN IS +
027006  005737  000446                                                                TST    SIGNO
027012  001003                                                                        BNE    $51106
027014                               LET (R1) :B= #53
027014  112711  000053                                                                MOVB   #53,(R1)
027020                             ELSE                                ;SIGN IS -
027020  000402                                                                        BR     $51107
027022                                                                        $51106:
027022                               LET (R1) :B= #55
027022  112711  000055                                                                MOVB   #55,(R1)
027026                             ENDIF
027026                                                                        $51107:
027026                           ENDIF
027026                                                                        $51105:



                                 ;*** LEADING SEPARATE ***
027026                           IF DATTYP EQ #50000 THEN
027026  023727  000462  050000                                                        CMP    DATTYP,#50000
027034  001012                                                                        BNE    $51110
027036                             IF SIGNO EQ #0 THEN                 ;SIGN IS +
027036  005737  000446                                                                TST    SIGNO
027042  001004                                                                        BNE    $51111
027044                               LET DSBUF1-1 :B= #53
027044  112737  000053  062367                                                        MOVB   #53,DSBUF1-1
027052                             ELSE                                ;SIGN IS -
027052  000403                                                                        BR     $51112
027054                                                                        $51111:
027054                               LET DSBUF1-1 :B= #55
027054  112737  000055  062367                                                        MOVB   #55,DSBUF1-1
027062                             ENDIF
027062                                                                        $51112:
027062                           ENDIF
027062                                                                        $51110:
```

```


                                        ;+
                                        ; LOCATE THE END OF THE EXPECTED DESTINATION, WHERE THE SIGN
                                        ; GOES.  GET THE DESTINATION DATA TYPE.
                                        ;-

027062                                  LET R2 := DATA02 CLR.BY #70000                  ;GET DST.LEN
027062  013702  000564                                                                          MOV     DATA02,R2
027066  042702  070000                                                                          BIC     #70000,R2
027072                                  INLINE   <ASR R2>
027072  006202                                                                                  ASR     R2
027074                                  LET R0 := #DS.EXP + R2
027074  012700  062536                                                                          MOV     #DS.EXP,R0
027100  060200                                                                                  ADD     R2,R0
027102                                  LET TEMP1 := DATA02 CLR.BY #107777
027102  013737  000564  000476                                                                  MOV     DATA02,TEMP1
027110  042737  107777  000476                                                                  BIC     #107777,TEMP1


                                        ;+
                                        ; PUT THE SIGN INTO THE EXPECTED DESTINATION.
                                        ;-

027116                                  LET DSLEN1 := DATA00 CLR.BY #70000              ;GET SRC.LEN
027116  013737  000560  000512                                                                  MOV     DATA00,DSLEN1
027124  042737  070000  000512                                                                  BIC     #70000,DSLEN1
027132                                  LET DSLEN2 := DATA02 CLR.BY #70000              ;GET DST.LEN
027132  013737  000564  000514                                                                  MOV     DATA02,DSLEN2
027140  042737  070000  000514                                                                  BIC     #70000,DSLEN2
027146                                  IF DSLEN1 EQ #0 THEN          ;SRC.LEN OR DST.LEN = 0
027146  005737  000512                                                                          TST     DSLEN1
027152  001003                                                                                  BNE     $51113
027154                                    LET (R0) :B= #14
027154  112710  000014                                                                          MOVB    #14,(R0)
027160                                  ELSE                                            ;SRC.LEN & DST.LEN > 0
027160  000414                                                                                  BR      $51114
027162                                                                          $51113:
027162                                    IF @DATA01 EQ #0 OR DATTYP EQ #10000 THEN
027162  005777  151374                                                                          TST     @DATA01
027166  001404                                                                                  BEQ     $51115
027170  023727  000462  010000                                                                  CMP     DATTYP,#10000
027176  001003                                                                                  BNE     $51116
027200                                                                          $51115:
027200                                      LET (R0) :B= #14                            ;SIGN IS +
027200  112710  000014                                                                          MOVB    #14,(R0)
027204                                    ELSE
027204  000402                                                                                  BR      $51117
027206                                                                          $51116:
027206                                      LET (R0) :B= #15                            ;SIGN IS -
027206  112710  000015                                                                          MOVB    #15,(R0)
027212                                    ENDIF
027212                                                                          $51117:
027212                                  ENDIF
027212                                                                          $51114:
027212                                  IF TEMP1 EQ #70000 THEN
```

```
027212  023727  000476  070000                                                          CMP     TEMP1,#70000
027220  001002                                                                          BNE     $51120
027222                                    LET (R0) :B= #17
027222  112710  000017                                                                  MOVB    #17,(R0)
027226                                  ENDIF
027226                                                                          $51120:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE NBIT INTO CC.EXP
                                        ;-

027226                                  IF DATTYP NE #10000 AND TEMP1 NE #70000 THEN
027226  023727  000462  010000                                                          CMP     DATTYP,#10000
027234  001415                                                                          BEQ     $51121
027236  023727  000476  070000                                                          CMP     TEMP1,#70000
027244  001411                                                                          BEQ     $51121
027246                                    IFB (R0) EQ #15 AND DSLEN2 GT #0 THEN         ;SIGN NIBBLE IN DS.EXP IS NEG.
027246  121027  000015                                                                  CMPB    (R0),#15
027252  001006                                                                          BNE     $51122
027254  005737  000514                                                                  TST     DSLEN2
027260  003403                                                                          BLE     $51122
027262                                      LET CC.EXP := CC.EXP SET.BY #NBIT
027262  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
027270                                    ENDIF
027270                                                                          $51122:
027270                                  ENDIF
027270                                                                          $51121:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE ZBIT INTO CC.EXP
                                        ;-

027270                                  IF DSLEN1 EQ #0 OR DSLEN2 EQ #0 THEN            ;SRC.LEN OR DST.LEN = 0
027270  005737  000512                                                                  TST     DSLEN1
027274  001403                                                                          BEQ     $51123
027276  005737  000514                                                                  TST     DSLEN2
027302  001003                                                                          BNE     $51124
027304                                                                          $51123:
027304                                    LET CC.EXP := CC.EXP SET.BY #ZBIT
027304  052737  000004  000520                                                          BIS     #ZBIT,CC.EXP
027312                                  ENDIF
027312                                                                          $51124:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE VBIT INTO CC.EXP
                                        ;-

027312                                  IF DSLEN1 HI DSLEN2 THEN              ;SRC.LEN > DST.LEN
027312  023737  000512  000514                                                          CMP     DSLEN1,DSLEN2
027320  101403                                                                          BLOS    $51125
027322                                    LET CC.EXP := CC.EXP SET.BY #VBIT
027322  052737  000002  000520                                                          BIS     #VBIT,CC.EXP
027330                                  ENDIF
```

```
027330                                                                       $51125:


                                ;+
                                ; CALCULATE THE NUMBER OF CHARACTERS TO BE MOVED INTO DS.EXP;
                                ; USE R0.
                                ;-

027330                          IF DSLEN2 HIS DSLEN1 THEN            ;DST.LEN >= SRC.LEN
027330  023737  000514  000512                                                      CMP     DSLEN2,DSLEN1
027336  103403                                                                      BLO     $51126
027340                            LET R0 := DSLEN1
027340  013700  000512                                                              MOV     DSLEN1,R0
027344                          ELSE                                 ;SRC.LEN > DST.LEN
027344  000402                                                                      BR      $51127
027346                                                                       $51126:
027346                            LET R0 := DSLEN2
027346  013700  000514                                                              MOV     DSLEN2,R0
027352                          ENDIF
027352                                                                       $51127:


                                ;+
                                ; MAKE R1 POINT TO THE END OF THE DESTINATION IN DS.EXP; MAKE
                                ; R2 POINT TO THE END OF THE SOURCE IN THE TABLE OF TEST CASES.
                                ;-

027352                          LET R1 := DSLEN2
027352  013701  000514                                                              MOV     DSLEN2,R1
027356                          INLINE    <ASR R1>
027356  006201                                                                      ASR     R1
027360                          LET R1 := R1 + #DS.EXP
027360  062701  062536                                                              ADD     #DS.EXP,R1
027364                          LET R2 := DATA01 + DSLEN1 + #1
027364  013702  000562                                                              MOV     DATA01,R2
027370  063702  000512                                                              ADD     DSLEN1,R2
027374  005202                                                                      INC     R2


                                ;+
                                ; MOVE THE LEAST SIGNIFICANT BCD FROM THE SOURCE TO THE
                                ; EXPECTED DESTINATION BUFFER, IN PACKED FORMAT.
                                ;-

027376                          IF R0 GT #0 THEN
027376  005700                                                                      TST     R0
027400  003405                                                                      BLE     $51130
027402                            LET R3 :B= (R2)
027402  111203                                                                      MOVB    (R2),R3
027404                            INLINE    <ASH        #4,R3>
027404  072327  000004                                                              ASH     #4,R3
027410                            LET (R1) :B= (R1) SET.BY R3
027410  150311                                                                      BISB    R3,(R1)
027412                            LET R0 := R0 - #1                  ;DECREMENT COUNT
027412  005300                                                                      DEC     R0
027414                          ENDIF
```

```
027414                                                                  $51130:


                        ;+
                        ; MOVE THE REST OF THE SOURCE TO THE EXPECTED DESTINATION
                        ; BUFFER, IN PACKED FORMAT, USING R0 AS A COUNTER FOR THE NUMBER
                        ; OF CHARACTERS TO MOVE.
                        ;-

027414                  WHILE R0 GT #0 DO
027414                                                                  $51131:
027414  005700                                                                  TST     R0
027416  003417                                                                  BLE     $51132

027420                    LET R1 := R1 - #1           ;DECREMENT DEST. POINTER
027420  005301                                                                  DEC     R1
027422                    LET R2 := R2 - #1           ;DECREMENT SRC. POINTER
027422  005302                                                                  DEC     R2
027424                    LET (R1) :B= (R2) CLR.BY #360       ;PUT BCD INTO LOWER NIBBLE
027424  111211                                                                  MOVB    (R2),(R1)
027426  142711  000360                                                          BICB    #360,(R1)
027432                    LET R0 := R0 - #1           ;DECREMENT COUNT
027432  005300                                                                  DEC     R0
027434                    IF R0 HI #0 THEN
027434  005700                                                                  TST     R0
027436  101406                                                                  BLOS    $51133
027440                      LET R2 := R2 - #1         ;DECREMENT SRC. POINTER
027440  005302                                                                  DEC     R2
027442                      LET R3 :B= (R2)
027442  111203                                                                  MOVB    (R2),R3
027444                      INLINE    <ASH     #4,R3>
027444  072327  000004                                                          ASH     #4,R3
027450                      LET (R1) :B= (R1) SET.BY R3       ;PUT BCD INTO UPPER NIBBLE
027450  150311                                                                  BISB    R3,(R1)
027452                      LET R0 := R0 - #1         ;DECREMENT COUNT
027452  005300                                                                  DEC     R0
027454                    ENDIF
027454                                                                  $51133:
027454                  ENDDO
027454  000757                                                                  BR      $51131
027456                                                                  $51132:


                        ;+
                        ; SET UP R0-R5 AND R0.EXP-R5.EXP; THEN DO THE CVTNP INSTRUCTION.
                        ;-


027456                  LET R0 := DATA00                        ;SRC DATA TYPE AND LENGTH
027456  013700  000560                                                          MOV     DATA00,R0
027462                  LET R1 := #DSBUF1                       ;SRC ADDRESS
027462  012701  062370                                                          MOV     #DSBUF1,R1
027466                  LET R2 := DATA02                        ;DST DATA TYPE AND LENGTH
027466  013702  000564                                                          MOV     DATA02,R2
027472                  LET R3 := #DS.DST                       ;DST ADDRESS
027472  012703  062474                                                          MOV     #DS.DST,R3
```

```
027476                                  LET R4 := #0
027476  005004                                                  CLR     R4
027500                                  LET R5 := #-1
027500  012705  177777                                          MOV     #-1,R5
027504                                  LET R0.EXP := #0
027504  005037  000522                                          CLR     R0.EXP
027510                                  LET R1.EXP := #0
027510  005037  000524                                          CLR     R1.EXP
027514                                  LET R2.EXP := R2
027514  010237  000526                                          MOV     R2,R2.EXP
027520                                  LET R3.EXP := R3
027520  010337  000530                                          MOV     R3,R3.EXP
027524                                  LET R4.EXP := #0
027524  005037  000532                                          CLR     R4.EXP
027530                                  LET R5.EXP := #-1
027530  012737  177777  000534                                  MOV     #-1,R5.EXP
027536                                  INLINE  <CVTNP>
027536  076055                                                  CVTNP

                                        ;+
                                        ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                        ;-

027540                                  LET CC := PSW
027540  013737  177776  000516                                  MOV     PSW,CC
027546                                  LET CC := CC CLR.BY #177760
027546  042737  177760  000516                                  BIC     #177760,CC
027554                                  IF CC NE CC.EXP THEN
027554  023737  000516  000520                                  CMP     CC,CC.EXP
027562  001402                                                  BEQ     $51134
027564                                    CALL ERROR
027564  004737  056274                                          JSR     PC,ERROR
027570                                  ENDIF
027570                                                  $51134:
027570                                  IF R0 NE R0.EXP THEN
027570  020037  000522                                          CMP     R0,R0.EXP
027574  001402                                                  BEQ     $51135
027576                                    CALL ERROR
027576  004737  056274                                          JSR     PC,ERROR
027602                                  ENDIF
027602                                                  $51135:
027602                                  IF R1 NE R1.EXP THEN
027602  020137  000524                                          CMP     R1,R1.EXP
027606  001402                                                  BEQ     $51136
027610                                    CALL ERROR
027610  004737  056274                                          JSR     PC,ERROR
027614                                  ENDIF
027614                                                  $51136:
027614                                  IF R2 NE R2.EXP THEN
027614  020237  000526                                          CMP     R2,R2.EXP
027620  001402                                                  BEQ     $51137
027622                                    CALL ERROR
027622  004737  056274                                          JSR     PC,ERROR
027626                                  ENDIF
027626                                                  $51137:
027626                                  IF R3 NE R3.EXP THEN
```

```
027626  020337  000530                                                      CMP     R3,R3.EXP
027632  001402                                                              BEQ     $51140
027634                              CALL ERROR
027634  004737  056274                                                      JSR     PC,ERROR
027640                            ENDIF
027640                                                            $51140:
027640                            IF R4 NE R4.EXP THEN
027640  020437  000532                                                      CMP     R4,R4.EXP
027644  001402                                                              BEQ     $51141
027646                              CALL ERROR
027646  004737  056274                                                      JSR     PC,ERROR
027652                            ENDIF
027652                                                            $51141:
027652                            IF R5 NE R5.EXP THEN
027652  020537  000534                                                      CMP     R5,R5.EXP
027656  001402                                                              BEQ     $51142
027660                              CALL ERROR
027660  004737  056274                                                      JSR     PC,ERROR
027664                            ENDIF
027664                                                            $51142:

                                  ;COMPARE DS.DST WITH DS.EXP
027664                            LET ERRFLG := #0
027664  005037  000454                                                      CLR     ERRFLG
027670                            LET R0 := #DS.DST
027670  012700  062474                                                      MOV     #DS.DST,R0
027674                            LET R1 := #DS.EXP
027674  012701  062536                                                      MOV     #DS.EXP,R1
027700                            WHILE ERRFLG EQ #0 AND R0 LO #DS.DST+40 DO
027700                                                            $51143:
027700  005737  000454                                                      TST     ERRFLG
027704  001010                                                              BNE     $51144
027706  020027  062534                                                      CMP     R0,#DS.DST+40
027712  103005                                                              BHIS    $51144
027714                              IFB (R0)+ NE (R1)+ THEN
027714  122021                                                              CMPB    (R0)+,(R1)+
027716  001402                                                              BEQ     $51145
027720                                CALL ERROR
027720  004737  056274                                                      JSR     PC,ERROR
027724                              ENDIF
027724                                                            $51145:
027724                            ENDDO
027724  000765                                                              BR      $51143
027726                                                            $51144:
027726                            LET TSTCAS := TSTCAS + #6
027726  062737  000006  000542                                              ADD     #6,TSTCAS
027734                            LET COUNT := COUNT - #1
027734  005337  000466                                                      DEC     COUNT
                                ;UNTIL COUNT EQ #0
027740                          IF COUNT NE #0 THEN
027740  005737  000466                                                      TST     COUNT
027744  001402                                                              BEQ     $51146
027746                            INLINE  <JMP  $5055>
027746  000137  026456                                                      JMP  $5055
027752                          ENDIF
027752                                                            $51146:
```

```
                                      ;+
                                      ; DO ONE INLINE CASE - CVTNPI
 027752                               CALL CLRREG
 027752  004737  055330                                                          JSR     PC,CLRREG
 027756                               CALL CLRDSB
 027756  004737  055520                                                          JSR     PC,CLRDSB
 027762                               INLINE  <CVTNPI>
 027762  076155                                                                  CVTNPI
 027764                               INLINE  <.WORD  TCVNPI>
 027764  030344                                                                  .WORD   TCVNPI
 027766                               INLINE  <.WORD  TCVNPI+4>
 027766  030350                                                                  .WORD   TCVNPI+4
 027770                               LET CC := PSW
 027770  013737  177776  000516                                                  MOV     PSW,CC
 027776                               LET CC := CC CLR.BY #177760
 027776  042737  177760  000516                                                  BIC     #177760,CC
 030004                               IF CC NE #0 THEN
 030004  005737  000516                                                          TST     CC
 030010  001402                                                                  BEQ     $51147
 030012                                 CALL ERROR
 030012  004737  056274                                                          JSR     PC,ERROR
 030016                               ENDIF
 030016                                                                 $51147:
 030016                               IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
 030016  005700                                                                  TST     R0
 030020  001004                                                                  BNE     $51150
 030022  005701                                                                  TST     R1
 030024  001002                                                                  BNE     $51150
 030026  005702                                                                  TST     R2
 030030  001402                                                                  BEQ     $51151
 030032                                                                 $51150:
 030032                                 CALL ERROR
 030032  004737  056274                                                          JSR     PC,ERROR
 030036                               ENDIF
 030036                                                                 $51151:
 030036                               IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
 030036  005703                                                                  TST     R3
 030040  001004                                                                  BNE     $51152
 030042  005704                                                                  TST     R4
 030044  001002                                                                  BNE     $51152
 030046  005705                                                                  TST     R5
 030050  001402                                                                  BEQ     $51153
 030052                                                                 $51152:
 030052                                 CALL ERROR
 030052  004737  056274                                                          JSR     PC,ERROR
 030056                               ENDIF
 030056                                                                 $51153:
 030056                               IFB DS.DST NE #124 THEN
 030056  123727  062474  000124                                                  CMPB    DS.DST,#124
 030064  001402                                                                  BEQ     $51154
 030066                                 CALL ERROR
 030066  004737  056274                                                          JSR     PC,ERROR
 030072                               ENDIF
```

```
030072                                                                   $51154:
030072                          IFB DS.DST+1 NE #62 THEN
030072  123727  062475  000062                                                   CMPB    DS.DST+1,#62
030100  001402                                                                   BEQ     $51155
030102                            CALL ERROR
030102  004737  056274                                                           JSR     PC,ERROR
030106                          ENDIF
030106                                                                   $51155:
030106                          IFB DS.DST+2 NE #37 THEN
030106  123727  062476  000037                                                   CMPB    DS.DST+2,#37
030114  001402                                                                   BEQ     $51156
030116                            CALL ERROR
030116  004737  056274                                                           JSR     PC,ERROR
030122                          ENDIF
030122                                                                   $51156:
030122                          INLINE  <JMP  CIS5END>
030122  000137  031700                                                           JMP  CIS5END



                                ;+
                                ; TABLE OF TEST CASES FOR CVTNP
                                ;-

030126  000010                  TCVTNP: .WORD   8.              ;# OF TEST CASES FOR CVTNP

030130  000000                          .WORD   0                       ;SRC DATA TYPE AND LENGTH
030132  030216                          .WORD   CVTNP1                  ;POINTER TO INTERMEDIATE SRC STRING
030134  060000                          .WORD   60000                   ;DST DATA TYPE AND LENGTH

030136  050000                          .WORD   50000           ;TEST CASE NUMBER 2
030140  030222                          .WORD   CVTNP2
030142  060000                          .WORD   60000

030144  030000                          .WORD   30000           ;TEST CASE NUMBER 3
030146  030226                          .WORD   CVTNP3
030150  060037                          .WORD   60037

030152  020023                          .WORD   20023           ;TEST CASE NUMBER 4
030154  030232                          .WORD   CVTNP4
030156  060000                          .WORD   60000

030160  040010                          .WORD   40010           ;TEST CASE NUMBER 5
030162  030260                          .WORD   CVTNP5
030164  060020                          .WORD   60020

030166  010011                          .WORD   10011           ;TEST CASE NUMBER 6
030170  030272                          .WORD   CVTNP6
030172  060006                          .WORD   60006

030174  000017                          .WORD   17              ;TEST CASE NUMBER 7
030176  030306                          .WORD   CVTNP7
030200  060017                          .WORD   60017

030202  000006                          .WORD   6               ;TEST CASE NUMBER 8
030204  030330                          .WORD   CVTNP8
```

```
030206  070006                                .WORD   70006

030210  050000                                .WORD   50000               ;TEST CASE NUMBER 9
030212  030340                                .WORD   CVTNP9
030214  060002                                .WORD   60002


030216  000000                       CVTNP1:  .WORD   0                            ;SIGN WORD: 0 = +, -1 = -
030220     000                                .BYTE                                ;MAGNITUDE, ONE BCD PER BYTE
        030222                                .EVEN

030222  177777                       CVTNP2:  .WORD   -1                  ;INTERMEDIATE SRC STRING 2
030224     000                                .BYTE
        030226                                .EVEN

030226  177777                       CVTNP3:  .WORD   -1                  ;INTERMEDIATE SRC STRING 3
030230     000                                .BYTE
        030232                                .EVEN

030232  177777                       CVTNP4:  .WORD   -1                  ;INTERMEDIATE SRC STRING 4
030234     011      010      007              .BYTE   011,010,007,006,005,004,003,002,001,000,001,002,003,004,005,006
030237     006      005      004
030242     003      002      001
030245     000      001      002
030250     003      004      005
030253     006
030254     007      010      011              .BYTE   007,010,011
        030260                                .EVEN

030260  000000                       CVTNP5:  .WORD   0                   ;INTERMEDIATE SRC STRING 5
030262     007      000      006              .BYTE   007,000,006,001,005,002,004,003
030265     001      005      002
030270     004      003
                                              .EVEN

030272  177777                       CVTNP6:  .WORD   -1                  ;INTERMEDIATE SRC STRING 6
030274     001      003      005              .BYTE   001,003,005,007,011,002,004,006,010
030277     007      011      002
030302     004      006      010
        030306                                .EVEN

030306  177777                       CVTNP7:  .WORD   -1                  ;INTERMEDIATE SRC STRING 7
030310     005      005      007              .BYTE   005,005,007,003,010,002,001,011,004,007,006,000,000,007,001
030313     003      010      002
030316     001      011      004
030321     007      006      000
030324     000      007      001
        030330                                .EVEN

030330  177777                       CVTNP8:  .WORD   -1                  ;INTERMEDIATE SRC STRING 8
030332     007      005      003              .BYTE   007,005,003,001,004,002
030335     001      004      002
                                              .EVEN

030340  000000                       CVTNP9:  .WORD   0                   ;INTERMEDIATE SRC STRING 9
030342     007      002                       .BYTE   007,002
```

```
                                         .EVEN



      030344                     TCVNPI:                            ;INLINE TEST CASE
      030344  000005                     .WORD   000005                     ;SIGNED ZONED, LENGTH = 5
      030346  030354                     .WORD   NP1                        ;POINTER TO SRC
      030350  070005                     .WORD   070005                     ;UNSIGNED PACKED, LENGTH = 5
      030352  062474                     .WORD   DS.DST                     ;POINTER TO DST

      030354     005     004     003 NP1:  .BYTE   5,4,3,2,161                ;-54321
      030357     002     161
              030362                     .EVEN
```

```
                                        ;;*************************************************************
                                        .SBTTL  CONVERT LONG INTEGER TO INTERMEDIATE FORM ROUTINE
                                        ;;*************************************************************
                                        ;* THIS ROUTINE CONVERTS A LONG INTEGER INTO
                                        ;* AN INTERMEDIATE FORM.
                                        ;* THE INPUT IS THE 31 BIT LONG INTEGER (PLUS THE
                                        ;* SIGN BIT) IN REGISTERS R2 AND R3:
                                        ;*
                                        ;*
                                        ;*          R2   ! SIGN !              HIGH                    !
                                        ;*               --------------------------------------------------
                                        ;*
                                        ;*
                                        ;*          R3   !                     LOW                     !
                                        ;*               --------------------------------------------------
                                        ;*
                                        ;*
                                        ;* THE OUTPUT IS:
                                        ;* SIGN0 SET TO SIGN OF THE LONG INTEGER
                                        ;* (0 FOR +, 177777 FOR -); AND 10 BINARY
                                        ;* CODED DECIMAL (BCD) DIGITS PUT INTO MEMORY,
                                        ;* ONE DIGIT PER BYTE, STARTING AT DSBUF1,
                                        ;* MOST SIGNIFICANT DIGIT FIRST.  DSLEN1 WILL
                                        ;* HAVE THE LENGTH (EXCLUDING LEADING ZEROES).
                                        ;* THE GENERAL PURPOSE REGISTERS ARE SAVED
                                        ;* AT THE BEGINNING OF THE ROUTINE AND RESTORED
                                        ;* AT THE END.
                                        ;* DSBUF1 DECIMAL STRING BUFFER SHOULD BE CLEAR BEFORE
                                        ;* ENTERING THIS ROUTINE.

030362                                  ROUTINE CVTLI
030362                                                                         CVTLI:

                                        ;+
                                        ; ROUTINE INITIALIZATION
                                        ;-

030362                                  CALL SAVREG                     ;SAVE THE GPR'S
030362  004737  055562                                                              JSR     PC,SAVREG
030366                                  LET SIGN0 := #0
030366  005037  000446                                                              CLR     SIGN0
030372                                  LET DSLEN1 := #0
030372  005037  000512                                                              CLR     DSLEN1

                                        ;+
                                        ; TEST FOR SPECIAL CASES OF 0 VALUE OR MOST NEGATIVE VALUE
                                        ;-

030376                                  INLINE <TST    R2>
030376  005702                                                                      TST   R2
030400                                  IFCOND MI THEN
030400  100003                                                                      BPL     $51161
030402                                      LET SIGN0 := #-1
030402  012737  177777  000446                                                      MOV     #-1,SIGN0
030410                                  ENDIF
030410                                                                         $51161:
```

```
030410                          LET TEMPO := R2 CLR.BY #100000
030410  010237  000474                                                          MOV     R2,TEMPO
030414  042737  100000  000474                                                  BIC     #100000,TEMPO
030422                          IF R3 EQ #0 AND TEMPO EQ #0 THEN
030422  005703                                                                  TST     R3
030424  001044                                                                  BNE     $51162
030426  005737  000474                                                          TST     TEMPO
030432  001041                                                                  BNE     $51162
030434                              IF SIGNO EQ #0 THEN
030434  005737  000446                                                          TST     SIGNO
030440  001003                                                                  BNE     $51163

                                        ;RETURN
030442                                  INLINE    <JMP  XCVTLI>
030442  000137  031264                                                          JMP  XCVTLI
030446                              ELSE                    ;RESULT = -2,147,483,648
030446  000433                                                                  BR      $51164
030450                                                               $51163:
030450                                  LET R0 := #DSBUF1
030450  012700  062370                                                          MOV     #DSBUF1,R0
030454                                  LET (R0)+ :B= #2
030454  112720  000002                                                          MOVB    #2,(R0)+
030460                                  LET (R0)+ :B= #1
030460  112720  000001                                                          MOVB    #1,(R0)+
030464                                  LET (R0)+ :B= #4
030464  112720  000004                                                          MOVB    #4,(R0)+
030470                                  LET (R0)+ :B= #7
030470  112720  000007                                                          MOVB    #7,(R0)+
030474                                  LET (R0)+ :B= #4
030474  112720  000004                                                          MOVB    #4,(R0)+
030500                                  LET (R0)+ :B= #8.
030500  112720  000010                                                          MOVB    #8.,(R0)+
030504                                  LET (R0)+ :B= #3
030504  112720  000003                                                          MOVB    #3,(R0)+
030510                                  LET (R0)+ :B= #6
030510  112720  000006                                                          MOVB    #6,(R0)+
030514                                  LET (R0)+ :B= #4
030514  112720  000004                                                          MOVB    #4,(R0)+
030520                                  LET (R0)+ :B= #8.
030520  112720  000010                                                          MOVB    #8.,(R0)+
030524                                  LET DSLEN1 := #10.
030524  012737  000012  000512                                                  MOV     #10.,DSLEN1

                                        ;RETURN
030532                                  INLINE    <JMP  XCVTLI>
030532  000137  031264                                                          JMP  XCVTLI
030536                              ENDIF
030536                                                               $51164:
030536                          ENDIF
030536                                                               $51162:


                                ;+
                                ; LONG INTEGER SOURCE WAS NOT ZERO OR MOST NEGATIVE NUMBER,
                                ; SO PREPARE FOR CONVERSION ALGORITHM.
                                ;-

030536                          IF SIGNO EQ #-1 THEN
030536  023727  000446  177777                                                  CMP     SIGNO,#-1
```

```
030544  001005                                                          BNE     $51165
030546                            LET R3 := NEGATE R3
030546  005403                                                          NEG     R3
030550                            LET R2 := COMP R2
030550  005102                                                          COM     R2
030552                            IF R3 EQ #0 THEN
030552  005703                                                          TST     R3
030554  001001                                                          BNE     $51166
030556                                 LET R2 := R2 + #1
030556  005202                                                          INC     R2
030560                            ENDIF
030560                                                          $51166:
030560                       ENDIF
030560                                                          $51165:
030560                       LET R0 := #DSBUF1
030560  012700  062370                                                  MOV     #DSBUF1,R0

                       ;+
                       ; GET TENTH BCD DIGIT (MOST SIGNIFICANT DIGIT)
                       ;-

030564                       WHILE R2 HI #35632 DO
030564                                                          $51167:
030564  020227  035632                                                  CMP     R2,#35632
030570  101407                                                          BLOS    $51170
030572                            LET R3 := R3 - #145000
030572  162703  145000                                                  SUB     #145000,R3
030576                            INLINE <SBC R2>
030576  005602                                                          SBC R2
030600                            LET R2 := R2 - #35632
030600  162702  035632                                                  SUB     #35632,R2
030604                            LET (R0) :B= (R0) + #1
030604  105210                                                          INCB    (R0)
030606                       ENDDO
030606  000766                                                          BR      $51167
030610                                                          $51170:
030610                       IF R2 EQ #35632 AND R3 HIS #145000 THEN
030610  020227  035632                                                  CMP     R2,#35632
030614  001007                                                          BNE     $51171
030616  020327  145000                                                  CMP     R3,#145000
030622  103404                                                          BLO     $51171
030624                            LET R3 := R3 - #145000
030624  162703  145000                                                  SUB     #145000,R3
030630                            LET R2 := #0
030630  005002                                                          CLR     R2
030632                            LET (R0) :B= (R0) + #1
030632  105210                                                          INCB    (R0)
030634                       ENDIF
030634                                                          $51171:

                       ;+
                       ; GET NINTH BCD DIGIT
                       ;-

030634                       LET R0 := R0 + #1
030634  005200                                                          INC     R0
```

```
030636                         WHILE R2 HI #2765 DO
030636                                                                  $51172:
030636  020227  002765                                                          CMP     R2,#2765
030642  101407                                                                  BLOS    $51173
030644                             LET R3 := R3 - #160400
030644  162703  160400                                                          SUB     #160400,R3
030650                             INLINE <SBC R2>
030650  005602                                                                  SBC R2
030652                             LET R2 := R2 - #2765
030652  162702  002765                                                          SUB     #2765,R2
030656                             LET (R0) :B= (R0) + #1
030656  105210                                                                  INCB    (R0)
030660                         ENDDO
030660  000766                                                                  BR      $51172
030662                                                                  $51173:
030662                         IF R2 EQ #2765 AND R3 HIS #160400 THEN
030662  020227  002765                                                          CMP     R2,#2765
030666  001007                                                                  BNE     $51174
030670  020327  160400                                                          CMP     R3,#160400
030674  103404                                                                  BLO     $51174
030676                             LET R3 := R3 - #160400
030676  162703  160400                                                          SUB     #160400,R3
030702                             LET R2 := #0
030702  005002                                                                  CLR     R2
030704                             LET (R0) :B= (R0) + #1
030704  105210                                                                  INCB    (R0)
030706                         ENDIF
030706                                                                  $51174:

                               ;+
                               ;    GET EIGHTH BCD DIGIT
                               ;-

030706                         LET R0 := R0 + #1
030706  005200                                                                  INC     R0
030710                         WHILE R2 HI #230 DO
030710                                                                  $51175:
030710  020227  000230                                                          CMP     R2,#230
030714  101407                                                                  BLOS    $51176
030716                             LET R3 := R3 - #113200
030716  162703  113200                                                          SUB     #113200,R3
030722                             INLINE <SBC R2>
030722  005602                                                                  SBC R2
030724                             LET R2 := R2 - #230
030724  162702  000230                                                          SUB     #230,R2
030730                             LET (R0) :B= (R0) + #1
030730  105210                                                                  INCB    (R0)
030732                         ENDDO
030732  000766                                                                  BR      $51175
030734                                                                  $51176:
030734                         IF R2 EQ #230 AND R3 HIS #113200 THEN
030734  020227  000230                                                          CMP     R2,#230
030740  001007                                                                  BNE     $51177
030742  020327  113200                                                          CMP     R3,#113200
030746  103404                                                                  BLO     $51177
030750                             LET R3 := R3 - #113200
```

```
030750 162703 113200                                          SUB     #113200,R3
030754                          LET R2 := #0
030754 005002                                                 CLR     R2
030756                          LET (R0) :B= (R0) + #1
030756 105210                                                 INCB    (R0)
030760                      ENDIF
030760                                                $51177:

                            ;+
                            ;   GET SEVENTH BCD DIGIT
                            ;-

030760                      LET R0 := R0 + #1
030760 005200                                                 INC     R0
030762                      WHILE R2 HI #17 DO
030762                                                $51200:
030762 020227 000017                                          CMP     R2,#17
030766 101407                                                 BLOS    $51201
030770                          LET R3 := R3 - #41100
030770 162703 041100                                          SUB     #41100,R3
030774                          INLINE <SBC R2>
030774 005602                                                 SBC R2
030776                          LET R2 := R2 - #17
030776 162702 000017                                          SUB     #17,R2
031002                          LET (R0) :B= (R0) + #1
031002 105210                                                 INCB    (R0)
031004                      ENDDO
031004 000766                                                 BR      $51200
031006                                                $51201:
031006                      IF R2 EQ #17 AND R3 HIS #41100 THEN
031006 020227 000017                                          CMP     R2,#17
031012 001007                                                 BNE     $51202
031014 020327 041100                                          CMP     R3,#41100
031020 103404                                                 BLO     $51202
031022                          LET R3 := R3 - #41100
031022 162703 041100                                          SUB     #41100,R3
031026                          LET R2 := #0
031026 005002                                                 CLR     R2
031030                          LET (R0) :B= (R0) + #1
031030 105210                                                 INCB    (R0)
031032                      ENDIF
031032                                                $51202:

                            ;+
                            ;   GET SIXTH BCD DIGIT
                            ;-

031032                      LET R0 := R0 + #1
031032 005200                                                 INC     R0
031034                      WHILE R2 HI #1 DO
031034                                                $51203:
031034 020227 000001                                          CMP     R2,#1
031040 101406                                                 BLOS    $51204
031042                          LET R3 := R3 - #103240
031042 162703 103240                                          SUB     #103240,R3
031046                          INLINE <SBC R2>
```

```
031046  005602                                                          SBC R2
031050                        LET R2 := R2 - #1
031050  005302                                                          DEC     R2
031052                        LET (R0) :B= (R0) + #1
031052  105210                                                          INCB    (R0)
031054                    ENDDO
031054  000767                                                          BR      $51203
031056                                                          $51204:
031056                    IF R2 EQ #1 AND R3 HIS #103240 THEN
031056  020227  000001                                                  CMP     R2,#1
031062  001007                                                          BNE     $51205
031064  020327  103240                                                  CMP     R3,#103240
031070  103404                                                          BLO     $51205
031072                        LET R3 := R3 - #103240
031072  162703  103240                                                  SUB     #103240,R3
031076                        LET R2 := #0
031076  005002                                                          CLR     R2
031100                        LET (R0) :B= (R0) + #1
031100  105210                                                          INCB    (R0)
031102                    ENDIF
031102                                                          $51205:

                          ;+
                          ;      GET FIFTH BCD DIGIT
                          ;-

031102                    LET R0 := R0 + #1
031102  005200                                                          INC     R0
031104                    WHILE R2 EQ #1 DO
031104                                                          $51206:
031104  020227  000001                                                  CMP     R2,#1
031110  001005                                                          BNE     $51207
031112                        LET R3 := R3 - #23420
031112  162703  023420                                                  SUB     #23420,R3
031116                        INLINE <SBC R2>
031116  005602                                                          SBC R2
031120                        LET (R0) :B= (R0) + #1
031120  105210                                                          INCB    (R0)
031122                    ENDDO
031122  000770                                                          BR      $51206
031124                                                          $51207:
031124                    WHILE R3 HIS #23420 DO
031124                                                          $51210:
031124  020327  023420                                                  CMP     R3,#23420
031130  103404                                                          BLO     $51211
031132                        LET R3 := R3 - #23420
031132  162703  023420                                                  SUB     #23420,R3
031136                        LET (R0) :B= (R0) + #1
031136  105210                                                          INCB    (R0)
031140                    ENDDO
031140  000771                                                          BR      $51210
031142                                                          $51211:

                          ;+
                          ;      GET FOURTH BCD DIGIT
                          ;-
```

```

031142                          LET R0 := R0 + #1
031142  005200                                                          INC     R0
031144                          WHILE R3 HIS #1750 DO
031144                                                          $51212:
031144  020327  001750                                                  CMP     R3,#1750
031150  103404                                                          BLO     $51213
031152                              LET R3 := R3 - #1750
031152  162703  001750                                                  SUB     #1750,R3
031156                              LET (R0) :B= (R0) + #1
031156  105210                                                          INCB    (R0)
031160                          ENDDO
031160  000771                                                          BR      $51212
031162                                                          $51213:

                                ;+
                                ;   GET THIRD BCD DIGIT
                                ;-

031162                          LET R0 := R0 + #1
031162  005200                                                          INC     R0
031164                          WHILE R3 HIS #144 DO
031164                                                          $51214:
031164  020327  000144                                                  CMP     R3,#144
031170  103404                                                          BLO     $51215
031172                              LET R3 := R3 - #144
031172  162703  000144                                                  SUB     #144,R3
031176                              LET (R0) :B= (R0) + #1
031176  105210                                                          INCB    (R0)
031200                          ENDDO
031200  000771                                                          BR      $51214
031202                                                          $51215:

                                ;+
                                ;    GET SECOND AND FIRST BCD DIGITS
                                ;-

031202                          LET R0 := R0 + #1
031202  005200                                                          INC     R0
031204                          WHILE R3 HIS #12 DO
031204                                                          $51216:
031204  020327  000012                                                  CMP     R3,#12
031210  103404                                                          BLO     $51217
031212                              LET R3 := R3 - #12
031212  162703  000012                                                  SUB     #12,R3
031216                              LET (R0) :B= (R0) + #1
031216  105210                                                          INCB    (R0)
031220                          ENDDO
031220  000771                                                          BR      $51216
031222                                                          $51217:
031222                          LET R0 := R0 + #1
031222  005200                                                          INC     R0
031224                          LET (R0) :B= R3
031224  110310                                                          MOVB    R3,(R0)

                                ;+
```

```
                                ; DETERMINE THE NUMBER OF SIGNIFICANT DIGITS.
                                ;-

031226                          LET R0 := #DSBUF1
031226  012700  062370                                                          MOV     #DSBUF1,R0
031232                          WHILEB (R0) EQ #0 DO
031232                                                               $51220:
031232  105710                                                                  TSTB    (R0)
031234  001002                                                                  BNE     $51221
031236                              LET R0 := R0 + #1
031236  005200                                                                  INC     R0
031240                          ENDDO
031240  000774                                                                  BR      $51220
031242                                                               $51221:
031242                          LET R0 := R0 - #DSBUF1           ;# OF LEADING 0'S
031242  162700  062370                                                          SUB     #DSBUF1,R0
031246                          LET DSLEN1 := #10. - R0          ;# OF MOST SIGNIFICANT DIGITS
031246  012737  000012  000512                                                  MOV     #10.,DSLEN1
031254  160037  000512                                                          SUB     R0,DSLEN1
031260                          CALL RESREG                      ;RESTORE THE GPR'S
031260  004737  055614                                                          JSR     PC,RESREG
031264                          INLINE   <XCVTLI:>
031264                                                                          XCVTLI:
031264                          ENDRTN
031264                                                               $51157:
031264                                                               $51160:
031264  000207                                                                  RTS     PC


                                ;;**********************************************************************
                                .SBTTL  CONVERT INTERMEDIATE FORM TO LONG INTEGER ROUTINE
                                ;;**********************************************************************
                                ;* THIS ROUTINE CONVERTS A 10 BCD DIGIT INTERMEDIATE FORM INTO
                                ;* LONG INTEGER FORMAT.  THE INPUT IS 10 BCD DIGITS IN THE 10 BYTES STARTING
                                ;* AT DSBUF1, MOST SIGNIFICANT DIGIT FIRST; AND SIGN0.
                                ;* THE OUTPUT IS A TWO'S COMPLEMENT 31 BIT BINARY LONG INTEGER IN LOCATIONS
                                ;* R2.EXP AND R3.EXP.
                                ;* THIS ROUTINE ASSUMES THAT THE 10 BCD DIGIT NUMBER IS SMALL ENOUGH
                                ;* TO BE REPRESENTED AS A 31 BIT BINARY INTEGER.

031266                          ROUTINE CVTIL
031266                                                               CVTIL:

                                ;+
                                ; ROUTINE INITIALIZATION
                                ;-

031266                          CALL SAVREG                      ;SAVE THE GPR'S
031266  004737  055562                                                          JSR     PC,SAVREG
031272                          LET R2.EXP := #0
031272  005037  000526                                                          CLR     R2.EXP
031276                          LET R3.EXP := #0
031276  005037  000530                                                          CLR     R3.EXP
031302                          LET R0 := #DSBUF1
031302  012700  062370                                                          MOV     #DSBUF1,R0
```

```
                                   ;+
                                   ;+
                                   ; ADD IN BINARY EQUIVALENT OF TENTH BCD DIGIT
                                   ;-

031306                             WHILEB (R0) GT #0 DO
031306                                                                   $51224:
031306  105710                                                                   TSTB    (R0)
031310  003412                                                                   BLE     $51225
031312                                 LET R3.EXP := R3.EXP + #145000
031312  062737  145000  000530                                                   ADD     #145000,R3.EXP
031320                                 INLINE   <ADC  R2.EXP>
031320  005537  000526                                                           ADC  R2.EXP
031324                                 LET R2.EXP := R2.EXP + #35632
031324  062737  035632  000526                                                   ADD     #35632,R2.EXP
031332                                 LET (R0) :B= (R0) - #1
031332  105310                                                                   DECB    (R0)
031334                             ENDDO
031334  000764                                                                   BR      $51224
031336                                                                   $51225:


                                   ;+
                                   ; ADD IN BINARY EQUIVALENT OF NINTH BCD DIGIT
                                   ;-

031336                             LET R0 := R0 + #1
031336  005200                                                                   INC     R0
031340                             WHILEB (R0) GT #0 DO
031340                                                                   $51226:
031340  105710                                                                   TSTB    (R0)
031342  003412                                                                   BLE     $51227
031344                                 LET R3.EXP := R3.EXP + #160400
031344  062737  160400  000530                                                   ADD     #160400,R3.EXP
031352                                 INLINE   <ADC  R2.EXP>
031352  005537  000526                                                           ADC  R2.EXP
031356                                 LET R2.EXP := R2.EXP + #2765
031356  062737  002765  000526                                                   ADD     #2765,R2.EXP
031364                                 LET (R0) :B= (R0) - #1
031364  105310                                                                   DECB    (R0)
031366                             ENDDO
031366  000764                                                                   BR      $51226
031370                                                                   $51227:


                                   ;+
                                   ; ADD IN BINARY EQUIVALENT OF EIGHTH BCD DIGIT
                                   ;-

031370                             LET R0 := R0 + #1
031370  005200                                                                   INC     R0
031372                             WHILEB (R0) GT #0 DO
031372                                                                   $51230:
031372  105710                                                                   TSTB    (R0)
031374  003412                                                                   BLE     $51231
031376                                 LET R3.EXP := R3.EXP + #113200
031376  062737  113200  000530                                                   ADD     #113200,R3.EXP
031404                                 INLINE   <ADC  R2.EXP>
```

```
031404 005537 000526                                                     ADC   R2.EXP
031410                                LET R2.EXP := R2.EXP + #230
031410 062737 000230 000526                                              ADD   #230,R2.EXP
031416                                LET (R0) :B= (R0) - #1
031416 105310                                                            DECB  (R0)
031420                        ENDDO
031420 000764                                                            BR    $51230
031422                                                           $51231:

                              ;+
                              ; ADD IN BINARY EQUIVALENT OF SEVENTH BCD DIGIT
                              ;-

031422                        LET R0 := R0 + #1
031422 005200                                                            INC   R0
031424                        WHILEB (R0) GT #0 DO
031424                                                           $51232:
031424 105710                                                            TSTB  (R0)
031426 003412                                                            BLE   $51233
031430                                LET R3.EXP := R3.EXP + #41100
031430 062737 041100 000530                                              ADD   #41100,R3.EXP
031436                                INLINE   <ADC  R2.EXP>
031436 005537 000526                                                     ADC   R2.EXP
031442                                LET R2.EXP := R2.EXP + #17
031442 062737 000017 000526                                              ADD   #17,R2.EXP
031450                                LET (R0) :B= (R0) - #1
031450 105310                                                            DECB  (R0)
031452                        ENDDO
031452 000764                                                            BR    $51232
031454                                                           $51233:

                              ;+
                              ; ADD IN BINARY EQUIVALENT OF SIXTH BCD DIGIT
                              ;-

031454                        LET R0 := R0 + #1
031454 005200                                                            INC   R0
031456                        WHILEB (R0) GT #0 DO
031456                                                           $51234:
031456 105710                                                            TSTB  (R0)
031460 003411                                                            BLE   $51235
031462                                LET R3.EXP := R3.EXP + #103240
031462 062737 103240 000530                                              ADD   #103240,R3.EXP
031470                                INLINE   <ADC  R2.EXP>
031470 005537 000526                                                     ADC   R2.EXP
031474                                LET R2.EXP := R2.EXP + #1
031474 005237 000526                                                     INC   R2.EXP
031500                                LET (R0) :B= (R0) - #1
031500 105310                                                            DECB  (R0)
031502                        ENDDO
031502 000765                                                            BR    $51234
031504                                                           $51235:

                              ;+
                              ; ADD IN BINARY EQUIVALENT OF FIFTH BCD DIGIT
                              ;-
```

```
031504                          LET R0 := R0 + #1
031504  005200                                                                    INC     R0
031506                          WHILEB (R0) GT #0 DO
031506                                                                  $51236:
031506  105710                                                                    TSTB    (R0)
031510  003407                                                                    BLE     $51237
031512                              LET R3.EXP := R3.EXP + #23420
031512  062737  023420  000530                                                    ADD     #23420,R3.EXP
031520                              INLINE   <ADC  R2.EXP>
031520  005537  000526                                                            ADC  R2.EXP
031524                              LET (R0) :B= (R0) - #1
031524  105310                                                                    DECB    (R0)
031526                          ENDDO
031526  000767                                                                    BR      $51236
031530                                                                  $51237:

                                ;+
                                ; ADD IN BINARY EQUIVALENT OF FOURTH BCD DIGIT
                                ;-

031530                          LET R0 := R0 + #1
031530  005200                                                                    INC     R0
031532                          WHILEB (R0) GT #0 DO
031532                                                                  $51240:
031532  105710                                                                    TSTB    (R0)
031534  003407                                                                    BLE     $51241
031536                              LET R3.EXP := R3.EXP + #1750
031536  062737  001750  000530                                                    ADD     #1750,R3.EXP
031544                              INLINE   <ADC  R2.EXP>
031544  005537  000526                                                            ADC  R2.EXP
031550                              LET (R0) :B= (R0) - #1
031550  105310                                                                    DECB    (R0)
031552                          ENDDO
031552  000767                                                                    BR      $51240
031554                                                                  $51241:

                                ;+
                                ; ADD IN BINARY EQUIVALENT OF THIRD BCD DIGIT
                                ;-

031554                          LET R0 := R0 + #1
031554  005200                                                                    INC     R0
031556                          WHILEB (R0) GT #0 DO
031556                                                                  $51242:
031556  105710                                                                    TSTB    (R0)
031560  003407                                                                    BLE     $51243
031562                              LET R3.EXP := R3.EXP + #144
031562  062737  000144  000530                                                    ADD     #144,R3.EXP
031570                              INLINE   <ADC  R2.EXP>
031570  005537  000526                                                            ADC  R2.EXP
031574                              LET (R0) :B= (R0) - #1
031574  105310                                                                    DECB    (R0)
031576                          ENDDO
031576  000767                                                                    BR      $51242
031600                                                                  $51243:
```

```

                                          ;+
                                          ; ADD IN BINARY EQUIVALENT OF SECOND BCD DIGIT
                                          ;-

031600                                    LET R0 := R0 + #1
031600  005200                                                                         INC     R0
031602                                    WHILEB (R0) GT #0 DO
031602                                                                        $51244:
031602  105710                                                                         TSTB    (R0)
031604  003407                                                                         BLE     $51245
031606                                        LET R3.EXP := R3.EXP + #12
031606  062737  000012  000530                                                         ADD     #12,R3.EXP
031614                                        INLINE   <ADC  R2.EXP>
031614  005537  000526                                                                 ADC  R2.EXP
031620                                        LET (R0) :B= (R0) - #1
031620  105310                                                                         DECB    (R0)
031622                                    ENDDO
031622  000767                                                                         BR      $51244
031624                                                                        $51245:

                                          ;+
                                          ; ADD IN FIRST DIGIT
                                          ;-

031624                                    LET R0 := R0 + #1
031624  005200                                                                         INC     R0
031626                                    INLINE  <SWAB   (R0)>
031626  000310                                                                         SWAB    (R0)
031630                                    LET R3.EXP := R3.EXP + (R0)
031630  061037  000530                                                                 ADD     (R0),R3.EXP
031634                                    INLINE   <ADC  R2.EXP>
031634  005537  000526                                                                 ADC  R2.EXP
031640                                    IF SIGN0 EQ #-1 THEN
031640  023727  000446  177777                                                         CMP     SIGN0,#-1
031646  001011                                                                         BNE     $51246
031650                                        LET R3.EXP := NEGATE R3.EXP
031650  005437  000530                                                                 NEG     R3.EXP
031654                                        LET R2.EXP := COMP R2.EXP
031654  005137  000526                                                                 COM     R2.EXP
031660                                        IF R3.EXP EQ #0 THEN
031660  005737  000530                                                                 TST     R3.EXP
031664  001002                                                                         BNE     $51247
031666                                            LET R2.EXP := R2.EXP + #1
031666  005237  000526                                                                 INC     R2.EXP
031672                                        ENDIF
031672                                                                        $51247:
031672                                    ENDIF
031672                                                                        $51246:
031672                                    CALL RESREG                 ;RESTORE GPR'S
031672  004737  055614                                                                 JSR     PC,RESREG
031676                                    ENDRTN
031676                                                                        $51222:
031676                                                                        $51223:
031676  000207                                                                         RTS     PC

```

```
031700                  INLINE  <CIS5END:>
031700                                                      CIS5END:
```

```
                                    ;*******************************************************************
                                    ;*******************************************************************
                                    ;++
                                    ;               C I S 6     M O D U L E
                                    ;
                                    ;  THIS MODULE TESTS THE NUMERIC DATA TYPE ARITHMETIC
                                    ;  INSTRUCTIONS: ADDN, SUBN, CMPN, AND ASHN.
                                    ;--
                                    ;*******************************************************************
                                    ;*******************************************************************
                                    .SBTTL  CIS6 INITIALIZATION
                                    ;*******************************************************************
                                    ;
                                    ;  CIS6 INITIALIZATION
                                    ;
                                    ;*******************************************************************
                                    ;IF SWR<5:0> ARE CLEARED OR IF SWR<2> IS SET THEN EXECUTE
                                    ;  THE CIS6 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.
031700                              INLINE   <SCOPE>
031700  000004                                                                      SCOPE
031702                              LET TEMPO := @SWR CLR.BY #177700
031702  017737  146520  000474                                                      MOV     @SWR,TEMPO
031710  042737  177700  000474                                                      BIC     #177700,TEMPO
031716                              IF TEMPO NE #0 THEN
031716  005737  000474                                                              TST     TEMPO
031722  001406                                                                      BEQ     $51250
031724                                IF #BIT2 NOTSETIN TEMPO THEN
031724  032737  000004  000474                                                      BIT     #BIT2,TEMPO
031732  001002                                                                      BNE     $51251
031734                                  INLINE   <JMP   CIS6END>
031734  000137  044432                                                              JMP   CIS6END
031740                                ENDIF
031740                                                                      $51251:
031740                              ENDIF
031740                                                                      $51250:
031740                              LET CTL := #6            ;CONTROL CHIP NUMBER
031740  012737  000006  000544                                                      MOV     #6,CTL
031746                              LET ERRFLG := #0         ;INITIALIZE ERROR FLAG
031746  005037  000454                                                              CLR     ERRFLG
031752                              LET PSW := #340
031752  012737  000340  177776                                                      MOV     #340,PSW
031760                              LET ERR := #1
031760  012737  000001  000550                                                      MOV     #1,ERR
```

```
                                         .SBTTL  ADDN
                                         ;*************************************************************
                                         ;
                                         ;       ADDN TEST
                                         ;
                                         ;*************************************************************

031766                                   INLINE <XADDN:>
031766                                                                                     XADDN:
031766                                   INLINE <SCOPE>
031766  000004                                                                             SCOPE
031770                                   LET $TIMES := #10            ;ITERATION COUNT
031770  012737  000010  000404                                                             MOV     #10,$TIMES
031776                                   LET COUNT := TADD            ;# OF TEST CASES
031776  013737  063200  000466                                                             MOV     TADD,COUNT
032004                                   LET TSTCAS := #TADD+2        ;POINT TO FIRST TEST CASE
032004  012737  063202  000542                                                             MOV     #TADD+2,TSTCAS

                                         ;+
                                         ;       CLR R0.EXT TO R3.EXP
                                         ;-

032012                                   INCR  R0 FROM #0 TO #6 BY #2
032012  005000                                                                             CLR     R0
032014  000402                                                                             BR      $51252
032016                                                                           $51253:
032016  062700  000002                                                                     ADD     #2,R0
032022                                                                           $51252:
032022  020027  000006                                                                     CMP     R0,#6
032026  003003                                                                             BGT     $51254
032030                                    INLINE <CLR R0.EXP(R0)>
032030  005060  000522                                                                     CLR R0.EXP(R0)
032034                                   ENDINC
032034  000770                                                                             BR      $51253
032036                                                                           $51254:

                                         ;REPEAT OUTER LOOP FOR TEST CASES
032036                                   INLINE <$5050:>
032036                                                                                     $5050:
032036                                    CALL CLRDSB                 ;CLR DS BUFFERS
032036  004737  055520                                                                     JSR     PC,CLRDSB

                                          ;+
                                          ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                          ;-

032042                                    LET R0 := TSTCAS
032042  013700  000542                                                                     MOV     TSTCAS,R0
032046                                    LET DATA00 := (R0)+         ;SRC1 LENGTH
032046  012037  000560                                                                     MOV     (R0)+,DATA00
032052                                    LET DATA01 := (R0)+         ;POINTER TO SRC1 DATA
032052  012037  000562                                                                     MOV     (R0)+,DATA01
032056                                    LET DATA02 := (R0)+         ;SRC2 LENGTH
032056  012037  000564                                                                     MOV     (R0)+,DATA02
032062                                    LET DATA03 := (R0)+         ;POINTER TO SRC2 DATA
032062  012037  000566                                                                     MOV     (R0)+,DATA03
032066                                    LET DATA04 := (R0)+         ;DEST LENGTH
```

```
032066  012037  000570                                                              MOV     (R0)+,DATA04
032072                          LET DATA05 := (R0)+          ;POINTER TO DS.EXP DATA (SUM)
032072  012037  000572                                                              MOV     (R0)+,DATA05
032076                          LET CC.EXP := (R0)+          ;CC.EXP (SUM)
032076  012037  000520                                                              MOV     (R0)+,CC.EXP

                                ;+
                                ;       LOAD DSBUF1
                                ;-

032102                          IF DATA00 NE #0 THEN         ;CHECK FOR ZERO LENGTH BUFFER
032102  005737  000560                                                              TST     DATA00
032106  001413                                                                      BEQ     $51255
032110                           LET R0 := DATA01
032110  013700  000562                                                              MOV     DATA01,R0
032114                           LET SIGN0 := (R0)+          ;STORE SIGN AND POINT AT FIRST BYTE
032114  012037  000446                                                              MOV     (R0)+,SIGN0
032120                           LET R1 := DATA00            ;# OF BYTES TO TRANSFER
032120  013701  000560                                                              MOV     DATA00,R1
032124                           LET R2 := #DSBUF1           ;TRANSFER DESTINATION
032124  012702  062370                                                              MOV     #DSBUF1,R2
032130                           INLINE <1$:>
032130                                                                              1$:
032130                           INLINE <MOVB (R0)+,(R2)+>
032130  112022                                                                      MOVB (R0)+,(R2)+
032132                           INLINE <SOB R1,1$>
032132  077102                                                                      SOB R1,1$
032134                          ELSE
032134  000402                                                                      BR      $51256
032136                                                                     $51255:
032136                           LET SIGN0 := #0
032136  005037  000446                                                              CLR     SIGN0
032142                          ENDIF
032142                                                                     $51256:

                                ;+
                                ;       LOAD DSBUF2
                                ;-

032142                          IF DATA02 NE #0 THEN
032142  005737  000564                                                              TST     DATA02
032146  001413                                                                      BEQ     $51257
032150                           LET R0 := DATA03
032150  013700  000566                                                              MOV     DATA03,R0
032154                           LET SIGN1 := (R0)+
032154  012037  000450                                                              MOV     (R0)+,SIGN1
032160                           LET R1 := DATA02
032160  013701  000564                                                              MOV     DATA02,R1
032164                           LET R2 := #DSBUF2
032164  012702  062432                                                              MOV     #DSBUF2,R2
032170                           INLINE <2$:>
032170                                                                              2$:
032170                           INLINE <MOVB (R0)+,(R2)+>
032170  112022                                                                      MOVB (R0)+,(R2)+
032172                           INLINE <SOB R1,2$>
032172  077102                                                                      SOB R1,2$
```

```
032174                           ELSE
032174  000402                                                              BR      $51260
032176                                                           $51257:
032176                            LET SIGN1 := #0
032176  005037  000450                                                      CLR     SIGN1
032202                           ENDIF
032202                                                           $51260:

                                 ;+
                                 ;        LOAD DS.EXP
                                 ;-

032202                           IF DATA04 NE #0 THEN
032202  005737  000570                                                      TST     DATA04
032206  001415                                                              BEQ     $51261
032210                            LET R0 := DATA05
032210  013700  000572                                                      MOV     DATA05,R0
032214                            LET SIGN2 := (R0)+
032214  012037  000452                                                      MOV     (R0)+,SIGN2
032220                            LET R1 := DATA04
032220  013701  000570                                                      MOV     DATA04,R1
032224                            LET R2 := #DS.EXP
032224  012702  062536                                                      MOV     #DS.EXP,R2
032230                            INLINE <3$:>
032230                                                                      3$:
032230                            INLINE <MOVB  (R0)+,(R2)>
032230  112012                                                              MOVB    (R0)+,(R2)
032232                            INLINE <BISB  #60,(R2)+>
032232  152722  000060                                                      BISB    #60,(R2)+
032236                            INLINE <SOB R1,3$>
032236  077104                                                              SOB R1,3$
032240                           ELSE
032240  000402                                                              BR      $51262
032242                                                           $51261:
032242                            LET SIGN2 := #0
032242  005037  000452                                                      CLR     SIGN2
032246                           ENDIF
032246                                                           $51262:

                                 ;+
                                 ;        LOAD DSTMP'S WITH MDS & LSD OF EACH BUFFER
                                 ;-

032246                           LET DSTMP0 :B= DSBUF1
032246  113737  062370  000552                                              MOVB    DSBUF1,DSTMP0
032254                           LET TEMP0 := #DSBUF1-1 + DATA00
032254  012737  062367  000474                                              MOV     #DSBUF1-1,TEMP0
032262  063737  000560  000474                                              ADD     DATA00,TEMP0
032270                           LET DSTMP1 :B= @TEMP0
032270  117737  146200  000553                                              MOVB    @TEMP0,DSTMP1
032276                           LET DSTMP2 :B= DSBUF2
032276  113737  062432  000554                                              MOVB    DSBUF2,DSTMP2
032304                           LET TEMP0 := #DSBUF2-1 + DATA02
032304  012737  062431  000474                                              MOV     #DSBUF2-1,TEMP0
032312  063737  000564  000474                                              ADD     DATA02,TEMP0
032320                           LET DSTMP3 :B= @TEMP0
```

```
032320 117737 146150 000555                                              MOVB    @TEMP0,DSTMP3
032326                               LET DSTMP4 :B= DS.EXP
032326 113737 062536 000556                                              MOVB    DS.EXP,DSTMP4
032334                               LET TEMP0 := #DS.EXP-1 + DATA04
032334 012737 062535 000474                                              MOV     #DS.EXP-1,TEMP0
032342 063737 000570 000474                                              ADD     DATA04,TEMP0
032350                               LET DSTMP5 :B= @TEMP0
032350 117737 146120 000557                                              MOVB    @TEMP0,DSTMP5
032356                               LET DESCR1 := #DSBUF1
032356 012737 062370 000616                                              MOV     #DSBUF1,DESCR1
032364                               LET DESCR3 := #DSBUF2
032364 012737 062432 000622                                              MOV     #DSBUF2,DESCR3
032372                               LET DESCR5 := #DS.DST
032372 012737 062474 000626                                              MOV     #DS.DST,DESCR5


                            ; INCR TEMP0 FROM #1 TO #5 BY #1        SRC1 DATA TYPE LOOP
032400                               INLINE <CLR @#TEMP0>
032400 005037 000474                                                     CLR @#TEMP0
032404                               INLINE <INC1: INC TEMP0>
032404 005237 000474                                                     INC1: INC TEMP0
032410                               IF TEMP0 GT #5 THEN
032410 023727 000474 000005                                              CMP     TEMP0,#5
032416 003402                                                            BLE     $51263
032420                                INLINE <JMP END1>
032420 000137 034246                                                     JMP END1
032424                               ENDIF
032424                                                         $51263:



                                 ;+
                                 ;       RESTORE MSD & LSD OF DSBUF1
                                 ;-

032424                                LET DSBUF1 :B= DSTMP0          ;MSD
032424 113737 000552 062370                                              MOVB    DSTMP0,DSBUF1
032432                                LET TEMP2 := #DSBUF1-1 + DATA00
032432 012737 062367 000500                                              MOV     #DSBUF1-1,TEMP2
032440 063737 000560 000500                                              ADD     DATA00,TEMP2
032446                                LET @TEMP2 :B= DSTMP1          ;LSD
032446 113777 000553 146024                                              MOVB    DSTMP1,@TEMP2


                                 ;+
                                 ;       SIGN DSBUF1 BY DATA TYPE
                                 ;-

032454                               SELECT TEMP0 OF 5
032454 013746 000474                                                     MOV     TEMP0,-(SP)
032460 006316                                                            ASL     (SP)
032462 060716                                                            ADD     PC,(SP)
032464 063607                                                            ADD     @(SP)+,PC
032466                                                         $51264:
032466 000012                                                            .WORD   $51272-$51264
032470 000052                                                            .WORD   $51271-$51264
032472 000116                                                            .WORD   $51270-$51264
032474 000162                                                            .WORD   $51267-$51264
032476 000226                                                            .WORD   $51266-$51264
032500                               CASE 1
```

```
032500                                                                   $51272:
032500                          LET DESCR0 := DATA00         ;SIGNED ZONED
032500  013737  000560  000614                                                   MOV     DATA00,DESCR0
032506                          IF SIGN0 EQ #0 THEN
032506  005737  000446                                                           TST     SIGN0
032512  001004                                                                   BNE     $51273
032514                           LET @TEMP2 :B= @TEMP2 SET.BY #60     ;+
032514  152777  000060  145756                                                   BISB    #60,@TEMP2
032522                          ELSE
032522  000403                                                                   BR      $51274
032524                                                                   $51273:
032524                           LET @TEMP2 :B= @TEMP2 SET.BY #160    ;-
032524  152777  000160  145746                                                   BISB    #160,@TEMP2
032532                          ENDIF
032532                                                                   $51274:
032532                          LET DSBUF1-1 :B= #0          ;FIX LEADING SEPARATE RESULT
032532  105037  062367                                                           CLRB    DSBUF1-1

032536                        CASE 2
032536  000512                                                                   BR      $51265
032540                                                                   $51271:
032540                          LET DESCR0 := DATA00 SET.BY #20000    ;TRAILING OVERPUNCH
032540  013737  000560  000614                                                   MOV     DATA00,DESCR0
032546  052737  020000  000614                                                   BIS     #20000,DESCR0
032554                          LET R5 :B= DSTMP1     ;GET LSD
032554  113705  000553                                                           MOVB    DSTMP1,R5
032560                          IF SIGN0 EQ #-1 THEN
032560  023727  000446  177777                                                   CMP     SIGN0,#-1
032566  001002                                                                   BNE     $51275
032570                           LET R5 := R5 + #10.          ;CHANGE INDEX FOR -
032570  062705  000012                                                           ADD     #10.,R5
032574                          ENDIF
032574                                                                   $51275:
032574                          LET @TEMP2 :B= OVPNCH(R5)
032574  116577  055254  145676                                                   MOVB    OVPNCH(R5),@TEMP

032602                        CASE 3
032602  000470                                                                   BR      $51265
032604                                                                   $51270:
032604                         LET DESCR0 := DATA00 SET.BY #30000    ;LEADING OVERPUNCH
032604  013737  000560  000614                                                   MOV     DATA00,DESCR0
032612  052737  030000  000614                                                   BIS     #30000,DESCR0
032620                           LET R5 :B= DSTMP0     ;GET MSD
032620  113705  000552                                                           MOVB    DSTMP0,R5
032624                           IF SIGN0 EQ #-1 THEN
032624  023727  000446  177777                                                   CMP     SIGN0,#-1
032632  001002                                                                   BNE     $51276
032634                            LET R5 := R5 + #10.
032634  062705  000012                                                           ADD     #10.,R5
032640                           ENDIF
032640                                                                   $51276:
032640                           LET DSBUF1 :B= OVPNCH(R5)
032640  116537  055254  062370                                                   MOVB    OVPNCH(R5),DSBUF


032646                        CASE 4
```

```
032646  000446                                                                    BR      $51265
032650                                                                  $51267:
032650                          LET DESCR0 := DATA00 SET.BY #40000   ;TRAILING SEPARATE
032650  013737  000560  000614                                                    MOV     DATA00,DESCR0
032656  052737  040000  000614                                                    BIS     #40000,DESCR0
032664                            LET R5 := TEMP2 + #1
032664  013705  000500                                                            MOV     TEMP2,R5
032670  005205                                                                    INC     R5
032672                           IF SIGN0 EQ #0 THEN
032672  005737  000446                                                            TST     SIGN0
032676  001003                                                                    BNE     $51277
032700                            LET (R5) :B= #53        ;+ SIGN
032700  112715  000053                                                            MOVB    #53,(R5)
032704                           ELSE
032704  000402                                                                    BR      $51300
032706                                                                  $51277:
032706                            LET (R5) :B= #55        ;- SIGN
032706  112715  000055                                                            MOVB    #55,(R5)
032712                           ENDIF
032712                                                                  $51300:

032712                         CASE 5
032712  000424                                                                    BR      $51265
032714                                                                  $51266:
032714                          LET DESCR0 := DATA00 SET.BY #50000   ;LEADING SEPARATE
032714  013737  000560  000614                                                    MOV     DATA00,DESCR0
032722  052737  050000  000614                                                    BIS     #50000,DESCR0
032730                            LET R5 := TEMP2 + #1
032730  013705  000500                                                            MOV     TEMP2,R5
032734  005205                                                                    INC     R5
032736                           LET (R5) :B= #0  ;RESTORE TRAILING SEPARATE
032736  105015                                                                    CLRB    (R5)
032740                           IF SIGN0 EQ #0 THEN
032740  005737  000446                                                            TST     SIGN0
032744  001004                                                                    BNE     $51301
032746                            LET DSBUF1-1 :B= #53
032746  112737  000053  062367                                                    MOVB    #53,DSBUF1-1
032754                           ELSE
032754  000403                                                                    BR      $51302
032756                                                                  $51301:
032756                            LET DSBUF1-1 :B= #55
032756  112737  000055  062367                                                    MOVB    #55,DSBUF1-1
032764                           ENDIF
032764                                                                  $51302:
032764                         ENDSELECT
032764                                                                  $51265:


                                ;INCR TEMP1 FROM #1 TO #5 BY #1       SRC2 DATA TYPES
032764                          INLINE <CLR @#TEMP1>
032764  005037  000476                                                            CLR @#TEMP1
032770                          INLINE <INC2: INC TEMP1>
032770  005237  000476                                                            INC2: INC TEMP1
032774                          IF TEMP1 GT #5 THEN
032774  023727  000476  000005                                                    CMP     TEMP1,#5
033002  003402                                                                    BLE     $51303
033004                            INLINE <JMP END2>
```

```
033004  000137  034242                                                        JMP     END2
033010                            ENDIF
033010                                                              $51303:

                                    ;+
                                    ;   RESTORE MSD & LSD OF DSBUF2
                                    ;-

033010                              LET DSBUF2 :B= DSTMP2
033010  113737  000554  062432                                                MOVB    DSTMP2,DSBUF2
033016                              LET TEMP3 := #DSBUF2-1 + DATA02
033016  012737  062431  000502                                                MOV     #DSBUF2-1,TEMP3
033024  063737  000564  000502                                                ADD     DATA02,TEMP3
033032                              LET @TEMP3 :B= DSTMP3
033032  113777  000555  145442                                                MOVB    DSTMP3,@TEMP3

                                    ;+
                                    ;   SIGN DSBUF2 BY DATA TYPE
                                    ;-

033040                            SELECT TEMP1 OF 5
033040  013746  000476                                                        MOV     TEMP1,-(SP)
033044  006316                                                                ASL     (SP)
033046  060716                                                                ADD     PC,(SP)
033050  063607                                                                ADD     @(SP)+,PC
033052                                                              $51304:
033052  000012                                                                .WORD   $51312-$51304
033054  000052                                                                .WORD   $51311-$51304
033056  000116                                                                .WORD   $51310-$51304
033060  000162                                                                .WORD   $51307-$51304
033062  000226                                                                .WORD   $51306-$51304
033064                            CASE 1
033064                                                              $51312:
033064                             LET DESCR2 := DATA02
033064  013737  000564  000620                                                MOV     DATA02,DESCR2
033072                                IF SIGN1 EQ #0 THEN
033072  005737  000450                                                        TST     SIGN1
033076  001004                                                                BNE     $51313
033100                                 LET @TEMP3 :B= @TEMP3 SET.BY #60  ;+
033100  152777  000060  145374                                                BISB    #60,@TEMP3
033106                                ELSE
033106  000403                                                                BR      $51314
033110                                                              $51313:
033110                                 LET @TEMP3 :B= @TEMP3 SET.BY #160;-
033110  152777  000160  145364                                                BISB    #160,@TEMP3
033116                                ENDIF
033116                                                              $51314:
033116                                LET DSBUF2-1 :B= #0
033116  105037  062431                                                        CLRB    DSBUF2-1

033122                            CASE 2
033122  000512                                                                BR      $51305
033124                                                              $51311:
033124                             LET DESCR2 := DATA02 SET.BY #20000  ;TRAILING OVERPUNCH
033124  013737  000564  000620                                                MOV     DATA02,DESCR2
033132  052737  020000  000620                                                BIS     #20000,DESCR2
```

```
033140                                   LET R5 :B= DSTMP3
033140  113705  000555                                                            MOVB    DSTMP3,R5
033144                                   IF SIGN1 EQ #-1 THEN
033144  023727  000450  177777                                                    CMP     SIGN1,#-1
033152  001002                                                                    BNE     $51315
033154                                    LET R5 := R5 + #10.
033154  062705  000012                                                            ADD     #10.,R5
033160                                   ENDIF
033160                                                                  $51315:
033160                                   LET @TEMP3 :B= OVPNCH(R5)
033160  116577  055254  145314                                                    MOVB    OVPNCH(R5),@TEMP

033166                               CASE 3
033166  000470                                                                    BR      $51305
033170                                                                  $51310:
033170                                LET DESCR2 := DATA02 SET.BY #30000  ;LEADING OVERPUNCH
033170  013737  000564  000620                                                    MOV     DATA02,DESCR2
033176  052737  030000  000620                                                    BIS     #30000,DESCR2
033204                                   LET R5 :B= DSTMP2
033204  113705  000554                                                            MOVB    DSTMP2,R5
033210                                   IF SIGN1 EQ #-1 THEN
033210  023727  000450  177777                                                    CMP     SIGN1,#-1
033216  001002                                                                    BNE     $51316
033220                                    LET R5 := R5 + #10.
033220  062705  000012                                                            ADD     #10.,R5
033224                                   ENDIF
033224                                                                  $51316:
033224                                   LET DSBUF2 :B= OVPNCH(R5)
033224  116537  055254  062432                                                    MOVB    OVPNCH(R5),DSBUF

033232                               CASE 4
033232  000446                                                                    BR      $51305
033234                                                                  $51307:
033234                                LET DESCR2 := DATA02 SET.BY #40000  ;TRAILING SEPARATE
033234  013737  000564  000620                                                    MOV     DATA02,DESCR2
033242  052737  040000  000620                                                    BIS     #40000,DESCR2
033250                                   LET R5 := TEMP3 + #1
033250  013705  000502                                                            MOV     TEMP3,R5
033254  005205                                                                    INC     R5
033256                                   IF SIGN1 EQ #0 THEN
033256  005737  000450                                                            TST     SIGN1
033262  001003                                                                    BNE     $51317
033264                                    LET (R5) :B= #53
033264  112715  000053                                                            MOVB    #53,(R5)
033270                                   ELSE
033270  000402                                                                    BR      $51320
033272                                                                  $51317:
033272                                    LET (R5) :B= #55
033272  112715  000055                                                            MOVB    #55,(R5)
033276                                   ENDIF
033276                                                                  $51320:

033276                               CASE 5
033276  000424                                                                    BR      $51305
033300                                                                  $51306:
033300                                LET DESCR2 := DATA02 SET.BY #50000  ;LEADING SEPARATE
```

```
033300  013737  000564  000620                                              MOV     DATA02,DESCR2
033306  052737  050000  000620                                              BIS     #50000,DESCR2
033314                          LET R5 := TEMP3 + #1
033314  013705  000502                                                      MOV     TEMP3,R5
033320  005205                                                              INC     R5
033322                          LET (R5) :B= #0
033322  105015                                                              CLRB    (R5)
033324                          IF SIGN1 EQ #0 THEN
033324  005737  000450                                                      TST     SIGN1
033330  001004                                                              BNE     $51321
033332                           LET DSBUF2-1 :B= #53
033332  112737  000053  062431                                              MOVB    #53,DSBUF2-1
033340                          ELSE
033340  000403                                                              BR      $51322
033342                                                             $51321:
033342                           LET DSBUF2-1 :B= #55
033342  112737  000055  062431                                              MOVB    #55,DSBUF2-1
033350                          ENDIF
033350                                                             $51322:
033350                        ENDSELECT
033350                                                             $51305:


                         ;INCR DATTYP FROM #1 TO #5 BY #1      ;DS.EXP LOOP
033350                          INLINE <CLR @#DATTYP>
033350  005037  000462                                                      CLR @#DATTYP
033354                          INLINE <INC3: INC DATTYP>
033354  005237  000462                                                      INC3: INC DATTYP
033360                          IF DATTYP GT #5 THEN
033360  023727  000462  000005                                              CMP     DATTYP,#5
033366  003402                                                              BLE     $51323
033370                            INLINE <JMP END3>
033370  000137  034236                                                      JMP END3
033374                          ENDIF
033374                                                             $51323:


                           ;+
                           ;        RESTORE MSD & LSD OF DS.EXP
                           ;-

033374                           LET DS.EXP :B= DSTMP4     ;MSD
033374  113737  000556  062536                                              MOVB    DSTMP4,DS.EXP
033402                           LET TEMP4 := #DS.EXP-1 + DATA04
033402  012737  062535  000504                                              MOV     #DS.EXP-1,TEMP4
033410  063737  000570  000504                                              ADD     DATA04,TEMP4
033416                           LET @TEMP4 :B= DSTMP5     ;LSD
033416  113777  000557  145060                                              MOVB    DSTMP5,@TEMP4


                           ;+
                           ;        SIGN DS.EXP BY DATA TYPE
                           ;-

033424                     SELECT DATTYP OF 5
033424  013746  000462                                                      MOV     DATTYP,-(SP)
033430  006316                                                              ASL     (SP)
033432  060716                                                              ADD     PC,(SP)
033434  063607                                                              ADD     @(SP)+,PC
```

```
033436                                                                          $51324:
033436  000012                                                                           .WORD   $51332-$51324
033440  000060                                                                           .WORD   $51331-$51324
033442  000136                                                                           .WORD   $51330-$51324
033444  000214                                                                           .WORD   $51327-$51324
033446  000260                                                                           .WORD   $51326-$51324
033450                              CASE 1
033450                                                                          $51332:
033450                               LET DESCR4 := DATA04             ;SIGNED ZONED
033450  013737  000570  000624                                                           MOV     DATA04,DESCR4
033456                              IF DATA04 NE #0 THEN
033456  005737  000570                                                                   TST     DATA04
033462  001414                                                                           BEQ     $51333
033464                                IF SIGN2 EQ #0 THEN
033464  005737  000452                                                                   TST     SIGN2
033470  001004                                                                           BNE     $51334
033472                                 LET @TEMP4 :B= @TEMP4 SET.BY #60
033472  152777  000060  145004                                                           BISB    #60,@TEMP4
033500                                ELSE
033500  000403                                                                           BR      $51335
033502                                                                          $51334:
033502                                 LET @TEMP4 :B= @TEMP4 SET.BY #160
033502  152777  000160  144774                                                           BISB    #160,@TEMP4
033510                                ENDIF
033510                                                                          $51335:
033510                                LET DS.EXP-1 :B= #0
033510  105037  062535                                                                   CLRB    DS.EXP-1
033514                              ENDIF
033514                                                                          $51333:

033514                             CASE 2
033514  000524                                                                           BR      $51325
033516                                                                          $51331:
033516                              LET DESCR4 := DATA04 SET.BY #20000 ;TRAILING OVERPUNCH
033516  013737  000570  000624                                                           MOV     DATA04,DESCR4
033524  052737  020000  000624                                                           BIS     #20000,DESCR4
033532                               IF DATA04 NE #0 THEN
033532  005737  000570                                                                   TST     DATA04
033536  001415                                                                           BEQ     $51336
033540                                LET R5 :B= DSTMP5
033540  113705  000557                                                                   MOVB    DSTMP5,R5
033544                                LET R5 := R5 - #60
033544  162705  000060                                                                   SUB     #60,R5
033550                                IF SIGN2 EQ #-1 THEN
033550  023727  000452  177777                                                           CMP     SIGN2,#-1
033556  001002                                                                           BNE     $51337
033560                                 LET R5 := R5 + #10.
033560  062705  000012                                                                   ADD     #10.,R5
033564                                ENDIF
033564                                                                          $51337:
033564                                LET @TEMP4 :B= OVPNCH(R5)
033564  116577  055254  144712                                                           MOVB    OVPNCH(R5),@TEMP
033572                               ENDIF
033572                                                                          $51336:

033572                             CASE 3
```

```
033572  000475                                                              BR      $51325
033574                                                             $51330:
033574                        LET DESCR4 := DATA04 SET.BY #30000 ;LEADING OVERPUNCH
033574  013737  000570  000624                                              MOV     DATA04,DESCR4
033602  052737  030000  000624                                              BIS     #30000,DESCR4
033610                         IF DATA04 NE #0 THEN
033610  005737  000570                                                      TST     DATA04
033614  001415                                                              BEQ     $51340
033616                           LET R5 :B= DSTMP4
033616  113705  000556                                                      MOVB    DSTMP4,R5
033622                           LET R5 := R5 - #60
033622  162705  000060                                                      SUB     #60,R5
033626                           IF SIGN2 EQ #-1 THEN
033626  023727  000452  177777                                              CMP     SIGN2,#-1
033634  001002                                                              BNE     $51341
033636                            LET R5 := R5 + #10.
033636  062705  000012                                                      ADD     #10.,R5
033642                           ENDIF
033642                                                             $51341:
033642                           LET DS.EXP :B= OVPNCH(R5)
033642  116537  055254  062536                                              MOVB    OVPNCH(R5),DS.EX
033650                         ENDIF
033650                                                             $51340:

033650                       CASE 4
033650  000446                                                              BR      $51325
033652                                                             $51327:
033652                        LET DESCR4 := DATA04 SET.BY #40000 ;TRAILING SEPARATE
033652  013737  000570  000624                                              MOV     DATA04,DESCR4
033660  052737  040000  000624                                              BIS     #40000,DESCR4
033666                           LET R5 := TEMP4 + #1
033666  013705  000504                                                      MOV     TEMP4,R5
033672  005205                                                              INC     R5
033674                           IF SIGN2 EQ #0 THEN
033674  005737  000452                                                      TST     SIGN2
033700  001003                                                              BNE     $51342
033702                            LET (R5) :B= #53
033702  112715  000053                                                      MOVB    #53,(R5)
033706                           ELSE
033706  000402                                                              BR      $51343
033710                                                             $51342:
033710                            LET (R5) :B= #55
033710  112715  000055                                                      MOVB    #55,(R5)
033714                           ENDIF
033714                                                             $51343:

033714                       CASE 5
033714  000424                                                              BR      $51325
033716                                                             $51326:
033716                        LET DESCR4 := DATA04 SET.BY #50000
033716  013737  000570  000624                                              MOV     DATA04,DESCR4
033724  052737  050000  000624                                              BIS     #50000,DESCR4
033732                           LET R5 := TEMP4 + #1
033732  013705  000504                                                      MOV     TEMP4,R5
033736  005205                                                              INC     R5
033740                           LET (R5) :B= #0
```

```
033740  105015                                                              CLRB    (R5)
033742                                  IF SIGN2 EQ #0 THEN
033742  005737  000452                                                      TST     SIGN2
033746  001004                                                              BNE     $51344
033750                                   LET DS.EXP-1 :B= #53
033750  112737  000053  062535                                              MOVB    #53,DS.EXP-1
033756                                  ELSE
033756  000403                                                              BR      $51345
033760                                                              $51344:
033760                                   LET DS.EXP-1 :B= #55
033760  112737  000055  062535                                              MOVB    #55,DS.EXP-1
033766                                  ENDIF
033766                                                              $51345:
033766                              ENDSELECT
033766                                                              $51325:

                                    ;+
                                    ;       CLR DS.DST & LOAD DESCRIPTORS
                                    ;-

033766                              LET R0 := #DS.DST-1
033766  012700  062473                                              MOV     #DS.DST-1,R0
033772                              LET R1 := #41
033772  012701  000041                                              MOV     #41,R1
033776                              INLINE <DOIT1:  CLRB    (R0)+>
033776  105020                                                      DOIT1:  CLRB    (R0)+
034000                              INLINE <SOB     R1,     DOIT1>
034000  077102                                                      SOB     R1,     DOIT1
034002                              LET R0 := DESCR0
034002  013700  000614                                              MOV     DESCR0,R0
034006                              LET R1 := DESCR1
034006  013701  000616                                              MOV     DESCR1,R1
034012                              LET R2 := DESCR2
034012  013702  000620                                              MOV     DESCR2,R2
034016                              LET R3 := DESCR3
034016  013703  000622                                              MOV     DESCR3,R3
034022                              LET R4 := DESCR4
034022  013704  000624                                              MOV     DESCR4,R4
034026                              LET R5 := DESCR5
034026  013705  000626                                              MOV     DESCR5,R5
034032                              LET R4.EXP := R4
034032  010437  000532                                              MOV     R4,R4.EXP
034036                              LET R5.EXP := R5
034036  010537  000534                                              MOV     R5,R5.EXP
034042                              INLINE <ADDN>
034042  076050                                                      ADDN

                                    ;+
                                    ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                    ;-

034044                              LET CC := PSW
034044  013737  177776  000516                                      MOV     PSW,CC
034052                              LET CC := CC CLR.BY #177760
034052  042737  177760  000516                                      BIC     #177760,CC
034060                              IF CC NE CC.EXP THEN
```

```
034060  023737  000516  000520                                          CMP     CC,CC.EXP
034066  001402                                                          BEQ     $51346
034070                                    CALL ERROR
034070  004737  056274                                                  JSR     PC,ERROR
034074                                  ENDIF
034074                                                          $51346:
034074                                  IF R0 NE R0.EXP THEN
034074  020037  000522                                                  CMP     R0,R0.EXP
034100  001402                                                          BEQ     $51347
034102                                    CALL ERROR
034102  004737  056274                                                  JSR     PC,ERROR
034106                                  ENDIF
034106                                                          $51347:
034106                                  IF R1 NE R1.EXP THEN
034106  020137  000524                                                  CMP     R1,R1.EXP
034112  001402                                                          BEQ     $51350
034114                                    CALL ERROR
034114  004737  056274                                                  JSR     PC,ERROR
034120                                  ENDIF
034120                                                          $51350:
034120                                  IF R2 NE R2.EXP THEN
034120  020237  000526                                                  CMP     R2,R2.EXP
034124  001402                                                          BEQ     $51351
034126                                    CALL ERROR
034126  004737  056274                                                  JSR     PC,ERROR
034132                                  ENDIF
034132                                                          $51351:
034132                                  IF R3 NE R3.EXP THEN
034132  020337  000530                                                  CMP     R3,R3.EXP
034136  001402                                                          BEQ     $51352
034140                                    CALL ERROR
034140  004737  056274                                                  JSR     PC,ERROR
034144                                  ENDIF
034144                                                          $51352:
034144                                  IF R4 NE R4.EXP THEN
034144  020437  000532                                                  CMP     R4,R4.EXP
034150  001402                                                          BEQ     $51353
034152                                    CALL ERROR
034152  004737  056274                                                  JSR     PC,ERROR
034156                                  ENDIF
034156                                                          $51353:
034156                                  IF R5 NE R5.EXP THEN
034156  020537  000534                                                  CMP     R5,R5.EXP
034162  001402                                                          BEQ     $51354
034164                                    CALL ERROR
034164  004737  056274                                                  JSR     PC,ERROR
034170                                  ENDIF
034170                                                          $51354:

                                ;+
                                ;       CHECK RESULTS VS EXPECTED RESULTS
                                ;-

034170                          LET R0 := #DS.DST-1
034170  012700  062473                                                  MOV     #DS.DST-1,R0
034174                          LET R1 := #DS.EXP-1
```

```
034174  012701  062535                                                         MOV     #DS.EXP-1,R1
034200                                 LET ERRFLG := #0
034200  005037  000454                                                         CLR     ERRFLG
034204                                 WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
034204                                                               $51355:
034204  020027  062534                                                         CMP     R0,#DS.DST+40
034210  001410                                                                 BEQ     $51356
034212  005737  000454                                                         TST     ERRFLG
034216  001005                                                                 BNE     $51356
034220                                  IFB (R0)+ NE (R1)+ THEN
034220  122021                                                                 CMPB    (R0)+,(R1)+
034222  001402                                                                 BEQ     $51357
034224                                   CALL ERROR
034224  004737  056274                                                         JSR     PC,ERROR
034230                                  ENDIF
034230                                                               $51357:
034230                                 ENDDO
034230  000765                                                                 BR      $51355
034232                                                               $51356:
                                     ;ENDINC
034232                                INLINE <JMP INC3>
034232  000137  033354                                                         JMP INC3
034236                                INLINE <END3:>
034236                                                                         END3:
                                   ;ENDINC
034236                             INLINE <JMP INC2>
034236  000137  032770                                                         JMP INC2
034242                             INLINE <END2:>
034242                                                                         END2:
                                 ;ENDINC
034242                           INLINE <JMP INC1>
034242  000137  032404                                                         JMP INC1
034246                           INLINE <END1:>
034246                                                                         END1:
034246                           LET TSTCAS := TSTCAS + #22
034246  062737  000022  000542                                                 ADD     #22,TSTCAS
034254                           LET COUNT := COUNT - #1
034254  005337  000466                                                         DEC     COUNT
                                ;UNTIL COUNT EQ #0
034260                          IF COUNT NE #0 THEN
034260  005737  000466                                                         TST     COUNT
034264  001402                                                                 BEQ     $51360
034266                           INLINE <JMP $5050>
034266  000137  032036                                                         JMP $5050
034272                          ENDIF
034272                                                               $51360:

                                ;+
                                ;       INLINE CASE - ADDNI, USING UNSIGNED ZONED DATA
                                ;-

034272                          CALL CLRDSB
034272  004737  055520                                                         JSR     PC,CLRDSB

                                ;+
                                ;       LOAD DSBUF1
```

```
                                 ;-

034276                           LET R0 := #ADD1+2                    ;SOURCE
034276  012700  063360                                                          MOV     #ADD1+2,R0
034302                           LET R1 := TADDI CLR.BY #10000        ;# OF BYTES TO XFER
034302  013701  064052                                                          MOV     TADDI,R1
034306  042701  010000                                                          BIC     #10000,R1
034312                           LET R2 := #DSBUF1                    ;DESTINATION
034312  012702  062370                                                          MOV     #DSBUF1,R2
034316                           INLINE <1$:    MOVB    (R0)+,  (R2)+>
034316  112022                                                          1$:     MOVB    (R0)+,
034320                           INLINE <       SOB     R1,     1$>
034320  077102                                                                  SOB     R1,

                                 ;+
                                 ;      LOAD DSBUF2
                                 ;-

034322                           LET R0 := #ADD1A+2
034322  012700  063402                                                          MOV     #ADD1A+2,R0
034326                           LET R1 := TADDI+4 CLR.BY #10000
034326  013701  064056                                                          MOV     TADDI+4,R1
034332  042701  010000                                                          BIC     #10000,R1
034336                           LET R2 := #DSBUF2
034336  012702  062432                                                          MOV     #DSBUF2,R2
034342                           INLINE <2$:    MOVB    (R0)+,  (R2)+>
034342  112022                                                          2$:     MOVB    (R0)+,
034344                           INLINE <       SOB     R1,     2$>
034344  077102                                                                  SOB     R1,

                                 ;+
                                 ;      LOAD DS.EXP
                                 ;-

034346                           LET R0 := #ADD1B+2
034346  012700  063426                                                          MOV     #ADD1B+2,R0
034352                           LET R1 := TADDI+10 CLR.BY #10000
034352  013701  064062                                                          MOV     TADDI+10,R1
034356  042701  010000                                                          BIC     #10000,R1
034362                           LET R2 := #DS.EXP
034362  012702  062536                                                          MOV     #DS.EXP,R2
034366                           INLINE <3$:    MOVB    (R0)+,  (R2)>
034366  112012                                                          3$:     MOVB    (R0)+,
034370                           INLINE <       BISB    #60,    (R2)+>
034370  152722  000060                                                          BISB    #60,
034374                           INLINE <       SOB     R1,     3$>
034374  077104                                                                  SOB     R1,

034376                           CALL CLRREG                  ;ENSURE R0-R5 ARE CLR
034376  004737  055330                                                          JSR     PC,CLRREG

034402                           INLINE <ADDNI>
034402  076150                                                          ADDNI
034404                           INLINE <.WORD TADDI>
034404  064052                                                          .WORD TADDI
034406                           INLINE <.WORD TADDI+4>
```

```
034406  064056                                                                .WORD  TADDI+4
034410                            INLINE <.WORD TADDI+10>
034410  064062                                                                .WORD  TADDI+10
034412                            LET CC := PSW
034412  013737  177776  000516                                                MOV    PSW,CC
034420                            LET CC := CC CLR.BY #177760
034420  042737  177760  000516                                                BIC    #177760,CC
034426                            IF CC NE #0 THEN
034426  005737  000516                                                        TST    CC
034432  001402                                                                BEQ    $51361
034434                             CALL ERROR
034434  004737  056274                                                        JSR    PC,ERROR
034440                            ENDIF
034440                                                              $51361:


                                  ;+
                                  ;        ENSURE GPR'S STILL ZERO
                                  ;-

034440                            IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
034440  005700                                                                TST    R0
034442  001004                                                                BNE    $51362
034444  005701                                                                TST    R1
034446  001002                                                                BNE    $51362
034450  005702                                                                TST    R2
034452  001402                                                                BEQ    $51363
034454                                                              $51362:
034454                             CALL ERROR
034454  004737  056274                                                        JSR    PC,ERROR
034460                            ENDIF
034460                                                              $51363:
034460                            IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
034460  005703                                                                TST    R3
034462  001004                                                                BNE    $51364
034464  005704                                                                TST    R4
034466  001002                                                                BNE    $51364
034470  005705                                                                TST    R5
034472  001402                                                                BEQ    $51365
034474                                                              $51364:
034474                             CALL ERROR
034474  004737  056274                                                        JSR    PC,ERROR
034500                            ENDIF
034500                                                              $51365:

                                  ;+
                                  ;        CHECK RESULTS
                                  ;-

034500                            LET R0 := #DS.DST
034500  012700  062474                                                        MOV    #DS.DST,R0
034504                            LET R1 := #DS.EXP               ;EXPECTED DATA
034504  012701  062536                                                        MOV    #DS.EXP,R1
034510                            LET ERRFLG := #0
034510  005037  000454                                                        CLR    ERRFLG
034514                            WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
034514                                                              $51366:
```

```
034514  020027  062534                                           CMP     R0,#DS.DST+40
034520  001410                                                   BEQ     $51367
034522  005737  000454                                           TST     ERRFLG
034526  001005                                                   BNE     $51367
034530                   IFB (R0)+ NE (R1)+ THEN
034530  122021                                                   CMPB    (R0)+,(R1)+
034532  001402                                                   BEQ     $51370
034534                    CALL ERROR
034534  004737  056274                                           JSR     PC,ERROR
034540                   ENDIF
034540                                                  $51370:
034540                  ENDDO
034540  000765                                                   BR      $51366
034542                                                  $51367:
```

```
                                      .SBTTL  SUBN
                                      ;******************************************************************
                                      ;
                                      ;       SUBN TEST
                                      ;
                                      ;******************************************************************

034542                                INLINE <XSUBN:>
034542                                                                                   XSUBN:
034542                                INLINE <SCOPE>
034542  000004                                                                           SCOPE
034544                                LET $TIMES := #10              ;ITERATION COUNT
034544  012737  000010  000404                                                           MOV     #10,$TIMES
034552                                LET COUNT := TADD              ;# OF TEST CASES
034552  013737  063200  000466                                                           MOV     TADD,COUNT
034560                                LET TSTCAS := #TADD+2          ;POINT TO FIRST TEST CASE
034560  012737  063202  000542                                                           MOV     #TADD+2,TSTCAS

                                      ;+
                                      ;       CLR R0.EXT TO R3.EXP
                                      ;-

034566                                INCR  R0 FROM #0 TO #6 BY #2
034566  005000                                                                           CLR     R0
034570  000402                                                                           BR      $51371
034572                                                                           $51372:
034572  062700  000002                                                                   ADD     #2,R0
034576                                                                           $51371:
034576  020027  000006                                                                   CMP     R0,#6
034602  003003                                                                           BGT     $51373
034604                                 INLINE <CLR R0.EXP(R0)>
034604  005060  000522                                                                   CLR R0.EXP(R0)
034610                                ENDINC
034610  000770                                                                           BR      $51372
034612                                                                           $51373:

                                      ;REPEAT OUTER LOOP FOR TEST CASES
034612                                INLINE <$5051:>
034612                                                                                   $5051:
034612                                 CALL CLRDSB                   ;CLR DS BUFFERS
034612  004737  055520                                                                   JSR     PC,CLRDSB

                                       ;+
                                       ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                       ;-

034616                                 LET R0 := TSTCAS
034616  013700  000542                                                                   MOV     TSTCAS,R0
034622                                 LET DATA00 := (R0)+           ;SRC1 LENGTH
034622  012037  000560                                                                   MOV     (R0)+,DATA00
034626                                 LET DATA01 := (R0)+           ;POINTER TO SRC1 DATA
034626  012037  000562                                                                   MOV     (R0)+,DATA01
034632                                 LET DATA02 := (R0)+           ;SRC2 LENGTH
034632  012037  000564                                                                   MOV     (R0)+,DATA02
034636                                 LET DATA03 := (R0)+           ;POINTER TO SRC2 DATA
034636  012037  000566                                                                   MOV     (R0)+,DATA03
034642                                 LET DATA04 := (R0)+           ;DEST LENGTH
```

```
034642  012037  000570                                                          MOV     (R0)+,DATA04
034646                          LET DATA05 := (R0)+         ;POINTER TO DS.EXP DATA (SUM)
034646  012037  000572                                                          MOV     (R0)+,DATA05
034652                          LET CC.EXP := (R0)+         ;CC.EXP (SUM)
034652  012037  000520                                                          MOV     (R0)+,CC.EXP
034656                          LET DATA05 := (R0)+         ;POINTER TO DS.EXP DATA (DIFF)
034656  012037  000572                                                          MOV     (R0)+,DATA05
034662                          LET CC.EXP := (R0)+         ;CC.EXP (DIFF)
034662  012037  000520                                                          MOV     (R0)+,CC.EXP

                                ;+
                                ;       LOAD DSBUF1
                                ;-

034666                          IF DATA00 NE #0 THEN        ;CHECK FOR ZERO LENGTH BUFFER
034666  005737  000560                                                          TST     DATA00
034672  001413                                                                  BEQ     $51374
034674                           LET R0 := DATA01
034674  013700  000562                                                          MOV     DATA01,R0
034700                           LET SIGN0 := (R0)+         ;STORE SIGN AND POINT AT FIRST BYTE
034700  012037  000446                                                          MOV     (R0)+,SIGN0
034704                           LET R1 := DATA00           ;# OF BYTES TO TRANSFER
034704  013701  000560                                                          MOV     DATA00,R1
034710                           LET R2 := #DSBUF1          ;TRANSFER DESTINATION
034710  012702  062370                                                          MOV     #DSBUF1,R2
034714                           INLINE <1$:>
034714                                                                          1$:
034714                           INLINE <MOVB (R0)+,(R2)+>
034714  112022                                                                  MOVB (R0)+,(R2)+
034716                           INLINE <SOB R1,1$>
034716  077102                                                                  SOB R1,1$
034720                          ELSE
034720  000402                                                                  BR      $51375
034722                                                                  $51374:
034722                           LET SIGN0 := #0
034722  005037  000446                                                          CLR     SIGN0
034726                          ENDIF
034726                                                                  $51375:

                                ;+
                                ;       LOAD DSBUF2
                                ;-

034726                          IF DATA02 NE #0 THEN
034726  005737  000564                                                          TST     DATA02
034732  001413                                                                  BEQ     $51376
034734                           LET R0 := DATA03
034734  013700  000566                                                          MOV     DATA03,R0
034740                           LET SIGN1 := (R0)+
034740  012037  000450                                                          MOV     (R0)+,SIGN1
034744                           LET R1 := DATA02
034744  013701  000564                                                          MOV     DATA02,R1
034750                           LET R2 := #DSBUF2
034750  012702  062432                                                          MOV     #DSBUF2,R2
034754                           INLINE <2$:>
034754                                                                          2$:
```

```
034754                          INLINE <MOVB (R0)+,(R2)+>
034754  112022                                                          MOVB (R0)+,(R2)+
034756                          INLINE <SOB R1,2$>
034756  077102                                                          SOB R1,2$
034760                         ELSE
034760  000402                                                          BR      $51377
034762                                                        $51376:
034762                          LET SIGN1 := #0
034762  005037  000450                                                  CLR     SIGN1
034766                         ENDIF
034766                                                        $51377:

                               ;+
                               ;       LOAD DS.EXP
                               ;-

034766                         IF DATA04 NE #0 THEN
034766  005737  000570                                                  TST     DATA04
034772  001415                                                          BEQ     $51400
034774                          LET R0 := DATA05
034774  013700  000572                                                  MOV     DATA05,R0
035000                          LET SIGN2 := (R0)+
035000  012037  000452                                                  MOV     (R0)+,SIGN2
035004                          LET R1 := DATA04
035004  013701  000570                                                  MOV     DATA04,R1
035010                          LET R2 := #DS.EXP
035010  012702  062536                                                  MOV     #DS.EXP,R2
035014                          INLINE <3$:>
035014                                                                  3$:
035014                          INLINE <MOVB (R0)+,(R2)>
035014  112012                                                          MOVB (R0)+,(R2)
035016                          INLINE <BISB  #60,    (R2)+>
035016  152722  000060                                                  BISB    #60,    (R2)+
035022                          INLINE <SOB R1,3$>
035022  077104                                                          SOB R1,3$
035024                         ELSE
035024  000402                                                          BR      $51401
035026                                                        $51400:
035026                          LET SIGN2 := #0
035026  005037  000452                                                  CLR     SIGN2
035032                         ENDIF
035032                                                        $51401:

                               ;+
                               ;       LOAD DSTMP'S WITH MDS & LSD OF EACH BUFFER
                               ;-

035032                         LET DSTMP0 :B= DSBUF1
035032  113737  062370  000552                                          MOVB    DSBUF1,DSTMP0
035040                         LET TEMP0 := #DSBUF1-1 + DATA00
035040  012737  062367  000474                                          MOV     #DSBUF1-1,TEMP0
035046  063737  000560  000474                                          ADD     DATA00,TEMP0
035054                         LET DSTMP1 :B= @TEMP0
035054  117737  143414  000553                                          MOVB    @TEMP0,DSTMP1
035062                         LET DSTMP2 :B= DSBUF2
035062  113737  062432  000554                                          MOVB    DSBUF2,DSTMP2
```

```
035070                               LET TEMPO := #DSBUF2-1 + DATA02
035070  012737  062431  000474                                                      MOV     #DSBUF2-1,TEMPO
035076  063737  000564  000474                                                      ADD     DATA02,TEMPO
035104                               LET DSTMP3 :B= @TEMPO
035104  117737  143364  000555                                                      MOVB    @TEMPO,DSTMP3
035112                               LET DSTMP4 :B= DS.EXP
035112  113737  062536  000556                                                      MOVB    DS.EXP,DSTMP4
035120                               LET TEMPO := #DS.EXP-1 + DATA04
035120  012737  062535  000474                                                      MOV     #DS.EXP-1,TEMPO
035126  063737  000570  000474                                                      ADD     DATA04,TEMPO
035134                               LET DSTMP5 :B= @TEMPO
035134  117737  143334  000557                                                      MOVB    @TEMPO,DSTMP5
035142                               LET DESCR1 := #DSBUF1
035142  012737  062370  000616                                                      MOV     #DSBUF1,DESCR1
035150                               LET DESCR3 := #DSBUF2
035150  012737  062432  000622                                                      MOV     #DSBUF2,DESCR3
035156                               LET DESCR5 := #DS.DST
035156  012737  062474  000626                                                      MOV     #DS.DST,DESCR5


                                    ; INCR TEMPO FROM #1 TO #5 BY #1          SRC1 DATA TYPE LOOP
035164                               INLINE <CLR @#TEMPO>
035164  005037  000474                                                              CLR @#TEMPO
035170                               INLINE <INC21: INC TEMPO>
035170  005237  000474                                                              INC21: INC TEMPO
035174                               IF TEMPO GT #5 THEN
035174  023727  000474  000005                                                      CMP     TEMPO,#5
035202  003402                                                                      BLE     $51402
035204                                INLINE <JMP END21>
035204  000137  037036                                                              JMP END21
035210                               ENDIF
035210                                                                   $51402:


                                      ;+
                                      ;      RESTORE MSD & LSD OF DSBUF1
                                      ;-

035210                                LET DSBUF1 :B= DSTMP0         ;MSD
035210  113737  000552  062370                                                      MOVB    DSTMP0,DSBUF1
035216                                LET TEMP2 := #DSBUF1-1 + DATA00
035216  012737  062367  000500                                                      MOV     #DSBUF1-1,TEMP2
035224  063737  000560  000500                                                      ADD     DATA00,TEMP2
035232                                LET @TEMP2 :B= DSTMP1         ;LSD
035232  113777  000553  143240                                                      MOVB    DSTMP1,@TEMP2


                                      ;+
                                      ;      SIGN DSBUF1 BY DATA TYPE
                                      ;-

035240                               SELECT TEMPO OF 5
035240  013746  000474                                                              MOV     TEMPO,-(SP)
035244  006316                                                                      ASL     (SP)
035246  060716                                                                      ADD     PC,(SP)
035250  063607                                                                      ADD     @(SP)+,PC
035252                                                                   $51403:
035252  000012                                                                      .WORD   $51411-$51403
035254  000052                                                                      .WORD   $51410-$51403
```

```
035256  000116                                                                  .WORD   $51407-$51403
035260  000162                                                                  .WORD   $51406-$51403
035262  000226                                                                  .WORD   $51405-$51403
035264                          CASE 1
035264                                                                  $51411:
035264                            LET DESCR0 := DATA00          ;SIGNED ZONED
035264  013737  000560  000614                                                  MOV     DATA00,DESCR0
035272                            IF SIGN0 EQ #0 THEN
035272  005737  000446                                                          TST     SIGN0
035276  001004                                                                  BNE     $51412
035300                             LET @TEMP2 :B= @TEMP2 SET.BY #60     ;+
035300  152777  000060  143172                                                  BISB    #60,@TEMP2
035306                            ELSE
035306  000403                                                                  BR      $51413
035310                                                                  $51412:
035310                             LET @TEMP2 :B= @TEMP2 SET.BY #160    ;-
035310  152777  000160  143162                                                  BISB    #160,@TEMP2
035316                            ENDIF
035316                                                                  $51413:
035316                            LET DSBUF1-1 :B= #0           ;FIX LEADING SEPARATE RESULT
035316  105037  062367                                                          CLRB    DSBUF1-1

035322                          CASE 2
035322  000512                                                                  BR      $51404
035324                                                                  $51410:
035324                            LET DESCR0 := DATA00 SET.BY #20000    ;TRAILING OVERPUNCH
035324  013737  000560  000614                                                  MOV     DATA00,DESCR0
035332  052737  020000  000614                                                  BIS     #20000,DESCR0
035340                            LET R5 :B= DSTMP1     ;GET LSD
035340  113705  000553                                                          MOVB    DSTMP1,R5
035344                            IF SIGN0 EQ #-1 THEN
035344  023727  000446  177777                                                  CMP     SIGN0,#-1
035352  001002                                                                  BNE     $51414
035354                             LET R5 := R5 + #10.          ;CHANGE INDEX FOR -
035354  062705  000012                                                          ADD     #10.,R5
035360                            ENDIF
035360                                                                  $51414:
035360                            LET @TEMP2 :B= OVPNCH(R5)
035360  116577  055254  143112                                                  MOVB    OVPNCH(R5),@TEMP

035366                          CASE 3
035366  000470                                                                  BR      $51404
035370                                                                  $51407:
035370                           LET DESCR0 := DATA00 SET.BY #30000     ;LEADING OVERPUNCH
035370  013737  000560  000614                                                  MOV     DATA00,DESCR0
035376  052737  030000  000614                                                  BIS     #30000,DESCR0
035404                             LET R5 :B= DSTMP0     ;GET MSD
035404  113705  000552                                                          MOVB    DSTMP0,R5
035410                             IF SIGN0 EQ #-1 THEN
035410  023727  000446  177777                                                  CMP     SIGN0,#-1
035416  001002                                                                  BNE     $51415
035420                              LET R5 := R5 + #10.
035420  062705  000012                                                          ADD     #10.,R5
035424                             ENDIF
035424                                                                  $51415:
035424                             LET DSBUF1 :B= OVPNCH(R5)
```

```
035424  116537  055254  062370                                                      MOVB    OVPNCH(R5),DSBUF


035432                          CASE 4
035432  000446                                                                      BR      $51404
035434                                                                  $51406:
035434                           LET DESCRO := DATA00 SET.BY #40000   ;TRAILING SEPARATE
035434  013737  000560  000614                                                      MOV     DATA00,DESCRO
035442  052737  040000  000614                                                      BIS     #40000,DESCRO
035450                           LET R5 := TEMP2 + #1
035450  013705  000500                                                              MOV     TEMP2,R5
035454  005205                                                                      INC     R5
035456                             IF SIGNO EQ #0 THEN
035456  005737  000446                                                              TST     SIGNO
035462  001003                                                                      BNE     $51416
035464                              LET (R5) :B= #53       ;+ SIGN
035464  112715  000053                                                              MOVB    #53,(R5)
035470                             ELSE
035470  000402                                                                      BR      $51417
035472                                                                  $51416:
035472                              LET (R5) :B= #55       ;- SIGN
035472  112715  000055                                                              MOVB    #55,(R5)
035476                             ENDIF
035476                                                                  $51417:

035476                          CASE 5
035476  000424                                                                      BR      $51404
035500                                                                  $51405:
035500                           LET DESCRO := DATA00 SET.BY #50000   ;LEADING SEPARATE
035500  013737  000560  000614                                                      MOV     DATA00,DESCRO
035506  052737  050000  000614                                                      BIS     #50000,DESCRO
035514                           LET R5 := TEMP2 + #1
035514  013705  000500                                                              MOV     TEMP2,R5
035520  005205                                                                      INC     R5
035522                             LET (R5) :B= #0  ;RESTORE TRAILING SEPARATE
035522  105015                                                                      CLRB    (R5)
035524                             IF SIGNO EQ #0 THEN
035524  005737  000446                                                              TST     SIGNO
035530  001004                                                                      BNE     $51420
035532                              LET DSBUF1-1 :B= #53
035532  112737  000053  062367                                                      MOVB    #53,DSBUF1-1
035540                             ELSE
035540  000403                                                                      BR      $51421
035542                                                                  $51420:
035542                              LET DSBUF1-1 :B= #55
035542  112737  000055  062367                                                      MOVB    #55,DSBUF1-1
035550                             ENDIF
035550                                                                  $51421:
035550                          ENDSELECT
035550                                                                  $51404:


                                  ;INCR TEMP1 FROM #1 TO #5 BY #1       SRC2 DATA TYPES
035550                            INLINE <CLR @#TEMP1>
035550  005037  000476                                                              CLR @#TEMP1
035554                            INLINE <INC22: INC TEMP1>
035554  005237  000476                                                              INC22: INC TEMP1
```

```
035560                              IF TEMP1 GT #5 THEN
035560  023727  000476  000005                                          CMP     TEMP1,#5
035566  003402                                                          BLE     $51422
035570                                INLINE <JMP END22>
035570  000137  037032                                                  JMP END22
035574                              ENDIF
035574                                                          $51422:
035574                                LET R3 := #DSBUF2
035574  012703  062432                                                  MOV     #DSBUF2,R3

                                      ;+
                                      ;  RESTORE MSD & LSD OF DSBUF2
                                      ;-

035600                                LET DSBUF2 :B= DSTMP2
035600  113737  000554  062432                                          MOVB    DSTMP2,DSBUF2
035606                                LET TEMP3 := #DSBUF2-1 + DATA02
035606  012737  062431  000502                                          MOV     #DSBUF2-1,TEMP3
035614  063737  000564  000502                                          ADD     DATA02,TEMP3
035622                                LET @TEMP3 :B= DSTMP3
035622  113777  000555  142652                                          MOVB    DSTMP3,@TEMP3

                                      ;+
                                      ;  SIGN DSBUF2 BY DATA TYPE
                                      ;-

035630                              SELECT TEMP1 OF 5
035630  013746  000476                                                  MOV     TEMP1,-(SP)
035634  006316                                                          ASL     (SP)
035636  060716                                                          ADD     PC,(SP)
035640  063607                                                          ADD     @(SP)+,PC
035642                                                          $51423:
035642  000012                                                          .WORD   $51431-$51423
035644  000052                                                          .WORD   $51430-$51423
035646  000116                                                          .WORD   $51427-$51423
035650  000162                                                          .WORD   $51426-$51423
035652  000226                                                          .WORD   $51425-$51423
035654                              CASE 1
035654                                                          $51431:
035654                               LET DESCR2 := DATA02
035654  013737  000564  000620                                          MOV     DATA02,DESCR2
035662                                 IF SIGN1 EQ #0 THEN
035662  005737  000450                                                  TST     SIGN1
035666  001004                                                          BNE     $51432
035670                                  LET @TEMP3 :B= @TEMP3 SET.BY #60  ;+
035670  152777  000060  142604                                          BISB    #60,@TEMP3
035676                                 ELSE
035676  000403                                                          BR      $51433
035700                                                          $51432:
035700                                  LET @TEMP3 :B= @TEMP3 SET.BY #160;-
035700  152777  000160  142574                                          BISB    #160,@TEMP3
035706                                 ENDIF
035706                                                          $51433:
035706                                 LET DSBUF2-1 :B= #0
035706  105037  062431                                                  CLRB    DSBUF2-1
```

```
035712                              CASE 2
035712  000512                                                                    BR      $51424
035714                                                                 $51430:
035714                               LET DESCR2 := DATA02 SET.BY #20000  ;TRAILING OVERPUNCH
035714  013737  000564  000620                                                    MOV     DATA02,DESCR2
035722  052737  020000  000620                                                    BIS     #20000,DESCR2
035730                                 LET R5 :B= DSTMP3
035730  113705  000555                                                            MOVB    DSTMP3,R5
035734                                 IF SIGN1 EQ #-1 THEN
035734  023727  000450  177777                                                    CMP     SIGN1,#-1
035742  001002                                                                    BNE     $51434
035744                                  LET R5 := R5 + #10.
035744  062705  000012                                                            ADD     #10.,R5
035750                                 ENDIF
035750                                                                 $51434:
035750                                 LET @TEMP3 :B= OVPNCH(R5)
035750  116577  055254  142524                                                    MOVB    OVPNCH(R5),@TEMP

035756                              CASE 3
035756  000470                                                                    BR      $51424
035760                                                                 $51427:
035760                               LET DESCR2 := DATA02 SET.BY #30000  ;LEADING OVERPUNCH
035760  013737  000564  000620                                                    MOV     DATA02,DESCR2
035766  052737  030000  000620                                                    BIS     #30000,DESCR2
035774                                 LET R5 :B= DSTMP2
035774  113705  000554                                                            MOVB    DSTMP2,R5
036000                                 IF SIGN1 EQ #-1 THEN
036000  023727  000450  177777                                                    CMP     SIGN1,#-1
036006  001002                                                                    BNE     $51435
036010                                  LET R5 := R5 + #10.
036010  062705  000012                                                            ADD     #10.,R5
036014                                 ENDIF
036014                                                                 $51435:
036014                                 LET DSBUF2 :B= OVPNCH(R5)
036014  116537  055254  062432                                                    MOVB    OVPNCH(R5),DSBUF

036022                              CASE 4
036022  000446                                                                    BR      $51424
036024                                                                 $51426:
036024                               LET DESCR2 := DATA02 SET.BY #40000  ;TRAILING SEPARATE
036024  013737  000564  000620                                                    MOV     DATA02,DESCR2
036032  052737  040000  000620                                                    BIS     #40000,DESCR2
036040                               LET R5 := TEMP3 + #1
036040  013705  000502                                                            MOV     TEMP3,R5
036044  005205                                                                    INC     R5
036046                                 IF SIGN1 EQ #0 THEN
036046  005737  000450                                                            TST     SIGN1
036052  001003                                                                    BNE     $51436
036054                                  LET (R5) :B= #53
036054  112715  000053                                                            MOVB    #53,(R5)
036060                                 ELSE
036060  000402                                                                    BR      $51437
036062                                                                 $51436:
036062                                  LET (R5) :B= #55
036062  112715  000055                                                            MOVB    #55,(R5)
036066                                 ENDIF
```

```
036066                                                                  $51437:

036066                              CASE 5
036066  000424                                                                  BR      $51424
036070                                                                  $51425:
036070                               LET DESCR2 := DATA02 SET.BY #50000  ;LEADING SEPARATE
036070  013737  000564  000620                                                  MOV     DATA02,DESCR2
036076  052737  050000  000620                                                  BIS     #50000,DESCR2
036104                               LET R5 := TEMP3 + #1
036104  013705  000502                                                          MOV     TEMP3,R5
036110  005205                                                                  INC     R5
036112                                 LET (R5) :B= #0
036112  105015                                                                  CLRB    (R5)
036114                                 IF SIGN1 EQ #0 THEN
036114  005737  000450                                                          TST     SIGN1
036120  001004                                                                  BNE     $51440
036122                                  LET DSBUF2-1 :B= #53
036122  112737  000053  062431                                                  MOVB    #53,DSBUF2-1
036130                                 ELSE
036130  000403                                                                  BR      $51441
036132                                                                  $51440:
036132                                  LET DSBUF2-1 :B= #55
036132  112737  000055  062431                                                  MOVB    #55,DSBUF2-1
036140                                 ENDIF
036140                                                                  $51441:
036140                              ENDSELECT
036140                                                                  $51424:

                                  ;INCR DATTYP FROM #1 TO #5 BY #1      ;DS.EXP LOOP
036140                                 INLINE <CLR @#DATTYP>
036140  005037  000462                                                          CLR @#DATTYP
036144                                 INLINE <INC23: INC DATTYP>
036144  005237  000462                                                          INC23: INC DATTYP
036150                                 IF DATTYP GT #5 THEN
036150  023727  000462  000005                                                  CMP     DATTYP,#5
036156  003402                                                                  BLE     $51442
036160                                   INLINE <JMP END23>
036160  000137  037026                                                          JMP END23
036164                                 ENDIF
036164                                                                  $51442:

                                    ;+
                                    ;          RESTORE MSD & LSD OF DS.EXP
                                    ;-

036164                                  LET DS.EXP :B= DSTMP4     ;MSD
036164  113737  000556  062536                                                  MOVB    DSTMP4,DS.EXP
036172                                  LET TEMP4 := #DS.EXP-1 + DATA04
036172  012737  062535  000504                                                  MOV     #DS.EXP-1,TEMP4
036200  063737  000570  000504                                                  ADD     DATA04,TEMP4
036206                                  LET @TEMP4 :B= DSTMP5     ;LSD
036206  113777  000557  142270                                                  MOVB    DSTMP5,@TEMP4

                                    ;+
                                    ;          SIGN DS.EXP BY DATA TYPE
                                    ;-
```

```
036214                               SELECT DATTYP OF 5
036214  013746  000462                                                          MOV     DATTYP,-(SP)
036220  006316                                                                  ASL     (SP)
036222  060716                                                                  ADD     PC,(SP)
036224  063607                                                                  ADD     @(SP)+,PC
036226                                                                  $51443:
036226  000012                                                                  .WORD   $51451-$51443
036230  000060                                                                  .WORD   $51450-$51443
036232  000136                                                                  .WORD   $51447-$51443
036234  000214                                                                  .WORD   $51446-$51443
036236  000260                                                                  .WORD   $51445-$51443
036240                                CASE 1
036240                                                                  $51451:
036240                                 LET DESCR4 := DATA04            ;SIGNED ZONED
036240  013737  000570  000624                                                  MOV     DATA04,DESCR4
036246                                IF DATA04 NE #0 THEN
036246  005737  000570                                                          TST     DATA04
036252  001414                                                                  BEQ     $51452
036254                                   IF SIGN2 EQ #0 THEN
036254  005737  000452                                                          TST     SIGN2
036260  001004                                                                  BNE     $51453
036262                                    LET @TEMP4 :B= @TEMP4 SET.BY #60
036262  152777  000060  142214                                                  BISB    #60,@TEMP4
036270                                   ELSE
036270  000403                                                                  BR      $51454
036272                                                                  $51453:
036272                                    LET @TEMP4 :B= @TEMP4 SET.BY #160
036272  152777  000160  142204                                                  BISB    #160,@TEMP4
036300                                   ENDIF
036300                                                                  $51454:
036300                                   LET DS.EXP-1 :B= #0
036300  105037  062535                                                          CLRB    DS.EXP-1
036304                                ENDIF
036304                                                                  $51452:

036304                               CASE 2
036304  000524                                                                  BR      $51444
036306                                                                  $51450:
036306                                LET DESCR4 := DATA04 SET.BY #20000 ;TRAILING OVERPUNCH
036306  013737  000570  000624                                                  MOV     DATA04,DESCR4
036314  052737  020000  000624                                                  BIS     #20000,DESCR4
036322                                 IF DATA04 NE #0 THEN
036322  005737  000570                                                          TST     DATA04
036326  001415                                                                  BEQ     $51455
036330                                   LET R5 :B= DSTMP5
036330  113705  000557                                                          MOVB    DSTMP5,R5
036334                                   LET R5 := R5 - #60
036334  162705  000060                                                          SUB     #60,R5
036340                                   IF SIGN2 EQ #-1 THEN
036340  023727  000452  177777                                                  CMP     SIGN2,#-1
036346  001002                                                                  BNE     $51456
036350                                    LET R5 := R5 + #10.
036350  062705  000012                                                          ADD     #10.,R5
036354                                   ENDIF
036354                                                                  $51456:
```

```
036354                                  LET @TEMP4 :B= OVPNCH(R5)
036354 116577 055254 142122                                                     MOVB    OVPNCH(R5),@TEMP
036362                                ENDIF
036362                                                                 $51455:

036362                              CASE 3
036362 000475                                                                   BR      $51444
036364                                                                 $51447:
036364                             LET DESCR4 := DATA04 SET.BY #30000 ;LEADING OVERPUNCH
036364 013737 000570 000624                                                     MOV     DATA04,DESCR4
036372 052737 030000 000624                                                     BIS     #30000,DESCR4
036400                                IF DATA04 NE #0 THEN
036400 005737 000570                                                            TST     DATA04
036404 001415                                                                   BEQ     $51457
036406                                  LET R5 :B= DSTMP4
036406 113705 000556                                                            MOVB    DSTMP4,R5
036412                                  LET R5 := R5 - #60
036412 162705 000060                                                            SUB     #60,R5
036416                                  IF SIGN2 EQ #-1 THEN
036416 023727 000452 177777                                                     CMP     SIGN2,#-1
036424 001002                                                                   BNE     $51460
036426                                   LET R5 := R5 + #10.
036426 062705 000012                                                            ADD     #10.,R5
036432                                  ENDIF
036432                                                                 $51460:
036432                                  LET DS.EXP :B= OVPNCH(R5)
036432 116537 055254 062536                                                     MOVB    OVPNCH(R5),DS.EX
036440                                ENDIF
036440                                                                 $51457:

036440                              CASE 4
036440 000446                                                                   BR      $51444
036442                                                                 $51446:
036442                             LET DESCR4 := DATA04 SET.BY #40000 ;TRAILING SEPARATE
036442 013737 000570 000624                                                     MOV     DATA04,DESCR4
036450 052737 040000 000624                                                     BIS     #40000,DESCR4
036456                                  LET R5 := TEMP4 + #1
036456 013705 000504                                                            MOV     TEMP4,R5
036462 005205                                                                   INC     R5
036464                                  IF SIGN2 EQ #0 THEN
036464 005737 000452                                                            TST     SIGN2
036470 001003                                                                   BNE     $51461
036472                                   LET (R5) :B= #53
036472 112715 000053                                                            MOVB    #53,(R5)
036476                                  ELSE
036476 000402                                                                   BR      $51462
036500                                                                 $51461:
036500                                   LET (R5) :B= #55
036500 112715 000055                                                            MOVB    #55,(R5)
036504                                  ENDIF
036504                                                                 $51462:

036504                              CASE 5
036504 000424                                                                   BR      $51444
036506                                                                 $51445:
036506                             LET DESCR4 := DATA04 SET.BY #50000
```

```
036506  013737  000570  000624                                                  MOV     DATA04,DESCR4
036514  052737  050000  000624                                                  BIS     #50000,DESCR4
036522                          LET R5 := TEMP4 + #1
036522  013705  000504                                                          MOV     TEMP4,R5
036526  005205                                                                  INC     R5
036530                          LET (R5) :B= #0
036530  105015                                                                  CLRB    (R5)
036532                          IF SIGN2 EQ #0 THEN
036532  005737  000452                                                          TST     SIGN2
036536  001004                                                                  BNE     $51463
036540                           LET DS.EXP-1 :B= #53
036540  112737  000053  062535                                                  MOVB    #53,DS.EXP-1
036546                          ELSE
036546  000403                                                                  BR      $51464
036550                                                                  $51463:
036550                           LET DS.EXP-1 :B= #55
036550  112737  000055  062535                                                  MOVB    #55,DS.EXP-1
036556                          ENDIF
036556                                                                  $51464:
036556                      ENDSELECT
036556                                                                  $51444:

                        ;+
                        ;       CLR DS.DST & LOAD DESCRIPTORS
                        ;-

036556                          LET R0 := #DS.DST-1
036556  012700  062473                                                          MOV     #DS.DST-1,R0
036562                          LET R1 := #41
036562  012701  000041                                                          MOV     #41,R1
036566                          INLINE <DOIT:   CLRB    (R0)+>
036566  105020                                                                  DOIT:   CLRB    (R0)+
036570                          INLINE <SOB     R1,     DOIT>
036570  077102                                                                  SOB     R1,     DOIT
036572                          LET R0 := DESCR0
036572  013700  000614                                                          MOV     DESCR0,R0
036576                          LET R1 := DESCR1
036576  013701  000616                                                          MOV     DESCR1,R1
036602                          LET R2 := DESCR2
036602  013702  000620                                                          MOV     DESCR2,R2
036606                          LET R3 := DESCR3
036606  013703  000622                                                          MOV     DESCR3,R3
036612                          LET R4 := DESCR4
036612  013704  000624                                                          MOV     DESCR4,R4
036616                          LET R5 := DESCR5
036616  013705  000626                                                          MOV     DESCR5,R5
036622                          LET R4.EXP := R4
036622  010437  000532                                                          MOV     R4,R4.EXP
036626                          LET R5.EXP := R5
036626  010537  000534                                                          MOV     R5,R5.EXP
036632                          INLINE <SUBN>
036632  076051                                                                  SUBN

                        ;+
                        ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                        ;-
```

```
036634                                  LET CC := PSW
036634  013737  177776  000516                                                          MOV     PSW,CC
036642                                  LET CC := CC CLR.BY #177760
036642  042737  177760  000516                                                          BIC     #177760,CC
036650                                  IF CC NE CC.EXP THEN
036650  023737  000516  000520                                                          CMP     CC,CC.EXP
036656  001402                                                                          BEQ     $51465
036660                                    CALL ERROR
036660  004737  056274                                                                  JSR     PC,ERROR
036664                                  ENDIF
036664                                                                        $51465:
036664                                  IF R0 NE R0.EXP THEN
036664  020037  000522                                                                  CMP     R0,R0.EXP
036670  001402                                                                          BEQ     $51466
036672                                    CALL ERROR
036672  004737  056274                                                                  JSR     PC,ERROR
036676                                  ENDIF
036676                                                                        $51466:
036676                                  IF R1 NE R1.EXP THEN
036676  020137  000524                                                                  CMP     R1,R1.EXP
036702  001402                                                                          BEQ     $51467
036704                                    CALL ERROR
036704  004737  056274                                                                  JSR     PC,ERROR
036710                                  ENDIF
036710                                                                        $51467:
036710                                  IF R2 NE R2.EXP THEN
036710  020237  000526                                                                  CMP     R2,R2.EXP
036714  001402                                                                          BEQ     $51470
036716                                    CALL ERROR
036716  004737  056274                                                                  JSR     PC,ERROR
036722                                  ENDIF
036722                                                                        $51470:
036722                                  IF R3 NE R3.EXP THEN
036722  020337  000530                                                                  CMP     R3,R3.EXP
036726  001402                                                                          BEQ     $51471
036730                                    CALL ERROR
036730  004737  056274                                                                  JSR     PC,ERROR
036734                                  ENDIF
036734                                                                        $51471:
036734                                  IF R4 NE R4.EXP THEN
036734  020437  000532                                                                  CMP     R4,R4.EXP
036740  001402                                                                          BEQ     $51472
036742                                    CALL ERROR
036742  004737  056274                                                                  JSR     PC,ERROR
036746                                  ENDIF
036746                                                                        $51472:
036746                                  IF R5 NE R5.EXP THEN
036746  020537  000534                                                                  CMP     R5,R5.EXP
036752  001402                                                                          BEQ     $51473
036754                                    CALL ERROR
036754  004737  056274                                                                  JSR     PC,ERROR
036760                                  ENDIF
036760                                                                        $51473:
```

```
                                   ;+
                                   ;        CHECK RESULTS VS EXPECTED RESULTS
                                   ;-

036760                             LET R0 := #DS.DST-1
036760  012700  062473                                                          MOV     #DS.DST-1,R0
036764                             LET R1 := #DS.EXP-1
036764  012701  062535                                                          MOV     #DS.EXP-1,R1
036770                             LET ERRFLG := #0
036770  005037  000454                                                          CLR     ERRFLG
036774                             WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
036774                                                                 $51474:
036774  020027  062534                                                          CMP     R0,#DS.DST+40
037000  001410                                                                  BEQ     $51475
037002  005737  000454                                                          TST     ERRFLG
037006  001005                                                                  BNE     $51475
037010                              IFB (R0)+ NE (R1)+ THEN
037010  122021                                                                  CMPB    (R0)+,(R1)+
037012  001402                                                                  BEQ     $51476
037014                               CALL ERROR
037014  004737  056274                                                          JSR     PC,ERROR
037020                              ENDIF
037020                                                                 $51476:
037020                             ENDDO
037020  000765                                                                  BR      $51474
037022                                                                 $51475:
                                ;ENDINC
037022                           INLINE <JMP INC23>
037022  000137  036144                                                          JMP INC23
037026                           INLINE <END23:>
037026                                                                          END23:
                             ;ENDINC
037026                       INLINE <JMP INC22>
037026  000137  035554                                                          JMP INC22
037032                       INLINE <END22:>
037032                                                                          END22:
                           ;ENDINC
037032                     INLINE <JMP INC21>
037032  000137  035170                                                          JMP INC21
037036                     INLINE <END21:>
037036                                                                          END21:
037036                     LET TSTCAS := TSTCAS + #22
037036  062737  000022  000542                                                  ADD     #22,TSTCAS
037044                     LET COUNT := COUNT - #1
037044  005337  000466                                                          DEC     COUNT
                          ;UNTIL COUNT EQ #0
037050                    IF COUNT NE #0 THEN
037050  005737  000466                                                          TST     COUNT
037054  001402                                                                  BEQ     $51477
037056                     INLINE <JMP $5051>
037056  000137  034612                                                          JMP $5051
037062                    ENDIF
037062                                                                 $51477:

                          ;+
                          ;         INLINE CASE - SUBNI, USING UNSIGNED ZONED DATA
```

```
                              ;-

037062                        CALL CLRDSB
037062  004737  055520                                                              JSR     PC,CLRDSB

                              ;+
                              ;       LOAD DSBUF1
                              ;-

037066                        LET R0 := #ADD1+2                         ;SOURCE
037066  012700  063360                                                              MOV     #ADD1+2,R0
037072                        LET R1 := TADDI CLR.BY #10000             ;# OF BYTES TO XFER
037072  013701  064052                                                              MOV     TADDI,R1
037076  042701  010000                                                              BIC     #10000,R1
037102                        LET R2 := #DSBUF1                         ;DESTINATION
037102  012702  062370                                                              MOV     #DSBUF1,R2
037106                        INLINE  <1$:    MOVB    (R0)+,  (R2)+>
037106  112022                                                                      1$:     MOVB    (R0)+,
037110                        INLINE  <       SOB     R1,     1$>
037110  077102                                                                              SOB     R1,

                              ;+
                              ;       LOAD DSBUF2
                              ;-

037112                        LET R0 := #ADD1A+2
037112  012700  063402                                                              MOV     #ADD1A+2,R0
037116                        LET R1 := TADDI+4 CLR.BY #10000
037116  013701  064056                                                              MOV     TADDI+4,R1
037122  042701  010000                                                              BIC     #10000,R1
037126                        LET R2 := #DSBUF2
037126  012702  062432                                                              MOV     #DSBUF2,R2
037132                        INLINE  <2$:    MOVB    (R0)+,  (R2)+>
037132  112022                                                                      2$:     MOVB    (R0)+,
037134                        INLINE  <       SOB     R1,     2$>
037134  077102                                                                              SOB     R1,

                              ;+
                              ;       LOAD DS.EXP
                              ;-

037136                        LET R0 := #ADD1C+2
037136  012700  063454                                                              MOV     #ADD1C+2,R0
037142                        LET R1 := TADDI+10 CLR.BY #10000
037142  013701  064062                                                              MOV     TADDI+10,R1
037146  042701  010000                                                              BIC     #10000,R1
037152                        LET R2 := #DS.EXP
037152  012702  062536                                                              MOV     #DS.EXP,R2
037156                        INLINE  <3$:    MOVB    (R0)+,  (R2)>
037156  112012                                                                      3$:     MOVB    (R0)+,
037160                        INLINE  <       BISB    #60.,   (R2)+>
037160  152722  000060                                                                      BISB    #60.,
037164                        INLINE  <       SOB     R1,     3$>
037164  077104                                                                              SOB     R1,

037166                        CALL CLRREG                          ;ENSURE R0-R5 ARE CLR
```

```
037166  004737  055330                                                          JSR     PC,CLRREG

037172                          INLINE <SUBNI>
037172  076151                                                                  SUBNI
037174                          INLINE <.WORD TADDI>
037174  064052                                                                  .WORD TADDI
037176                          INLINE <.WORD TADDI+4>
037176  064056                                                                  .WORD TADDI+4
037200                          INLINE <.WORD TADDI+10>
037200  064062                                                                  .WORD TADDI+10
037202                          LET CC := PSW
037202  013737  177776  000516                                                  MOV     PSW,CC
037210                          LET CC := CC CLR.BY #177760
037210  042737  177760  000516                                                  BIC     #177760,CC
037216                          IF CC NE #0 THEN
037216  005737  000516                                                          TST     CC
037222  001402                                                                  BEQ     $51500
037224                           CALL ERROR
037224  004737  056274                                                          JSR     PC,ERROR
037230                          ENDIF
037230                                                                  $51500:


                                ;+
                                ;       ENSURE GPR'S STILL ZERO
                                ;-

037230                          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
037230  005700                                                                  TST     R0
037232  001004                                                                  BNE     $51501
037234  005701                                                                  TST     R1
037236  001002                                                                  BNE     $51501
037240  005702                                                                  TST     R2
037242  001402                                                                  BEQ     $51502
037244                                                                  $51501:
037244                           CALL ERROR
037244  004737  056274                                                          JSR     PC,ERROR
037250                          ENDIF
037250                                                                  $51502:
037250                          IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
037250  005703                                                                  TST     R3
037252  001004                                                                  BNE     $51503
037254  005704                                                                  TST     R4
037256  001002                                                                  BNE     $51503
037260  005705                                                                  TST     R5
037262  001402                                                                  BEQ     $51504
037264                                                                  $51503:
037264                           CALL ERROR
037264  004737  056274                                                          JSR     PC,ERROR
037270                          ENDIF
037270                                                                  $51504:


                                ;+
                                ;       CHECK RESULTS
                                ;-

037270                          LET R0 := #DS.DST
```

```
037270  012700  062474                                                                  MOV     #DS.DST,R0
037274                   LET R1 := #DS.EXP              ;EXPECTED DATA
037274  012701  062536                                                                  MOV     #DS.EXP,R1
037300                   LET ERRFLG := #0
037300  005037  000454                                                                  CLR     ERRFLG
037304                   WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
037304                                                                          $51505:
037304  020027  062534                                                                  CMP     R0,#DS.DST+40
037310  001410                                                                          BEQ     $51506
037312  005737  000454                                                                  TST     ERRFLG
037316  001005                                                                          BNE     $51506
037320                    IFB (R0)+ NE (R1)+ THEN
037320  122021                                                                          CMPB    (R0)+,(R1)+
037322  001402                                                                          BEQ     $51507
037324                     CALL ERROR
037324  004737  056274                                                                  JSR     PC,ERROR
037330                    ENDIF
037330                                                                          $51507:
037330                   ENDDO
037330  000765                                                                          BR      $51505
037332                                                                          $51506:
```

```
                                  .SBTTL  CMPN
                                  ;*****************************************************************
                                  ;
                                  ;  CMPN TEST
                                  ;
                                  ;*****************************************************************

037332                            INLINE <XCMPN:>
037332                                                                              XCMPN:
037332                            INLINE <SCOPE>
037332  000004                                                                      SCOPE
037334                            LET $TIMES := #20                 ;DO 20 ITERATIONS
037334  012737  000020  000404                                                      MOV    #20,$TIMES
037342                            LET COUNT := TCMP                 ;GET TEST COUNT
037342  013737  062576  000466                                                      MOV    TCMP,COUNT
037350                            LET TSTCAS := #TCMP+2             ;POINT TO FIRST TEST CASE
037350  012737  062600  000542                                                      MOV    #TCMP+2,TSTCAS
                                  ;REPEAT
037356                            INLINE <$5052:>
037356                                                                              $5052:
037356                               CALL CLRDSB
037356  004737  055520                                                              JSR    PC,CLRDSB
037362                               LET CC.EXP := #0
037362  005037  000520                                                              CLR    CC.EXP
037366                               LET SIGNO := #0
037366  005037  000446                                                              CLR    SIGNO
037372                               LET DATTYP := #0
037372  005037  000462                                                              CLR    DATTYP

                                     ;+
                                     ; GET SOURCE DESCRIPTORS FROM TABLE
                                     ;-

037376                               LET R0 := TSTCAS
037376  013700  000542                                                              MOV    TSTCAS,R0
037402                               LET DATA00 := (R0)+            ;SRC1 LENGTH
037402  012037  000560                                                              MOV    (R0)+,DATA00
037406                               LET DATA01 := (R0)+            ;SRC1 POINTER
037406  012037  000562                                                              MOV    (R0)+,DATA01
037412                               LET DATA02 := (R0)+            ;SRC2 LENGTH
037412  012037  000564                                                              MOV    (R0)+,DATA02
037416                               LET DATA03 := (R0)             ;SRC2 POINTER
037416  011037  000566                                                              MOV    (R0),DATA03

                                     ;+
                                     ; LOAD SRC1 AND SRC2 INTO DSBUF1 AND DSBUF2.
                                     ;-

037422                               LET R2 := DATA01 + #2          ;GET SRC1 ADDRESS
037422  013702  000562                                                              MOV    DATA01,R2
037426  062702  000002                                                              ADD    #2,R2
037432                               LET R3 := #DSBUF1
037432  012703  062370                                                              MOV    #DSBUF1,R3
037436                               LET DSTMP0 :B= (R2)            ;SAVE SRC1 MSD
037436  111237  000552                                                              MOVB   (R2),DSTMP0
037442                               DECR R1 FROM DATA00 TO #1 BY #1
```

```
037442  013701  000560                                                          MOV     DATA00,R1
037446  000401                                                                  BR      $51510
037450                                                              $51511:
037450  005301                                                                  DEC     R1
037452                                                              $51510:
037452  020127  000001                                                          CMP     R1,#1
037456  002402                                                                  BLT     $51512
037460                          LET (R3)+ :B= (R2)+
037460  112223                                                                  MOVB    (R2)+,(R3)+
037462                  ENDDEC
037462  000772                                                                  BR      $51511
037464                                                              $51512:
037464                  IF DATA00 HI #0 THEN
037464  005737  000560                                                          TST     DATA00
037470  101402                                                                  BLOS    $51513
037472                    LET DSTMP1 :B= -(R2)                  ;SAVE SRC1 LSD
037472  114237  000553                                                          MOVB    -(R2),DSTMP1
037476                  ENDIF
037476                                                              $51513:
037476                  LET R2 := DATA03 + #2                   ;GET SRC2 ADDRESS
037476  013702  000566                                                          MOV     DATA03,R2
037502  062702  000002                                                          ADD     #2,R2
037506                  LET R3 := #DSBUF2
037506  012703  062432                                                          MOV     #DSBUF2,R3
037512                  LET DSTMP2 :B= (R2)                     ;SAVE SRC2 MSD
037512  111237  000554                                                          MOVB    (R2),DSTMP2
037516                  DECR R1 FROM DATA02 TO #1 BY #1
037516  013701  000564                                                          MOV     DATA02,R1
037522  000401                                                                  BR      $51514
037524                                                              $51515:
037524  005301                                                                  DEC     R1
037526                                                              $51514:
037526  020127  000001                                                          CMP     R1,#1
037532  002402                                                                  BLT     $51516
037534                          LET (R3)+ :B= (R2)+
037534  112223                                                                  MOVB    (R2)+,(R3)+
037536                  ENDDEC
037536  000772                                                                  BR      $51515
037540                                                              $51516:
037540                  LET DSTMP3 :B= -(R2)                    ;SAVE SRC2 LSD
037540  114237  000555                                                          MOVB    -(R2),DSTMP3

                        ;+
                        ; COMPARE SRC1 AND SRC2, AND SET N AND Z BITS
                        ; IN CC.EXP ACCORDINGLY.
                        ;-

037544                  IF DATA00 EQ #0 AND DATA02 EQ #0 THEN        ;SRC1 LENGTH AND SRC2 LENGTH = 0
037544  005737  000560                                                          TST     DATA00
037550  001007                                                                  BNE     $51517
037552  005737  000564                                                          TST     DATA02
037556  001004                                                                  BNE     $51517
037560                          LET CC.EXP := CC.EXP SET.BY #ZBIT
037560  052737  000004  000520                                                  BIS     #ZBIT,CC.EXP
037566                  ELSE
037566  000424                                                                  BR      $51520
```

```
037570                                                                                   $51517:
037570                                   IF DATA00 EQ #0 AND @DATA03 EQ #0 THEN  ;SRC1 LENGTH = 0 AND SRC2 SIGN IS +
037570  005737  000560                                                                       TST     DATA00
037574  001007                                                                               BNE     $51521
037576  005777  140764                                                                       TST     @DATA03
037602  001004                                                                               BNE     $51521
037604                                       LET CC.EXP := CC.EXP SET.BY #NBIT
037604  052737  000010  000520                                                               BIS     #NBIT,CC.EXP
037612                                   ELSE
037612  000412                                                                               BR      $51522
037614                                                                                   $51521:
037614                                       IF DATA02 EQ #0 AND @DATA01 EQ #-1 THEN    ;SRC2 LENGTH = 0 & SRC1 SIGN IS -
037614  005737  000564                                                                       TST     DATA02
037620  001007                                                                               BNE     $51523
037622  027727  140734  177777                                                               CMP     @DATA01,#-1
037630  001003                                                                               BNE     $51523
037632                                           LET CC.EXP := CC.EXP SET.BY #NBIT
037632  052737  000010  000520                                                               BIS     #NBIT,CC.EXP
037640                                       ENDIF
037640                                                                                   $51523:
037640                                   ENDIF
037640                                                                                   $51522:
037640                              ENDIF
037640                                                                                   $51520:
037640                              IF DATA00 NE #0 AND DATA02 NE #0 THEN         ;SRC1 LENGTH AND SRC2 LENGTH > 0
037640  005737  000560                                                                       TST     DATA00
037644  001520                                                                               BEQ     $51524
037646  005737  000564                                                                       TST     DATA02
037652  001515                                                                               BEQ     $51524
037654                                 IF @DATA01 NE @DATA03 THEN                 ;SRC1 SIGN AND SRC2 SIGN ARE DIFFERENT
037654  027777  140702  140704                                                               CMP     @DATA01,@DATA03
037662  001410                                                                               BEQ     $51525
037664                                   IF @DATA01 EQ #-1 THEN                   ;SRC1 SIGN IS -
037664  027727  140672  177777                                                               CMP     @DATA01,#-1
037672  001003                                                                               BNE     $51526
037674                                       LET CC.EXP := CC.EXP SET.BY #NBIT
037674  052737  000010  000520                                                               BIS     #NBIT,CC.EXP
037702                                   ENDIF
037702                                                                                   $51526:
037702                                 ELSE                              ;SRC1 SIGN AND SRC2 SIGN ARE EQUAL
037702  000501                                                                               BR      $51527
037704                                                                                   $51525:
037704                                   LET SIGN0 := @DATA01                           ;SAVE THE COMMON SIGN
037704  017737  140652  000446                                                               MOV     @DATA01,SIGN0
037712                                   IF DATA00 LO DATA02 AND SIGN0 EQ #0 THEN   ;SRC1 LENGTH < SRC2 LENGTH AND SIGNS
037712  023737  000560  000564                                                               CMP     DATA00,DATA02
037720  103007                                                                               BHIS    $51530
037722  005737  000446                                                                       TST     SIGN0
037726  001004                                                                               BNE     $51530
037730                                       LET CC.EXP := CC.EXP SET.BY #NBIT
037730  052737  000010  000520                                                               BIS     #NBIT,CC.EXP
037736                                   ELSE
037736  000413                                                                               BR      $51531
037740                                                                                   $51530:
037740                                       IF DATA00 HI DATA02 AND SIGN0 EQ #-1 THEN    ;SRC1 LENGTH > SRC2 LENGTH AND
037740  023737  000560  000564                                                               CMP     DATA00,DATA02
```

```
037746  101407                                                                      BLOS    $51532
037750  023727  000446  177777                                                      CMP     SIGNO,#-1
037756  001003                                                                      BNE     $51532
037760                                  LET CC.EXP := CC.EXP SET.BY #NBIT
037760  052737  000010  000520                                                      BIS     #NBIT,CC.EXP
037766                              ENDIF
037766                                                                  $51532:
037766                          ENDIF
037766                                                                  $51531:
037766                          IF DATA00 EQ DATA02 THEN            ;SRC1 LENGTH AND SRC2 LENGTH ARE EQUAL
037766  023737  000560  000564                                                      CMP     DATA00,DATA02
037774  001044                                                                      BNE     $51533


                              ;+
                              ; COMPARE SRC1 AND SRC2 BYTE BY BYTE
                              ;-

037776                        LET R0 := DATA00                      ;SRC BUFFER LENGTH
037776  013700  000560                                                              MOV     DATA00,R0
040002                        LET R1 := #DSBUF1              ;SRC1 BUFFER
040002  012701  062370                                                              MOV     #DSBUF1,R1
040006                        LET R2 := #DSBUF2              ;SRC2 BUFFER
040006  012702  062432                                                              MOV     #DSBUF2,R2
040012                        WHILEB R0 NE #0 AND (R1)+ EQ (R2)+ DO
040012                                                                  $51534:
040012  105700                                                                      TSTB    R0
040014  001404                                                                      BEQ     $51535
040016  022122                                                                      CMP     (R1)+,(R2)+
040020  001002                                                                      BNE     $51535
040022                            LET R0 := R0 - #1                 ;DECREMENT COUNTER
040022  005300                                                                      DEC     R0
040024                        ENDDO
040024  000772                                                                      BR      $51534
040026                                                                  $51535:
040026                        IFB -(R1) NE -(R2) THEN        ;SOURCES WERE NOT =
040026  124142                                                                      CMPB    -(R1),-(R2)
040030  001423                                                                      BEQ     $51536
040032                            IFB (R1) LO (R2) AND SIGNO EQ #0 THEN
040032  121112                                                                      CMPB    (R1),(R2)
040034  103007                                                                      BHIS    $51537
040036  005737  000446                                                              TST     SIGNO
040042  001004                                                                      BNE     $51537
040044                                LET CC.EXP := CC.EXP SET.BY #NBIT
040044  052737  000010  000520                                                      BIS     #NBIT,CC.EXP
040052                            ELSE
040052  000411                                                                      BR      $51540
040054                                                                  $51537:
040054                                IFB (R1) HI (R2) AND SIGNO EQ #-1 THEN
040054  121112                                                                      CMPB    (R1),(R2)
040056  101407                                                                      BLOS    $51541
040060  023727  000446  177777                                                      CMP     SIGNO,#-1
040066  001003                                                                      BNE     $51541
040070                                    LET CC.EXP := CC.EXP SET.BY #NBIT
040070  052737  000010  000520                                                      BIS     #NBIT,CC.EXP
040076                                ENDIF
040076                                                                  $51541:
```

```
040076                                    ENDIF
040076                                                                             $51540:
040076                                 ELSE                          ;SOURCES WERE EQUAL
040076  000403                                                                               BR      $51542
040100                                                                             $51536:
040100                                    LET CC.EXP := CC.EXP SET.BY #ZBIT
040100  052737  000004  000520                                                               BIS     #ZBIT,CC.EXP
040106                                 ENDIF
040106                                                                             $51542:
040106                              ENDIF
040106                                                                             $51533:
040106                           ENDIF
040106                                                                             $51527:
040106                        ENDIF
040106                                                                             $51524:

                              ;+
                              ; PERFORM THE CMPN INSTRUCTION WITH ALL COMBINATIONS
                              ; OF SIGNED ZONE, TRAILING AND LEADING OVERPUNCH, AND
                              ; TRAILING AND LEADING SEPARATE (UNSIGNED ZONE WILL
                              ; BE TESTED IN THE INLINE PORTION OF THE TEST).
                              ; CHECK THE RESULTS AND REPORT ERRORS. ''DATTYP''
                              ; WILL CONTAIN SRC1 DATA TYPE AND ''TEMP1'' WILL
                              ; CONTAIN SRC2 DATA TYPE CURRENTLY BEING TESTED.
                              ;-

                               ;REPEAT                                      ;SRC1 LOOP
040106                         INLINE   <$5201:>
040106                                                                                       $5201:
040106                            IF DATTYP EQ #10000 THEN                  ;SKIP UNSIGNED ZONED
040106  023727  000462  010000                                                               CMP     DATTYP,#10000
040114  001003                                                                               BNE     $51543
040116                               LET DATTYP := DATTYP + #10000
040116  062737  010000  000462                                                               ADD     #10000,DATTYP
040124                            ENDIF
040124                                                                             $51543:
                                  ;RESTORE THE MSD AND LSD OF SRC1
040124                            LET DSBUF1 :B= DSTMP0                     ;SRC1 MSD
040124  113737  000552  062370                                                               MOVB    DSTMP0,DSBUF1
040132                            LET R0 := #DSBUF1-1 + DATA00
040132  012700  062367                                                                       MOV     #DSBUF1-1,R0
040136  063700  000560                                                                       ADD     DATA00,R0
040142                            LET (R0) :B= DSTMP1                       ;SRC1 LSD
040142  113710  000553                                                                       MOVB    DSTMP1,(R0)
                                  ;PUT THE PROPER SIGN INTO SRC1, ACCORDING TO DATTYP.
040146                            IF DATTYP EQ #0 THEN                                ;*** SIGNED ZONED ***
040146  005737  000462                                                                       TST     DATTYP
040152  001017                                                                               BNE     $51544
040154                               LET R0 := #DSBUF1-1 + DATA00
040154  012700  062367                                                                       MOV     #DSBUF1-1,R0
040160  063700  000560                                                                       ADD     DATA00,R0
040164                               IF @DATA01 EQ #0 THEN                  ;SIGN IS +
040164  005777  140372                                                                       TST     @DATA01
040170  001003                                                                               BNE     $51545
040172                                  LET (R0) :B= (R0) SET.BY #60
040172  152710  000060                                                                       BISB    #60,(R0)
```

```
040176                                  ELSE                                ;SIGN IS -
040176  000402                                                                                      BR      $51546
040200                                                                                  $51545:
040200                                     LET (R0) :B= (R0) SET.BY #160
040200  152710  000160                                                                              BISB    #160,(R0)
040204                                  ENDIF
040204                                                                                  $51546:
040204                                  LET R0 := #DSBUF1-1
040204  012700  062367                                                                              MOV     #DSBUF1-1,R0
040210                                  LET (R0) :B= #0                     ;RESTORE AFTER LEADING SEPARATE
040210  105010                                                                                      CLRB    (R0)
040212                               ENDIF
040212                                                                                  $51544:
040212                               IF DATTYP EQ #20000 THEN                         ;*** TRAILING OVERPUNCH ***
040212  023727  000462  020000                                                                      CMP     DATTYP,#20000
040220  001021                                                                                      BNE     $51547
040222                                IF DATA00 HI #0 THEN
040222  005737  000560                                                                              TST     DATA00
040226  101416                                                                                      BLOS    $51550
040230                                  LET R0 := #DSBUF1-1 + DATA00
040230  012700  062367                                                                              MOV     #DSBUF1-1,R0
040234  063700  000560                                                                              ADD     DATA00,R0
040240                                  IF @DATA01 EQ #0 THEN               ;SIGN IS +
040240  005777  140316                                                                              TST     @DATA01
040244  001002                                                                                      BNE     $51551
040246                                     LET R1 := #0
040246  005001                                                                                      CLR     R1
040250                                  ELSE                                ;SIGN IS -
040250  000402                                                                                      BR      $51552
040252                                                                                  $51551:
040252                                     LET R1 := #10.
040252  012701  000012                                                                              MOV     #10.,R1
040256                                  ENDIF
040256                                                                                  $51552:
040256                                  LET R1 :B= R1 SET.BY (R0)           ;FORM TABLE OFFSET
040256  151001                                                                                      BISB    (R0),R1
040260                                  LET (R0) :B= OVPNCH(R1)             ;PUT IN SIGN/DIGIT
040260  116110  055254                                                                              MOVB    OVPNCH(R1),(R0)
040264                                ENDIF
040264                                                                                  $51550:
040264                               ENDIF
040264                                                                                  $51547:
040264                               IF DATTYP EQ #30000 THEN                         ;*** LEADING OVERPUNCH ***
040264  023727  000462  030000                                                                      CMP     DATTYP,#30000
040272  001017                                                                                      BNE     $51553
040274                                  IF DATA00 HI #0 THEN
040274  005737  000560                                                                              TST     DATA00
040300  101414                                                                                      BLOS    $51554
040302                                    LET R0 := #DSBUF1
040302  012700  062370                                                                              MOV     #DSBUF1,R0
040306                                    IF @DATA01 EQ #0 THEN                       ;SIGN IS +
040306  005777  140250                                                                              TST     @DATA01
040312  001002                                                                                      BNE     $51555
040314                                      LET R1 := #0
040314  005001                                                                                      CLR     R1
040316                                    ELSE                                        ;SIGN IS -
```

```
040316  000402                                                            BR      $51556
040320                                                        $51555:
040320                                  LET R1 := #10.
040320  012701  000012                                                    MOV     #10.,R1
040324                                ENDIF
040324                                                        $51556:
040324                                LET R1 :B= R1 SET.BY (R0)  ;FORM TABLE OFFSET
040324  151001                                                            BISB    (R0),R1
040326                                LET (R0) :B= OVPNCH(R1)    ;PUT IN SIGN/DIGIT
040326  116110  055254                                                    MOVB    OVPNCH(R1),(R0)
040332                              ENDIF
040332                                                        $51554:
040332                            ENDIF
040332                                                        $51553:
040332                            IF DATTYP EQ #40000 THEN              ;*** TRAILING SEPARATE ***
040332  023727  000462  040000                                            CMP     DATTYP,#40000
040340  001014                                                            BNE     $51557
040342                              LET R0 := #DSBUF1 + DATA00
040342  012700  062370                                                    MOV     #DSBUF1,R0
040346  063700  000560                                                    ADD     DATA00,R0
040352                              IF @DATA01 EQ #0 THEN               ;SIGN IS +
040352  005777  140204                                                    TST     @DATA01
040356  001003                                                            BNE     $51560
040360                                LET (R0) :B= #53
040360  112710  000053                                                    MOVB    #53,(R0)
040364                              ELSE                                ;SIGN IS -
040364  000402                                                            BR      $51561
040366                                                        $51560:
040366                                LET (R0) :B= #55
040366  112710  000055                                                    MOVB    #55,(R0)
040372                              ENDIF
040372                                                        $51561:
040372                            ENDIF
040372                                                        $51557:
040372                            IF DATTYP EQ #50000 THEN              ;*** LEADING SEPARATE ***
040372  023727  000462  050000                                            CMP     DATTYP,#50000
040400  001017                                                            BNE     $51562
040402                              LET R0 := #DSBUF1-1
040402  012700  062367                                                    MOV     #DSBUF1-1,R0
040406                              IF @DATA01 EQ #0 THEN               ;SIGN IS +
040406  005777  140150                                                    TST     @DATA01
040412  001003                                                            BNE     $51563
040414                                LET (R0) :B= #53
040414  112710  000053                                                    MOVB    #53,(R0)
040420                              ELSE                                ;SIGN IS -
040420  000402                                                            BR      $51564
040422                                                        $51563:
040422                                LET (R0) :B= #55
040422  112710  000055                                                    MOVB    #55,(R0)
040426                              ENDIF
040426                                                        $51564:
040426                              LET R0 := #DSBUF1 + DATA00
040426  012700  062370                                                    MOV     #DSBUF1,R0
040432  063700  000560                                                    ADD     DATA00,R0
040436                              LET (R0) :B= #0                     ;RESTORE AFTER TRAILING SEPARATE
040436  105010                                                            CLRB    (R0)
```

```
040440                            ENDIF
040440                                                                  $51562:
040440                            LET TEMP1 := #0           ;CLEAR SRC2 DATA TYPE
040440  005037  000476                                                  CLR     TEMP1
                                  ;REPEAT                   ;SRC2 LOOP
040444                            INLINE  <$5202:>
040444                                                                  $5202:
040444                              IF TEMP1 EQ #10000 THEN     ;SKIP UNSIGNED ZONED
040444  023727  000476  010000                                          CMP     TEMP1,#10000
040452  001003                                                          BNE     $51565
040454                                LET TEMP1 := TEMP1 + #10000
040454  062737  010000  000476                                          ADD     #10000,TEMP1
040462                              ENDIF
040462                                                                  $51565:
                                    ;RESTORE THE MSD AND LSD OF SRC2
040462                              LET DSBUF2 :B= DSTMP2           ;SRC2 MSD
040462  113737  000554  062432                                          MOVB    DSTMP2,DSBUF2
040470                              LET R0 := #DSBUF2-1 + DATA02
040470  012700  062431                                                  MOV     #DSBUF2-1,R0
040474  063700  000564                                                  ADD     DATA02,R0
040500                              LET (R0) :B= DSTMP3             ;SRC2 LSD
040500  113710  000555                                                  MOVB    DSTMP3,(R0)
                                    ;PUT THE PROPER SIGN INTO SRC2, ACCORDING TO TEMP1
040504                              IF TEMP1 EQ #0 THEN             ;*** SIGNED ZONED ***
040504  005737  000476                                                  TST     TEMP1
040510  001017                                                          BNE     $51566
040512                                  LET R0 := #DSBUF2-1 + DATA02
040512  012700  062431                                                  MOV     #DSBUF2-1,R0
040516  063700  000564                                                  ADD     DATA02,R0
040522                                  IF @DATA03 EQ #0 THEN       ;SIGN IS +
040522  005777  140040                                                  TST     @DATA03
040526  001003                                                          BNE     $51567
040530                                      LET (R0) :B= (R0) SET.BY #60
040530  152710  000060                                                  BISB    #60,(R0)
040534                                  ELSE                        ;SIGN IS -
040534  000402                                                          BR      $51570
040536                                                                  $51567:
040536                                      LET (R0) :B= (R0) SET.BY #160
040536  152710  000160                                                  BISB    #160,(R0)
040542                                  ENDIF
040542                                                                  $51570:
040542                                  LET R0 := #DSBUF2-1
040542  012700  062431                                                  MOV     #DSBUF2-1,R0
040546                                  LET (R0) :B= #0             ;RESTORE AFTER LEADING SEPARATE
040546  105010                                                          CLRB    (R0)
040550                              ENDIF
040550                                                                  $51566:
040550                              IF TEMP1 EQ #20000 THEN         ;*** TRAILING OVERPUNCH ***
040550  023727  000476  020000                                          CMP     TEMP1,#20000
040556  001016                                                          BNE     $51571
040560                                  LET R0 := #DSBUF2-1 + DATA02
040560  012700  062431                                                  MOV     #DSBUF2-1,R0
040564  063700  000564                                                  ADD     DATA02,R0
040570                                  IF @DATA03 EQ #0 THEN       ;SIGN IS +
040570  005777  137772                                                  TST     @DATA03
040574  001002                                                          BNE     $51572
```

```
040576                                    LET R1 := #0
040576  005001                                                                       CLR     R1
040600                                 ELSE                            ;SIGN IS -
040600  000402                                                                       BR      $51573
040602                                                                     $51572:
040602                                    LET R1 := #10.
040602  012701  000012                                                               MOV     #10.,R1
040606                                 ENDIF
040606                                                                     $51573:
040606                                 LET R1 :B= R1 SET.BY (R0)       ;FORM TABLE OFFSET
040606  151001                                                                       BISB    (R0),R1
040610                                 LET (R0) :B= OVPNCH(R1)         ;PUT IN SIGN/DIGIT
040610  116110  055254                                                               MOVB    OVPNCH(R1),(R0)
040614                              ENDIF
040614                                                                     $51571:
040614                              IF TEMP1 EQ #30000 THEN            ;*** LEADING OVERPUNCH ***
040614  023727  000476  030000                                                       CMP     TEMP1,#30000
040622  001014                                                                       BNE     $51574
040624                                 LET R0 := #DSBUF2
040624  012700  062432                                                               MOV     #DSBUF2,R0
040630                                 IF @DATA03 EQ #0 THEN           ;SIGN IS +
040630  005777  137732                                                               TST     @DATA03
040634  001002                                                                       BNE     $51575
040636                                    LET R1 := #0
040636  005001                                                                       CLR     R1
040640                                 ELSE                            ;SIGN IS -
040640  000402                                                                       BR      $51576
040642                                                                     $51575:
040642                                    LET R1 := #10.
040642  012701  000012                                                               MOV     #10.,R1
040646                                 ENDIF
040646                                                                     $51576:
040646                                 LET R1 :B= R1 SET.BY (R0)       ;FORM TABLE OFFSET
040646  151001                                                                       BISB    (R0),R1
040650                                 LET (R0) :B= OVPNCH(R1)         ;PUT IN SIGN/DIGIT
040650  116110  055254                                                               MOVB    OVPNCH(R1),(R0)
040654                              ENDIF
040654                                                                     $51574:
040654                              IF TEMP1 EQ #40000 THEN            ;*** TRAILING SEPARATE ***
040654  023727  000476  040000                                                       CMP     TEMP1,#40000
040662  001014                                                                       BNE     $51577
040664                                 LET R0 := #DSBUF2 + DATA02
040664  012700  062432                                                               MOV     #DSBUF2,R0
040670  063700  000564                                                               ADD     DATA02,R0
040674                                 IF @DATA03 EQ #0 THEN           ;SIGN IS +
040674  005777  137666                                                               TST     @DATA03
040700  001003                                                                       BNE     $51600
040702                                    LET (R0) :B= #53
040702  112710  000053                                                               MOVB    #53,(R0)
040706                                 ELSE                            ;SIGN IS -
040706  000402                                                                       BR      $51601
040710                                                                     $51600:
040710                                    LET (R0) :B= #55
040710  112710  000055                                                               MOVB    #55,(R0)
040714                                 ENDIF
040714                                                                     $51601:
```

```
040714                                  ENDIF
040714                                                                          $51577:
040714                                  IF TEMP1 EQ #50000 THEN         ;*** LEADING SEPARATE ***
040714  023727  000476  050000                                                  CMP     TEMP1,#50000
040722  001017                                                                  BNE     $51602
040724                                      LET R0 := #DSBUF2-1
040724  012700  062431                                                          MOV     #DSBUF2-1,R0
040730                                      IF @DATA03 EQ #0 THEN       ;SIGN IS +
040730  005777  137632                                                          TST     @DATA03
040734  001003                                                                  BNE     $51603
040736                                          LET (R0) :B= #53
040736  112710  000053                                                          MOVB    #53,(R0)
040742                                      ELSE                        ;SIGN IS -
040742  000402                                                                  BR      $51604
040744                                                                  $51603:
040744                                          LET (R0) :B= #55
040744  112710  000055                                                          MOVB    #55,(R0)
040750                                      ENDIF
040750                                                                  $51604:
040750                                      LET R0 := #DSBUF2 + DATA02
040750  012700  062432                                                          MOV     #DSBUF2,R0
040754  063700  000564                                                          ADD     DATA02,R0
040760                                      LET (R0) :B= #0         ;RESTORE AFTER TRAILING SEPARATE
040760  105010                                                                  CLRB    (R0)
040762                                  ENDIF
040762                                                                  $51602:


                                        ;+
                                        ; LOAD THE GPR'S AND DO THE CMPN INSTRUCTION
                                        ;-

040762                                  LET R0 := DATTYP SET.BY DATA00  ;SRC1.DSCR
040762  013700  000462                                                          MOV     DATTYP,R0
040766  053700  000560                                                          BIS     DATA00,R0
040772                                  LET R1 := #DSBUF1               ;  ''
040772  012701  062370                                                          MOV     #DSBUF1,R1
040776                                  LET R2 := TEMP1 SET.BY DATA02   ;SRC2.DSCR
040776  013702  000476                                                          MOV     TEMP1,R2
041002  053702  000564                                                          BIS     DATA02,R2
041006                                  LET R3 := #DSBUF2               ;  ''
041006  012703  062432                                                          MOV     #DSBUF2,R3
041012                                  LET R4 := #0
041012  005004                                                                  CLR     R4
041014                                  LET R5 := #0
041014  005005                                                                  CLR     R5
041016                                  INLINE <CMPN>
041016  076052                                                                  CMPN


                                        ;+
                                        ; CHECK THE RESULTS
                                        ;-

041020                                  LET CC := PSW
041020  013737  177776  000516                                                  MOV     PSW,CC
041026                                  LET CC := CC CLR.BY #177760
041026  042737  177760  000516                                                  BIC     #177760,CC
```

```
041034                                      IF CC NE CC.EXP THEN
041034  023737  000516  000520                                                  CMP     CC,CC.EXP
041042  001402                                                                  BEQ     $51605
041044                                          CALL ERROR
041044  004737  056274                                                          JSR     PC,ERROR
041050                                      ENDIF
041050                                                                  $51605:
041050                                      IF R0 NE #0 THEN
041050  005700                                                                  TST     R0
041052  001402                                                                  BEQ     $51606
041054                                          CALL ERROR
041054  004737  056274                                                          JSR     PC,ERROR
041060                                      ENDIF
041060                                                                  $51606:
041060                                      IF R1 NE #0 THEN
041060  005701                                                                  TST     R1
041062  001402                                                                  BEQ     $51607
041064                                          CALL ERROR
041064  004737  056274                                                          JSR     PC,ERROR
041070                                      ENDIF
041070                                                                  $51607:
041070                                      IF R2 NE #0 THEN
041070  005702                                                                  TST     R2
041072  001402                                                                  BEQ     $51610
041074                                          CALL ERROR
041074  004737  056274                                                          JSR     PC,ERROR
041100                                      ENDIF
041100                                                                  $51610:
041100                                      IF R3 NE #0 THEN
041100  005703                                                                  TST     R3
041102  001402                                                                  BEQ     $51611
041104                                          CALL ERROR
041104  004737  056274                                                          JSR     PC,ERROR
041110                                      ENDIF
041110                                                                  $51611:
041110                                      IF R4 NE #0 THEN
041110  005704                                                                  TST     R4
041112  001402                                                                  BEQ     $51612
041114                                          CALL ERROR
041114  004737  056274                                                          JSR     PC,ERROR
041120                                      ENDIF
041120                                                                  $51612:
041120                                      IF R5 NE #0 THEN
041120  005705                                                                  TST     R5
041122  001402                                                                  BEQ     $51613
041124                                          CALL ERROR
041124  004737  056274                                                          JSR     PC,ERROR
041130                                      ENDIF
041130                                                                  $51613:
041130                                      LET TEMP1 := TEMP1 + #10000     ;UPDATE SRC2 TO NEXT DATA TYPE
041130  062737  010000  000476                                                  ADD     #10000,TEMP1
                                    ;UNTIL TEMP1 EQ #60000
041136                              IF TEMP1 NE #60000 THEN
041136  023727  000476  060000                                                  CMP     TEMP1,#60000
041144  001402                                                                  BEQ     $51614
041146                                  INLINE  <JMP  $5202>
```

```
041146  000137  040444                                                          JMP     $5202
041152                          ENDIF
041152                                                                  $51614:
041152                          LET DATTYP := DATTYP + #10000          ;UPDATE SRC1 TO NEXT DATA TYPE
041152  062737  010000  000462                                                  ADD     #10000,DATTYP
                        ;UNTIL DATTYP EQ #60000
041160                  IF DATTYP NE #60000 THEN
041160  023727  000462  060000                                                  CMP     DATTYP,#60000
041166  001402                                                                  BEQ     $51615
041170                          INLINE  <JMP  $5201>
041170  000137  040106                                                          JMP     $5201
041174                  ENDIF
041174                                                                  $51615:

041174                  LET TSTCAS := TSTCAS + #10
041174  062737  000010  000542                                                  ADD     #10,TSTCAS
041202                  LET COUNT := COUNT - #1
041202  005337  000466                                                          DEC     COUNT
                ;UNTIL COUNT EQ #0 THEN
041206          IF COUNT NE #0 THEN
041206  005737  000466                                                          TST     COUNT
041212  001402                                                                  BEQ     $51616
041214                  INLINE <JMP $5052>
041214  000137  037356                                                          JMP $5052
041220          ENDIF
041220                                                                  $51616:



                ;+
                ; DO ONE INLINE CASE - CMPNI.  USE UNSIGNED ZONED DATA TYPE.
                ;-

041220          LET R0 := #-1
041220  012700  177777                                                          MOV     #-1,R0
041224          LET R1 := #-1
041224  012701  177777                                                          MOV     #-1,R1
041230          LET R2 := #-1
041230  012702  177777                                                          MOV     #-1,R2
041234          LET R3 := #-1
041234  012703  177777                                                          MOV     #-1,R3
041240          LET R4 := #-1
041240  012704  177777                                                          MOV     #-1,R4
041244          LET R5 := #-1
041244  012705  177777                                                          MOV     #-1,R5
041250          INLINE  <CMPNI>
041250  076152                                                                  CMPNI
041252          INLINE  <.WORD  TCMPNI>
041252  041366                                                                  .WORD   TCMPNI
041254          INLINE  <.WORD  TCMPNI+4>
041254  041372                                                                  .WORD   TCMPNI+4
041256          LET CC := PSW
041256  013737  177776  000516                                                  MOV     PSW,CC
041264          LET CC := CC CLR.BY #177760
041264  042737  177760  000516                                                  BIC     #177760,CC
041272          IF CC NE #4 THEN
041272  023727  000516  000004                                                  CMP     CC,#4
```

```
041300  001402                                                                  BEQ     $51617
041302                              CALL ERROR
041302  004737  056274                                                          JSR     PC,ERROR
041306                          ENDIF
041306                                                                $51617:
041306                          IF R0 NE #-1 OR R1 NE #-1 OR R2 NE #-1 THEN
041306  020027  177777                                                          CMP     R0,#-1
041312  001006                                                                  BNE     $51620
041314  020127  177777                                                          CMP     R1,#-1
041320  001003                                                                  BNE     $51620
041322  020227  177777                                                          CMP     R2,#-1
041326  001402                                                                  BEQ     $51621
041330                                                                $51620:
041330                              CALL ERROR
041330  004737  056274                                                          JSR     PC,ERROR
041334                          ENDIF
041334                                                                $51621:
041334                          IF R3 NE #-1 OR R4 NE #-1 OR R5 NE #-1 THEN
041334  020327  177777                                                          CMP     R3,#-1
041340  001006                                                                  BNE     $51622
041342  020427  177777                                                          CMP     R4,#-1
041346  001003                                                                  BNE     $51622
041350  020527  177777                                                          CMP     R5,#-1
041354  001402                                                                  BEQ     $51623
041356                                                                $51622:
041356                              CALL ERROR
041356  004737  056274                                                          JSR     PC,ERROR
041362                          ENDIF
041362                                                                $51623:
041362                          INLINE <JMP XASHN>
041362  000137  041404                                                          JMP XASHN



                                ;+
                                ; INLINE TEST CASE
                                ;-

041366  010005                  TCMPNI: .WORD   010005          ;SRC1 DATA TYPE = UNSIGNED ZONED, LENGTH = 5
041370  041376                          .WORD   CMPNI1          ;  ''
041372  010005                          .WORD   010005          ;SRC2 DATA TYPE = UNSIGNED ZONED, LENGTH = 5
041374  041376                          .WORD   CMPNI1          ;  ''

041376     001     002     003  CMPNI1: .BYTE   001,002,003,004,065     ;DECIMAL STRING = 12345
041401     004     065
        041404                          .EVEN

```

```
                                        .SBTTL  ASHN
                                        ;*****************************************************************
                                        ;
                                        ;  ASHN TEST
                                        ;
                                        ;*****************************************************************
041404                                  INLINE  <XASHN:>
041404                                                                              XASHN:
041404                                  INLINE  <SCOPE>
041404  000004                                                                      SCOPE
041406                                  LET $TIMES := #20               ;DO 20 ITERATIONS
041406  012737  000020  000404                                                      MOV     #20,$TIMES
041414                                  LET COUNT := TASH           ;GET TEST COUNT
041414  013737  063044  000466                                                      MOV     TASH,COUNT
041422                                  LET TSTCAS := #TASH+2       ;POINT TO FIRST TEST CASE
041422  012737  063046  000542                                                      MOV     #TASH+2,TSTCAS
041430                                  LET SIGNO := #0
041430  005037  000446                                                              CLR     SIGNO
                                        ;REPEAT
041434                                  INLINE  <$5056:>
041434                                                                              $5056:
041434                                    LET CC.EXP := #0
041434  005037  000520                                                              CLR     CC.EXP
041440                                    LET DATTYP := #0
041440  005037  000462                                                              CLR     DATTYP

                                          ;+
                                          ; GET TEST DATA FROM TABLE
                                          ;-

041444                                    LET R0 := TSTCAS
041444  013700  000542                                                              MOV     TSTCAS,R0
041450                                    LET DATA00 := (R0)+       ;SRC.LENGTH
041450  012037  000560                                                              MOV     (R0)+,DATA00
041454                                    LET DATA01 := (R0)+       ;DST.LENGTH
041454  012037  000562                                                              MOV     (R0)+,DATA01
041460                                    LET DATA02 := (R0)        ;SHIFT.DSCR
041460  011037  000564                                                              MOV     (R0),DATA02
041464                                    CALL CLRDSB
041464  004737  055520                                                              JSR     PC,CLRDSB

                                          ;+
                                          ; PUT TEST STRING INTO DSBUF1 WITHOUT THE SIGN
                                          ;-

041470                                    LET R0 := DATA00              ;SRC.LENGTH
041470  013700  000560                                                              MOV     DATA00,R0
041474                                    LET R1 := #DSBUF1             ;SRC.ADDRESS
041474  012701  062370                                                              MOV     #DSBUF1,R1
041500                                    WHILE R0 NE #0 DO
041500                                                                    $51624:
041500  005700                                                                      TST     R0
041502  001404                                                                      BEQ     $51625
041504                                      LET (R1)+ :B= #4
041504  112721  000004                                                              MOVB    #4,(R1)+
```

```
041510                              LET R0 := R0 - #1
041510  005300                                                                  DEC     R0
041512                             ENDDO
041512  000772                                                                  BR      $51624
041514                                                               $51625:


                                   ;+
                                   ; LOAD DS.EXP AND CC.EXP WITH EXPECTED RESULTS.
                                   ;-

                                   ;GET SHIFT COUNT MAGNITUDE AND PUT IT INTO TEMPO

041514                             LET TEMPO := DATA02
041514  013737  000564  000474                                                  MOV     DATA02,TEMPO
041522                             IF #BIT07 SETIN TEMPO THEN          ;NEGATIVE SHIFT COUNT
041522  032737  000200  000474                                                  BIT     #BIT07,TEMPO
041530  001402                                                                  BEQ     $51626
041532                              LET TEMPO := NEGATE TEMPO
041532  005437  000474                                                          NEG     TEMPO
041536                             ENDIF
041536                                                               $51626:
041536                             LET TEMPO := TEMPO CLR.BY #177600
041536  042737  177600  000474                                                  BIC     #177600,TEMPO

                                   ;TAKE CARE OF EXPECTED NBIT

041544                             IF SIGNO EQ #-1 AND DATA00 NE #0 THEN
041544  023727  000446  177777                                                  CMP     SIGNO,#-1
041552  001006                                                                  BNE     $51627
041554  005737  000560                                                          TST     DATA00
041560  001403                                                                  BEQ     $51627
041562                              LET CC.EXP := CC.EXP SET.BY #NBIT
041562  052737  000010  000520                                                  BIS     #NBIT,CC.EXP
041570                             ENDIF
041570                                                               $51627:

                                   ;TAKE CARE OF ZERO LENGTH SOURCE OR DESTINATION

041570                             IF DATA01 NE #0 THEN
041570  005737  000562                                                          TST     DATA01
041574  001414                                                                  BEQ     $51630
041576                              LET R0 := #DS.EXP
041576  012700  062536                                                          MOV     #DS.EXP,R0
041602                              INCR R1 FROM #1 TO DATA01 BY #1
041602  012701  000001                                                          MOV     #1,R1
041606  000401                                                                  BR      $51631
041610                                                               $51632:
041610  005201                                                                  INC     R1
041612                                                               $51631:
041612  020137  000562                                                          CMP     R1,DATA01
041616  003003                                                                  BGT     $51633
041620                               LET (R0)+ :B= #60
041620  112720  000060                                                          MOVB    #60,(R0)+
041624                              ENDINC
041624  000771                                                                  BR      $51632
041626                                                               $51633:
```

```
041626                              ENDIF
041626                                                                       $51630:
041626                              IF DATA00 EQ #0 OR DATA01 EQ #0 THEN
041626  005737  000560                                                               TST     DATA00
041632  001403                                                                       BEQ     $51634
041634  005737  000562                                                               TST     DATA01
041640  001004                                                                       BNE     $51635
041642                                                                       $51634:
041642                                LET CC.EXP := CC.EXP SET.BY #ZBIT
041642  052737  000004  000520                                                       BIS     #ZBIT,CC.EXP
041650                              ELSE
041650  000567                                                                       BR      $51636
041652                                                                       $51635:

                                      ;TAKE CARE OF NEGATIVE SHIFT

041652                                IF #BIT07 SETIN DATA02 THEN
041652  032737  000200  000564                                                       BIT     #BIT07,DATA02
041660  001465                                                                       BEQ     $51637
041662                                  LET R0 := DATA00 - TEMP0          ;SRC.LEN - SHIFT COUNT
041662  013700  000560                                                               MOV     DATA00,R0
041666  163700  000474                                                               SUB     TEMP0,R0
041672                                  LET R1 := #DS.EXP + DATA01
041672  012701  062536                                                               MOV     #DS.EXP,R1
041676  063701  000562                                                               ADD     DATA01,R1
041702                                  LET R2 := #1
041702  012702  000001                                                               MOV     #1,R2
041706                                  LET R3 := DATA01
041706  013703  000562                                                               MOV     DATA01,R3
041712                                  IF R0 EQ #0 THEN
041712  005700                                                                       TST     R0
041714  001012                                                                       BNE     $51640
041716                                    IF DATA02 HIS #3000 THEN
041716  023727  000564  003000                                                       CMP     DATA02,#3000
041724  103403                                                                       BLO     $51641
041726                                      LET -(R1) :B= #61             ;ROUNDING
041726  112741  000061                                                               MOVB    #61,-(R1)
041732                                    ELSE
041732  000403                                                                       BR      $51642
041734                                                                       $51641:
041734                                      LET CC.EXP := CC.EXP SET.BY #ZBIT
041734  052737  000004  000520                                                       BIS     #ZBIT,CC.EXP
041742                                    ENDIF
041742                                                                       $51642:
041742                                  ENDIF
041742                                                                       $51640:
041742                                  IF R0 LT #0 THEN
041742  005700                                                                       TST     R0
041744  002003                                                                       BGE     $51643
041746                                    LET CC.EXP := CC.EXP SET.BY #ZBIT
041746  052737  000004  000520                                                       BIS     #ZBIT,CC.EXP
041754                                  ENDIF
041754                                                                       $51643:
041754                                  WHILE R2 LE R0 AND R3 HI #0 DO
041754                                                                       $51644:
041754  020200                                                                       CMP     R2,R0
```

```
041756  003017                                                                              BGT     $51645
041760  005703                                                                              TST     R3
041762  101415                                                                              BLOS    $51645
041764                                    LET -(R1) :B= #64
041764  112741  000064                                                                      MOVB    #64,-(R1)
041770                                    IF R2 EQ #1 AND DATA02 HIS #3000 THEN
041770  020227  000001                                                                      CMP     R2,#1
041774  001005                                                                              BNE     $51646
041776  023727  000564  003000                                                              CMP     DATA02,#3000
042004  103401                                                                              BLO     $51646
042006                                      LET (R1) :B= (R1) + #1                ;ROUNDING
042006  105211                                                                              INCB    (R1)
042010                                    ENDIF
042010                                                                           $51646:
042010                                    LET R2 := R2 + #1
042010  005202                                                                              INC     R2
042012                                    LET R3 := R3 - #1
042012  005303                                                                              DEC     R3
042014                                  ENDDO
042014  000757                                                                              BR      $51644
042016                                                                           $51645:
042016                                  IF R3 EQ #0 AND R2 LE R0 THEN
042016  005703                                                                              TST     R3
042020  001005                                                                              BNE     $51647
042022  020200                                                                              CMP     R2,R0
042024  003003                                                                              BGT     $51647
042026                                    LET CC.EXP := CC.EXP SET.BY #VBIT
042026  052737  000002  000520                                                              BIS     #VBIT,CC.EXP
042034                                  ENDIF
042034                                                                           $51647:
042034                                ENDIF
042034                                                                           $51637:

                                ;TAKE CARE OF POSITIVE SHIFT

042034                          IF #BIT07 NOTSETIN DATA02 THEN
042034  032737  000200  000564                                                              BIT     #BIT07,DATA02
042042  001072                                                                              BNE     $51650
042044                            LET TEMP1 := DATA00 + TEMP0                  ;SRC.LEN + SHIFT COUNT
042044  013737  000560  000476                                                              MOV     DATA00,TEMP1
042052  063737  000474  000476                                                              ADD     TEMP0,TEMP1
042060                            IF TEMP1 HI DATA01 THEN
042060  023737  000476  000562                                                              CMP     TEMP1,DATA01
042066  101403                                                                              BLOS    $51651
042070                              LET CC.EXP := CC.EXP SET.BY #VBIT
042070  052737  000002  000520                                                              BIS     #VBIT,CC.EXP
042076                            ENDIF
042076                                                                           $51651:
042076                            IF TEMP0 HIS DATA01 THEN                     ;SHIFT COUNT >= DST.LEN
042076  023737  000474  000562                                                              CMP     TEMP0,DATA01
042104  103420                                                                              BLO     $51652
042106                              LET CC.EXP := CC.EXP SET.BY #ZBIT
042106  052737  000004  000520                                                              BIS     #ZBIT,CC.EXP
042114                              LET R1 := #DS.EXP
042114  012701  062536                                                                      MOV     #DS.EXP,R1
042120                              INCR R0 FROM #1 TO DATA01 BY #1
```

```
042120  012700  000001                                                      MOV     #1,R0
042124  000401                                                              BR      $51653
042126                                                          $51654:
042126  005200                                                              INC     R0
042130                                                          $51653:
042130  020037  000562                                                      CMP     R0,DATA01
042134  003003                                                              BGT     $51655
042136                          LET (R1)+ :B= #60
042136  112721  000060                                                      MOVB    #60,(R1)+
042142                        ENDINC
042142  000771                                                              BR      $51654
042144                                                          $51655:
042144                      ELSE                          ;SHIFT COUNT < DST.LEN
042144  000431                                                              BR      $51656
042146                                                          $51652:
042146                        LET R1 := #DS.EXP + DATA01
042146  012701  062536                                                      MOV     #DS.EXP,R1
042152  063701  000562                                                      ADD     DATA01,R1
042156                        INCR R0 FROM #1 TO TEMP0 BY #1
042156  012700  000001                                                      MOV     #1,R0
042162  000401                                                              BR      $51657
042164                                                          $51660:
042164  005200                                                              INC     R0
042166                                                          $51657:
042166  020037  000474                                                      CMP     R0,TEMP0
042172  003003                                                              BGT     $51661
042174                          LET -(R1) :B= #60
042174  112741  000060                                                      MOVB    #60,-(R1)
042200                        ENDINC
042200  000771                                                              BR      $51660
042202                                                          $51661:
042202                        LET R0 := DATA00                    ;SRC.LEN
042202  013700  000560                                                      MOV     DATA00,R0
042206                        WHILE R1 HI #DS.EXP AND R0 HI #0 DO
042206                                                          $51662:
042206  020127  062536                                                      CMP     R1,#DS.EXP
042212  101406                                                              BLOS    $51663
042214  005700                                                              TST     R0
042216  101404                                                              BLOS    $51663
042220                          LET -(R1) :B= #64
042220  112741  000064                                                      MOVB    #64,-(R1)
042224                          LET R0 := R0 - #1
042224  005300                                                              DEC     R0
042226                        ENDDO
042226  000767                                                              BR      $51662
042230                                                          $51663:
042230                      ENDIF
042230                                                          $51656:
042230                    ENDIF
042230                                                          $51650:
042230                  ENDIF
042230                                                          $51636:
042230                  IF #ZBIT SETIN CC.EXP THEN
042230  032737  000004  000520                                              BIT     #ZBIT,CC.EXP
042236  001403                                                              BEQ     $51664
042240                    LET CC.EXP := CC.EXP CLR.BY #NBIT
```

```
042240 042737 000010 000520                                                        BIC     #NBIT,CC.EXP
042246                          ENDIF
042246                                                                    $51664:

                                ;SAVE THE FIRST AND LAST EXPECTED DST DIGITS

042246                          LET DSTMP0 :B= DS.EXP
042246 113737 062536 000552                                                        MOVB    DS.EXP,DSTMP0
042254                          LET R0 := #DS.EXP + DATA01 - #1
042254 012700 062536                                                               MOV     #DS.EXP,R0
042260 063700 000562                                                               ADD     DATA01,R0
042264 005300                                                                      DEC     R0
042266                          LET DSTMP1 :B= (R0)
042266 111037 000553                                                               MOVB    (R0),DSTMP1

                                ;+
                                ; PERFORM THE ASHN INSTRUCTION WITH ALL SIX NUMERIC
                                ; DATA TYPES.  "DATTYP" WILL CONTAIN THE DATA TYPE
                                ; CURRENTLY BEING TESTED.
                                ;-

                                ;INCR DATTYP FROM #0 TO #50000 BY #10000
042272                          INLINE  <CLR  DATTYP>
042272 005037 000462                                                               CLR  DATTYP
042276                          INLINE  <BR  $5602>
042276 000403                                                                      BR  $5602
042300                          INLINE  <$5601:>
042300                                                                             $5601:
042300                          LET DATTYP := DATTYP + #10000
042300 062737 010000 000462                                                        ADD     #10000,DATTYP
042306                          INLINE  <$5602:>
042306                                                                             $5602:
042306                          IF DATTYP GT #50000 THEN
042306 023727 000462 050000                                                        CMP     DATTYP,#50000
042314 003402                                                                      BLE     $51665
042316                            INLINE  <JMP  $5603>
042316 000137 044076                                                               JMP  $5603
042322                          ENDIF
042322                                                                    $51665:

                                  ;RESTORE FIRST AND LAST SRC DIGITS
042322                            IF DATA00 HI #0 THEN                 ;SRC.LEN > 0
042322 005737 000560                                                               TST     DATA00
042326 101411                                                                      BLOS    $51666
042330                              LET DSBUF1 :B= #4
042330 112737 000004 062370                                                        MOVB    #4,DSBUF1
042336                              LET R0 := #DSBUF1-1 + DATA00
042336 012700 062367                                                               MOV     #DSBUF1-1,R0
042342 063700 000560                                                               ADD     DATA00,R0
042346                              LET (R0) :B= #4
042346 112710 000004                                                               MOVB    #4,(R0)
042352                            ENDIF
042352                                                                    $51666:
                                  ;RESTORE FIRST AND LAST DST DIGITS
042352                            IF DATA01 HI #0 THEN            ;DST.LEN > 0
042352 005737 000562                                                               TST     DATA01
```

```
042356  101411                                                                          BLOS    $51667
042360                                  LET DS.EXP :B= DSTMP0
042360  113737  000552  062536                                                          MOVB    DSTMP0,DS.EXP
042366                                  LET R0 := #DS.EXP-1 + DATA01
042366  012700  062535                                                                  MOV     #DS.EXP-1,R0
042372  063700  000562                                                                  ADD     DATA01,R0
042376                                  LET (R0) :B= DSTMP1
042376  113710  000553                                                                  MOVB    DSTMP1,(R0)
042402                                ENDIF
042402                                                                          $51667:

042402                                ;FINISH SETTING UP EXPECTED RESULTS ACCORDING TO DATA TYPE
042402                                IF DATTYP EQ #0 THEN                          ;*** SIGNED ZONED ***
042402  005737  000462                                                                  TST     DATTYP
042406  001067                                                                          BNE     $51670
042410                                  LET DSBUF1-1 :B= #0                 ;RESTORE SRC AFTER LEADING SEPARATE
042410  105037  062367                                                                  CLRB    DSBUF1-1
042414                                  IF DATA00 HI #0 THEN                        ;SRC.LEN > 0
042414  005737  000560                                                                  TST     DATA00
042420  101414                                                                          BLOS    $51671
042422                                    LET R0 := #DSBUF1-1 + DATA00
042422  012700  062367                                                                  MOV     #DSBUF1-1,R0
042426  063700  000560                                                                  ADD     DATA00,R0
042432                                    IF SIGN0 EQ #0 THEN                       ;SIGN IS +
042432  005737  000446                                                                  TST     SIGN0
042436  001003                                                                          BNE     $51672
042440                                      LET (R0) :B= #64
042440  112710  000064                                                                  MOVB    #64,(R0)
042444                                    ELSE                                      ;SIGN IS -
042444  000402                                                                          BR      $51673
042446                                                                          $51672:
042446                                      LET (R0) :B= #164
042446  112710  000164                                                                  MOVB    #164,(R0)
042452                                    ENDIF
042452                                                                          $51673:
042452                                  ENDIF
042452                                                                          $51671:
042452                                  LET DS.EXP-1 :B= #0                 ;RESTORE DST AFTER LEADING SEPARATE
042452  105037  062535                                                                  CLRB    DS.EXP-1
042456                                  IF DATA01 HI #0 THEN                        ;DST.LEN > 0
042456  005737  000562                                                                  TST     DATA01
042462  101441                                                                          BLOS    $51674
042464                                    LET R0 := #DS.EXP-1 + DATA01
042464  012700  062535                                                                  MOV     #DS.EXP-1,R0
042470  063700  000562                                                                  ADD     DATA01,R0
042474                                    IF SIGN0 EQ #0 OR DATA00 EQ #0 OR #ZBIT SETIN CC.EXP THEN      ;SIGN IS +
042474  005737  000446                                                                  TST     SIGN0
042500  001407                                                                          BEQ     $51675
042502  005737  000560                                                                  TST     DATA00
042506  001404                                                                          BEQ     $51675
042510  032737  000004  000520                                                          BIT     #ZBIT,CC.EXP
042516  001403                                                                          BEQ     $51676
042520                                                                          $51675:
042520                                      LET (R0) :B= (R0) SET.BY #60
042520  152710  000060                                                                  BISB    #60,(R0)
042524                                    ELSE                                      ;SIGN IS -
042524  000402                                                                          BR      $51677
```

```
042526                                                               $51676:
042526                            LET (R0) :B= (R0) SET.BY #160
042526  152710  000160                                                        BISB    #160,(R0)
042532                          ENDIF
042532                                                               $51677:
042532                        IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02  AND SIGNO EQ #-1 THEN
042532  123737  000564  000560                                                CMPB    DATA02,DATA00
042540  103012                                                                BHIS    $51700
042542  032737  000200  000564                                                BIT     #BIT07,DATA02
042550  001006                                                                BNE     $51700
042552  023727  000446  177777                                                CMP     SIGNO,#-1
042560  001002                                                                BNE     $51700
042562                          LET (R0) :B= (R0) SET.BY #160
042562  152710  000160                                                        BISB    #160,(R0)
042566                        ENDIF
042566                                                               $51700:
042566                        ENDIF
042566                                                               $51674:
042566                      ENDIF
042566                                                               $51670:
042566                      IF DATTYP EQ #10000 THEN               ;*** UNSIGNED ZONED ***
042566  023727  000462  010000                                                CMP     DATTYP,#10000
042574  001025                                                                BNE     $51701
042576                        LET CC.EXP := CC.EXP CLR.BY #NBIT
042576  042737  000010  000520                                                BIC     #NBIT,CC.EXP
042604                        IF DATA00 HI #0 THEN                 ;SRC.LEN > 0
042604  005737  000560                                                        TST     DATA00
042610  101406                                                                BLOS    $51702
042612                          LET R0 := #DSBUF1-1 + DATA00
042612  012700  062367                                                        MOV     #DSBUF1-1,R0
042616  063700  000560                                                        ADD     DATA00,R0
042622                          LET (R0) :B= #64
042622  112710  000064                                                        MOVB    #64,(R0)
042626                        ENDIF
042626                                                               $51702:
042626                        IF DATA01 HI #0 THEN                 ;DST.LEN > 0
042626  005737  000562                                                        TST     DATA01
042632  101406                                                                BLOS    $51703
042634                          LET R0 := #DS.EXP-1 + DATA01
042634  012700  062535                                                        MOV     #DS.EXP-1,R0
042640  063700  000562                                                        ADD     DATA01,R0
042644                          LET (R0) :B= (R0) SET.BY #60
042644  152710  000060                                                        BISB    #60,(R0)
042650                        ENDIF
042650                                                               $51703:
042650                      ENDIF
042650                                                               $51701:
042650                      IF DATTYP EQ #20000 THEN               ;*** TRAILING OVERPUNCH ***
042650  023727  000462  020000                                                CMP     DATTYP,#20000
042656  001102                                                                BNE     $51704
042660                        IF DATA00 HI #0 THEN                 ;SRC.LEN > 0
042660  005737  000560                                                        TST     DATA00
042664  101427                                                                BLOS    $51705
042666                          IF SIGNO EQ #-1 AND #ZBIT NOTSETIN CC.EXP THEN
042666  023727  000446  177777                                                CMP     SIGNO,#-1
042674  001007                                                                BNE     $51706
```

```
042676  032737  000004  000520                                                                   BIT     #ZBIT,CC.EXP
042704  001003                                                                                   BNE     $51706
042706                                  LET CC.EXP := CC.EXP SET.BY #NBIT   ;RESTORE NBIT AFTER UNSIGNED ZONED
042706  052737  000010  000520                                                                   BIS     #NBIT,CC.EXP
042714                                ENDIF
042714                                                                                 $51706:
042714                                LET R0 := #DSBUF1-1 + DATA00
042714  012700  062367                                                                           MOV     #DSBUF1-1,R0
042720  063700  000560                                                                           ADD     DATA00,R0
042724                                IF SIGN0 EQ #0 THEN                         ;SIGN IS +
042724  005737  000446                                                                           TST     SIGN0
042730  001003                                                                                   BNE     $51707
042732                                  LET (R0) :B= #104
042732  112710  000104                                                                           MOVB    #104,(R0)
042736                                ELSE                                        ;SIGN IS -
042736  000402                                                                                   BR      $51710
042740                                                                                 $51707:
042740                                  LET (R0) :B= #115
042740  112710  000115                                                                           MOVB    #115,(R0)
042744                                ENDIF
042744                                                                                 $51710:
042744                              ENDIF
042744                                                                                 $51705:
042744                              IF DATA01 HI #0 THEN                          ;DST.LEN > 0
042744  005737  000562                                                                           TST     DATA01
042750  101445                                                                                   BLOS    $51711
042752                                LET R0 := #DS.EXP-1 + DATA01
042752  012700  062535                                                                           MOV     #DS.EXP-1,R0
042756  063700  000562                                                                           ADD     DATA01,R0
042762                                IF SIGN0 EQ #0 OR DATA00 EQ #0 OR #ZBIT SETIN CC.EXP THEN          ;SIGN IS +
042762  005737  000446                                                                           TST     SIGN0
042766  001407                                                                                   BEQ     $51712
042770  005737  000560                                                                           TST     DATA00
042774  001404                                                                                   BEQ     $51712
042776  032737  000004  000520                                                                   BIT     #ZBIT,CC.EXP
043004  001402                                                                                   BEQ     $51713
043006                                                                                 $51712:
043006                                  LET R1 :B= #0
043006  105001                                                                                   CLRB    R1
043010                                ELSE                                        ;SIGN IS -
043010  000402                                                                                   BR      $51714
043012                                                                                 $51713:
043012                                  LET R1 :B= #10.
043012  112701  000012                                                                           MOVB    #10.,R1
043016                                ENDIF
043016                                                                                 $51714:
043016                                IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
043016  123737  000564  000560                                                                   CMPB    DATA02,DATA00
043024  103012                                                                                   BHIS    $51715
043026  032737  000200  000564                                                                   BIT     #BIT07,DATA02
043034  001006                                                                                   BNE     $51715
043036  023727  000446  177777                                                                   CMP     SIGN0,#-1
043044  001002                                                                                   BNE     $51715
043046                                  LET R1 :B= #10.
043046  112701  000012                                                                           MOVB    #10.,R1
043052                                ENDIF
```

```
043052                                                                   $51715:
043052                               LET R1 :B= R1 SET.BY (R0)
043052  151001                                                                          BISB    (R0),R1
043054                               LET R1 := R1 CLR.BY #177760
043054  042701  177760                                                                  BIC     #177760,R1
043060                               LET (R0) :B= OVPNCH(R1)
043060  116110  055254                                                                  MOVB    OVPNCH(R1),(R0)
043064                             ENDIF
043064                                                                   $51711:
043064                           ENDIF
043064                                                                   $51704:
043064                           IF DATTYP EQ #30000 THEN                ;*** LEADING OVERPUNCH ***
043064  023727  000462  030000                                                          CMP     DATTYP,#30000
043072  001063                                                                          BNE     $51716
043074                             IF DATA00 HI #0 THEN                  ;SRC.LEN > 0
043074  005737  000560                                                                  TST     DATA00
043100  101412                                                                          BLOS    $51717
043102                               IF SIGN0 EQ #0 THEN                 ;SIGN IS +
043102  005737  000446                                                                  TST     SIGN0
043106  001004                                                                          BNE     $51720
043110                                 LET DSBUF1 :B= #104
043110  112737  000104  062370                                                          MOVB    #104,DSBUF1
043116                               ELSE                                ;SIGN IS -
043116  000403                                                                          BR      $51721
043120                                                                   $51720:
043120                                 LET DSBUF1 :B= #115
043120  112737  000115  062370                                                          MOVB    #115,DSBUF1
043126                               ENDIF
043126                                                                   $51721:
043126                             ENDIF
043126                                                                   $51717:
043126                             IF DATA01 HI #0 THEN                  ;DST.LEN > 0
043126  005737  000562                                                                  TST     DATA01
043132  101443                                                                          BLOS    $51722
043134                               IF SIGN0 EQ #0 OR DATA00 EQ #0 OR #ZBIT SETIN CC.EXP THEN  ;SIGN IS +
043134  005737  000446                                                                  TST     SIGN0
043140  001407                                                                          BEQ     $51723
043142  005737  000560                                                                  TST     DATA00
043146  001404                                                                          BEQ     $51723
043150  032737  000004  000520                                                          BIT     #ZBIT,CC.EXP
043156  001402                                                                          BEQ     $51724
043160                                                                   $51723:
043160                                 LET R1 :B= #0
043160  105001                                                                          CLRB    R1
043162                               ELSE                                ;SIGN IS -
043162  000402                                                                          BR      $51725
043164                                                                   $51724:
043164                                 LET R1 :B= #10.
043164  112701  000012                                                                  MOVB    #10.,R1
043170                               ENDIF
043170                                                                   $51725:
043170                               IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
043170  123737  000564  000560                                                          CMPB    DATA02,DATA00
043176  103012                                                                          BHIS    $51726
043200  032737  000200  000564                                                          BIT     #BIT07,DATA02
043206  001006                                                                          BNE     $51726
```

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043210  023727  000446  177777                                                    CMP     SIGNO,#-1
043216  001002                                                                    BNE     $51726
043220                                  LET R1 :B= #10.
043220  112701  000012                                                            MOVB    #10.,R1
043224                                ENDIF
043224                                                                   $51726:
043224                                LET R1 :B= R1 SET.BY DS.EXP
043224  153701  062536                                                            BISB    DS.EXP,R1
043230                                LET R1 := R1 CLR.BY #177760
043230  042701  177760                                                            BIC     #177760,R1
043234                                LET DS.EXP :B= OVPNCH(R1)
043234  116137  055254  062536                                                    MOVB    OVPNCH(R1),DS.EX
043242                              ENDIF
043242                                                                   $51722:
043242                            ENDIF
043242                                                                   $51716:
043242                            IF DATTYP EQ #40000 THEN           ;*** TRAILING SEPARATE ***
043242  023727  000462  040000                                                    CMP     DATTYP,#40000
043250  001071                                                                    BNE     $51727

                              ;PUT SIGN INTO SOURCE

043252                        LET TEMPO := #DSBUF1 + DATA00
043252  012737  062370  000474                                                    MOV     #DSBUF1,TEMPO
043260  063737  000560  000474                                                    ADD     DATA00,TEMPO
043266                        IF SIGNO EQ #0 THEN                  ;SIGN IS +
043266  005737  000446                                                            TST     SIGNO
043272  001004                                                                    BNE     $51730
043274                          LET @TEMPO :B= #53
043274  112777  000053  135172                                                    MOVB    #53,@TEMPO
043302                        ELSE                                 ;SIGN IS -
043302  000403                                                                    BR      $51731
043304                                                                   $51730:
043304                          LET @TEMPO :B= #55
043304  112777  000055  135162                                                    MOVB    #55,@TEMPO
043312                        ENDIF
043312                                                                   $51731:

                              ;PUT EXPECTED SIGN INTO DS.EXP

043312                        LET TEMPO := #DS.EXP + DATA01
043312  012737  062536  000474                                                    MOV     #DS.EXP,TEMPO
043320  063737  000562  000474                                                    ADD     DATA01,TEMPO
043326                        IF SIGNO EQ #0 OR #ZBIT SETIN CC.EXP THEN
043326  005737  000446                                                            TST     SIGNO
043332  001404                                                                    BEQ     $51732
043334  032737  000004  000520                                                    BIT     #ZBIT,CC.EXP
043342  001404                                                                    BEQ     $51733
043344                                                                   $51732:
043344                          LET @TEMPO :B= #53
043344  112777  000053  135122                                                    MOVB    #53,@TEMPO
043352                        ELSE
043352  000403                                                                    BR      $51734
043354                                                                   $51733:
043354                          LET @TEMPO :B= #55
043354  112777  000055  135112                                                    MOVB    #55,@TEMPO
```

```
043362                              ENDIF
043362                                                                          $51734:
043362                              IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
043362  123737  000564  000560                                                          CMPB    DATA02,DATA00
043370  103013                                                                          BHIS    $51735
043372  032737  000200  000564                                                          BIT     #BIT07,DATA02
043400  001007                                                                          BNE     $51735
043402  023727  000446  177777                                                          CMP     SIGN0,#-1
043410  001003                                                                          BNE     $51735
043412                                LET @TEMP0 :B= #55
043412  112777  000055  135054                                                          MOVB    #55,@TEMP0
043420                              ENDIF
043420                                                                          $51735:
043420                              IF DATA01 EQ #0 THEN                  ;DST.LEN = 0
043420  005737  000562                                                                  TST     DATA01
043424  001003                                                                          BNE     $51736
043426                                LET CC.EXP := CC.EXP CLR.BY #VBIT
043426  042737  000002  000520                                                          BIC     #VBIT,CC.EXP
043434                              ENDIF
043434                                                                          $51736:
043434                            ENDIF
043434                                                                          $51727:
043434                            IF DATTYP EQ #50000 THEN                ;*** LEADING SEPARATE ***
043434  023727  000462  050000                                                          CMP     DATTYP,#50000
043442  001075                                                                          BNE     $51737
043444                              LET TEMP0 := #DS.EXP + DATA01
043444  012737  062536  000474                                                          MOV     #DS.EXP,TEMP0
043452  063737  000562  000474                                                          ADD     DATA01,TEMP0
043460                              LET @TEMP0 :B= #0              ;RESTORE DS.EXP FROM TRAILING SEPARATE
043460  105077  135010                                                                  CLRB    @TEMP0
043464                              LET TEMP0 := #DS.DST + DATA01
043464  012737  062474  000474                                                          MOV     #DS.DST,TEMP0
043472  063737  000562  000474                                                          ADD     DATA01,TEMP0
043500                              LET @TEMP0 :B= #0              ;RESTORE DS.DST FROM TRAILING SEPARATE
043500  105077  134770                                                                  CLRB    @TEMP0

                                    ;PUT SIGN INTO SOURCE

043504                              IF SIGN0 EQ #0 THEN                   ;SIGN IS +
043504  005737  000446                                                                  TST     SIGN0
043510  001004                                                                          BNE     $51740
043512                                LET DSBUF1-1 :B= #53
043512  112737  000053  062367                                                          MOVB    #53,DSBUF1-1
043520                              ELSE                                  ;SIGN IS -
043520  000403                                                                          BR      $51741
043522                                                                          $51740:
043522                                LET DSBUF1-1 :B= #55
043522  112737  000055  062367                                                          MOVB    #55,DSBUF1-1
043530                              ENDIF
043530                                                                          $51741:
043530                              IF SIGN0 EQ #0 OR #ZBIT SETIN CC.EXP THEN
043530  005737  000446                                                                  TST     SIGN0
043534  001404                                                                          BEQ     $51742
043536  032737  000004  000520                                                          BIT     #ZBIT,CC.EXP
043544  001404                                                                          BEQ     $51743
043546                                                                          $51742:
```

```
043546                              LET DS.EXP-1 :B= #53
043546  112737  000053  062535                                                      MOVB    #53,DS.EXP-1
043554                            ELSE
043554  000403                                                                      BR      $51744
043556                                                                  $51743:
043556                              LET DS.EXP-1 :B= #55
043556  112737  000055  062535                                                      MOVB    #55,DS.EXP-1
043564                            ENDIF
043564                                                                  $51744:
043564                            IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
043564  123737  000564  000560                                                      CMPB    DATA02,DATA00
043572  103013                                                                      BHIS    $51745
043574  032737  000200  000564                                                      BIT     #BIT07,DATA02
043602  001007                                                                      BNE     $51745
043604  023727  000446  177777                                                      CMP     SIGN0,#-1
043612  001003                                                                      BNE     $51745
043614                              LET DS.EXP-1 :B= #55
043614  112737  000055  062535                                                      MOVB    #55,DS.EXP-1
043622                            ENDIF
043622                                                                  $51745:
043622                            IF DATA01 EQ #0 THEN                  ;DST.LEN = 0
043622  005737  000562                                                              TST     DATA01
043626  001003                                                                      BNE     $51746
043630                              LET CC.EXP := CC.EXP CLR.BY #VBIT
043630  042737  000002  000520                                                      BIC     #VBIT,CC.EXP
043636                            ENDIF
043636                                                                  $51746:
043636                          ENDIF
043636                                                                  $51737:


                          ;+
                          ; SET UP THE GPR'S AND DO THE ASHN INSTRUCTION
                          ;-

043636                          LET R0 := DATA00 SET.BY DATTYP
043636  013700  000560                                                              MOV     DATA00,R0
043642  053700  000462                                                              BIS     DATTYP,R0
043646                          LET R1 := #DSBUF1
043646  012701  062370                                                              MOV     #DSBUF1,R1
043652                          LET R2 := DATA01 SET.BY DATTYP
043652  013702  000562                                                              MOV     DATA01,R2
043656  053702  000462                                                              BIS     DATTYP,R2
043662                          LET R3 := #DS.DST
043662  012703  062474                                                              MOV     #DS.DST,R3
043666                          LET R4 := DATA02
043666  013704  000564                                                              MOV     DATA02,R4
043672                          LET R5 := #-1
043672  012705  177777                                                              MOV     #-1,R5
043676                          INLINE    <ASHN>
043676  076056                                                                      ASHN


                          ;+
                          ; CHECK THE RESULTS AND REPORT ERRORS
                          ;-

043700                          LET CC := PSW
```

```
043700  013737  177776  000516                                                      MOV     PSW,CC
043706                                  LET CC := CC CLR.BY #177760
043706  042737  177760  000516                                                      BIC     #177760,CC
043714                                  IF CC NE CC.EXP THEN
043714  023737  000516  000520                                                      CMP     CC,CC.EXP
043722  001402                                                                      BEQ     $51747
043724                                    CALL ERROR
043724  004737  056274                                                              JSR     PC,ERROR
043730                                  ENDIF
043730                                                                      $51747:
043730                                  IF R0 NE #0 OR R1 NE #0 OR R4 NE #0 THEN
043730  005700                                                                      TST     R0
043732  001004                                                                      BNE     $51750
043734  005701                                                                      TST     R1
043736  001002                                                                      BNE     $51750
043740  005704                                                                      TST     R4
043742  001402                                                                      BEQ     $51751
043744                                                                      $51750:
043744                                    CALL ERROR
043744  004737  056274                                                              JSR     PC,ERROR
043750                                  ENDIF
043750                                                                      $51751:
043750                                  LET TEMPO := DATA01 SET.BY DATTYP
043750  013737  000562  000474                                                      MOV     DATA01,TEMPO
043756  053737  000462  000474                                                      BIS     DATTYP,TEMPO
043764                                  IF R2 NE TEMPO THEN
043764  020237  000474                                                              CMP     R2,TEMPO
043770  001402                                                                      BEQ     $51752
043772                                    CALL ERROR
043772  004737  056274                                                              JSR     PC,ERROR
043776                                  ENDIF
043776                                                                      $51752:
043776                                  IF R3 NE #DS.DST THEN
043776  020327  062474                                                              CMP     R3,#DS.DST
044002  001402                                                                      BEQ     $51753
044004                                    CALL ERROR                 ;DS.EXP AND DS.DST DO NOT MATCH
044004  004737  056274                                                              JSR     PC,ERROR
044010                                  ENDIF
044010                                                                      $51753:
                                        ;COMPARE DS.EXP WITH DS.DST
044010                                  LET ERRFLG := #0                      ;CLEAR ERROR FLAG
044010  005037  000454                                                              CLR     ERRFLG
044014                                  LET R0 := #41
044014  012700  000041                                                              MOV     #41,R0
044020                                  LET R1 := #DS.DST-1
044020  012701  062473                                                              MOV     #DS.DST-1,R1
044024                                  LET R2 := #DS.EXP-1
044024  012702  062535                                                              MOV     #DS.EXP-1,R2
044030                                  WHILE R0 NE #0 AND ERRFLG EQ #0 DO
044030                                                                      $51754:
044030  005700                                                                      TST     R0
044032  001412                                                                      BEQ     $51755
044034  005737  000454                                                              TST     ERRFLG
044040  001007                                                                      BNE     $51755
044042                                    IFB (R1)+ NE (R2)+ THEN
044042  122122                                                                      CMPB    (R1)+,(R2)+
```

```
044044  001403                                                                   BEQ     $51756
044046                                    LET ERRFLG := #-1
044046  012737  177777  000454                                                   MOV     #-1,ERRFLG
044054                                  ENDIF
044054                                                                  $51756:
044054                                  LET R0 := R0 - #1
044054  005300                                                                   DEC     R0
044056                                ENDDO
044056  000764                                                                   BR      $51754
044060                                                                  $51755:
044060                                IF ERRFLG NE #0 THEN
044060  005737  000454                                                           TST     ERRFLG
044064  001402                                                                   BEQ     $51757
044066                                  CALL ERROR
044066  004737  056274                                                           JSR     PC,ERROR
044072                                ENDIF
044072                                                                  $51757:
                                    ;ENDINC
044072                              INLINE  <JMP  $5601>
044072  000137  042300                                                           JMP  $5601
044076                              INLINE  <$5603:>
044076                                                                           $5603:

044076                              INCR R0 FROM #DS.EXP-1 TO #DS.EXP+37 BY #1
044076  012700  062535                                                           MOV     #DS.EXP-1,R0
044102  000401                                                                   BR      $51760
044104                                                                  $51761:
044104  005200                                                                   INC     R0
044106                                                                  $51760:
044106  020027  062575                                                           CMP     R0,#DS.EXP+37
044112  003002                                                                   BGT     $51762
044114                                LET (R0) :B= #0                   ;CLEAR DS.DST
044114  105010                                                                   CLRB    (R0)
044116                              ENDINC
044116  000772                                                                   BR      $51761
044120                                                                  $51762:
044120                              LET SIGN0 := COMP SIGN0   ;REPEAT THE TEST CASE WITH A NEGATIVE
044120  005137  000446                                                           COM     SIGN0
                                                              ;  SIGN BEFORE MOVING ON TO THE NEXT ONE
044124                              IF SIGN0 EQ #0 THEN
044124  005737  000446                                                           TST     SIGN0
044130  001005                                                                   BNE     $51763
044132                                LET TSTCAS := TSTCAS + #6
044132  062737  000006  000542                                                   ADD     #6,TSTCAS
044140                                LET COUNT := COUNT - #1
044140  005337  000466                                                           DEC     COUNT
044144                              ENDIF
044144                                                                  $51763:
                                  ;UNTIL COUNT EQ #0
044144                            IF COUNT NE #0 THEN
044144  005737  000466                                                           TST     COUNT
044150  001402                                                                   BEQ     $51764
044152                              INLINE   <JMP   $5056>
044152  000137  041434                                                           JMP   $5056
044156                            ENDIF
044156                                                                  $51764:
```

```
                                  ;+
                                  ; DO ONE INLINE CASE - ASHNI
                                  ;-

044156                            CALL CLRDSB
044156  004737  055520                                                   JSR     PC,CLRDSB
                                  ;LOAD SRC STRING INTO DSBUF1
044162                            LET R0 := #DSBUF1-1
044162  012700  062367                                                   MOV     #DSBUF1-1,R0
044166                            LET (R0)+ :B= #53                 ;LEADING SEPARATE SIGN OF +
044166  112720  000053                                                   MOVB    #53,(R0)+
044172                            LET (R0)+ :B= #9.                 ;PUT SRC MAGNITUDE OF 9999
044172  112720  000011                                                   MOVB    #9.,(R0)+
044176                            LET (R0)+ :B= #9.                 ;  INTO DSBUF1
044176  112720  000011                                                   MOVB    #9.,(R0)+
044202                            LET (R0)+ :B= #9.
044202  112720  000011                                                   MOVB    #9.,(R0)+
044206                            LET (R0) :B= #9.
044206  112710  000011                                                   MOVB    #9.,(R0)
044212                            LET R0 := #0
044212  005000                                                           CLR     R0
044214                            LET R1 := #0
044214  005001                                                           CLR     R1
044216                            LET R2 := #0
044216  005002                                                           CLR     R2
044220                            LET R3 := #0
044220  005003                                                           CLR     R3
044222                            LET R4 := #0
044222  005004                                                           CLR     R4
044224                            LET R5 := #0
044224  005005                                                           CLR     R5
044226                            INLINE   <ASHNI>
044226  076156                                                           ASHNI
044230                            INLINE   <.WORD  TASHNI>
044230  044422                                                           .WORD   TASHNI
044232                            INLINE   <.WORD  TASHNI+4>
044232  044426                                                           .WORD   TASHNI+4
044234                            INLINE   <.WORD  000002>          ;SHIFT COUNT = 2, RND DIGIT = 0
044234  000002                                                           .WORD   000002
044236                            LET CC := PSW
044236  013737  177776  000516                                           MOV     PSW,CC
044244                            LET CC := CC CLR.BY #177760
044244  042737  177760  000516                                           BIC     #177760,CC
044252                            IF CC NE #6 THEN                  ;VBIT SHOULD BE SET
044252  023727  000516  000006                                           CMP     CC,#6
044260  001402                                                           BEQ     $51765
044262                              CALL ERROR
044262  004737  056274                                                   JSR     PC,ERROR
044266                            ENDIF
044266                                                           $51765:
044266                            IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
044266  005700                                                           TST     R0
044270  001004                                                           BNE     $51766
044272  005701                                                           TST     R1
```

```
044274 001002                                                        BNE     $51766
044276 005702                                                        TST     R2
044300 001402                                                        BEQ     $51767
044302                                                  $51766:
044302                    CALL ERROR
044302 004737 056274                                                 JSR     PC,ERROR
044306                  ENDIF
044306                                                  $51767:
044306                  IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
044306 005703                                                        TST     R3
044310 001004                                                        BNE     $51770
044312 005704                                                        TST     R4
044314 001002                                                        BNE     $51770
044316 005705                                                        TST     R5
044320 001402                                                        BEQ     $51771
044322                                                  $51770:
044322                    CALL ERROR
044322 004737 056274                                                 JSR     PC,ERROR
044326                  ENDIF
044326                                                  $51771:
                        ;CHECK DS.DST
044326                  LET R0 := #DS.DST
044326 012700 062474                                                 MOV     #DS.DST,R0
044332                  IFB (R0)+ NE #173 THEN
044332 122027 000173                                                 CMPB    (R0)+,#173
044336 001402                                                        BEQ     $51772
044340                    CALL ERROR
044340 004737 056274                                                 JSR     PC,ERROR
044344                  ENDIF
044344                                                  $51772:
044344                  IFB (R0)+ NE #60 THEN
044344 122027 000060                                                 CMPB    (R0)+,#60
044350 001402                                                        BEQ     $51773
044352                    CALL ERROR
044352 004737 056274                                                 JSR     PC,ERROR
044356                  ENDIF
044356                                                  $51773:
044356                  LET ERRFLG := #0
044356 005037 000454                                                 CLR     ERRFLG
044362                  WHILE ERRFLG EQ #0 AND R0 NE #DS.DST+37 DO
044362                                                  $51774:
044362 005737 000454                                                 TST     ERRFLG
044366 001013                                                        BNE     $51775
044370 020027 062533                                                 CMP     R0,#DS.DST+37
044374 001410                                                        BEQ     $51775
044376                    IFB (R0)+ NE #0 THEN
044376 105720                                                        TSTB    (R0)+
044400 001405                                                        BEQ     $51776
044402                      CALL ERROR
044402 004737 056274                                                 JSR     PC,ERROR
044406                      LET ERRFLG := #-1
044406 012737 177777 000454                                          MOV     #-1,ERRFLG
044414                    ENDIF
044414                                                  $51776:
044414                  ENDDO
044414 000762                                                        BR      $51774
```

```
044416                                                          $51775:
044416                    INLINE   <JMP    CIS6END>
044416  000137  044432                                                  JMP     CIS6END


                          ;+
                          ; INLINE TEST CASE
                          ;-

044422  050004            TASHNI: .WORD    050004           ;SRC.DSCR, LEADING SEPARATE, SRC.LEN = 4
044424  062370                    .WORD    DSBUF1           ;SRC.DSCR
044426  030002                    .WORD    030002           ;DST.DSCR, LEADING OVERPUNCH, DST.LEN = 2
044430  062474                    .WORD    DS.DST           ;DST.DSCR



044432                    INLINE   <CIS6END:>
044432                                                                  CIS6END:
```

```
                                        ;*****************************************************************
                                        ;*****************************************************************
                                        ;++
                                        ;                   C I S 7      M O D U L E
                                        ;
                                        ;  THIS MODULE TESTS THE PACKED DATA TYPE ARITHMETIC
                                        ;  INSTRUCTIONS: ADDP, SUBP, CMPP, ASHP.
                                        ;--
                                        ;*****************************************************************
                                        ;*****************************************************************





                                        .SBTTL  CIS7 INITIALIZATION
                                        ;*****************************************************************
                                        ;
                                        ;  CIS7 INITIALIZATION
                                        ;
                                        ;*****************************************************************

                                        ;IF SWR<5:0> ARE CLEARED OR IF SWR<3> IS SET THEN EXECUTE
                                        ;  THE CIS7 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

044432                                  INLINE   <SCOPE>
044432  000004                                                                          SCOPE

044434                                  LET TEMPO := @SWR CLR.BY #177700
044434  017737  133766  000474                                                          MOV     @SWR,TEMPO
044442  042737  177700  000474                                                          BIC     #177700,TEMPO
044450                                  IF TEMPO NE #0 THEN
044450  005737  000474                                                                  TST     TEMPO
044454  001406                                                                          BEQ     $51777
044456                                    IF #BIT3 NOTSETIN TEMPO THEN
044456  032737  000010  000474                                                          BIT     #BIT3,TEMPO
044464  001002                                                                          BNE     $52000
044466                                      INLINE   <JMP   CIS7END>
044466  000137  052020                                                                  JMP   CIS7END
044472                                    ENDIF
044472                                                                          $52000:
044472                                  ENDIF
044472                                                                          $51777:
044472                                  LET CTL := #7           ;CONTROL CHIP NUMBER
044472  012737  000007  000544                                                          MOV     #7,CTL
044500                                  LET ERRFLG := #0        ;INITIALIZE ERROR FLAG
044500  005037  000454                                                                  CLR     ERRFLG
044504                                  LET PSW := #340
044504  012737  000340  177776                                                          MOV     #340,PSW
044512                                  LET ERR := #1
044512  012737  000001  000550                                                          MOV     #1,ERR
```

```
                                        .SBTTL  ADDP
                                        ;*************************************************************
                                        ;
                                        ;       ADDP TEST
                                        ;
                                        ;*************************************************************

044520                                  INLINE <XADDP:>
044520                                                                              XADDP:
044520                                  INLINE <SCOPE>
044520  000004                                                                      SCOPE
044522                                  LET $TIMES := #20           ;ITERATION COUNT
044522  012737  000020  000404                                                      MOV     #20,$TIMES
044530                                  LET COUNT := TADD           ;# OF TEST CASES
044530  013737  063200  000466                                                      MOV     TADD,COUNT
044536                                  LET TSTCAS := #TADD+2       ;POINT TO FIRST TEST CASE
044536  012737  063202  000542                                                      MOV     #TADD+2,TSTCAS

                                        ;+
                                        ;       CLR R0.EXT TO R3.EXP
                                        ;-

044544                                  INCR  R0 FROM #0 TO #6 BY #2
044544  005000                                                                      CLR     R0
044546  000402                                                                      BR      $52001
044550                                                                      $52002:
044550  062700  000002                                                              ADD     #2,R0
044554                                                                      $52001:
044554  020027  000006                                                              CMP     R0,#6
044560  003003                                                                      BGT     $52003
044562                                   INLINE <CLR R0.EXP(R0)>
044562  005060  000522                                                              CLR R0.EXP(R0)
044566                                  ENDINC
044566  000770                                                                      BR      $52002
044570                                                                      $52003:
                                        ;REPEAT OUTER LOOP FOR TEST CASES
044570                                  INLINE <$5070:>
044570                                                                              $5070:
044570                                   CALL CLRDSB                ;CLR DS BUFFERS
044570  004737  055520                                                              JSR     PC,CLRDSB

                                         ;+
                                         ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                         ;-

044574                                   LET R0 := TSTCAS
044574  013700  000542                                                              MOV     TSTCAS,R0
044600                                   LET DATA00 := (R0)+        ;SRC1 LENGTH
044600  012037  000560                                                              MOV     (R0)+,DATA00
044604                                   LET DATA01 := (R0)+        ;POINTER TO SRC1 DATA
044604  012037  000562                                                              MOV     (R0)+,DATA01
044610                                   LET DATA02 := (R0)+        ;SRC2 LENGTH
044610  012037  000564                                                              MOV     (R0)+,DATA02
044614                                   LET DATA03 := (R0)+        ;POINTER TO SRC2 DATA
044614  012037  000566                                                              MOV     (R0)+,DATA03
044620                                   LET DATA04 := (R0)+        ;DEST LENGTH
```

```
044620  012037  000570                                                                 MOV     (R0)+,DATA04
044624                      LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (SUM)
044624  012037  000572                                                                 MOV     (R0)+,DATA05
044630                      LET CC.EXP := (R0)+             ;CC.EXP (SUM)
044630  012037  000520                                                                 MOV     (R0)+,CC.EXP


                            ;+
                            ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
                            ;-

044634                      LET R5 := #CHRSET                          ;R5 IS OPERAND STACK FOR ROUTINE
044634  012705  061766                                                                 MOV     #CHRSET,R5
044640                      CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
044640  010546                                                                         MOV     R5,-(SP)
044642  013745  000560                                                                 MOV     DATA00,-(R5)
044646  013745  000562                                                                 MOV     DATA01,-(R5)
044652  012745  062370                                                                 MOV     #DSBUF1,-(R5)
044656  004737  055646                                                                 JSR     PC,PACK
044662  012605                                                                         MOV     (SP)+,R5
044664                      CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
044664  010546                                                                         MOV     R5,-(SP)
044666  013745  000564                                                                 MOV     DATA02,-(R5)
044672  013745  000566                                                                 MOV     DATA03,-(R5)
044676  012745  062432                                                                 MOV     #DSBUF2,-(R5)
044702  004737  055646                                                                 JSR     PC,PACK
044706  012605                                                                         MOV     (SP)+,R5
044710                      CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
044710  010546                                                                         MOV     R5,-(SP)
044712  013745  000570                                                                 MOV     DATA04,-(R5)
044716  013745  000572                                                                 MOV     DATA05,-(R5)
044722  012745  062536                                                                 MOV     #DS.EXP,-(R5)
044726  004737  055646                                                                 JSR     PC,PACK
044732  012605                                                                         MOV     (SP)+,R5

                            ;+
                            ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
                            ;-

044734                      LET R0 := DATA00 SET.BY #60000
044734  013700  000560                                                                 MOV     DATA00,R0
044740  052700  060000                                                                 BIS     #60000,R0
044744                      LET R1 := #DSBUF1
044744  012701  062370                                                                 MOV     #DSBUF1,R1
044750                      LET R2 := DATA02 SET.BY #60000
044750  013702  000564                                                                 MOV     DATA02,R2
044754  052702  060000                                                                 BIS     #60000,R2
044760                      LET R3 := #DSBUF2
044760  012703  062432                                                                 MOV     #DSBUF2,R3
044764                      LET R4 := DATA04 SET.BY #60000
044764  013704  000570                                                                 MOV     DATA04,R4
044770  052704  060000                                                                 BIS     #60000,R4
044774                      LET R5 := #DS.DST
044774  012705  062474                                                                 MOV     #DS.DST,R5

                            ;+
                            ;       FINISH SET UP & DO CIS INSTRUCTION
```

```
                                  ;-


045000                            LET R4.EXP := R4
045000  010437  000532                                                  MOV     R4,R4.EXP
045004                            LET R5.EXP := R5
045004  010537  000534                                                  MOV     R5,R5.EXP
045010                            INLINE <ADDP>
045010  076070                                                          ADDP

                                  ;+
                                  ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                  ;-

045012                            LET CC := PSW
045012  013737  177776  000516                                          MOV     PSW,CC
045020                            LET CC := CC CLR.BY #177760
045020  042737  177760  000516                                          BIC     #177760,CC
045026                            IF CC NE CC.EXP THEN
045026  023737  000516  000520                                          CMP     CC,CC.EXP
045034  001402                                                          BEQ     $52004
045036                              CALL ERROR
045036  004737  056274                                                  JSR     PC,ERROR
045042                            ENDIF
045042                                                         $52004:
045042                            IF R0 NE R0.EXP THEN
045042  020037  000522                                                  CMP     R0,R0.EXP
045046  001402                                                          BEQ     $52005
045050                              CALL ERROR
045050  004737  056274                                                  JSR     PC,ERROR
045054                            ENDIF
045054                                                         $52005:
045054                            IF R1 NE R1.EXP THEN
045054  020137  000524                                                  CMP     R1,R1.EXP
045060  001402                                                          BEQ     $52006
045062                              CALL ERROR
045062  004737  056274                                                  JSR     PC,ERROR
045066                            ENDIF
045066                                                         $52006:
045066                            IF R2 NE R2.EXP THEN
045066  020237  000526                                                  CMP     R2,R2.EXP
045072  001402                                                          BEQ     $52007
045074                              CALL ERROR
045074  004737  056274                                                  JSR     PC,ERROR
045100                            ENDIF
045100                                                         $52007:
045100                            IF R3 NE R3.EXP THEN
045100  020337  000530                                                  CMP     R3,R3.EXP
045104  001402                                                          BEQ     $52010
045106                              CALL ERROR
045106  004737  056274                                                  JSR     PC,ERROR
045112                            ENDIF
045112                                                         $52010:
045112                            IF R4 NE R4.EXP THEN
045112  020437  000532                                                  CMP     R4,R4.EXP
045116  001402                                                          BEQ     $52011
```

```
045120                                  CALL ERROR
045120  004737  056274                                                  JSR     PC,ERROR
045124                                 ENDIF
045124                                                          $52011:
045124                                 IF R5 NE R5.EXP THEN
045124  020537  000534                                                  CMP     R5,R5.EXP
045130  001402                                                          BEQ     $52012
045132                                  CALL ERROR
045132  004737  056274                                                  JSR     PC,ERROR
045136                                 ENDIF
045136                                                          $52012:


                                       ;+
                                       ;       CHECK RESULTS VS EXPECTED RESULTS
                                       ;-

045136                                 LET R0 := #DS.DST
045136  012700  062474                                                  MOV     #DS.DST,R0
045142                                 LET R1 := #DS.EXP
045142  012701  062536                                                  MOV     #DS.EXP,R1
045146                                 LET ERRFLG := #0
045146  005037  000454                                                  CLR     ERRFLG
045152                                 WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
045152                                                          $52013:
045152  020027  062534                                                  CMP     R0,#DS.DST+40
045156  001410                                                          BEQ     $52014
045160  005737  000454                                                  TST     ERRFLG
045164  001005                                                          BNE     $52014
045166                                  IFB (R0)+ NE (R1)+ THEN
045166  122021                                                          CMPB    (R0)+,(R1)+
045170  001402                                                          BEQ     $52015
045172                                  CALL ERROR
045172  004737  056274                                                  JSR     PC,ERROR
045176                                  ENDIF
045176                                                          $52015:
045176                                 ENDDO
045176  000765                                                          BR      $52013
045200                                                          $52014:
045200                                 LET TSTCAS := TSTCAS + #22
045200  062737  000022  000542                                          ADD     #22,TSTCAS
045206                                 LET COUNT := COUNT - #1
045206  005337  000466                                                  DEC     COUNT
                                      ;UNTIL COUNT EQ #0
045212                                IF COUNT NE #0 THEN
045212  005737  000466                                                  TST     COUNT
045216  001402                                                          BEQ     $52016
045220                                 INLINE <JMP $5070>
045220  000137  044570                                                  JMP $5070
045224                                ENDIF
045224                                                          $52016:

                                      ;+
                                      ;        INLINE CASE - ADDPI, USING UNSIGNED PACKED DATA
                                      ;-

045224                                CALL CLRDSB
```

```
045224  004737  055520                                                              JSR     PC,CLRDSB

                                 ;+
                                 ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
                                 ;-

045230                           LET R0 := #TADD+2
045230  012700  063202                                                              MOV     #TADD+2,R0
045234                           LET DATA00 := (R0)+             ;SRC1 LENGTH
045234  012037  000560                                                              MOV     (R0)+,DATA00
045240                           LET DATA01 := (R0)+             ;POINTER TO SRC1 DATA
045240  012037  000562                                                              MOV     (R0)+,DATA01
045244                           LET DATA02 := (R0)+             ;SRC2 LENGTH
045244  012037  000564                                                              MOV     (R0)+,DATA02
045250                           LET DATA03 := (R0)+             ;POINTER TO SRC2 DATA
045250  012037  000566                                                              MOV     (R0)+,DATA03
045254                           LET DATA04 := (R0)+             ;DEST LENGTH
045254  012037  000570                                                              MOV     (R0)+,DATA04
045260                           LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (SUM)
045260  012037  000572                                                              MOV     (R0)+,DATA05

                                 ;+
                                 ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
                                 ;-

045264                           LET R5 := #CHRSET                         ;R5 IS OPERAND STACK FOR ROUTINE
045264  012705  061766                                                              MOV     #CHRSET,R5
045270                           CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
045270  010546                                                                      MOV     R5,-(SP)
045272  013745  000560                                                              MOV     DATA00,-(R5)
045276  013745  000562                                                              MOV     DATA01,-(R5)
045302  012745  062370                                                              MOV     #DSBUF1,-(R5)
045306  004737  055646                                                              JSR     PC,PACK
045312  012605                                                                      MOV     (SP)+,R5
045314                           CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
045314  010546                                                                      MOV     R5,-(SP)
045316  013745  000564                                                              MOV     DATA02,-(R5)
045322  013745  000566                                                              MOV     DATA03,-(R5)
045326  012745  062432                                                              MOV     #DSBUF2,-(R5)
045332  004737  055646                                                              JSR     PC,PACK
045336  012605                                                                      MOV     (SP)+,R5
045340                           CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
045340  010546                                                                      MOV     R5,-(SP)
045342  013745  000570                                                              MOV     DATA04,-(R5)
045346  013745  000572                                                              MOV     DATA05,-(R5)
045352  012745  062536                                                              MOV     #DS.EXP,-(R5)
045356  004737  055646                                                              JSR     PC,PACK
045362  012605                                                                      MOV     (SP)+,R5

045364                           CALL CLRREG                     ;ENSURE GPR'S 0-5 ARE ZERO
045364  004737  055330                                                              JSR     PC,CLRREG


045370                          INLINE <ADDPI>
045370  076170                                                                      ADDPI
045372                          INLINE <.WORD TADDPI>
```

```
045372  064066                                                       .WORD TADDPI
045374                           INLINE <.WORD TADDPI+4>
045374  064072                                                       .WORD TADDPI+4
045376                           INLINE <.WORD TADDPI+10>
045376  064076                                                       .WORD TADDPI+10
045400                           LET CC := PSW
045400  013737  177776  000516                                       MOV     PSW,CC
045406                           LET CC := CC CLR.BY #177760
045406  042737  177760  000516                                       BIC     #177760,CC
045414                           IF CC NE #0 THEN
045414  005737  000516                                               TST     CC
045420  001402                                                       BEQ     $52017
045422                            CALL ERROR
045422  004737  056274                                               JSR     PC,ERROR
045426                           ENDIF
045426                                                       $52017:

                                 ;+
                                 ;       ENSURE GPR'S STILL ZERO
                                 ;-

045426                           IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
045426  005700                                                       TST     R0
045430  001004                                                       BNE     $52020
045432  005701                                                       TST     R1
045434  001002                                                       BNE     $52020
045436  005702                                                       TST     R2
045440  001402                                                       BEQ     $52021
045442                                                       $52020:
045442                            CALL ERROR
045442  004737  056274                                               JSR     PC,ERROR
045446                           ENDIF
045446                                                       $52021:
045446                           IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
045446  005703                                                       TST     R3
045450  001004                                                       BNE     $52022
045452  005704                                                       TST     R4
045454  001002                                                       BNE     $52022
045456  005705                                                       TST     R5
045460  001402                                                       BEQ     $52023
045462                                                       $52022:
045462                            CALL ERROR
045462  004737  056274                                               JSR     PC,ERROR
045466                           ENDIF
045466                                                       $52023:

                                 ;+
                                 ;       CHECK RESULTS
                                 ;-

045466                           LET R0 := #DS.DST
045466  012700  062474                                               MOV     #DS.DST,R0
045472                           LET R1 := #DS.EXP               ;EXPECTED DATA
045472  012701  062536                                               MOV     #DS.EXP,R1
045476                           LET R2 := TADDPI+10 CLR.BY #70000;GET STRING LENGTH
045476  013702  064076                                               MOV     TADDPI+10,R2
```

```
045502  042702  070000                                                                 BIC     #70000,R2
045506                   INLINE  <ASR    R2>              ;LENGTH/2 (PACKING FACTOR)
045506  006202                                                                         ASR     R2
045510                   LET R2 := R2 + #DS.EXP           ;R2 POINTS TO MSD/SIGN
045510  062702  062536                                                                 ADD     #DS.EXP,R2
045514                   LET (R2) :B= (R2) SET.BY #17     ;MAKE IT UNSIGNED
045514  152712  000017                                                                 BISB    #17,(R2)
045520                   LET ERRFLG := #0
045520  005037  000454                                                                 CLR     ERRFLG
045524                   WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO
045524                                                                       $52024:
045524  020027  062533                                                                 CMP     R0,#DS.DST+37
045530  001410                                                                         BEQ     $52025
045532  005737  000454                                                                 TST     ERRFLG
045536  001005                                                                         BNE     $52025
045540                    IFB (R0)+ NE (R1)+ THEN
045540  122021                                                                         CMPB    (R0)+,(R1)+
045542  001402                                                                         BEQ     $52026
045544                     CALL ERROR
045544  004737  056274                                                                 JSR     PC,ERROR
045550                    ENDIF
045550                                                                       $52026:
045550                   ENDDO
045550  000765                                                                         BR      $52024
045552                                                                       $52025:
```

```
                                .SBTTL  SUBP
                                ;******************************************************************
                                ;
                                ;       SUBP TEST
                                ;
                                ;******************************************************************

045552                          INLINE <XSUBP:>
045552                                                                          XSUBP:
045552                          INLINE <SCOPE>
045552  000004                                                                  SCOPE
045554                          LET $TIMES := #20               ;ITERATION COUNT
045554  012737  000020  000404                                                  MOV     #20,$TIMES
045562                          LET COUNT := TADD               ;# OF TEST CASES
045562  013737  063200  000466                                                  MOV     TADD,COUNT
045570                          LET TSTCAS := #TADD+2           ;POINT TO FIRST TEST CASE
045570  012737  063202  000542                                                  MOV     #TADD+2,TSTCAS

                                ;+
                                ;       CLR R0.EXT TO R3.EXP
                                ;-

045576                          INCR  R0 FROM #0 TO #6 BY #2
045576  005000                                                                  CLR     R0
045600  000402                                                                  BR      $52027
045602                                                                  $52030:
045602  062700  000002                                                          ADD     #2,R0
045606                                                                  $52027:
045606  020027  000006                                                          CMP     R0,#6
045612  003003                                                                  BGT     $52031
045614                           INLINE <CLR R0.EXP(R0)>
045614  005060  000522                                                          CLR R0.EXP(R0)
045620                          ENDINC
045620  000770                                                                  BR      $52030
045622                                                                  $52031:

                                ;REPEAT OUTER LOOP FOR TEST CASES
045622                          INLINE <$5071:>
045622                                                                          $5071:
045622                           CALL CLRDSB                    ;CLR DS BUFFERS
045622  004737  055520                                                          JSR     PC,CLRDSB

                                 ;+
                                 ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                 ;-

045626                           LET R0 := TSTCAS
045626  013700  000542                                                          MOV     TSTCAS,R0
045632                           LET DATA00 := (R0)+            ;SRC1 LENGTH
045632  012037  000560                                                          MOV     (R0)+,DATA00
045636                           LET DATA01 := (R0)+            ;POINTER TO SRC1 DATA
045636  012037  000562                                                          MOV     (R0)+,DATA01
045642                           LET DATA02 := (R0)+            ;SRC2 LENGTH
045642  012037  000564                                                          MOV     (R0)+,DATA02
045646                           LET DATA03 := (R0)+            ;POINTER TO SRC2 DATA
045646  012037  000566                                                          MOV     (R0)+,DATA03
045652                           LET DATA04 := (R0)+            ;DEST LENGTH
```

```
045652  012037  000570                                                                     MOV     (R0)+,DATA04
045656                          LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (SUM)
045656  012037  000572                                                                     MOV     (R0)+,DATA05
045662                          LET CC.EXP := (R0)+             ;CC.EXP (SUM)
045662  012037  000520                                                                     MOV     (R0)+,CC.EXP
045666                          LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (DIFF)
045666  012037  000572                                                                     MOV     (R0)+,DATA05
045672                          LET CC.EXP := (R0)+             ;CC.EXP (DIFF)
045672  012037  000520                                                                     MOV     (R0)+,CC.EXP

                                ;+
                                ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
                                ;-

045676                          LET R5 := #CHRSET                               ;R5 IS OPERAND STACK FOR ROUTINE
045676  012705  061766                                                                     MOV     #CHRSET,R5
045702                          CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
045702  010546                                                                             MOV     R5,-(SP)
045704  013745  000560                                                                     MOV     DATA00,-(R5)
045710  013745  000562                                                                     MOV     DATA01,-(R5)
045714  012745  062370                                                                     MOV     #DSBUF1,-(R5)
045720  004737  055646                                                                     JSR     PC,PACK
045724  012605                                                                             MOV     (SP)+,R5
045726                          CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
045726  010546                                                                             MOV     R5,-(SP)
045730  013745  000564                                                                     MOV     DATA02,-(R5)
045734  013745  000566                                                                     MOV     DATA03,-(R5)
045740  012745  062432                                                                     MOV     #DSBUF2,-(R5)
045744  004737  055646                                                                     JSR     PC,PACK
045750  012605                                                                             MOV     (SP)+,R5
045752                          CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
045752  010546                                                                             MOV     R5,-(SP)
045754  013745  000570                                                                     MOV     DATA04,-(R5)
045760  013745  000572                                                                     MOV     DATA05,-(R5)
045764  012745  062536                                                                     MOV     #DS.EXP,-(R5)
045770  004737  055646                                                                     JSR     PC,PACK
045774  012605                                                                             MOV     (SP)+,R5


                                ;+
                                ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
                                ;-

045776                          LET R0 := DATA00 SET.BY #60000
045776  013700  000560                                                                     MOV     DATA00,R0
046002  052700  060000                                                                     BIS     #60000,R0
046006                          LET R1 := #DSBUF1
046006  012701  062370                                                                     MOV     #DSBUF1,R1
046012                          LET R2 := DATA02 SET.BY #60000
046012  013702  000564                                                                     MOV     DATA02,R2
046016  052702  060000                                                                     BIS     #60000,R2
046022                          LET R3 := #DSBUF2
046022  012703  062432                                                                     MOV     #DSBUF2,R3
046026                          LET R4 := DATA04 SET.BY #60000
046026  013704  000570                                                                     MOV     DATA04,R4
046032  052704  060000                                                                     BIS     #60000,R4
```

```
046036                          LET R5 := #DS.DST
046036  012705  062474                                                  MOV     #DS.DST,R5

                                ;+
                                ;       FINISH SET UP & DO CIS INSTRUCTION
                                ;-

046042                          LET R4.EXP := R4
046042  010437  000532                                                  MOV     R4,R4.EXP
046046                          LET R5.EXP := R5
046046  010537  000534                                                  MOV     R5,R5.EXP
046052                          INLINE <SUBP>
046052  076071                                                          SUBP

                                ;+
                                ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                ;-

046054                          LET CC := PSW
046054  013737  177776  000516                                          MOV     PSW,CC
046062                          LET CC := CC CLR.BY #177760
046062  042737  177760  000516                                          BIC     #177760,CC
046070                          IF CC NE CC.EXP THEN
046070  023737  000516  000520                                          CMP     CC,CC.EXP
046076  001402                                                          BEQ     $52032
046100                            CALL ERROR
046100  004737  056274                                                  JSR     PC,ERROR
046104                          ENDIF
046104                                                          $52032:
046104                          IF R0 NE R0.EXP THEN
046104  020037  000522                                                  CMP     R0,R0.EXP
046110  001402                                                          BEQ     $52033
046112                            CALL ERROR
046112  004737  056274                                                  JSR     PC,ERROR
046116                          ENDIF
046116                                                          $52033:
046116                          IF R1 NE R1.EXP THEN
046116  020137  000524                                                  CMP     R1,R1.EXP
046122  001402                                                          BEQ     $52034
046124                            CALL ERROR
046124  004737  056274                                                  JSR     PC,ERROR
046130                          ENDIF
046130                                                          $52034:
046130                          IF R2 NE R2.EXP THEN
046130  020237  000526                                                  CMP     R2,R2.EXP
046134  001402                                                          BEQ     $52035
046136                            CALL ERROR
046136  004737  056274                                                  JSR     PC,ERROR
046142                          ENDIF
046142                                                          $52035:
046142                          IF R3 NE R3.EXP THEN
046142  020337  000530                                                  CMP     R3,R3.EXP
046146  001402                                                          BEQ     $52036
046150                            CALL ERROR
046150  004737  056274                                                  JSR     PC,ERROR
```

```
046154                          ENDIF
046154                                                                          $52036:
046154                          IF R4 NE R4.EXP THEN
046154  020437  000532                                                                  CMP     R4,R4.EXP
046160  001402                                                                          BEQ     $52037
046162                            CALL ERROR
046162  004737  056274                                                                  JSR     PC,ERROR
046166                          ENDIF
046166                                                                          $52037:
046166                          IF R5 NE R5.EXP THEN
046166  020537  000534                                                                  CMP     R5,R5.EXP
046172  001402                                                                          BEQ     $52040
046174                            CALL ERROR
046174  004737  056274                                                                  JSR     PC,ERROR
046200                          ENDIF
046200                                                                          $52040:


                                ;+
                                ;       CHECK RESULTS VS EXPECTED RESULTS
                                ;-

046200                          LET R0 := #DS.DST
046200  012700  062474                                                                  MOV     #DS.DST,R0
046204                          LET R1 := #DS.EXP
046204  012701  062536                                                                  MOV     #DS.EXP,R1
046210                          LET ERRFLG := #0
046210  005037  000454                                                                  CLR     ERRFLG
046214                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
046214                                                                          $52041:
046214  020027  062534                                                                  CMP     R0,#DS.DST+40
046220  001410                                                                          BEQ     $52042
046222  005737  000454                                                                  TST     ERRFLG
046226  001005                                                                          BNE     $52042
046230                           IFB (R0)+ NE (R1)+ THEN
046230  122021                                                                          CMPB    (R0)+,(R1)+
046232  001402                                                                          BEQ     $52043
046234                            CALL ERROR
046234  004737  056274                                                                  JSR     PC,ERROR
046240                           ENDIF
046240                                                                          $52043:
046240                          ENDDO
046240  000765                                                                          BR      $52041
046242                                                                          $52042:
046242                          LET TSTCAS := TSTCAS + #22
046242  062737  000022  000542                                                          ADD     #22,TSTCAS
046250                          LET COUNT := COUNT - #1
046250  005337  000466                                                                  DEC     COUNT
                                ;UNTIL COUNT EQ #0
046254                          IF COUNT NE #0 THEN
046254  005737  000466                                                                  TST     COUNT
046260  001402                                                                          BEQ     $52044
046262                          INLINE <JMP $5071>
046262  000137  045622                                                                  JMP $5071
046266                          ENDIF
046266                                                                          $52044:
```

```


                                 ;+
                                 ;      INLINE CASE - SUBPI, USING UNSIGNED PACKED DATA
                                 ;-

046266                           CALL CLRDSB
046266  004737  055520                                                              JSR     PC,CLRDSB

                                  ;+
                                  ;     LOAD DATAXX AND CC.EXP FROM TEST CASE
                                  ;-

046272                            LET R0 := #TADD+2
046272  012700  063202                                                              MOV     #TADD+2,R0
046276                            LET DATA00 := (R0)+               ;SRC1 LENGTH
046276  012037  000560                                                              MOV     (R0)+,DATA00
046302                            LET DATA01 := (R0)+               ;POINTER TO SRC1 DATA
046302  012037  000562                                                              MOV     (R0)+,DATA01
046306                            LET DATA02 := (R0)+               ;SRC2 LENGTH
046306  012037  000564                                                              MOV     (R0)+,DATA02
046312                            LET DATA03 := (R0)+               ;POINTER TO SRC2 DATA
046312  012037  000566                                                              MOV     (R0)+,DATA03
046316                            LET DATA04 := (R0)+               ;DEST LENGTH
046316  012037  000570                                                              MOV     (R0)+,DATA04
046322                            LET DATA05 := (R0)+               ;POINTER TO DS.EXP DATA (SUM)
046322  012037  000572                                                              MOV     (R0)+,DATA05
046326                            LET CC.EXP := (R0)+
046326  012037  000520                                                              MOV     (R0)+,CC.EXP
046332                            LET DATA05 := (R0)+               ;POINTER TO DS.EXP DATA (DIFFERENCE)
046332  012037  000572                                                              MOV     (R0)+,DATA05

                                  ;+
                                  ;     PACK BUFFERS FOR SRC1,SRC2, & DEST
                                  ;-

046336                            LET R5 := #CHRSET                         ;R5 IS OPERAND STACK FOR ROUTINE
046336  012705  061766                                                              MOV     #CHRSET,R5
046342                            CALL PACK IN <#DSBUF1,DATA01,DATA00>      ;SRC1
046342  010546                                                                      MOV     R5,-(SP)
046344  013745  000560                                                              MOV     DATA00,-(R5)
046350  013745  000562                                                              MOV     DATA01,-(R5)
046354  012745  062370                                                              MOV     #DSBUF1,-(R5)
046360  004737  055646                                                              JSR     PC,PACK
046364  012605                                                                      MOV     (SP)+,R5
046366                            CALL PACK IN <#DSBUF2,DATA03,DATA02>      ;SRC2
046366  010546                                                                      MOV     R5,-(SP)
046370  013745  000564                                                              MOV     DATA02,-(R5)
046374  013745  000566                                                              MOV     DATA03,-(R5)
046400  012745  062432                                                              MOV     #DSBUF2,-(R5)
046404  004737  055646                                                              JSR     PC,PACK
046410  012605                                                                      MOV     (SP)+,R5
046412                            CALL PACK IN <#DS.EXP,DATA05,DATA04>      ;DEST
046412  010546                                                                      MOV     R5,-(SP)
046414  013745  000570                                                              MOV     DATA04,-(R5)
046420  013745  000572                                                              MOV     DATA05,-(R5)
046424  012745  062536                                                              MOV     #DS.EXP,-(R5)
```

```
046430  004737  055646                                                              JSR     PC,PACK
046434  012605                                                                      MOV     (SP)+,R5
046436                           CALL CLRREG                 ;ENSURE GPR'S 0-5 ARE ZERO
046436  004737  055330                                                              JSR     PC,CLRREG
046442                          INLINE <SUBPI>
046442  076171                                                                      SUBPI
046444                          INLINE <.WORD TADDPI>
046444  064066                                                                      .WORD TADDPI
046446                          INLINE <.WORD TADDPI+4>
046446  064072                                                                      .WORD TADDPI+4
046450                          INLINE <.WORD TADDPI+10>
046450  064076                                                                      .WORD TADDPI+10
046452                          LET CC := PSW
046452  013737  177776  000516                                                      MOV     PSW,CC
046460                          LET CC := CC CLR.BY #177760
046460  042737  177760  000516                                                      BIC     #177760,CC
046466                          IF CC NE #0 THEN
046466  005737  000516                                                              TST     CC
046472  001402                                                                      BEQ     $52045
046474                           CALL ERROR
046474  004737  056274                                                              JSR     PC,ERROR
046500                          ENDIF
046500                                                                      $52045:

                                ;+
                                ;       ENSURE GPR'S STILL ZERO
                                ;-

046500                          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
046500  005700                                                                      TST     R0
046502  001004                                                                      BNE     $52046
046504  005701                                                                      TST     R1
046506  001002                                                                      BNE     $52046
046510  005702                                                                      TST     R2
046512  001402                                                                      BEQ     $52047
046514                                                                      $52046:
046514                           CALL ERROR
046514  004737  056274                                                              JSR     PC,ERROR
046520                          ENDIF
046520                                                                      $52047:
046520                          IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
046520  005703                                                                      TST     R3
046522  001004                                                                      BNE     $52050
046524  005704                                                                      TST     R4
046526  001002                                                                      BNE     $52050
046530  005705                                                                      TST     R5
046532  001402                                                                      BEQ     $52051
046534                                                                      $52050:
046534                           CALL ERROR
046534  004737  056274                                                              JSR     PC,ERROR
046540                          ENDIF
046540                                                                      $52051:

                                ;+
                                ;       CHECK RESULTS
                                ;-
```

```
                                 
046540                          LET R0 := #DS.DST
046540  012700  062474                                                                    MOV     #DS.DST,R0
046544                          LET R1 := #DS.EXP                  ;EXPECTED DATA
046544  012701  062536                                                                    MOV     #DS.EXP,R1
046550                          LET R2 := TADDPI+10 CLR.BY #70000      ;GET STRING LENGTH
046550  013702  064076                                                                    MOV     TADDPI+10,R2
046554  042702  070000                                                                    BIC     #70000,R2
046560                          INLINE  <ASR    R2>                ;LENGTH/2 (PACKING FACTOR)
046560  006202                                                                            ASR     R2
046562                          LET R2 := R2 + #DS.EXP             ;R2 POINTS TO MSD/SIGN
046562  062702  062536                                                                    ADD     #DS.EXP,R2
046566                          LET (R2) :B= (R2) SET.BY #17       ;MAKE IT UNSIGNED
046566  152712  000017                                                                    BISB    #17,(R2)
046572                          LET ERRFLG := #0
046572  005037  000454                                                                    CLR     ERRFLG
046576                          WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO
046576                                                                           $52052:
046576  020027  062533                                                                    CMP     R0,#DS.DST+37
046602  001410                                                                            BEQ     $52053
046604  005737  000454                                                                    TST     ERRFLG
046610  001005                                                                            BNE     $52053
046612                           IFB (R0)+ NE (R1)+ THEN
046612  122021                                                                            CMPB    (R0)+,(R1)+
046614  001402                                                                            BEQ     $52054
046616                            CALL ERROR
046616  004737  056274                                                                    JSR     PC,ERROR
046622                           ENDIF
046622                                                                           $52054:
046622                          ENDDO
046622  000765                                                                            BR      $52052
046624                                                                           $52053:
```

```
                                        .SBTTL  CMPP
                                        ;*****************************************************************
                                        ;
                                        ;  CMPP TEST
                                        ;
                                        ;*****************************************************************
046624                                  INLINE <XCMPP:>
046624                                                                                  XCMPP:
046624                                  INLINE <SCOPE>
046624  000004                                                                          SCOPE
046626                                  LET $TIMES := #20                 ;ITERATION COUNT
046626  012737  000020  000404                                                          MOV     #20,$TIMES
046634                                  LET COUNT := TCMP                 ;GET TEST COUNT
046634  013737  062576  000466                                                          MOV     TCMP,COUNT
046642                                  LET TSTCAS := #TCMP+2             ;POINT TO FIRST TEST CASE
046642  012737  062600  000542                                                          MOV     #TCMP+2,TSTCAS
                                        ;REPEAT
046650                                  INLINE <$5072:>
046650                                                                                  $5072:
046650                                     CALL CLRDSB
046650  004737  055520                                                                  JSR     PC,CLRDSB
046654                                     LET CC.EXP := #0
046654  005037  000520                                                                  CLR     CC.EXP
046660                                     LET SIGNO := #0
046660  005037  000446                                                                  CLR     SIGNO
046664                                     LET DATTYP := #0
046664  005037  000462                                                                  CLR     DATTYP

                                           ;+
                                           ; GET SOURCE DESCRIPTORS FROM TABLE
                                           ;-

046670                                     LET R0 := TSTCAS
046670  013700  000542                                                                  MOV     TSTCAS,R0
046674                                     LET DATA00 := (R0)+            ;SRC1 LENGTH
046674  012037  000560                                                                  MOV     (R0)+,DATA00
046700                                     LET DATA01 := (R0)+            ;SRC1 POINTER
046700  012037  000562                                                                  MOV     (R0)+,DATA01
046704                                     LET DATA02 := (R0)+            ;SRC2 LENGTH
046704  012037  000564                                                                  MOV     (R0)+,DATA02
046710                                     LET DATA03 := (R0)             ;SRC2 POINTER
046710  011037  000566                                                                  MOV     (R0),DATA03

                                           ;+
                                           ; LOAD SRC1 AND SRC2 INTO DSBUF1 AND DSBUF2
                                           ; IN NON-PACKED FORMAT, FOR NOW.
                                           ;-

046714                                     LET R2 := DATA01 + #2          ;GET SRC1 ADDRESS
046714  013702  000562                                                                  MOV     DATA01,R2
046720  062702  000002                                                                  ADD     #2,R2
046724                                     LET R3 := #DSBUF1
046724  012703  062370                                                                  MOV     #DSBUF1,R3
046730                                     LET DSTMP0 :B= (R2)            ;SAVE SRC1 MSD
046730  111237  000552                                                                  MOVB    (R2),DSTMP0
```

```
046734                          DECR R1 FROM DATA00 TO #0 BY #1
046734  013701  000560                                                           MOV     DATA00,R1
046740  000401                                                                   BR      $52055
046742                                                                 $52056:
046742  005301                                                                   DEC     R1
046744                                                                 $52055:
046744  005701                                                                   TST     R1
046746  002402                                                                   BLT     $52057
046750                                LET (R3)+ :B= (R2)+
046750  112223                                                                   MOVB    (R2)+,(R3)+
046752                          ENDDEC
046752  000773                                                                   BR      $52056
046754                                                                 $52057:
046754                          LET DSTMP1 :B= -(R2)                ;SAVE SRC1 LSD
046754  114237  000553                                                           MOVB    -(R2),DSTMP1
046760                          LET R2 := DATA03 + #2               ;GET SRC2 ADDRESS
046760  013702  000566                                                           MOV     DATA03,R2
046764  062702  000002                                                           ADD     #2,R2
046770                          LET R3 := #DSBUF2
046770  012703  062432                                                           MOV     #DSBUF2,R3
046774                          LET DSTMP2 :B= (R2)                 ;SAVE SRC2 MSD
046774  111237  000554                                                           MOVB    (R2),DSTMP2
047000                          DECR R1 FROM DATA02 TO #0 BY #1
047000  013701  000564                                                           MOV     DATA02,R1
047004  000401                                                                   BR      $52060
047006                                                                 $52061:
047006  005301                                                                   DEC     R1
047010                                                                 $52060:
047010  005701                                                                   TST     R1
047012  002402                                                                   BLT     $52062
047014                                LET (R3)+ :B= (R2)+
047014  112223                                                                   MOVB    (R2)+,(R3)+
047016                          ENDDEC
047016  000773                                                                   BR      $52061
047020                                                                 $52062:
047020                          LET DSTMP3 :B= -(R2)                ;SAVE SRC2 LSD
047020  114237  000555                                                           MOVB    -(R2),DSTMP3


                                ;+
                                ; COMPARE SRC1 AND SRC2, AND SET N AND Z BITS
                                ; IN CC.EXP ACCORDINGLY.
                                ;-

047024                          IF DATA00 EQ #0 AND DATA02 EQ #0 THEN       ;SRC1 LENGTH AND SRC2 LENGTH = 0
047024  005737  000560                                                           TST     DATA00
047030  001007                                                                   BNE     $52063
047032  005737  000564                                                           TST     DATA02
047036  001004                                                                   BNE     $52063
047040                                LET CC.EXP := CC.EXP SET.BY #ZBIT
047040  052737  000004  000520                                                   BIS     #ZBIT,CC.EXP
047046                          ELSE
047046  000424                                                                   BR      $52064
047050                                                                 $52063:
047050                                IF DATA00 EQ #0 AND @DATA03 EQ #0 THEN  ;SRC1 LENGTH = 0 AND SRC2 SIGN IS +
047050  005737  000560                                                           TST     DATA00
047054  001007                                                                   BNE     $52065
```

```
047056  005777  131504                                                                TST     @DATA03
047062  001004                                                                        BNE     $52065
047064                              LET CC.EXP := CC.EXP SET.BY #NBIT
047064  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
047072                          ELSE
047072  000412                                                                        BR      $52066
047074                                                                      $52065:
047074                              IF DATA02 EQ #0 AND @DATA01 EQ #-1 THEN        ;SRC2 LENGTH = 0 & SRC1 SIGN IS -
047074  005737  000564                                                                TST     DATA02
047100  001007                                                                        BNE     $52067
047102  027727  131454  177777                                                        CMP     @DATA01,#-1
047110  001003                                                                        BNE     $52067
047112                                  LET CC.EXP := CC.EXP SET.BY #NBIT
047112  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
047120                              ENDIF
047120                                                                      $52067:
047120                          ENDIF
047120                                                                      $52066:
047120                      ENDIF
047120                                                                      $52064:
047120                      IF DATA00 NE #0 AND DATA02 NE #0 THEN           ;SRC1 LENGTH AND SRC2 LENGTH > 0
047120  005737  000560                                                                TST     DATA00
047124  001520                                                                        BEQ     $52070
047126  005737  000564                                                                TST     DATA02
047132  001515                                                                        BEQ     $52070
047134                         IF @DATA01 NE @DATA03 THEN                   ;SRC1 SIGN AND SRC2 SIGN ARE DIFFERENT
047134  027777  131422  131424                                                        CMP     @DATA01,@DATA03
047142  001410                                                                        BEQ     $52071
047144                           IF @DATA01 EQ #-1 THEN                     ;SRC1 SIGN IS -
047144  027727  131412  177777                                                        CMP     @DATA01,#-1
047152  001003                                                                        BNE     $52072
047154                              LET CC.EXP := CC.EXP SET.BY #NBIT
047154  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
047162                           ENDIF
047162                                                                      $52072:
047162                         ELSE                                             ;SRC1 SIGN AND SRC2 SIGN ARE EQUAL
047162  000501                                                                        BR      $52073
047164                                                                      $52071:
047164                           LET SIGN0 := @DATA01                           ;SAVE THE COMMON SIGN
047164  017737  131372  000446                                                        MOV     @DATA01,SIGN0
047172                           IF DATA00 LO DATA02 AND SIGN0 EQ #0 THEN      ;SRC1 LENGTH < SRC2 LENGTH AND SIGNS
047172  023737  000560  000564                                                        CMP     DATA00,DATA02
047200  103007                                                                        BHIS    $52074
047202  005737  000446                                                                TST     SIGN0
047206  001004                                                                        BNE     $52074
047210                              LET CC.EXP := CC.EXP SET.BY #NBIT
047210  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
047216                           ELSE
047216  000413                                                                        BR      $52075
047220                                                                      $52074:
047220                              IF DATA00 HI DATA02 AND SIGN0 EQ #-1 THEN    ;SRC1 LENGTH > SRC2 LENGTH AND
047220  023737  000560  000564                                                        CMP     DATA00,DATA02
047226  101407                                                                        BLOS    $52076
047230  023727  000446  177777                                                        CMP     SIGN0,#-1
047236  001003                                                                        BNE     $52076
047240                                  LET CC.EXP := CC.EXP SET.BY #NBIT
```

```
047240  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
047246                                  ENDIF
047246                                                                          $52076:
047246                          ENDIF
047246                                                                          $52075:
047246                          IF DATA00 EQ DATA02 THEN                ;SRC1 LENGTH AND SRC2 LENGTH ARE EQUAL
047246  023737  000560  000564                                                          CMP     DATA00,DATA02
047254  001044                                                                          BNE     $52077

                                ;+
                                ; COMPARE SRC1 AND SRC2 BYTE BY BYTE
                                ;-

047256                          LET R0 := DATA00                        ;SRC BUFFER LENGTH
047256  013700  000560                                                                  MOV     DATA00,R0
047262                          LET R1 := #DSBUF1                       ;SRC1 BUFFER
047262  012701  062370                                                                  MOV     #DSBUF1,R1
047266                          LET R2 := #DSBUF2                       ;SRC2 BUFFER
047266  012702  062432                                                                  MOV     #DSBUF2,R2
047272                          WHILEB R0 NE #0 AND (R1)+ EQ (R2)+ DO
047272                                                                          $52100:
047272  105700                                                                          TSTB    R0
047274  001404                                                                          BEQ     $52101
047276  022122                                                                          CMP     (R1)+,(R2)+
047300  001002                                                                          BNE     $52101
047302                             LET R0 := R0 - #1                    ;DECREMENT COUNTER
047302  005300                                                                          DEC     R0
047304                          ENDDO
047304  000772                                                                          BR      $52100
047306                                                                          $52101:
047306                          IFB -(R1) NE -(R2) THEN     ;SOURCES WERE NOT =
047306  124142                                                                          CMPB    -(R1),-(R2)
047310  001423                                                                          BEQ     $52102
047312                             IFB (R1) LO (R2) AND SIGN0 EQ #0 THEN
047312  121112                                                                          CMPB    (R1),(R2)
047314  103007                                                                          BHIS    $52103
047316  005737  000446                                                                  TST     SIGN0
047322  001004                                                                          BNE     $52103
047324                                LET CC.EXP := CC.EXP SET.BY #NBIT
047324  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
047332                             ELSE
047332  000411                                                                          BR      $52104
047334                                                                          $52103:
047334                                IFB (R1) HI (R2) AND SIGN0 EQ #-1 THEN
047334  121112                                                                          CMPB    (R1),(R2)
047336  101407                                                                          BLOS    $52105
047340  023727  000446  177777                                                          CMP     SIGN0,#-1
047346  001003                                                                          BNE     $52105
047350                                   LET CC.EXP := CC.EXP SET.BY #NBIT
047350  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
047356                                ENDIF
047356                                                                          $52105:
047356                             ENDIF
047356                                                                          $52104:
047356                          ELSE                        ;SOURCES WERE EQUAL
047356  000403                                                                          BR      $52106
```

```
047360                                                                  $52102:
047360                                  LET CC.EXP := CC.EXP SET.BY #ZBIT
047360  052737  000004  000520                                               BIS     #ZBIT,CC.EXP
047366                              ENDIF
047366                                                                  $52106:
047366                        ENDIF
047366                                                                  $52077:
047366                     ENDIF
047366                                                                  $52073:
047366                ENDIF
047366                                                                  $52070:


                         ;+
                         ; PERFORM THE CMPP INSTRUCTION WITH THE SIGNED
                         ; PACKED DATA TYPE. (UNSIGNED PACKED WILL BE
                         ; TESTED IN THE INLINE PORTION OF THE TEST).
                         ; CHECK THE RESULTS AND REPORT ANY ERRORS.
                         ;-

047366                   CALL CLRDSB
047366  004737  055520                                                      JSR     PC,CLRDSB

                         ;LOAD DSBUF1 WITH SRC1 DECIMAL STRING AND SIGN, IN PACKED FORMAT.
047372                   LET R0 := #DSBUF1
047372  012700  062370                                                      MOV     #DSBUF1,R0
047376                   LET R1 := DATA01 + #2
047376  013701  000562                                                      MOV     DATA01,R1
047402  062701  000002                                                      ADD     #2,R1
047406                   LET R2 := DATA00                 ;DECIMAL STRING LENGTH
047406  013702  000560                                                      MOV     DATA00,R2
047412                   IF R2 EQ #0 THEN                 ;LENGTH = 0
047412  005702                                                              TST     R2
047414  001011                                                              BNE     $52107
047416                      IF @DATA01 EQ #0 THEN         ;SIGN IS +
047416  005777  131140                                                      TST     @DATA01
047422  001003                                                              BNE     $52110
047424                         LET (R0) :B= #14
047424  112710  000014                                                      MOVB    #14,(R0)
047430                      ELSE                          ;SIGN IS -
047430  000402                                                              BR      $52111
047432                                                                  $52110:
047432                         LET (R0) :B= #15
047432  112710  000015                                                      MOVB    #15,(R0)
047436                      ENDIF
047436                                                                  $52111:
047436                   ELSE
047436  000434                                                              BR      $52112
047440                                                                  $52107:
047440                      IF #BIT00 NOTSETIN R2 THEN    ;LENGTH IS EVEN AND > 0
047440  032702  000001                                                      BIT     #BIT00,R2
047444  001002                                                              BNE     $52113
047446                         LET (R0)+ :B= (R1)+        ;MOVE THE EVEN NIBBLE
047446  112120                                                              MOVB    (R1)+,(R0)+
047450                         LET R2 := R2 - #1          ;DECREMENT COUNTER
047450  005302                                                              DEC     R2
047452                      ENDIF
047452                                                                  $52113:
```

```
047452                          WHILE R2 NE #1 DO
047452                                                                     $52114:
047452  020227  000001                                                             CMP     R2,#1
047456  001410                                                                     BEQ     $52115
047460                            LET R3 :B= (R1)+              ;GET A BCD
047460  112103                                                                     MOVB    (R1)+,R3
047462                            INLINE   <ASH  #4,R3>         ;SHIFT IT TO THE HIGH NIBBLE
047462  072327  000004                                                             ASH  #4,R3
047466                            LET R3 :B= R3 SET.BY (R1)+        ;PUT NEXT BCD INTO LOWER NIBBLE
047466  152103                                                                     BISB    (R1)+,R3
047470                            LET (R0)+ :B= R3
047470  110320                                                                     MOVB    R3,(R0)+
047472                            LET R2 := R2 - #2             ;DECREMENT  COUNTER
047472  162702  000002                                                             SUB     #2,R2
047476                          ENDDO
047476  000765                                                                     BR      $52114
047500                                                                     $52115:
047500                          LET R3 :B= (R1)                 ;GET LAST BCD
047500  111103                                                                     MOVB    (R1),R3
047502                          INLINE   <ASH  #4,R3>
047502  072327  000004                                                             ASH  #4,R3
047506                          IF @DATA01 EQ #0 THEN           ;SIGN IS +
047506  005777  131050                                                             TST     @DATA01
047512  001003                                                                     BNE     $52116
047514                            LET R3 :B= R3 SET.BY #14
047514  152703  000014                                                             BISB    #14,R3
047520                          ELSE                            ;SIGN IS -
047520  000402                                                                     BR      $52117
047522                                                                     $52116:
047522                            LET R3 :B= R3 SET.BY #15
047522  152703  000015                                                             BISB    #15,R3
047526                          ENDIF
047526                                                                     $52117:
047526                          LET (R0) :B= R3                 ;PUT MSD AND SIGN INTO THE BUFFER
047526  110310                                                                     MOVB    R3,(R0)
047530                        ENDIF
047530                                                                     $52112:
                              ;LOAD DSBUF2 WITH SRC2 DECIMAL STRING AND SIGN, IN PACKED FORMAT.
047530                        LET R0 := #DSBUF2
047530  012700  062432                                                             MOV     #DSBUF2,R0
047534                        LET R1 := DATA03 + #2
047534  013701  000566                                                             MOV     DATA03,R1
047540  062701  000002                                                             ADD     #2,R1
047544                        LET R2 := DATA02                  ;DECIMAL STRING LENGTH
047544  013702  000564                                                             MOV     DATA02,R2
047550                        IF R2 EQ #0 THEN                  ;LENGTH = 0
047550  005702                                                                     TST     R2
047552  001011                                                                     BNE     $52120
047554                          IF @DATA03 EQ #0 THEN           ;SIGN IS +
047554  005777  131006                                                             TST     @DATA03
047560  001003                                                                     BNE     $52121
047562                            LET (R0) :B= #14
047562  112710  000014                                                             MOVB    #14,(R0)
047566                          ELSE                            ;SIGN IS -
047566  000402                                                                     BR      $52122
047570                                                                     $52121:
```

```
047570                                        LET (R0) :B= #15
047570  112710  000015                                                                    MOVB    #15,(R0)
047574                                     ENDIF
047574                                                                          $52122:
047574                                  ELSE
047574  000434                                                                            BR      $52123
047576                                                                          $52120:
047576                                     IF #BIT00 NOTSETIN R2 THEN   ;LENGTH IS EVEN AND > 0
047576  032702  000001                                                                    BIT     #BIT00,R2
047602  001002                                                                            BNE     $52124
047604                                        LET (R0)+ :B= (R1)+       ;MOVE THE EVEN NIBBLE
047604  112120                                                                            MOVB    (R1)+,(R0)+
047606                                        LET R2 := R2 - #1         ;DECREMENT COUNTER
047606  005302                                                                            DEC     R2
047610                                     ENDIF
047610                                                                          $52124:
047610                                     WHILE R2 NE #1 DO
047610                                                                          $52125:
047610  020227  000001                                                                    CMP     R2,#1
047614  001410                                                                            BEQ     $52126
047616                                        LET R3 :B= (R1)+          ;GET A BCD
047616  112103                                                                            MOVB    (R1)+,R3
047620                                        INLINE   <ASH  #4,R3>     ;SHIFT IT TO THE HIGH NIBBLE
047620  072327  000004                                                                    ASH  #4,R3
047624                                        LET R3 :B= R3 SET.BY (R1)+       ;PUT NEXT BCD INTO LOWER NIBBLE
047624  152103                                                                            BISB    (R1)+,R3
047626                                        LET (R0)+ :B= R3
047626  110320                                                                            MOVB    R3,(R0)+
047630                                        LET R2 := R2 - #2         ;DECREMENT COUNTER
047630  162702  000002                                                                    SUB     #2,R2
047634                                      ENDDO
047634  000765                                                                            BR      $52125
047636                                                                          $52126:
047636                                      LET R3 :B= (R1)
047636  111103                                                                            MOVB    (R1),R3
047640                                      INLINE   <ASH  #4,R3>
047640  072327  000004                                                                    ASH  #4,R3
047644                                      IF @DATA03 EQ #0 THEN       ;SIGN IS +
047644  005777  130716                                                                    TST     @DATA03
047650  001003                                                                            BNE     $52127
047652                                         LET R3 :B= R3 SET.BY #14
047652  152703  000014                                                                    BISB    #14,R3
047656                                      ELSE                        ;SIGN IS -
047656  000402                                                                            BR      $52130
047660                                                                          $52127:
047660                                         LET R3 :B= R3 SET.BY #15
047660  152703  000015                                                                    BISB    #15,R3
047664                                      ENDIF
047664                                                                          $52130:
047664                                      LET (R0) :B= R3             ;PUT MSD AND SIGN INTO THE BUFFER
047664  110310                                                                            MOVB    R3,(R0)
047666                                  ENDIF
047666                                                                          $52123:

                                        ;+
                                        ; LOAD THE GPR'S AND DO THE CMPP INSTRUCTION
```

```
                                        ;-

047666                                  LET R0 := #60000 SET.BY DATA00  ;SRC1.DSCR
047666  012700  060000                                                                  MOV     #60000,R0
047672  053700  000560                                                                  BIS     DATA00,R0
047676                                  LET R1 := #DSBUF1               ;  ''
047676  012701  062370                                                                  MOV     #DSBUF1,R1
047702                                  LET R2 := #60000 SET.BY DATA02  ;SRC2.DSCR
047702  012702  060000                                                                  MOV     #60000,R2
047706  053702  000564                                                                  BIS     DATA02,R2
047712                                  LET R3 := #DSBUF2               ;  ''
047712  012703  062432                                                                  MOV     #DSBUF2,R3
047716                                  LET R4 := #0
047716  005004                                                                          CLR     R4
047720                                  LET R5 := #0
047720  005005                                                                          CLR     R5
047722                                  INLINE <CMPP>
047722  076072                                                                          CMPP

                                        ;+
                                        ; CHECK THE RESULTS AND REPORT ANY ERRORS
                                        ;-

047724                                  LET CC := PSW
047724  013737  177776  000516                                                          MOV     PSW,CC
047732                                  LET CC := CC CLR.BY #177760
047732  042737  177760  000516                                                          BIC     #177760,CC
047740                                  IF CC NE CC.EXP THEN
047740  023737  000516  000520                                                          CMP     CC,CC.EXP
047746  001402                                                                          BEQ     $52131
047750                                      CALL ERROR
047750  004737  056274                                                                  JSR     PC,ERROR
047754                                  ENDIF
047754                                                                          $52131:
047754                                  IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
047754  005700                                                                          TST     R0
047756  001004                                                                          BNE     $52132
047760  005701                                                                          TST     R1
047762  001002                                                                          BNE     $52132
047764  005702                                                                          TST     R2
047766  001402                                                                          BEQ     $52133
047770                                                                          $52132:
047770                                      CALL ERROR
047770  004737  056274                                                                  JSR     PC,ERROR
047774                                  ENDIF
047774                                                                          $52133:
047774                                  IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
047774  005703                                                                          TST     R3
047776  001004                                                                          BNE     $52134
050000  005704                                                                          TST     R4
050002  001002                                                                          BNE     $52134
050004  005705                                                                          TST     R5
050006  001402                                                                          BEQ     $52135
050010                                                                          $52134:
050010                                      CALL ERROR
050010  004737  056274                                                                  JSR     PC,ERROR
```

```
050014                                     ENDIF
050014                                                                         $52135:
050014                                     LET TSTCAS := TSTCAS + #10
050014  062737  000010  000542                                                         ADD     #10,TSTCAS
050022                                     LET COUNT := COUNT - #1
050022  005337  000466                                                                 DEC     COUNT
                                ;UNTIL COUNT EQ #0
050026                          IF COUNT NE #0 THEN
050026  005737  000466                                                                 TST     COUNT
050032  001402                                                                         BEQ     $52136
050034                                     INLINE <JMP $5072>
050034  000137  046650                                                                 JMP $5072
050040                          ENDIF
050040                                                                         $52136:



                                ;+
                                ; DO ONE INLINE CASE - CMPPI.  USE UNSIGNED PACKED DATA TYPE.
                                ;-

050040                          LET R0 := #-1
050040  012700  177777                                                                 MOV     #-1,R0
050044                          LET R1 := #-1
050044  012701  177777                                                                 MOV     #-1,R1
050050                          LET R2 := #-1
050050  012702  177777                                                                 MOV     #-1,R2
050054                          LET R3 := #-1
050054  012703  177777                                                                 MOV     #-1,R3
050060                          LET R4 := #-1
050060  012704  177777                                                                 MOV     #-1,R4
050064                          LET R5 := #-1
050064  012705  177777                                                                 MOV     #-1,R5
050070                          INLINE   <CMPPI>
050070  076172                                                                         CMPPI
050072                          INLINE   <.WORD  TCMPPI>
050072  050206                                                                         .WORD  TCMPPI
050074                          INLINE   <.WORD  TCMPPI+4>
050074  050212                                                                         .WORD  TCMPPI+4
050076                          LET CC := PSW
050076  013737  177776  000516                                                         MOV     PSW,CC
050104                          LET CC := CC CLR.BY #177760
050104  042737  177760  000516                                                         BIC     #177760,CC
050112                          IF CC NE #4 THEN
050112  023727  000516  000004                                                         CMP     CC,#4
050120  001402                                                                         BEQ     $52137
050122                             CALL ERROR
050122  004737  056274                                                                 JSR     PC,ERROR
050126                          ENDIF
050126                                                                         $52137:
050126                          IF R0 NE #-1 OR R1 NE #-1 OR R2 NE #-1 THEN
050126  020027  177777                                                                 CMP     R0,#-1
050132  001006                                                                         BNE     $52140
050134  020127  177777                                                                 CMP     R1,#-1
050140  001003                                                                         BNE     $52140
050142  020227  177777                                                                 CMP     R2,#-1
```

```
050146  001402                                                                  BEQ     $52141
050150                                                                $52140:
050150                             CALL ERROR
050150  004737  056274                                                          JSR     PC,ERROR
050154                          ENDIF
050154                                                                $52141:
050154                          IF R3 NE #-1 OR R4 NE #-1 OR R5 NE #-1 THEN
050154  020327  177777                                                          CMP     R3,#-1
050160  001006                                                                  BNE     $52142
050162  020427  177777                                                          CMP     R4,#-1
050166  001003                                                                  BNE     $52142
050170  020527  177777                                                          CMP     R5,#-1
050174  001402                                                                  BEQ     $52143
050176                                                                $52142:
050176                             CALL ERROR
050176  004737  056274                                                          JSR     PC,ERROR
050202                          ENDIF
050202                                                                $52143:
050202                          INLINE  <JMP XASHP>
050202  000137  050222                                                          JMP XASHP



                                ;+
                                ;INLINE TEST CASE
                                ;-

050206  070005                  TCMPPI: .WORD   070005          ;SRC1 DATA TYPE = UNSIGNED PACKED, LENGTH = 5
050210  050216                          .WORD   CMPPI1          ;SRC1.DSCR
050212  070005                          .WORD   070005          ;SRC2 DATA TYPE = UNSIGNED PACKED, LENGTH = 5
050214  050216                          .WORD   CMPPI1          ;SRC2.DSCR

050216     022     064     137  CMPPI1: .BYTE   022,064,137     ;PACKED DECIMAL STRING = 12345
        050222                          .EVEN

```

```
                                        .SBTTL  ASHP
                                        ;*************************************************************
                                        ;
                                        ;  ASHP TEST
                                        ;
                                        ;*************************************************************

050222                                  INLINE  <XASHP:>
050222                                                                                      XASHP:
050222                                  INLINE  <SCOPE>
050222  000004                                                                              SCOPE
050224                                  LET $TIMES := #20                ;ITERATION COUNT
050224  012737  000020  000404                                                              MOV     #20,$TIMES
050232                                  LET COUNT := TASH                ;GET TEST COUNT
050232  013737  063044  000466                                                              MOV     TASH,COUNT
050240                                  LET TSTCAS := #TASH+2            ;POINT TO FIRST TEST CASE
050240  012737  063046  000542                                                              MOV     #TASH+2,TSTCAS
050246                                  LET SIGNO := #0                  ;INITIALIZE THE SIGN WORD
050246  005037  000446                                                                      CLR     SIGNO
                                        ;REPEAT
050252                                  INLINE  <$5076:>
050252                                                                                      $5076:
050252                                    CALL CLRDSB                    ;CLEAR DECIMAL STRING BUFFERS
050252  004737  055520                                                                      JSR     PC,CLRDSB
050256                                    LET CC.EXP := #0
050256  005037  000520                                                                      CLR     CC.EXP

                                          ;+
                                          ; GET TEST DATA FROM TABLE
                                          ;-

050262                                    LET R0 := TSTCAS
050262  013700  000542                                                                      MOV     TSTCAS,R0
050266                                    LET DATA00 := (R0)+            ;SRC LENGTH
050266  012037  000560                                                                      MOV     (R0)+,DATA00
050272                                    LET DATA01 := (R0)+            ;DST LENGTH
050272  012037  000562                                                                      MOV     (R0)+,DATA01
050276                                    LET DATA02 := (R0)             ;SHIFT DSCR.
050276  011037  000564                                                                      MOV     (R0),DATA02

                                          ;+
                                          ;+
                                          ; PUT THE TEST STRING INTO DSBUF1 IN SIGNED PACKED FORMAT.  INCLUDE
                                          ; THE SIGN.
                                          ;-

050302                                    LET R0 := #DSBUF1
050302  012700  062370                                                                      MOV     #DSBUF1,R0
050306                                    LET R1 := DATA00
050306  013701  000560                                                                      MOV     DATA00,R1
050312                                    IF R1 EQ #0 THEN                       ;SRC.LEN = 0
050312  005701                                                                              TST     R1
050314  001011                                                                              BNE     $52144
050316                                      IF SIGNO EQ #0 THEN                  ;SIGN IS +
050316  005737  000446                                                                      TST     SIGNO
050322  001003                                                                              BNE     $52145
```

```
050324                              LET (R0) :B= #14
050324  112710  000014                                                        MOVB    #14,(R0)
050330                            ELSE                               ;SIGN IS -
050330  000402                                                                BR      $52146
050332                                                              $52145:
050332                              LET (R0) :B= #15
050332  112710  000015                                                        MOVB    #15,(R0)
050336                            ENDIF
050336                                                              $52146:
050336                          ELSE
050336  000426                                                                BR      $52147
050340                                                              $52144:
050340                            IF #BIT00 NOTSETIN R1 THEN         ;SRC.LEN IS EVEN AND > 0
050340  032701  000001                                                        BIT     #BIT00,R1
050344  001003                                                                BNE     $52150
050346                              LET (R0)+ :B= #4
050346  112720  000004                                                        MOVB    #4,(R0)+
050352                              LET R1 := R1 - #1                ;DECREMENT COUNT
050352  005301                                                                DEC     R1
050354                            ENDIF
050354                                                              $52150:
050354                            WHILE R1 NE #1 DO
050354                                                              $52151:
050354  020127  000001                                                        CMP     R1,#1
050360  001405                                                                BEQ     $52152
050362                              LET (R0)+ :B= #104               ;MOVE TWO NIBBLES OF BCD
050362  112720  000104                                                        MOVB    #104,(R0)+
050366                              LET R1 := R1 - #2                ;DECREMENT COUNT
050366  162701  000002                                                        SUB     #2,R1
050372                            ENDDO
050372  000770                                                                BR      $52151
050374                                                              $52152:
050374                            IF SIGN0 EQ #0 THEN                 ;SIGN IS +
050374  005737  000446                                                        TST     SIGN0
050400  001003                                                                BNE     $52153
050402                              LET (R0) :B= #114
050402  112710  000114                                                        MOVB    #114,(R0)
050406                            ELSE                                ;SIGN IS -
050406  000402                                                                BR      $52154
050410                                                              $52153:
050410                              LET (R0) :B= #115
050410  112710  000115                                                        MOVB    #115,(R0)
050414                            ENDIF
050414                                                              $52154:
050414                          ENDIF
050414                                                              $52147:

                                ;+
                                ; LOAD DS.EXP AND CC.EXP WITH EXPECTED RESULTS.
                                ;-

                                ;GET SHIFT COUNT MAGNITUDE AND PUT IT INTO TEMP0.

050414                          LET TEMP0 := DATA02
050414  013737  000564  000474                                                MOV     DATA02,TEMP0
050422                          IF #BIT07 SETIN TEMP0 THEN           ;NEGATIVE SHIFT COUNT
```

```
050422 032737 000200 000474                                                       BIT     #BIT07,TEMPO
050430 001402                                                                     BEQ     $52155
050432                          LET TEMPO := NEGATE TEMPO
050432 005437 000474                                                              NEG     TEMPO
050436                        ENDIF
050436                                                                  $52155:
050436                        LET TEMPO := TEMPO CLR.BY #177600
050436 042737 177600 000474                                                       BIC     #177600,TEMPO

                              ;TAKE CARE OF EXPECTED NBIT

050444                        IF SIGNO EQ #-1 AND DATA00 NE #0 THEN
050444 023727 000446 177777                                                       CMP     SIGNO,#-1
050452 001006                                                                     BNE     $52156
050454 005737 000560                                                              TST     DATA00
050460 001403                                                                     BEQ     $52156
050462                          LET CC.EXP := CC.EXP SET.BY #NBIT
050462 052737 000010 000520                                                       BIS     #NBIT,CC.EXP
050470                        ENDIF
050470                                                                  $52156:

                              ;PUT THE SIGN NIBBLE INTO THE EXPECTED DESTINATION

050470                        LET R1 := DATA01                        ;DST.LEN
050470 013701 000562                                                              MOV     DATA01,R1
050474                        INLINE   <ASR  R1>
050474 006201                                                                     ASR  R1
050476                        LET R1 := R1 + #DS.EXP
050476 062701 062536                                                              ADD     #DS.EXP,R1
050502                        IF SIGNO EQ #0 OR DATA00 EQ #0 THEN
050502 005737 000446                                                              TST     SIGNO
050506 001403                                                                     BEQ     $52157
050510 005737 000560                                                              TST     DATA00
050514 001003                                                                     BNE     $52160
050516                                                                  $52157:
050516                          LET (R1) :B= (R1) SET.BY #14          ;POSITIVE SIGN
050516 152711 000014                                                              BISB    #14,(R1)
050522                        ELSE
050522 000402                                                                     BR      $52161
050524                                                                  $52160:
050524                          LET (R1) :B= (R1) SET.BY #15          ;NEGATIVE SIGN
050524 152711 000015                                                              BISB    #15,(R1)
050530                        ENDIF
050530                                                                  $52161:

                              ;TAKE CARE OF ZERO LENGTH SOURCE OR DESTINATION

050530                        IF DATA00 EQ #0 OR DATA01 EQ #0 THEN
050530 005737 000560                                                              TST     DATA00
050534 001403                                                                     BEQ     $52162
050536 005737 000562                                                              TST     DATA01
050542 001003                                                                     BNE     $52163
050544                                                                  $52162:
050544                          LET CC.EXP := CC.EXP SET.BY #ZBIT
050544 052737 000004 000520                                                       BIS     #ZBIT,CC.EXP
050552                        ENDIF
```

```
050552                                                                                 $52163:
050552                            IF DATA00 NE #0 AND DATA01 NE #0 AND #BIT07 SETIN DATA02 THEN
050552 005737 000560                                                                           TST     DATA00
050556 001531                                                                                  BEQ     $52164
050560 005737 000562                                                                           TST     DATA01
050564 001526                                                                                  BEQ     $52164
050566 032737 000200 000564                                                                    BIT     #BIT07,DATA02
050574 001522                                                                                  BEQ     $52164

                              ;TAKE CARE OF NEGATIVE SHIFT

050576                          LET R0 := DATA00 - TEMPO            ;SRC.LEN - SHIFT COUNT
050576 013700 000560                                                                           MOV     DATA00,R0
050602 163700 000474                                                                           SUB     TEMPO,R0
050606                          LET R1 := DATA01                    ;DST.LEN
050606 013701 000562                                                                           MOV     DATA01,R1
050612                          INLINE   <ASR  R1>
050612 006201                                                                                  ASR  R1
050614                          LET R1 := R1 + #DS.EXP
050614 062701 062536                                                                           ADD     #DS.EXP,R1
050620                          LET R2 := #1
050620 012702 000001                                                                           MOV     #1,R2
050624                          LET R3 := DATA01
050624 013703 000562                                                                           MOV     DATA01,R3
050630                          IF R0 EQ #0 THEN
050630 005700                                                                                  TST     R0
050632 001024                                                                                  BNE     $52165
050634                            IF DATA02 HIS #3000 THEN
050634 023727 000564 003000                                                                    CMP     DATA02,#3000
050642 103403                                                                                  BLO     $52166
050644                              LET (R1) :B= (R1) SET.BY #20            ;ROUNDING
050644 152711 000020                                                                           BISB    #20,(R1)
050650                            ELSE
050650 000415                                                                                  BR      $52167
050652                                                                                 $52166:
050652                              LET CC.EXP := CC.EXP SET.BY #ZBIT
050652 052737 000004 000520                                                                    BIS     #ZBIT,CC.EXP
050660                              LET CC.EXP := CC.EXP CLR.BY #NBIT
050660 042737 000010 000520                                                                    BIC     #NBIT,CC.EXP
050666                              LET R5 := DATA01
050666 013705 000562                                                                           MOV     DATA01,R5
050672                              INLINE   <ASR  R5>
050672 006205                                                                                  ASR  R5
050674                              LET R5 := R5 + #DS.EXP
050674 062705 062536                                                                           ADD     #DS.EXP,R5
050700                              LET (R5) :B= (R5) CLR.BY #1
050700 142715 000001                                                                           BICB    #1,(R5)
050704                            ENDIF
050704                                                                                 $52167:
050704                          ENDIF
050704                                                                                 $52165:
050704                          IF R0 LT #0 THEN
050704 005700                                                                                  TST     R0
050706 002015                                                                                  BGE     $52170
050710                            LET CC.EXP := CC.EXP SET.BY #ZBIT
050710 052737 000004 000520                                                                    BIS     #ZBIT,CC.EXP
```

```
050716                                  LET CC.EXP := CC.EXP CLR.BY #NBIT
050716  042737  000010  000520                                                          BIC     #NBIT,CC.EXP
050724                                  LET R5 := DATA01
050724  013705  000562                                                                  MOV     DATA01,R5
050730                                  INLINE   <ASR  R5>
050730  006205                                                                          ASR  R5
050732                                  LET R5 := R5 + #DS.EXP
050732  062705  062536                                                                  ADD     #DS.EXP,R5
050736                                  LET (R5) :B= (R5) CLR.BY #1
050736  142715  000001                                                                  BICB    #1,(R5)
050742                                ENDIF
050742                                                                          $52170:
050742                                WHILE R2 LE R0 AND R3 HI #0 DO
050742                                                                          $52171:
050742  020200                                                                          CMP     R2,R0
050744  003027                                                                          BGT     $52172
050746  005703                                                                          TST     R3
050750  101425                                                                          BLOS    $52172
050752                                  IF #BIT00 SETIN R2 THEN
050752  032702  000001                                                                  BIT     #BIT00,R2
050756  001415                                                                          BEQ     $52173
050760                                    LET (R1) :B= (R1) SET.BY #100
050760  152711  000100                                                                  BISB    #100,(R1)
050764                                    IF R2 EQ #1 AND DATA02 HIS #3000 THEN
050764  020227  000001                                                                  CMP     R2,#1
050770  001006                                                                          BNE     $52174
050772  023727  000564  003000                                                          CMP     DATA02,#3000
051000  103402                                                                          BLO     $52174
051002                                      LET (R1) :B= (R1) SET.BY #20        ;ROUNDING
051002  152711  000020                                                                  BISB    #20,(R1)
051006                                    ENDIF
051006                                                                          $52174:
051006                                    LET R1 := R1 - #1
051006  005301                                                                          DEC     R1
051010                                  ELSE
051010  000402                                                                          BR      $52175
051012                                                                          $52173:
051012                                    LET (R1) :B= (R1) SET.BY #4
051012  152711  000004                                                                  BISB    #4,(R1)
051016                                  ENDIF
051016                                                                          $52175:
051016                                  LET R2 := R2 + #1
051016  005202                                                                          INC     R2
051020                                  LET R3 := R3 - #1
051020  005303                                                                          DEC     R3
051022                                ENDDO
051022  000747                                                                          BR      $52171
051024                                                                          $52172:
051024                                IF R3 EQ #0 AND R2 LE R0 THEN
051024  005703                                                                          TST     R3
051026  001005                                                                          BNE     $52176
051030  020200                                                                          CMP     R2,R0
051032  003003                                                                          BGT     $52176
051034                                  LET CC.EXP := CC.EXP SET.BY #VBIT
051034  052737  000002  000520                                                          BIS     #VBIT,CC.EXP
051042                                ENDIF
```

```
051042                                                                        $52176:
051042                               ENDIF
051042                                                                        $52164:
051042                               IF DATA00 NE #0 AND DATA01 NE #0 AND #BIT07 NOTSETIN DATA02 THEN
051042  005737  000560                                                              TST     DATA00
051046  001506                                                                      BEQ     $52177
051050  005737  000562                                                              TST     DATA01
051054  001503                                                                      BEQ     $52177
051056  032737  000200  000564                                                      BIT     #BIT07,DATA02
051064  001077                                                                      BNE     $52177


                                   ;TAKE CARE OF POSITIVE SHIFT

051066                             IF #BIT07 NOTSETIN DATA02 THEN
051066  032737  000200  000564                                                      BIT     #BIT07,DATA02
051074  001073                                                                      BNE     $52200
051076                               LET TEMP1 := DATA00 + TEMP0              ;SRC.LEN + SHIFT COUNT
051076  013737  000560  000476                                                      MOV     DATA00,TEMP1
051104  063737  000474  000476                                                      ADD     TEMP0,TEMP1
051112                               IF TEMP1 HI DATA01 THEN
051112  023737  000476  000562                                                      CMP     TEMP1,DATA01
051120  101403                                                                      BLOS    $52201
051122                                 LET CC.EXP := CC.EXP SET.BY #VBIT
051122  052737  000002  000520                                                      BIS     #VBIT,CC.EXP
051130                               ENDIF
051130                                                                        $52201:
051130                               IF TEMP0 HIS DATA01 THEN
051130  023737  000474  000562                                                      CMP     TEMP0,DATA01
051136  103407                                                                      BLO     $52202
051140                                 LET CC.EXP := CC.EXP SET.BY #ZBIT
051140  052737  000004  000520                                                      BIS     #ZBIT,CC.EXP
051146                                 LET CC.EXP := CC.EXP CLR.BY #NBIT
051146  042737  000010  000520                                                      BIC     #NBIT,CC.EXP
051154                               ELSE
051154  000443                                                                      BR      $52203
051156                                                                        $52202:
051156                                 LET R4 := TEMP0 + #1                   ;SHIFT COUNT + 1
051156  013704  000474                                                              MOV     TEMP0,R4
051162  005204                                                                      INC     R4
051164                                 INLINE   <ASR  R4>
051164  006204                                                                      ASR  R4
051166                                 LET R1 := DATA01                       ;DST.LEN
051166  013701  000562                                                              MOV     DATA01,R1
051172                                 INLINE   <ASR  R1>
051172  006201                                                                      ASR  R1
051174                                 LET R1 := R1 + #DS.EXP - R4
051174  062701  062536                                                              ADD     #DS.EXP,R1
051200  160401                                                                      SUB     R4,R1
051202                                 LET R0 := TEMP0                        ;SHIFT COUNT
051202  013700  000474                                                              MOV     TEMP0,R0
051206                                 LET R2 := DATA00                       ;SRC.LEN
051206  013702  000560                                                              MOV     DATA00,R2
051212                                 LET R3 := DATA01 - TEMP0               ;DST.LEN - SHIFT COUNT
051212  013703  000562                                                              MOV     DATA01,R3
051216  163703  000474                                                              SUB     TEMP0,R3
```

```
051222                              WHILE R2 NE #0 AND R3 NE #0 DO
051222                                                                         $52204:
051222  005702                                                                          TST     R2
051224  001417                                                                          BEQ     $52205
051226  005703                                                                          TST     R3
051230  001415                                                                          BEQ     $52205
051232                                IF #BIT00 NOTSETIN R0 THEN
051232  032700  000001                                                                  BIT     #BIT00,R0
051236  001004                                                                          BNE     $52206
051240                                  LET (R1) :B= (R1) SET.BY #100
051240  152711  000100                                                                  BISB    #100,(R1)
051244                                  LET R1 := R1 - #1
051244  005301                                                                          DEC     R1
051246                                ELSE
051246  000402                                                                          BR      $52207
051250                                                                         $52206:
051250                                  LET (R1) :B= (R1) SET.BY #4
051250  152711  000004                                                                  BISB    #4,(R1)
051254                                ENDIF
051254                                                                         $52207:
051254                                LET R0 := COMP R0                        ;TOGGLE SHIFT COUNT
051254  005100                                                                          COM     R0
051256                                LET R2 := R2 - #1
051256  005302                                                                          DEC     R2
051260                                LET R3 := R3 - #1
051260  005303                                                                          DEC     R3
051262                              ENDDO
051262  000757                                                                          BR      $52204
051264                                                                         $52205:
051264                            ENDIF
051264                                                                         $52203:
051264                          ENDIF
051264                                                                         $52200:
051264                      ENDIF
051264                                                                         $52177:

                            ;+
                            ; DO THE ASHP INSTRUCTION USING SIGNED PACKED (UNSIGNED
                            ; PACKED WILL BE TESTED IN THE INLINE PORTION OF THE TEST).
                            ; CHECK THE RESULTS AND REPORT ANY ERRORS.
                            ;-

051264                      LET R0 := DATA00 SET.BY #60000
051264  013700  000560                                                                  MOV     DATA00,R0
051270  052700  060000                                                                  BIS     #60000,R0
051274                      LET R1 := #DSBUF1
051274  012701  062370                                                                  MOV     #DSBUF1,R1
051300                      LET R2 := DATA01 SET.BY #60000
051300  013702  000562                                                                  MOV     DATA01,R2
051304  052702  060000                                                                  BIS     #60000,R2
051310                      LET R3 := #DS.DST
051310  012703  062474                                                                  MOV     #DS.DST,R3
051314                      LET R4 := DATA02
051314  013704  000564                                                                  MOV     DATA02,R4
051320                      LET R5 := #0
051320  005005                                                                          CLR     R5
```

```
051322                                INLINE   <ASHP>
051322  076076                                                        ASHP
                                      ;CHECK RESULTS
051324                                LET CC := PSW
051324  013737  177776  000516                                        MOV     PSW,CC
051332                                LET CC := CC CLR.BY #177760
051332  042737  177760  000516                                        BIC     #177760,CC
051340                                IF CC NE CC.EXP THEN
051340  023737  000516  000520                                        CMP     CC,CC.EXP
051346  001402                                                        BEQ     $52210
051350                                  CALL ERROR
051350  004737  056274                                                JSR     PC,ERROR
051354                                ENDIF
051354                                                        $52210:
051354                                IF R0 NE #0 OR R1 NE #0 THEN
051354  005700                                                        TST     R0
051356  001002                                                        BNE     $52211
051360  005701                                                        TST     R1
051362  001402                                                        BEQ     $52212
051364                                                        $52211:
051364                                  CALL ERROR
051364  004737  056274                                                JSR     PC,ERROR
051370                                ENDIF
051370                                                        $52212:
051370                                IF R4 NE #0 OR R5 NE #0 THEN
051370  005704                                                        TST     R4
051372  001002                                                        BNE     $52213
051374  005705                                                        TST     R5
051376  001402                                                        BEQ     $52214
051400                                                        $52213:
051400                                  CALL ERROR
051400  004737  056274                                                JSR     PC,ERROR
051404                                ENDIF
051404                                                        $52214:
051404                                LET TEMP0 := DATA01 SET.BY #60000
051404  013737  000562  000474                                        MOV     DATA01,TEMP0
051412  052737  060000  000474                                        BIS     #60000,TEMP0
051420                                IF R2 NE TEMP0 THEN
051420  020237  000474                                                CMP     R2,TEMP0
051424  001402                                                        BEQ     $52215
051426                                  CALL ERROR
051426  004737  056274                                                JSR     PC,ERROR
051432                                ENDIF
051432                                                        $52215:
051432                                IF R3 NE #DS.DST THEN
051432  020327  062474                                                CMP     R3,#DS.DST
051436  001402                                                        BEQ     $52216
051440                                  CALL ERROR
051440  004737  056274                                                JSR     PC,ERROR
051444                                ENDIF
051444                                                        $52216:
                                      ;SEE IF DS.DST = DS.EXP

051444                                LET R0 := #40
051444  012700  000040                                                MOV     #40,R0
051450                                LET R1 := #DS.EXP
```

```
051450  012701  062536                                                          MOV     #DS.EXP,R1
051454                          LET R2 := #DS.DST
051454  012702  062474                                                          MOV     #DS.DST,R2
051460                          LET ERRFLG := #0
051460  005037  000454                                                          CLR     ERRFLG
051464                          WHILE R0 HI #0 AND ERRFLG EQ #0 DO
051464                                                                  $52217:
051464  005700                                                                  TST     R0
051466  101412                                                                  BLOS    $52220
051470  005737  000454                                                          TST     ERRFLG
051474  001007                                                                  BNE     $52220
051476                            IFB (R1)+ NE (R2)+ THEN
051476  122122                                                                  CMPB    (R1)+,(R2)+
051500  001403                                                                  BEQ     $52221
051502                              LET ERRFLG := #-1
051502  012737  177777  000454                                                  MOV     #-1,ERRFLG
051510                            ENDIF
051510                                                                  $52221:
051510                            LET R0 := R0 - #1
051510  005300                                                                  DEC     R0
051512                          ENDDO
051512  000764                                                                  BR      $52217
051514                                                                  $52220:
051514                          IF ERRFLG NE #0 THEN
051514  005737  000454                                                          TST     ERRFLG
051520  001402                                                                  BEQ     $52222
051522                            CALL ERROR                    ;DS.DST AND DS.EXP DO NOT MATCH
051522  004737  056274                                                          JSR     PC,ERROR
051526                          ENDIF
051526                                                                  $52222:
051526                          LET SIGNO := COMP SIGNO         ;REPEAT THE TEST CASE WITH A NEGATIVE
051526  005137  000446                                                          COM     SIGNO
                                                                ;  SIGN BEFORE MOVING ON TO THE NEXT TEST CASE
051532                          IF SIGNO EQ #0 THEN
051532  005737  000446                                                          TST     SIGNO
051536  001005                                                                  BNE     $52223
051540                            LET TSTCAS := TSTCAS + #6
051540  062737  000006  000542                                                  ADD     #6,TSTCAS
051546                            LET COUNT := COUNT - #1
051546  005337  000466                                                          DEC     COUNT
051552                          ENDIF
051552                                                                  $52223:
                        ;UNTIL COUNT EQ #0
051552                  IF COUNT NE #0 THEN
051552  005737  000466                                                          TST     COUNT
051556  001402                                                                  BEQ     $52224
051560                          INLINE  <JMP   $5076>
051560  000137  050252                                                          JMP   $5076
051564                  ENDIF
051564                                                                  $52224:




                        ;+
                        ; DO ONE INLINE CASE - ASHPI.  USE UNSIGNED PACKED.
                        ;-
```

```

051564                              CALL    CLRDSB
051564  004737  055520                                                                  JSR     PC,CLRDSB
051570                              LET DSBUF1 :B= #231             ;9/9
051570  112737  000231  062370                                                          MOVB    #231,DSBUF1
051576                              LET DSBUF1+1 :B= #231           ;9/9
051576  112737  000231  062371                                                          MOVB    #231,DSBUF1+1
051604                              LET DSBUF1+2 :B= #237           ;9/17
051604  112737  000237  062372                                                          MOVB    #237,DSBUF1+2
051612                              CALL CLRREG
051612  004737  055330                                                                  JSR     PC,CLRREG
051616                              INLINE   <ASHPI>
051616  076176                                                                          ASHPI
051620                              INLINE   <.WORD   TASHPI>
051620  052010                                                                          .WORD   TASHPI
051622                              INLINE   <.WORD   TASHPI+4>
051622  052014                                                                          .WORD   TASHPI+4
051624                              INLINE   <.WORD   375>              ;SHIFT COUNT = -3, RND DIGIT = 0
051624  000375                                                                          .WORD   375
051626                              LET CC := PSW
051626  013737  177776  000516                                                          MOV     PSW,CC
051634                              LET CC := CC CLR.BY #177760
051634  042737  177760  000516                                                          BIC     #177760,CC
051642                              IF CC NE #0 THEN                    ;VBIT SHOULD BE SET
051642  005737  000516                                                                  TST     CC
051646  001402                                                                          BEQ     $52225
051650                                CALL ERROR
051650  004737  056274                                                                  JSR     PC,ERROR
051654                              ENDIF
051654                                                                          $52225:
051654                              IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
051654  005700                                                                          TST     R0
051656  001004                                                                          BNE     $52226
051660  005701                                                                          TST     R1
051662  001002                                                                          BNE     $52226
051664  005702                                                                          TST     R2
051666  001402                                                                          BEQ     $52227
051670                                                                          $52226:
051670                                CALL ERROR
051670  004737  056274                                                                  JSR     PC,ERROR
051674                              ENDIF
051674                                                                          $52227:
051674                              IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
051674  005703                                                                          TST     R3
051676  001004                                                                          BNE     $52230
051700  005704                                                                          TST     R4
051702  001002                                                                          BNE     $52230
051704  005705                                                                          TST     R5
051706  001402                                                                          BEQ     $52231
051710                                                                          $52230:
051710                                CALL ERROR
051710  004737  056274                                                                  JSR     PC,ERROR
051714                              ENDIF
051714                                                                          $52231:
                                    ;CHECK DS.DST
051714                              LET R0 := #DS.DST
```

```
051714  012700  062474                                                                  MOV     #DS.DST,R0
051720                          IFB (R0)+ NE #11 THEN                   ;FIRST BYTE = 0/9
051720  122027  000011                                                                  CMPB    (R0)+,#11
051724  001402                                                                          BEQ     $52232
051726                            CALL ERROR
051726  004737  056274                                                                  JSR     PC,ERROR
051732                          ENDIF
051732                                                                          $52232:
051732                          IFB (R0)+ NE #237 THEN                  ;SECOND BYTE = 9/17
051732  122027  000237                                                                  CMPB    (R0)+,#237
051736  001402                                                                          BEQ     $52233
051740                            CALL ERROR
051740  004737  056274                                                                  JSR     PC,ERROR
051744                          ENDIF
051744                                                                          $52233:
051744                          LET ERRFLG := #0
051744  005037  000454                                                                  CLR     ERRFLG
051750                          WHILE ERRFLG NE #0 AND R0 NE #DS.DST+37 DO
051750                                                                          $52234:
051750  005737  000454                                                                  TST     ERRFLG
051754  001413                                                                          BEQ     $52235
051756  020027  062533                                                                  CMP     R0,#DS.DST+37
051762  001410                                                                          BEQ     $52235
051764                            IFB (R0)+ NE #0 THEN
051764  105720                                                                          TSTB    (R0)+
051766  001405                                                                          BEQ     $52236
051770                              LET ERRFLG := #-1
051770  012737  177777  000454                                                          MOV     #-1,ERRFLG
051776                              CALL ERROR
051776  004737  056274                                                                  JSR     PC,ERROR
052002                            ENDIF
052002                                                                          $52236:
052002                          ENDDO
052002  000762                                                                          BR      $52234
052004                                                                          $52235:
052004                          INLINE   <JMP    CIS7END>
052004  000137  052020                                                                  JMP     CIS7END




                                ;+
                                ; INLINE TEST CASE
                                ;-

052010  070005                  TASHPI: .WORD   070005          ;SRC.DSCR, UNSIGNED PACKED, SRC.LEN = 5
052012  062370                          .WORD   DSBUF1          ;SRC.DSCR
052014  070002                          .WORD   070002          ;DST.DSCR, UNSIGNED PACKED, DST.LEN = 2
052016  062474                          .WORD   DS.DST          ;DST.DSCR

052020                          INLINE   <CIS7END:>
052020                                                                          CIS7END:
```

```
                                        ;*****************************************************************
                                        ;*****************************************************************
                                        ;++
                                        ;                 C I S 8     M O D U L E
                                        ;
                                        ;  THIS MODULE TESTS THE PACKED MULTIPLY INSTRUCTION: MULP.
                                        ;--
                                        ;*****************************************************************
                                        ;*****************************************************************




                                        .SBTTL  CIS8 INITIALIZATION
                                        ;*****************************************************************
                                        ;
                                        ;  CIS8 INITIALIZATION
                                        ;
                                        ;*****************************************************************

                                        ;IF SWR<5:0> ARE CLEARED OR IF SWR<4> IS SET THEN EXECUTE
                                        ;  THE CIS8 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

052020                                  INLINE   <SCOPE>
052020  000004                                                                      SCOPE

052022                                  LET TEMPO := @SWR CLR.BY #177700
052022  017737  126400  000474                                                      MOV     @SWR,TEMPO
052030  042737  177700  000474                                                      BIC     #177700,TEMPO
052036                                  IF TEMPO NE #0 THEN
052036  005737  000474                                                              TST     TEMPO
052042  001406                                                                      BEQ     $52237
052044                                    IF #BIT4 NOTSETIN TEMPO THEN
052044  032737  000020  000474                                                      BIT     #BIT4,TEMPO
052052  001002                                                                      BNE     $52240
052054                                      INLINE   <JMP   CIS8END>
052054  000137  053140                                                              JMP   CIS8END
052060                                    ENDIF
052060                                                                     $52240:
052060                                  ENDIF
052060                                                                     $52237:
052060                                  LET CTL := #8.           ;CONTROL CHIP NUMBER
052060  012737  000010  000544                                                      MOV     #8.,CTL
052066                                  LET ERRFLG := #0         ;INITIALIZE ERROR FLAG
052066  005037  000454                                                              CLR     ERRFLG
052072                                  LET PSW := #340
052072  012737  000340  177776                                                      MOV     #340,PSW
052100                                  LET ERR := #1
052100  012737  000001  000550                                                      MOV     #1,ERR
```

```
                                  .SBTTL  MULP
                                  ;*******************************
                                  ;+
                                  ;       MULP TEST
                                  ;-
                                  ;*******************************

052106                            INLINE <XMULP:>
052106                                                                            XMULP:
052106                            INLINE <SCOPE>
052106  000004                                                                    SCOPE
052110                            LET $TIMES := #20           ;ITERATION COUNT
052110  012737  000020  000404                                                    MOV     #20,$TIMES
052116                            LET COUNT := TAB89          ;# OF TEST CASES
052116  013737  054304  000466                                                    MOV     TAB89,COUNT
052124                            LET TSTCAS := #TAB89+2      ;POINT TO FIRST TEST CASE
052124  012737  054306  000542                                                    MOV     #TAB89+2,TSTCAS

                                  ;+
                                  ;       CLR R0.EXT TO R3.EXP
                                  ;-

052132                            INCR  R0 FROM #0 TO #6 BY #2
052132  005000                                                                    CLR     R0
052134  000402                                                                    BR      $52241
052136                                                                    $52242:
052136  062700  000002                                                            ADD     #2,R0
052142                                                                    $52241:
052142  020027  000006                                                            CMP     R0,#6
052146  003003                                                                    BGT     $52243
052150                             INLINE <CLR R0.EXP(R0)>
052150  005060  000522                                                            CLR R0.EXP(R0)
052154                            ENDINC
052154  000770                                                                    BR      $52242
052156                                                                    $52243:
                                  ;REPEAT OUTER LOOP FOR TEST CASES
052156                            INLINE <$5074:>
052156                                                                            $5074:
052156                             CALL CLRDSB                ;CLR DS BUFFERS
052156  004737  055520                                                            JSR     PC,CLRDSB

                                   ;+
                                   ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                   ;-

052162                             LET R0 := TSTCAS
052162  013700  000542                                                            MOV     TSTCAS,R0
052166                             LET DATA00 := (R0)+        ;SRC1 LENGTH
052166  012037  000560                                                            MOV     (R0)+,DATA00
052172                             LET DATA01 := (R0)+        ;POINTER TO SRC1 DATA
052172  012037  000562                                                            MOV     (R0)+,DATA01
052176                             LET DATA02 := (R0)+        ;SRC2 LENGTH
052176  012037  000564                                                            MOV     (R0)+,DATA02
052202                             LET DATA03 := (R0)+        ;POINTER TO SRC2 DATA
052202  012037  000566                                                            MOV     (R0)+,DATA03
```

```
052206                          LET DATA04 := (R0)+            ;DEST LENGTH
052206  012037  000570                                                            MOV     (R0)+,DATA04
052212                          LET DATA05 := (R0)+            ;POINTER TO DS.EXP DATA (PRODUCT)
052212  012037  000572                                                            MOV     (R0)+,DATA05
052216                          LET CC.EXP := (R0)+            ;CC.EXP (PRODUCT)
052216  012037  000520                                                            MOV     (R0)+,CC.EXP


                                ;+
                                ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
                                ;-

052222                          LET R5 := #CHRSET                    ;R5 IS OPERAND STACK FOR ROUTINE
052222  012705  061766                                                            MOV     #CHRSET,R5
052226                          CALL PACK IN <#DSBUF1,DATA01,DATA00>   ;SRC1
052226  010546                                                                    MOV     R5,-(SP)
052230  013745  000560                                                            MOV     DATA00,-(R5)
052234  013745  000562                                                            MOV     DATA01,-(R5)
052240  012745  062370                                                            MOV     #DSBUF1,-(R5)
052244  004737  055646                                                            JSR     PC,PACK
052250  012605                                                                    MOV     (SP)+,R5
052252                          CALL PACK IN <#DSBUF2,DATA03,DATA02>   ;SRC2
052252  010546                                                                    MOV     R5,-(SP)
052254  013745  000564                                                            MOV     DATA02,-(R5)
052260  013745  000566                                                            MOV     DATA03,-(R5)
052264  012745  062432                                                            MOV     #DSBUF2,-(R5)
052270  004737  055646                                                            JSR     PC,PACK
052274  012605                                                                    MOV     (SP)+,R5
052276                          CALL PACK IN <#DS.EXP,DATA05,DATA04>   ;DEST
052276  010546                                                                    MOV     R5,-(SP)
052300  013745  000570                                                            MOV     DATA04,-(R5)
052304  013745  000572                                                            MOV     DATA05,-(R5)
052310  012745  062536                                                            MOV     #DS.EXP,-(R5)
052314  004737  055646                                                            JSR     PC,PACK
052320  012605                                                                    MOV     (SP)+,R5

                                ;+
                                ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
                                ;-

052322                          LET R0 := DATA00 SET.BY #60000
052322  013700  000560                                                            MOV     DATA00,R0
052326  052700  060000                                                            BIS     #60000,R0
052332                          LET R1 := #DSBUF1
052332  012701  062370                                                            MOV     #DSBUF1,R1
052336                          LET R2 := DATA02 SET.BY #60000
052336  013702  000564                                                            MOV     DATA02,R2
052342  052702  060000                                                            BIS     #60000,R2
052346                          LET R3 := #DSBUF2
052346  012703  062432                                                            MOV     #DSBUF2,R3
052352                          LET R4 := DATA04 SET.BY #60000
052352  013704  000570                                                            MOV     DATA04,R4
052356  052704  060000                                                            BIS     #60000,R4
052362                          LET R5 := #DS.DST
052362  012705  062474                                                            MOV     #DS.DST,R5

                                ;+
```

```
                                        ;       FINISH SET UP & DO CIS INSTRUCTION
                                        ;-

052366                                  LET R4.EXP := R4
052366  010437  000532                                                          MOV     R4,R4.EXP
052372                                  LET R5.EXP := R5
052372  010537  000534                                                          MOV     R5,R5.EXP
052376                                  INLINE <MULP>
052376  076074                                                                  MULP

                                        ;+
                                        ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                        ;-

052400                                  LET CC := PSW
052400  013737  177776  000516                                                  MOV     PSW,CC
052406                                  LET CC := CC CLR.BY #177760
052406  042737  177760  000516                                                  BIC     #177760,CC
052414                                  IF CC NE CC.EXP THEN
052414  023737  000516  000520                                                  CMP     CC,CC.EXP
052422  001402                                                                  BEQ     $52244
052424                                    CALL ERROR
052424  004737  056274                                                          JSR     PC,ERROR
052430                                  ENDIF
052430                                                                  $52244:
052430                                  IF R0 NE R0.EXP THEN
052430  020037  000522                                                          CMP     R0,R0.EXP
052434  001402                                                                  BEQ     $52245
052436                                    CALL ERROR
052436  004737  056274                                                          JSR     PC,ERROR
052442                                  ENDIF
052442                                                                  $52245:
052442                                  IF R1 NE R1.EXP THEN
052442  020137  000524                                                          CMP     R1,R1.EXP
052446  001402                                                                  BEQ     $52246
052450                                    CALL ERROR
052450  004737  056274                                                          JSR     PC,ERROR
052454                                  ENDIF
052454                                                                  $52246:
052454                                  IF R2 NE R2.EXP THEN
052454  020237  000526                                                          CMP     R2,R2.EXP
052460  001402                                                                  BEQ     $52247
052462                                    CALL ERROR
052462  004737  056274                                                          JSR     PC,ERROR
052466                                  ENDIF
052466                                                                  $52247:
052466                                  IF R3 NE R3.EXP THEN
052466  020337  000530                                                          CMP     R3,R3.EXP
052472  001402                                                                  BEQ     $52250
052474                                    CALL ERROR
052474  004737  056274                                                          JSR     PC,ERROR
052500                                  ENDIF
052500                                                                  $52250:
052500                                  IF R4 NE R4.EXP THEN
052500  020437  000532                                                          CMP     R4,R4.EXP
```

```
052504  001402                                                          BEQ     $52251
052506                           CALL ERROR
052506  004737  056274                                                  JSR     PC,ERROR
052512                         ENDIF
052512                                                         $52251:
052512                         IF R5 NE R5.EXP THEN
052512  020537  000534                                                  CMP     R5,R5.EXP
052516  001402                                                          BEQ     $52252
052520                           CALL ERROR
052520  004737  056274                                                  JSR     PC,ERROR
052524                         ENDIF
052524                                                         $52252:


                               ;+
                               ;         CHECK RESULTS VS EXPECTED RESULTS
                               ;-

052524                         LET R0 := #DS.DST
052524  012700  062474                                                  MOV     #DS.DST,R0
052530                         LET R1 := #DS.EXP
052530  012701  062536                                                  MOV     #DS.EXP,R1
052534                         LET ERRFLG := #0
052534  005037  000454                                                  CLR     ERRFLG
052540                         WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
052540                                                         $52253:
052540  020027  062534                                                  CMP     R0,#DS.DST+40
052544  001410                                                          BEQ     $52254
052546  005737  000454                                                  TST     ERRFLG
052552  001005                                                          BNE     $52254
052554                          IFB (R0)+ NE (R1)+ THEN
052554  122021                                                          CMPB    (R0)+,(R1)+
052556  001402                                                          BEQ     $52255
052560                           CALL ERROR
052560  004737  056274                                                  JSR     PC,ERROR
052564                          ENDIF
052564                                                         $52255:
052564                         ENDDO
052564  000765                                                          BR      $52253
052566                                                         $52254:
052566                         LET TSTCAS := TSTCAS + #22
052566  062737  000022  000542                                          ADD     #22,TSTCAS
052574                         LET COUNT := COUNT - #1
052574  005337  000466                                                  DEC     COUNT
                               ;UNTIL COUNT EQ #0
052600                         IF COUNT NE #0 THEN
052600  005737  000466                                                  TST     COUNT
052604  001402                                                          BEQ     $52256
052606                          INLINE <JMP $5074>
052606  000137  052156                                                  JMP $5074
052612                         ENDIF
052612                                                         $52256:

                               ;+
                               ;      INLINE CASE - MULPI, USING UNSIGNED PACKED DATA
                               ;-
```

```

052612                          CALL CLRDSB
052612  004737  055520                                                                  JSR     PC,CLRDSB

                                 ;+
                                 ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                 ;-

052616                           LET R0 := #TAB89+2
052616  012700  054306                                                                  MOV     #TAB89+2,R0
052622                           LET DATA00 := (R0)+              ;SRC1 LENGTH
052622  012037  000560                                                                  MOV     (R0)+,DATA00
052626                           LET DATA01 := (R0)+              ;POINTER TO SRC1 DATA
052626  012037  000562                                                                  MOV     (R0)+,DATA01
052632                           LET DATA02 := (R0)+              ;SRC2 LENGTH
052632  012037  000564                                                                  MOV     (R0)+,DATA02
052636                           LET DATA03 := (R0)+              ;POINTER TO SRC2 DATA
052636  012037  000566                                                                  MOV     (R0)+,DATA03
052642                           LET DATA04 := (R0)+              ;DEST LENGTH
052642  012037  000570                                                                  MOV     (R0)+,DATA04
052646                           LET DATA05 := (R0)+              ;POINTER TO DS.EXP DATA (PRODUCT)
052646  012037  000572                                                                  MOV     (R0)+,DATA05

                                 ;+
                                 ;      PACK BUFFERS FOR SRC1,SRC2, & DEST
                                 ;-

052652                           LET R5 := #CHRSET                          ;R5 IS OPERAND STACK FOR ROUTINE
052652  012705  061766                                                                  MOV     #CHRSET,R5
052656                           CALL PACK IN <#DSBUF1,DATA01,DATA00>       ;SRC1
052656  010546                                                                          MOV     R5,-(SP)
052660  013745  000560                                                                  MOV     DATA00,-(R5)
052664  013745  000562                                                                  MOV     DATA01,-(R5)
052670  012745  062370                                                                  MOV     #DSBUF1,-(R5)
052674  004737  055646                                                                  JSR     PC,PACK
052700  012605                                                                          MOV     (SP)+,R5
052702                           CALL PACK IN <#DSBUF2,DATA03,DATA02>       ;SRC2
052702  010546                                                                          MOV     R5,-(SP)
052704  013745  000564                                                                  MOV     DATA02,-(R5)
052710  013745  000566                                                                  MOV     DATA03,-(R5)
052714  012745  062432                                                                  MOV     #DSBUF2,-(R5)
052720  004737  055646                                                                  JSR     PC,PACK
052724  012605                                                                          MOV     (SP)+,R5
052726                           CALL PACK IN <#DS.EXP,DATA05,DATA04>       ;DEST
052726  010546                                                                          MOV     R5,-(SP)
052730  013745  000570                                                                  MOV     DATA04,-(R5)
052734  013745  000572                                                                  MOV     DATA05,-(R5)
052740  012745  062536                                                                  MOV     #DS.EXP,-(R5)
052744  004737  055646                                                                  JSR     PC,PACK
052750  012605                                                                          MOV     (SP)+,R5
052752                           CALL CLRREG                      ;ENSURE GPR'S 0-5 ARE ZERO
052752  004737  055330                                                                  JSR     PC,CLRREG

052756                          INLINE <MULPI>
052756  076174                                                                          MULPI
052760                          INLINE <.WORD TMULPI>
```

```
052760  055100                                                                        .WORD   TMULPI
052762                              INLINE <.WORD TMULPI+4>
052762  055104                                                                        .WORD   TMULPI+4
052764                              INLINE <.WORD TMULPI+10>
052764  055110                                                                        .WORD   TMULPI+10
052766                              LET CC := PSW
052766  013737  177776  000516                                                        MOV     PSW,CC
052774                              LET CC := CC CLR.BY #177760
052774  042737  177760  000516                                                        BIC     #177760,CC
053002                              IF CC NE #0 THEN
053002  005737  000516                                                                TST     CC
053006  001402                                                                        BEQ     $52257
053010                               CALL ERROR
053010  004737  056274                                                                JSR     PC,ERROR
053014                              ENDIF
053014                                                                        $52257:


                                    ;+
                                    ;       ENSURE GPR'S STILL ZERO
                                    ;-

053014                              IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
053014  005700                                                                        TST     R0
053016  001004                                                                        BNE     $52260
053020  005701                                                                        TST     R1
053022  001002                                                                        BNE     $52260
053024  005702                                                                        TST     R2
053026  001402                                                                        BEQ     $52261
053030                                                                        $52260:
053030                               CALL ERROR
053030  004737  056274                                                                JSR     PC,ERROR
053034                              ENDIF
053034                                                                        $52261:
053034                              IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
053034  005703                                                                        TST     R3
053036  001004                                                                        BNE     $52262
053040  005704                                                                        TST     R4
053042  001002                                                                        BNE     $52262
053044  005705                                                                        TST     R5
053046  001402                                                                        BEQ     $52263
053050                                                                        $52262:
053050                               CALL ERROR
053050  004737  056274                                                                JSR     PC,ERROR
053054                              ENDIF
053054                                                                        $52263:


                                    ;+
                                    ;       CHECK RESULTS
                                    ;-

053054                              LET R0 := #DS.DST
053054  012700  062474                                                                MOV     #DS.DST,R0
053060                              LET R1 := #DS.EXP                 ;EXPECTED DATA
053060  012701  062536                                                                MOV     #DS.EXP,R1
053064                              LET R2 := TMULFI+10 CLR.BY #70000       ;GET STRING LENGTH
053064  013702  055110                                                                MOV     TMULPI+10,R2
```

```
053070  042702  070000                                                                      BIC     #70000,R2
053074                     INLINE  <ASR    R2>              ;LENGTH/2 (PACKING FACTOR)
053074  006202                                                                              ASR     R2
053076                     LET R2 := R2 + #DS.EXP           ;R2 POINTS TO MSD/SIGN
053076  062702  062536                                                                      ADD     #DS.EXP,R2
053102                     LET (R2) :B= (R2) SET.BY #17     ;MAKE IT UNSIGNED
053102  152712  000017                                                                      BISB    #17,(R2)
053106                     LET ERRFLG := #0
053106  005037  000454                                                                      CLR     ERRFLG
053112                     WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO
053112                                                                            $52264:
053112  020027  062533                                                                      CMP     R0,#DS.DST+37
053116  001410                                                                              BEQ     $52265
053120  005737  000454                                                                      TST     ERRFLG
053124  001005                                                                              BNE     $52265
053126                      IFB (R0)+ NE (R1)+ THEN
053126  122021                                                                              CMPB    (R0)+,(R1)+
053130  001402                                                                              BEQ     $52266
053132                       CALL ERROR
053132  004737  056274                                                                      JSR     PC,ERROR
053136                      ENDIF
053136                                                                            $52266:
053136                     ENDDO
053136  000765                                                                              BR      $52264
053140                                                                            $52265:

053140                     INLINE <CIS8END:>
053140                                                                              CIS8END:
```

```
                                        ;*****************************************************************
                                        ;*****************************************************************
                                        ;++
                                        ;                   C I S 9     M O D U L E
                                        ;
                                        ;  THIS MODULE TESTS THE PACKED DIVIDE INSTRUCTION: DIVP.
                                        ;--
                                        ;*****************************************************************
                                        ;*****************************************************************





                                        .SBTTL  CIS9 INITIALIZATION
                                        ;*****************************************************************
                                        ;
                                        ;  CIS9 INITIALIZATION
                                        ;
                                        ;*****************************************************************

                                        ;IF SWR<5:0> ARE CLEARED OR IF SWR<5> IS SET THEN EXECUTE
                                        ;  THE CIS9 MODULE; OTHERWISE, SKIP TO END OF PASS.

053140                                  INLINE   <SCOPE>
053140  000004                                                                   SCOPE

053142                                  LET TEMPO := @SWR CLR.BY #177700
053142  017737  125260  000474                                                   MOV     @SWR,TEMPO
053150  042737  177700  000474                                                   BIC     #177700,TEMPO
053156                                  IF TEMPO NE #0 THEN
053156  005737  000474                                                           TST     TEMPO
053162  001406                                                                   BEQ     $52267
053164                                    IF #BIT5 NOTSETIN TEMPO THEN
053164  032737  000040  000474                                                   BIT     #BIT5,TEMPO
053172  001002                                                                   BNE     $52270
053174                                      INLINE   <JMP   CIS9END>
053174  000137  055114                                                           JMP   CIS9END
053200                                    ENDIF
053200                                                                   $52270:
053200                                  ENDIF
053200                                                                   $52267:
053200                                  LET CTL := #9.          ;CONTROL CHIP NUMBER
053200  012737  000011  000544                                                   MOV     #9.,CTL
053206                                  LET ERRFLG := #0        ;INITIALIZE ERROR FLAG
053206  005037  000454                                                           CLR     ERRFLG
053212                                  LET PSW := #340
053212  012737  000340  177776                                                   MOV     #340,PSW
053220                                  LET ERR := #1
053220  012737  000001  000550                                                   MOV     #1,ERR
```

```
                                        .SBTTL  DIVP
                                        ;*******************************
                                        ;+
                                        ;       DIVP TEST
                                        ;
                                        ;-
                                        ;*******************************

053226                                  INLINE <XDIVP:>
053226                                                                                          XDIVP:
053226                                  INLINE <SCOPE>
053226  000004                                                                                  SCOPE
053230                                  LET $TIMES := #20             ;ITERATION COUNT
053230  012737  000020  000404                                                                  MOV     #20,$TIMES
053236                                  LET COUNT := TAB89            ;# OF TEST CASES
053236  013737  054304  000466                                                                  MOV     TAB89,COUNT
053244                                  LET TSTCAS := #TAB89+2        ;POINT TO FIRST TEST CASE
053244  012737  054306  000542                                                                  MOV     #TAB89+2,TSTCAS

                                        ;+
                                        ;       CLR R0.EXT TO R3.EXP
                                        ;-

053252                                  INCR  R0 FROM #0 TO #6 BY #2
053252  005000                                                                                  CLR     R0
053254  000402                                                                                  BR      $52271
053256                                                                                  $52272:
053256  062700  000002                                                                          ADD     #2,R0
053262                                                                                  $52271:
053262  020027  000006                                                                          CMP     R0,#6
053266  003003                                                                                  BGT     $52273
053270                                   INLINE <CLR R0.EXP(R0)>
053270  005060  000522                                                                          CLR R0.EXP(R0)
053274                                  ENDINC
053274  000770                                                                                  BR      $52272
053276                                                                                  $52273:

                                        ;REPEAT OUTER LOOP FOR TEST CASES
053276                                  INLINE <$5075:>
053276                                                                                          $5075:
053276                                   CALL CLRDSB                  ;CLR DS BUFFERS
053276  004737  055520                                                                          JSR     PC,CLRDSB

                                         ;+
                                         ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                         ;-

053302                                   LET R0 := TSTCAS
053302  013700  000542                                                                          MOV     TSTCAS,R0
053306                                   LET DATA00 := (R0)+          ;SRC1 LENGTH
053306  012037  000560                                                                          MOV     (R0)+,DATA00
053312                                   LET DATA01 := (R0)+          ;POINTER TO SRC1 DATA
053312  012037  000562                                                                          MOV     (R0)+,DATA01
053316                                   LET DATA02 := (R0)+          ;SRC2 LENGTH
053316  012037  000564                                                                          MOV     (R0)+,DATA02
053322                                   LET DATA03 := (R0)+          ;POINTER TO SRC2 DATA
053322  012037  000566                                                                          MOV     (R0)+,DATA03
053326                                   LET DATA04 := (R0)+          ;DEST LENGTH
```

```
053326  012037  000570                                                                           MOV     (R0)+,DATA04
053332                     LET DATA05 := (R0)+            ;POINTER TO DS.EXP DATA (PRODUCT)
053332  012037  000572                                                                           MOV     (R0)+,DATA05
053336                     LET CC.EXP := (R0)+            ;CC.EXP (PRODUCT)
053336  012037  000520                                                                           MOV     (R0)+,CC.EXP
053342                     LET DATA05 := (R0)+            ;POINTER TO DS.EXP DATA (QUOTIENT)
053342  012037  000572                                                                           MOV     (R0)+,DATA05
053346                     LET CC.EXP := (R0)+            ;CC.EXP (QUOTIENT)
053346  012037  000520                                                                           MOV     (R0)+,CC.EXP


                           ;+
                           ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
                           ;-

053352                     LET R5 := #CHRSET                         ;R5 IS OPERAND STACK FOR ROUTINE
053352  012705  061766                                                                           MOV     #CHRSET,R5
053356                     CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
053356  010546                                                                                   MOV     R5,-(SP)
053360  013745  000560                                                                           MOV     DATA00,-(R5)
053364  013745  000562                                                                           MOV     DATA01,-(R5)
053370  012745  062370                                                                           MOV     #DSBUF1,-(R5)
053374  004737  055646                                                                           JSR     PC,PACK
053400  012605                                                                                   MOV     (SP)+,R5
053402                     CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
053402  010546                                                                                   MOV     R5,-(SP)
053404  013745  000564                                                                           MOV     DATA02,-(R5)
053410  013745  000566                                                                           MOV     DATA03,-(R5)
053414  012745  062432                                                                           MOV     #DSBUF2,-(R5)
053420  004737  055646                                                                           JSR     PC,PACK
053424  012605                                                                                   MOV     (SP)+,R5
053426                     CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
053426  010546                                                                                   MOV     R5,-(SP)
053430  013745  000570                                                                           MOV     DATA04,-(R5)
053434  013745  000572                                                                           MOV     DATA05,-(R5)
053440  012745  062536                                                                           MOV     #DS.EXP,-(R5)
053444  004737  055646                                                                           JSR     PC,PACK
053450  012605                                                                                   MOV     (SP)+,R5


                           ;+
                           ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
                           ;-

053452                     LET R0 := DATA00 SET.BY #60000
053452  013700  000560                                                                           MOV     DATA00,R0
053456  052700  060000                                                                           BIS     #60000,R0
053462                     LET R1 := #DSBUF1
053462  012701  062370                                                                           MOV     #DSBUF1,R1
053466                     LET R2 := DATA02 SET.BY #60000
053466  013702  000564                                                                           MOV     DATA02,R2
053472  052702  060000                                                                           BIS     #60000,R2
053476                     LET R3 := #DSBUF2
053476  012703  062432                                                                           MOV     #DSBUF2,R3
053502                     LET R4 := DATA04 SET.BY #60000
053502  013704  000570                                                                           MOV     DATA04,R4
053506  052704  060000                                                                           BIS     #60000,R4
```

```
053512                              LET R5 := #DS.DST
053512  012705  062474                                                          MOV     #DS.DST,R5

                                    ;+
                                    ;       FINISH SET UP & DO CIS INSTRUCTION
                                    ;-


053516                              LET R4.EXP := R4
053516  010437  000532                                                          MOV     R4,R4.EXP
053522                              LET R5.EXP := R5
053522  010537  000534                                                          MOV     R5,R5.EXP
053526                              INLINE <DIVP>
053526  076075                                                                  DIVP

                                    ;+
                                    ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
                                    ;-

053530                              LET CC := PSW
053530  013737  177776  000516                                                  MOV     PSW,CC
053536                              LET CC := CC CLR.BY #177760
053536  042737  177760  000516                                                  BIC     #177760,CC
053544                              IF CC NE CC.EXP THEN
053544  023737  000516  000520                                                  CMP     CC,CC.EXP
053552  001402                                                                  BEQ     $52274
053554                                CALL ERROR
053554  004737  056274                                                          JSR     PC,ERROR
053560                              ENDIF
053560                                                                  $52274:
053560                              IF R0 NE R0.EXP THEN
053560  020037  000522                                                          CMP     R0,R0.EXP
053564  001402                                                                  BEQ     $52275
053566                                CALL ERROR
053566  004737  056274                                                          JSR     PC,ERROR
053572                              ENDIF
053572                                                                  $52275:
053572                              IF R1 NE R1.EXP THEN
053572  020137  000524                                                          CMP     R1,R1.EXP
053576  001402                                                                  BEQ     $52276
053600                                CALL ERROR
053600  004737  056274                                                          JSR     PC,ERROR
053604                              ENDIF
053604                                                                  $52276:
053604                              IF R2 NE R2.EXP THEN
053604  020237  000526                                                          CMP     R2,R2.EXP
053610  001402                                                                  BEQ     $52277
053612                                CALL ERROR
053612  004737  056274                                                          JSR     PC,ERROR
053616                              ENDIF
053616                                                                  $52277:
053616                              IF R3 NE R3.EXP THEN
053616  020337  000530                                                          CMP     R3,R3.EXP
053622  001402                                                                  BEQ     $52300
053624                                CALL ERROR
053624  004737  056274                                                          JSR     PC,ERROR
```

```
053630                          ENDIF
053630                                                                  $52300:
053630                          IF R4 NE R4.EXP THEN
053630  020437  000532                                                          CMP     R4,R4.EXP
053634  001402                                                                  BEQ     $52301
053636                            CALL ERROR
053636  004737  056274                                                          JSR     PC,ERROR
053642                          ENDIF
053642                                                                  $52301:
053642                          IF R5 NE R5.EXP THEN
053642  020537  000534                                                          CMP     R5,R5.EXP
053646  001402                                                                  BEQ     $52302
053650                            CALL ERROR
053650  004737  056274                                                          JSR     PC,ERROR
053654                          ENDIF
053654                                                                  $52302:


                                ;+
                                ;       CHECK RESULTS VS EXPECTED RESULTS
                                ;-

053654                          LET R0 := #DS.DST
053654  012700  062474                                                          MOV     #DS.DST,R0
053660                          LET R1 := #DS.EXP
053660  012701  062536                                                          MOV     #DS.EXP,R1
053664                          LET ERRFLG := #0
053664  005037  000454                                                          CLR     ERRFLG
053670                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
053670                                                                  $52303:
053670  020027  062534                                                          CMP     R0,#DS.DST+40
053674  001410                                                                  BEQ     $52304
053676  005737  000454                                                          TST     ERRFLG
053702  001005                                                                  BNE     $52304
053704                           IFB (R0)+ NE (R1)+ THEN
053704  122021                                                                  CMPB    (R0)+,(R1)+
053706  001402                                                                  BEQ     $52305
053710                            CALL ERROR
053710  004737  056274                                                          JSR     PC,ERROR
053714                           ENDIF
053714                                                                  $52305:
053714                          ENDDO
053714  000765                                                                  BR      $52303
053716                                                                  $52304:
053716                          LET TSTCAS := TSTCAS + #22
053716  062737  000022  000542                                                  ADD     #22,TSTCAS
053724                          LET COUNT := COUNT - #1
053724  005337  000466                                                          DEC     COUNT
                               ;UNTIL COUNT EQ #0
053730                         IF COUNT NE #0 THEN
053730  005737  000466                                                          TST     COUNT
053734  001402                                                                  BEQ     $52306
053736                          INLINE <JMP $5075>
053736  000137  053276                                                          JMP $5075
053742                         ENDIF
053742                                                                  $52306:
```

```

                                ;+
                                ;       INLINE CASE - DIVPI, USING UNSIGNED PACKED DATA
                                ;-

053742                          CALL CLRDSB
053742  004737  055520                                                                  JSR     PC,CLRDSB

                                 ;+
                                 ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                 ;-

053746                           LET R0 := #TAB89+2
053746  012700  054306                                                                  MOV     #TAB89+2,R0
053752                           LET DATA00 := (R0)+                 ;SRC1 LENGTH
053752  012037  000560                                                                  MOV     (R0)+,DATA00
053756                           LET DATA01 := (R0)+                 ;POINTER TO SRC1 DATA
053756  012037  000562                                                                  MOV     (R0)+,DATA01
053762                           LET DATA02 := (R0)+                 ;SRC2 LENGTH
053762  012037  000564                                                                  MOV     (R0)+,DATA02
053766                           LET DATA03 := (R0)+                 ;POINTER TO SRC2 DATA
053766  012037  000566                                                                  MOV     (R0)+,DATA03
053772                           LET DATA04 := (R0)+                 ;DEST LENGTH
053772  012037  000570                                                                  MOV     (R0)+,DATA04
053776                           LET DATA05 := (R0)+                 ;POINTER TO DS.EXP DATA (PRODUCT)
053776  012037  000572                                                                  MOV     (R0)+,DATA05
054002                           LET CC.EXP := (R0)+
054002  012037  000520                                                                  MOV     (R0)+,CC.EXP
054006                           LET DATA05 := (R0)+                 ;POINTER TO DS.EXP DATA (QUOTIENT)
054006  012037  000572                                                                  MOV     (R0)+,DATA05

                                 ;+
                                 ;      PACK BUFFERS FOR SRC1,SRC2, & DEST
                                 ;-

054012                           LET R5 := #CHRSET                          ;R5 IS OPERAND STACK FOR ROUTINE
054012  012705  061766                                                                  MOV     #CHRSET,R5
054016                           CALL PACK IN <#DSBUF1,DATA01,DATA00>   ;SRC1
054016  010546                                                                          MOV     R5,-(SP)
054020  013745  000560                                                                  MOV     DATA00,-(R5)
054024  013745  000562                                                                  MOV     DATA01,-(R5)
054030  012745  062370                                                                  MOV     #DSBUF1,-(R5)
054034  004737  055646                                                                  JSR     PC,PACK
054040  012605                                                                          MOV     (SP)+,R5
054042                           CALL PACK IN <#DSBUF2,DATA03,DATA02>   ;SRC2
054042  010546                                                                          MOV     R5,-(SP)
054044  013745  000564                                                                  MOV     DATA02,-(R5)
054050  013745  000566                                                                  MOV     DATA03,-(R5)
054054  012745  062432                                                                  MOV     #DSBUF2,-(R5)
054060  004737  055646                                                                  JSR     PC,PACK
054064  012605                                                                          MOV     (SP)+,R5
054066                           CALL PACK IN <#DS.EXP,DATA05,DATA04>   ;DEST
054066  010546                                                                          MOV     R5,-(SP)
054070  013745  000570                                                                  MOV     DATA04,-(R5)
054074  013745  000572                                                                  MOV     DATA05,-(R5)
054100  012745  062536                                                                  MOV     #DS.EXP,-(R5)
```

```
054104  004737  055646                                                          JSR     PC,PACK
054110  012605                                                                  MOV     (SP)+,R5
054112                          CALL CLRREG                 ;ENSURE GPR'S 0-5 ARE ZERO
054112  004737  055330                                                          JSR     PC,CLRREG

054116                          INLINE <DIVPI>
054116  076175                                                                  DIVPI
054120                          INLINE <.WORD TMULPI>
054120  055100                                                                  .WORD TMULPI
054122                          INLINE <.WORD TMULPI+4>
054122  055104                                                                  .WORD TMULPI+4
054124                          INLINE <.WORD TMULPI+10>
054124  055110                                                                  .WORD TMULPI+10
054126                          LET CC := PSW
054126  013737  177776  000516                                                  MOV     PSW,CC
054134                          LET CC := CC CLR.BY #177760
054134  042737  177760  000516                                                  BIC     #177760,CC
054142                          IF CC NE #0 THEN
054142  005737  000516                                                          TST     CC
054146  001402                                                                  BEQ     $52307
054150                           CALL ERROR
054150  004737  056274                                                          JSR     PC,ERROR
054154                          ENDIF
054154                                                                  $52307:

                                ;+
                                ;       ENSURE GPR'S STILL ZERO
                                ;-

054154                          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
054154  005700                                                                  TST     R0
054156  001004                                                                  BNE     $52310
054160  005701                                                                  TST     R1
054162  001002                                                                  BNE     $52310
054164  005702                                                                  TST     R2
054166  001402                                                                  BEQ     $52311
054170                                                                  $52310:
054170                           CALL ERROR
054170  004737  056274                                                          JSR     PC,ERROR
054174                          ENDIF
054174                                                                  $52311:
054174                          IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
054174  005703                                                                  TST     R3
054176  001004                                                                  BNE     $52312
054200  005704                                                                  TST     R4
054202  001002                                                                  BNE     $52312
054204  005705                                                                  TST     R5
054206  001402                                                                  BEQ     $52313
054210                                                                  $52312:
054210                           CALL ERROR
054210  004737  056274                                                          JSR     PC,ERROR
054214                          ENDIF
054214                                                                  $52313:

                                ;+
                                ;       CHECK RESULTS
```

```
                                ;-

054214                          LET R0 := #DS.DST
054214  012700  062474                                                          MOV     #DS.DST,R0
054220                          LET R1 := #DS.EXP           ;EXPECTED DATA
054220  012701  062536                                                          MOV     #DS.EXP,R1
054224                          LET R2 := TMULPI+10 CLR.BY #70000     ;GET STRING LENGTH
054224  013702  055110                                                          MOV     TMULPI+10,R2
054230  042702  070000                                                          BIC     #70000,R2
054234                          INLINE  <ASR    R2>         ;LENGTH/2 (PACKING FACTOR)
054234  006202                                                                  ASR     R2
054236                          LET R2 := R2 + #DS.EXP      ;R2 POINTS TO MSD/SIGN
054236  062702  062536                                                          ADD     #DS.EXP,R2
054242                          LET (R2) :B= (R2) SET.BY #17   ;MAKE IT UNSIGNED
054242  152712  000017                                                          BISB    #17,(R2)
054246                          LET ERRFLG := #0
054246  005037  000454                                                          CLR     ERRFLG
054252                          WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO
054252                                                                 $52314:
054252  020027  062533                                                          CMP     R0,#DS.DST+37
054256  001410                                                                  BEQ     $52315
054260  005737  000454                                                          TST     ERRFLG
054264  001005                                                                  BNE     $52315
054266                           IFB (R0)+ NE (R1)+ THEN
054266  122021                                                                  CMPB    (R0)+,(R1)+
054270  001402                                                                  BEQ     $52316
054272                            CALL ERROR
054272  004737  056274                                                          JSR     PC,ERROR
054276                           ENDIF
054276                                                                 $52316:
054276                          ENDDO
054276  000765                                                                  BR      $52314
054300                                                                 $52315:
054300                          INLINE <JMP CIS9END>
054300  000137  055114                                                          JMP CIS9END

```

```
                                .SBTTL  TEST CASES FOR CIS8 & CIS9

054304  000007          TAB89:  .WORD   7               ;# OF TEST CASES

054306  000017                  .WORD   15.             ;SRC1 LENGTH
054310  054504                  .WORD   MUL1            ;SRC1 PTR
054312  000021                  .WORD   17.             ;SRC2 LENGTH
054314  054526                  .WORD   MUL1A           ;SRC2 PTR
054316  000037                  .WORD   31.             ;DEST LENGTH
054320  054552                  .WORD   MUL1B           ;DEST PTR (PRODUCT)
054322  000000                  .WORD   0               ;CC.EXP (PRODUCT)
054324  054614                  .WORD   MUL1C           ;DEST PTR (QUOTIENT)
054326  000000                  .WORD   0               ;CC.EXP (QUOTIENT)

054330  000004                  .WORD   4
054332  054656                  .WORD   MUL2
054334  000007                  .WORD   7
054336  054664                  .WORD   MUL2A
054340  000013                  .WORD   11.
054342  054676                  .WORD   MUL2B
054344  000010                  .WORD   10
054346  054714                  .WORD   MUL2C
054350  000010                  .WORD   10

054352  000005                  .WORD   5
054354  054732                  .WORD   MUL3
054356  000002                  .WORD   2
054360  054742                  .WORD   MUL3A
054362  000006                  .WORD   6
054364  054746                  .WORD   MUL3B
054366  000000                  .WORD   0
054370  054756                  .WORD   MUL3C
054372  000004                  .WORD   4

054374  000005                  .WORD   5
054376  054766                  .WORD   MUL4
054400  000001                  .WORD   1
054402  054776                  .WORD   MUL4A
054404  000001                  .WORD   1
054406  055002                  .WORD   MUL4B
054410  000004                  .WORD   4
054412  055006                  .WORD   MUL4C
054414  000004                  .WORD   4

054416  000002                  .WORD   2
054420  055012                  .WORD   MUL5
054422  000005                  .WORD   5
054424  055016                  .WORD   MUL5A
054426  000000                  .WORD   0
054430  055026                  .WORD   MUL5B
054432  000006                  .WORD   6
054434  055032                  .WORD   MUL5C
054436  000006                  .WORD   6

054440  000005                  .WORD   5
054442  054766                  .WORD   MUL4
```

```
15626  054444  000001                         .WORD   1
15627  054446  054776                         .WORD   MUL4A
15628  054450  000004                         .WORD   4
15629  054452  055002                         .WORD   MUL4B
15630  054454  000004                         .WORD   4
15631  054456  055006                         .WORD   MUL4C
15632  054460  000004                         .WORD   4
15633
15634  054462  000005                         .WORD   5
15635  054464  055036                         .WORD   MUL7
15636  054466  000004                         .WORD   4
15637  054470  055046                         .WORD   MUL7A
15638  054472  000010                         .WORD   8.
15639  054474  055054                         .WORD   MUL7B
15640  054476  000000                         .WORD   0
15641  054500  055066                         .WORD   MUL7C
15642  054502  000004                         .WORD   4
15643
15644  054504  000000               MUL1:     .WORD   0
15645  054506     004     004     004         .BYTE   4,4,4,4,4,4,4,4,4,4,4,4,4,4,4
15646  054511     004     004     004
15647  054514     004     004     004
15648  054517     004     004     004
15649  054522     004     004     004
15650          054526                         .EVEN
15651
15652  054526  000000               MUL1A:    .WORD   0
15653  054530     001     007     004         .BYTE   1,7,4,3,2,1,6,9.,5,3,4,7,9.,4,1,6,2
15654  054533     003     002     001
15655  054536     006     011     005
15656  054541     003     004     007
15657  054544     011     004     001
15658  054547     006     002
15659          054552                         .EVEN
15660
15661  054552  000000               MUL1B:    .WORD   0
15662  054554     007     007     004         .BYTE   7,7,4,7,6,3,0,9.,0,4,3,5,2,9.,5,3
15663  054557     007     006     003
15664  054562     000     011     000
15665  054565     004     003     005
15666  054570     002     011     005
15667  054573     003
15668  054574     001     004     001         .BYTE   1,4,1,2,5,7,9.,8.,4,5,3,5,9.,2,8.
15669  054577     002     005     007
15670  054602     011     010     004
15671  054605     005     003     005
15672  054610     011     002     010
15673          054614                         .EVEN
15674
15675  054614  000000               MUL1C:    .WORD   0
15676  054616     000     000     000         .BYTE   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
15677  054621     000     000     000
15678  054624     000     000     000
15679  054627     000     000     000
15680  054632     000     000     000
15681  054635     000
```

```
054636     000     000     000             .BYTE   0,0,0,0,0,0,0,0,0,0,0,0,0,3,9.
054641     000     000     000
054644     000     000     000
054647     000     000     000
054652     000     003     011
        054656                             .EVEN

054656  177777                     MUL2:   .WORD   -1
054660     002     007     004             .BYTE   2,7,4,1
054663     001
                                           .EVEN

054664  000000                     MUL2A:  .WORD   0
054666     010     004     006             .BYTE   8.,4,6,2,9.,7,3
054671     002     011     007
054674     003
        054676                             .EVEN
054676  177777                     MUL2B:  .WORD   -1
054700     002     003     001             .BYTE   2,3,1,9.,7,0,0,8.,9.,9.,3
054703     011     007     000
054706     000     010     011
054711     011     003
        054714                             .EVEN

054714  177777                     MUL2C:  .WORD   -1
054716     000     000     000             .BYTE   0,0,0,0,0,0,0,3,0,8.,7
054721     000     000     000
054724     000     003     000
054727     010     007
        054732                             .EVEN

054732  177777                     MUL3:   .WORD   -1
054734     004     001     007             .BYTE   4,1,7,3,9.
054737     003     011
        054742                             .EVEN

054742  177777                     MUL3A:  .WORD   -1
054744     001     001                     .BYTE   1,1
                                           .EVEN

054746  000000                     MUL3B:  .WORD   0
054750     004     005     011             .BYTE   4,5,9.,1,2,9.
054753     001     002     011
                                           .EVEN

054756  000000                     MUL3C:  .WORD   0
054760     000     000     000             .BYTE   0,0,0,0,0,0
054763     000     000     000
                                           .EVEN

054766  000000                     MUL4:   .WORD   0
054770     001     007     003             .BYTE   1,7,3,5,4
054773     005     004
        054776                             .EVEN

054776  000000                     MUL4A:  .WORD   0
```

```
055000     000                                 .BYTE   0
        055002                                 .EVEN

055002  000000                         MUL4B:  .WORD   0
055004     000                                 .BYTE   0
        055006                                 .EVEN

055006  000000                         MUL4C:  .WORD   0
055010     000                                 .BYTE   0
        055012                                 .EVEN

055012  000000                         MUL5:   .WORD   0
055014     001     007                         .BYTE   1,7
                                               .EVEN

055016  000000                         MUL5A:  .WORD   0
055020     005     002     000                 .BYTE   5,2,0,0,0
055023     000     000
        055026                                 .EVEN

055026  000000                         MUL5B:  .WORD   0
055030     000                                 .BYTE   0
        055032                                 .EVEN

055032  000000                         MUL5C:  .WORD   0
055034     000                                 .BYTE   0
        055036                                 .EVEN

                                       ;MUL6   USES THE MUL4 STRINGS

055036  000000                         MUL7:   .WORD   0
055040     001     000     000                 .BYTE   1,0,0,0,0
055043     000     000
        055046                                 .EVEN
055046  000000                         MUL7A:  .WORD   0
055050     001     000     000                 .BYTE   1,0,0,1
055053     001
                                               .EVEN
055054  000000                         MUL7B:  .WORD   0
055056     001     000     000                 .BYTE   1,0,0,1,0,0,0,0
055061     001     000     000
055064     000     000
                                               .EVEN
055066  000000                         MUL7C:  .WORD   0
055070     000     000     000                 .BYTE   0,0,0,0,0,0,0,0
055073     000     000     000
055076     000     000

                                               .EVEN



                                       ;+
                                       ;       INLINE TEST CASE FOR MULP & DIVP
                                       ;-

055100  070017                         TMULPI: .WORD   070017
055102  062370                                 .WORD   #DSBUF1
```

```
055104 070021                   .WORD   070021
055106 062432                   .WORD   #DSBUF2
055110 070037                   .WORD   070037
055112 062474                   .WORD   #DS.DST


055114                  CIS9END:


```

```
                                        .ABS
                                        ;;*****************************************************************
                                        .SBTTL  END OF PASS ROUTINE
                                        ;;*****************************************************************
                                        ;;*INCREMENT THE PASS NUMBER ($PASS)
                                        ;;*TYPE 'END PASS #XXXXX' (WHERE XXXXX IS A DECIMAL NUMBER)
                                        ;;*IF THERES A MONITOR GO TO IT
                                        ;;*IF THERE ISN'T JUMP TO BEGIN

055114                                  $EOP:
055114  000004                                  SCOPE
055116  005037  000402                          CLR     $TSTNM          ;;ZERO THE TEST NUMBER
055122  005037  000404                          CLR     $TIMES
055126  005237  000636                          INC     $PASS           ;;INCREMENT THE PASS NUMBER
055132  042737  100000  000636                  BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
055140  005337  055230                          DEC     $EOPCT          ;;LOOP?
055144  003027                                  BGT     $DOAGN          ;;YES
055146  013737  055232  055230                  MOV     $ENDCT,$EOPCT   ;;RESTORE COUNTER
055154  012737  055237  000546                  MOV     #$ENDMG,MSGADR
055162  104401                                  TYPE                    ;;TYPE 'END PASS #'
055164  013746  000636                          MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
055170  104403                                  TYPOS                   ;;GO TYPE--OCTAL ASCII, NO LEADING ZEROES
055172     006                                  .BYTE   6
055173     000                                  .BYTE   0
055174  013737  055234  000546                  MOV     $ENULL,MSGADR
055202  104401                                  TYPE                    ;;TYPE A NULL CHARACTER
055204  013700  000042                  $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
055210  001405                                  BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
055212  000005                                  RESET                   ;;CLEAR THE WORLD
055214  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
055216  000240                                  NOP                     ;;SAVE ROOM
055220  000240                                  NOP                     ;;FOR
055222  000240                                  NOP                     ;;ACT11
055224                                  $DOAGN:
055224  000137  001510                          JMP     BEGIN           ;;RETURN
055230  000001                          $EOPCT: .WORD   1
055232  000001                          $ENDCT: .WORD   1
055234     377     377     000          $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
055237     015  042412  042116          $ENDMG: .ASCIZ  <15><12>/END PASS #/
055244  050040  051501  020123
055252  000043



                                        ;;*****************************************************************
                                        ; TABLE OF SIGN/DIGIT COMBINATIONS FOR OVERPUNCH
                                        ;;*****************************************************************
055254     173                          OVPNCH: .BYTE   173             ; +0
055255     101                                  .BYTE   101             ; +1
055256     102                                  .BYTE   102             ; +2
055257     103                                  .BYTE   103             ; +3
055260     104                                  .BYTE   104             ; +4
055261     105                                  .BYTE   105             ; +5
055262     106                                  .BYTE   106             ; +6
055263     107                                  .BYTE   107             ; +7
055264     110                                  .BYTE   110             ; +8
055265     111                                  .BYTE   111             ; +9
```

```
055266      175                          .BYTE   175              ; -0
055267      112                          .BYTE   112              ; -1
055270      113                          .BYTE   113              ; -2
055271      114                          .BYTE   114              ; -3
055272      115                          .BYTE   115              ; -4
055273      116                          .BYTE   116              ; -5
055274      117                          .BYTE   117              ; -6
055275      120                          .BYTE   120              ; -7
055276      121                          .BYTE   121              ; -8
055277      122                          .BYTE   122              ; -9


                                 ;;*************************************************************
                                 .SBTTL  UNEXPECTED TIME-OUT TRAP ROUTINE
                                 ;;*************************************************************
                                 ;*ANY UNEXPECTED TIME-OUT TRAP WILL END UP HERE
                                 ;*

055300  012737  060466  000546   TIMOUT: MOV     #TIMMSG,MSGADR          ;TYPE OUT ERROR MESSAGE
055306  104401                           TYPE
055310  000000                           HALT
055312  000002                           RTI


                                 ;;*************************************************************
                                 .SBTTL  ILLEGAL/RESERVED INSTRUCTION TRAP ROUTINE
                                 ;;*************************************************************
                                 ;*ANY ILLEGAL OR RESERVED INSTRUCTION TRAPS WILL END UP HERE.
                                 ;*

055314  012737  060534  000546   ILLRES: MOV     #ILLMSG,MSGADR          ;TYPE OUT ERROR MESSAGE
055322  104401                           TYPE
055324  000000                           HALT
055326  000002                           RTI


                                 ;;*************************************************************
                                 .SBTTL  CLEAR REGISTERS R0 - R5 ROUTINE
                                 ;;*************************************************************
                                 ;*THIS ROUTINE CLEARS GENERAL PURPOSE REGISTERS R0 THROUGH R5.
                                 ;*

055330                           ROUTINE  CLRREG
055330                                                                  CLRREG:
055330                           LET R0 := #0
055330  005000                                                                  CLR     R0
055332                           LET R1 := #0
055332  005001                                                                  CLR     R1
055334                           LET R2 := #0
055334  005002                                                                  CLR     R2
055336                           LET R3 := #0
055336  005003                                                                  CLR     R3
055340                           LET R4 := #0
055340  005004                                                                  CLR     R4
055342                           LET R5 := #0
055342  005005                                                                  CLR     R5
```

```
055344                  ENDRTN
055344                                                          $52317:
055344                                                          $52320:
055344  000207                                                          RTS     PC




                        ;;*****************************************************************
                        .SBTTL  CLEAR BUFFER ROUTINE
                        ;;*****************************************************************
                        ;*THIS ROUTINE CLEARS A 100 BYTE BUFFER WHOSE STARTING ADDRESS
                        ;*HAS BEEN PUT INTO 'BFADRS'.
                        ;*

055346                  ROUTINE  CLRBUF
055346                                                          CLRBUF:
055346                  LET SAVR0 := R0
055346  010037  000576                                                  MOV     R0,SAVR0
055352                  LET SAVR1 := R1
055352  010137  000600                                                  MOV     R1,SAVR1
055356                  LET R0 := BFADRS
055356  013700  000540                                                  MOV     BFADRS,R0
055362                  LET R1 := #40
055362  012701  000040                                                  MOV     #40,R1
055366                  REPEAT
055366                                                          $52323:
055366                      LET (R0)+ := #0
055366  005020                                                          CLR     (R0)+
055370                      LET R1 := R1 - #1
055370  005301                                                          DEC     R1
055372                  UNTIL R1 EQ #0
055372  005701                                                          TST     R1
055374  001374                                                          BNE     $52323
055376                  LET R0 := SAVR0
055376  013700  000576                                                  MOV     SAVR0,R0
055402                  LET R1 := SAVR1
055402  013701  000600                                                  MOV     SAVR1,R1
055406                  ENDRTN
055406                                                          $52321:
055406                                                          $52322:
055406  000207                                                          RTS     PC




                        ;;*****************************************************************
                        .SBTTL  SET BUFFER ROUTINE
                        ;;*****************************************************************
                        ;*THIS ROUTINE SETS ALL BITS IN A 100 BYTE BUFFER WHOSE STARTING
                        ;*ADDRESS HAS BEEN PUT INTO 'BFADRS'.
                        ;*

055410                  ROUTINE  SETBUF
055410                                                          SETBUF:
055410                  LET SAVR0 := R0
055410  010037  000576                                                  MOV     R0,SAVR0
```

```
055414                          LET SAVR1 := R1
055414  010137  000600                                                   MOV     R1,SAVR1
055420                          LET R0 := BFADRS
055420  013700  000540                                                   MOV     BFADRS,R0
055424                          LET R1 := #40
055424  012701  000040                                                   MOV     #40,R1
055430                          REPEAT
055430                                                           $52326:
055430                              LET (R0)+ := #177777
055430  012720  177777                                                   MOV     #177777,(R0)+
055434                              LET R1 := R1 - #1
055434  005301                                                           DEC     R1
055436                          UNTIL R1 EQ #0
055436  005701                                                           TST     R1
055440  001373                                                           BNE     $52326
055442                          LET R0 := SAVR0
055442  013700  000576                                                   MOV     SAVR0,R0
055446                          LET R1 := SAVR1
055446  013701  000600                                                   MOV     SAVR1,R1
055452                          ENDRTN
055452                                                           $52324:
055452                                                           $52325:
055452  000207                                                           RTS     PC



                                ;;*******************************************************************
                                .SBTTL  ONES AND ZEROES BUFFER ROUTINE
                                ;;*******************************************************************
                                ;*THIS ROUTINE SETS AN ALTERNATING ONES AND ZEROES PATTERN IN A 100 BYTE
                                ;*BUFFER WHOSE STARTING ADDRESS HAS BEEN PUT INTO 'BFADRS'.
                                ;*

055454                          ROUTINE  ALTBUF
055454                                                           ALTBUF:
055454                          LET SAVR0 := R0
055454  010037  000576                                                   MOV     R0,SAVR0
055460                          LET SAVR1 := R1
055460  010137  000600                                                   MOV     R1,SAVR1
055464                          LET R0 := BFADRS
055464  013700  000540                                                   MOV     BFADRS,R0
055470                          LET R1 := #40
055470  012701  000040                                                   MOV     #40,R1
055474                          REPEAT
055474                                                           $52331:
055474                              LET (R0)+ := #125252
055474  012720  125252                                                   MOV     #125252,(R0)+
055500                              LET R1 := R1 - #1
055500  005301                                                           DEC     R1
055502                          UNTIL R1 EQ #0
055502  005701                                                           TST     R1
055504  001373                                                           BNE     $52331
055506                          LET R0 := SAVR0
055506  013700  000576                                                   MOV     SAVR0,R0
055512                          LET R1 := SAVR1
055512  013701  000600                                                   MOV     SAVR1,R1
```

```
055516                      ENDRTN
055516                                                                      $52327:
055516                                                                      $52330:
055516  000207                                                                      RTS     PC




                            ;;******************************************************************
                            .SBTTL  CLEAR DECIMAL STRING BUFFERS ROUTINE
                            ;;******************************************************************
                            ;*THIS ROUTINE CLEARS ALL BITS IN THE FOUR 40-BYTE DECIMAL
                            ;*STRING BUFFERS.
                            ;*

055520                      ROUTINE  CLRDSB
055520                                                                      CLRDSB:
055520                      LET SAVR0 := R0
055520  010037  000576                                                              MOV     R0,SAVR0
055524                      LET SAVR1 := R1
055524  010137  000600                                                              MOV     R1,SAVR1
055530                      LET R0 := #DSBUF1-1
055530  012700  062367                                                              MOV     #DSBUF1-1,R0
055534                      LET R1 := #207
055534  012701  000207                                                              MOV     #207,R1
055540                      REPEAT
055540                                                                      $52334:
055540                          LET (R0)+ :B= #0
055540  105020                                                                      CLRB    (R0)+
055542                          LET R1 := R1 - #1
055542  005301                                                                      DEC     R1
055544                      UNTIL R1 EQ #0
055544  005701                                                                      TST     R1
055546  001374                                                                      BNE     $52334
055550                      LET R0 := SAVR0
055550  013700  000576                                                              MOV     SAVR0,R0
055554                      LET R1 := SAVR1
055554  013701  000600                                                              MOV     SAVR1,R1
055560                      ENDRTN
055560                                                                      $52332:
055560                                                                      $52333:
055560  000207                                                                      RTS     PC




                            ;;******************************************************************
                            .SBTTL  SAVE REGISTERS R0 - R5
                            ;;******************************************************************
                            ;*THIS ROUTINE SAVES R0 THROUGH R5 IN LOCATIONS SAVR0 - SAVR5.
                            ;*

055562                      ROUTINE SAVREG
055562                                                                      SAVREG:
055562                      LET SAVR0 := R0
055562  010037  000576                                                              MOV     R0,SAVR0
055566                      LET SAVR1 := R1
```

```
055566  010137  000600                                                      MOV     R1,SAVR1
055572                          LET SAVR2 := R2
055572  010237  000602                                                      MOV     R2,SAVR2
055576                          LET SAVR3 := R3
055576  010337  000604                                                      MOV     R3,SAVR3
055602                          LET SAVR4 := R4
055602  010437  000606                                                      MOV     R4,SAVR4
055606                          LET SAVR5 := R5
055606  010537  000610                                                      MOV     R5,SAVR5
055612                          ENDRTN
055612                                                              $52335:
055612                                                              $52336:
055612  000207                                                              RTS     PC



                        ;;*****************************************************************
                        .SBTTL  RESTORE REGISTERS R0 - R5
                        ;;*****************************************************************
                        ;*THIS ROUTINE RESTORES R0 THROUGH R5 FROM LOCATIONS SAVR0 - SAVR5
                        ;*

055614                          ROUTINE RESREG
055614                                                              RESREG:
055614                          LET R0 := SAVR0
055614  013700  000576                                                      MOV     SAVR0,R0
055620                          LET R1 := SAVR1
055620  013701  000600                                                      MOV     SAVR1,R1
055624                          LET R2 := SAVR2
055624  013702  000602                                                      MOV     SAVR2,R2
055630                          LET R3 := SAVR3
055630  013703  000604                                                      MOV     SAVR3,R3
055634                          LET R4 := SAVR4
055634  013704  000606                                                      MOV     SAVR4,R4
055640                          LET R5 := SAVR5
055640  013705  000610                                                      MOV     SAVR5,R5
055644                          ENDRTN
055644                                                              $52337:
055644                                                              $52340:
055644  000207                                                              RTS     PC
```

```

                                    ;*******************************************
                                    .SBTTL  PACK - PACK DECIMAL STRING ROUTINE
                                    ;*******************************************

                                    ;+
                                    ;  FUNCTIONAL DESCRIPTION
                                    ;
                                    ;       THE PACK ROUTINE ACCEPTS UNPACKED DATA FROM A TEST CASE
                                    ;       TABLE AND PACKS IT (TWO BCD CHARS/BYTE) INTO ONE OF THE
                                    ;       DECIMAL STRING BUFFERS.
                                    ;
                                    ;  INPUTS:
                                    ;       1. ADDRESS OF THE DESTINATION BUFFER. ** NOTE: ** THIS MUST
                                    ;          BE #DSBUF1, #DSBUF2, OR #DS.EXP.
                                    ;       2. POINTER TO SOURCE DATA IN TEST CASE TABLE. ** NOTE: **
                                    ;          THIS MUST BE DATA01, DATA03, OR DATA05.
                                    ;       3. POINTER TO DESTINATION STRING LENGTH. ** NOTE: ** THIS
                                    ;          MUST BE DATA00, DATA02, OR DATA04.
                                    ;
                                    ;  OUTPUTS:
                                    ;       NONE
                                    ;
                                    ;  PATHOLOGICAL CONNECTIONS:
                                    ;       NONE.
                                    ;
                                    ;  SUBORDINATE ROUTINES:
                                    ;       NONE.
                                    ;
                                    ;  FUNCTIONAL SIDE-EFFECTS:
                                    ;       NONE.
                                    ;
                                    ;  CALLING SEQUENCE:
                                    ;
                                    ;       CALL PACK IN <DSTADR,SRCADR,LENGTH>. FOR INPUT PARAMETERS
                                    ;       REFER TO ABOVE INPUTS:.
                                    ;
                                    ;  NOTE:
                                    ;       R3 IS USED AS A BYTE ASSEMBLY AREA.
                                    ;       R4 IS USED TO HOLD THE SIGN OF THE STRING (+ = #14,- = #15).
                                    ;-

 055646                             ROUTINE PACK <DSTADR,SRCADR,LENGTH>
 055646                                                                           PACK:
 055646                               LET R0 := DSTADR(R5)
 055646  016500  000000                                                                 MOV     DSTADR(R5),R0
 055652                               LET R1 := SRCADR(R5)
 055652  016501  000002                                                                 MOV     SRCADR(R5),R1
 055656                               LET R2 := LENGTH(R5) CLR.BY #70000
 055656  016502  000004                                                                 MOV     LENGTH(R5),R2
 055662  042702  070000                                                                 BIC     #70000,R2

                                      ;+
                                      ;     STORE SIGN OF STRING IN R4
                                      ;-

```

```
055666                         IF (R1)+ EQ #0 THEN            ;SIGN IS +
055666  005721                                                                    TST     (R1)+
055670  001003                                                                    BNE     $52343
055672                           LET R4 := #14
055672  012704  000014                                                            MOV     #14,R4
055676                         ELSE                           ;SIGN IS -
055676  000402                                                                    BR      $52344
055700                                                                  $52343:
055700                           LET R4 := #15
055700  012704  000015                                                            MOV     #15,R4
055704                         ENDIF
055704                                                                  $52344:


                               ;+
                               ;       IF LENGTH IS ZERO, THEN SIGN STRING AND EXIT; ELSE IF
                               ;       STRING LENGTH IS EVEN, STORE THE MSD (STRING LENGTH IS
                               ;       NOW ODD).NOW STORE ALL BUT THE LAST DIGIT. BUILD LSD
                               ;       & SIGN AND EXIT.
                               ;-

055704                         IF R2 EQ #0 THEN               ;STRING LENGTH = 0
055704  005702                                                                    TST     R2
055706  001002                                                                    BNE     $52345
055710                           LET (R0) :B= R4              ;SIGN THE BUFFER AND EXIT
055710  110410                                                                    MOVB    R4,(R0)
055712                         ELSE
055712  000425                                                                    BR      $52346
055714                                                                  $52345:
055714                           IF #BIT00 NOTSETIN R2 THEN   ;LENGTH IS EVEN & > 0
055714  032702  000001                                                            BIT     #BIT00,R2
055720  001002                                                                    BNE     $52347
055722                             LET (R0)+ :B= (R1)+        ;MOVE THE EVEN NIBBLE
055722  112120                                                                    MOVB    (R1)+,(R0)+
055724                             LET R2 := R2 - #1          ;DEC NIBBLE COUNTER
055724  005302                                                                    DEC     R2
055726                           ENDIF
055726                                                                  $52347:
055726                           WHILE R2 NE #1 DO
055726                                                                  $52350:
055726  020227  000001                                                            CMP     R2,#1
055732  001410                                                                    BEQ     $52351
055734                             LET R3 :B= (R1)+           ;GET A BCD
055734  112103                                                                    MOVB    (R1)+,R3
055736                             INLINE <ASH #4,   R3>      ;SHIFT IT TO THE HIGH NIBBLE
055736  072327  000004                                                            ASH #4, R3
055742                             LET R3 :B= R3 SET.BY (R1)+      ;PACK IN LOW NIBBLE
055742  152103                                                                    BISB    (R1)+,R3
055744                             LET (R0)+ :B= R3           ;STORE RESULT
055744  110320                                                                    MOVB    R3,(R0)+
055746                             LET R2 := R2 - #2          ;DEC NIBBLE COUNTER
055746  162702  000002                                                            SUB     #2,R2
055752                           ENDDO
055752  000765                                                                    BR      $52350
055754                                                                  $52351:
055754                           LET R3 :B= (R1)              ;GET LAST BCD
055754  111103                                                                    MOVB    (R1),R3
```

```
055756                      INLINE <ASH #4,      R3>      ;SHIFT IT TO THE HIGH NIBBLE
055756  072327  000004                                                          ASH #4, R3
055762                      LET R3 :B= R3 SET.BY R4       ;ADD SIGN
055762  150403                                                                  BISB    R4,R3
055764                      LET (R0) :B= R3               ;STORE LSD & SIGN
055764  110310                                                                  MOVB    R3,(R0)
055766                    ENDIF
055766                                                               $52346:
055766                  ENDRTN
055766                                                               $52341:
055766                                                               $52342:
055766  000207                                                                  RTS     PC

```

```
                                     ;;*****************************************************************
                                     .SBTTL  SCOPE HANDLER ROUTINE
                                     ;;*****************************************************************
                                     ;;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                     ;;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
                                     ;;*AND LOAD THE ERROR FLAG (ERRFLG) INTO DISPLAY<15:08>
                                     ;;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                     ;;*SW14=1         LOOP ON TEST
                                     ;;*SW11=1         INHIBIT ITERATIONS
                                     ;;*
                                     ;;*CALL
                                     ;;*        SCOPE           ;;SCOPE=IOT

055770                               $SCOPE:
055770  104406                               CKSWR                       ;;TEST  FOR CHANGE IN SOFT-SWR
055772  032777  040000  122426               BIT     #BIT14,@SWR         ;;LOOP ON PRESENT TEST?
056000  001034                               BNE     $OVER               ;;YES IF SW14=1
056002  032777  004000  122416               BIT     #BIT11,@SWR         ;;INHIBIT ITERATIONS?
056010  001011                               BNE     1$                  ;;BRANCH IF YES
056012  005737  000636                       TST     $PASS               ;;IF FIRST PASS OF PROGRAM
056016  001406                               BEQ     1$                  ;;        INHIBIT ITERATIONS
056020  005237  000406                       INC     $ICNT               ;;INCREMENT ITERATION COUNT
056024  023737  000404  000406               CMP     $TIMES,$ICNT        ;;CHECK THE NUMBER OF ITERATIONS MADE
056032  002017                               BGE     $OVER               ;;BRANCH IF MORE ITERATION REQUIRED
056034  012737  000001  000406       1$:     MOV     #1,$ICNT            ;;REINITIALIZE THE ITERATION COUNTER
056042  013737  056106  000404               MOV     $MXCNT,$TIMES               ;;SET NUMBER OF ITERATIONS TO DO
056050  005237  000402               $SVLAD: INC     $TSTNM              ;;COUNT TEST NUMBERS
056054  013737  000402  000634               MOV     $TSTNM,$TESTN       ;;SET TEST NUMBER IN APT MAILBOX
056062  011637  000410                       MOV     (SP),$LPADR         ;;SAVE SCOPE LOOP ADDRESS
056066  005037  000454                       CLR     ERRFLG              ;;ZERO THE ERROR FLAG
056072  013777  000402  122330       $OVER:  MOV     $TSTNM,@DISPLAY     ;;DISPLAY TEST NUMBER
056100  013716  000410                       MOV     $LPADR,(SP)         ;;FUDGE RETURN ADDRESS
056104  000002                               RTI                         ;;FIXES PS
056106  000100                       $MXCNT: .WORD   100                 ;;MAXIMUM NUMBER OF ITERATIONS



                                     ;;*****************************************************************
                                     .SBTTL  POWER DOWN AND UP ROUTINES
                                     ;;*****************************************************************
                                     ;POWER DOWN ROUTINE
056110  012737  056260  000024       $PWRDN: MOV     #$ILLUP,@#PWRVEC    ;;SET FOR FAST UP
056116  012737  000340  000026               MOV     #340,@#PWRVEC+2     ;;PRIO:7
056124  010046                               MOV     R0,-(SP)            ;;PUSH R0 ON STACK
056126  010146                               MOV     R1,-(SP)            ;;PUSH R1 ON STACK
056130  010246                               MOV     R2,-(SP)            ;;PUSH R2 ON STACK
056132  010346                               MOV     R3,-(SP)            ;;PUSH R3 ON STACK
056134  010446                               MOV     R4,-(SP)            ;;PUSH R4 ON STACK
056136  010546                               MOV     R5,-(SP)            ;;PUSH R5 ON STACK
056140  017746  122262                       MOV     @SWR,-(SP)          ;;PUSH @SWR ON STACK
056144  010637  056264                       MOV     SP,$SAVR6           ;;SAVE SP
056150  012737  056162  000024               MOV     #$PWRUP,@#PWRVEC    ;;SET UP VECTOR
056156  000000                               HALT
056160  000776                               BR      .-2                 ;;HANG UP


                                     ;;*****************************************************************
                                     ;POWER UP ROUTINE
```

```
056162  012737  056260  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
056170  013706  056264                  MOV     $SAVR6,SP        ;;GET SP
056174  005037  056264                  CLR     $SAVR6           ;;WAIT LOOP FOR THE TTY
056200  005237  056264          1$:     INC     $SAVR6           ;;WAIT FOR THE INC
056204  001375                          BNE     1$               ;;OF  WORD
056206  012677  122214                  MOV     (SP)+,@SWR       ;;POP STACK INTO @SWR
056212  012605                          MOV     (SP)+,R5         ;;POP STACK INTO R5
056214  012604                          MOV     (SP)+,R4         ;;POP STACK INTO R4
056216  012603                          MOV     (SP)+,R3         ;;POP STACK INTO R3
056220  012602                          MOV     (SP)+,R2         ;;POP STACK INTO R2
056222  012601                          MOV     (SP)+,R1         ;;POP STACK INTO R1
056224  012600                          MOV     (SP)+,R0         ;;POP STACK INTO R0
056226  012737  056110  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
056234  012737  000340  000026          MOV     #340,@#PWRVEC+2  ;;PRIO:7
056242  012737  060630  000546          MOV     #PWRMSG,MSGADR
056250  104401                          TYPE                     ;;REPORT THE POWER FAILURE
056252  012716                          MOV     (PC)+,(SP)       ;;RESTART AT PHALT
056254  056266                  $PWRAD: .WORD   PHALT            ;;RESTART ADDRESS
056256  000002                          RTI
056260  000000                  $ILLUP: HALT                     ;;THE POWER UP SEQUENCE WAS STARTED
056262  000776                          BR      .-2              ;; BEFORE THE POWER DOWN WAS COMPLETE
056264  000000                  $SAVR6: 0                        ;;PUT THE SP HERE

056266  000000                  PHALT:  HALT                             ;HALT HERE AFTER A POWER FAIL
056270  000137  001200                  JMP     @#START                  ;RESTART THE TEST AT THE BEGINNING


                                ;;*****************************************************************
                                .SBTTL  ERROR HANDLER ROUTINE
                                ;;*****************************************************************
                                ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
                                ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
                                ;*AND GO TO $ERRTYP ON ERROR
                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                ;*SW15=1         HALT ON ERROR
                                ;*SW13=1         INHIBIT ERROR TYPEOUTS

056274                          ERROR:
056274  104406                          CKSWR                    ;;TEST FOR CHANGE IN SOFT-SWR
056276  005237  000454          7$:     INC     ERRFLG           ;;SET THE ERROR FLAG
056302  001775                          BEQ     7$               ;;DON'T LET THE FLAG GO TO ZERO
056304  013777  000402  122116          MOV     $TSTNM,@DISPLAY  ;;DISPLAY TEST NUMBER AND ERROR FLAG
056312  005237  000414          1$:     INC     $ERTTL           ;;COUNT THE NUMBER OF ERRORS
056316  011637  000420                  MOV     (SP),$ERRPC      ;;GET ADDRESS OF ERROR INSTRUCTION
056322  162737  000004  000420          SUB     #4,$ERRPC
056330  032777  020000  122070          BIT     #BIT13,@SWR      ;;SKIP TYPEOUT IF SET
056336  001006                          BNE     20$              ;;SKIP TYPEOUTS
056340  004737  056430                  JSR     PC,$ERRTYP       ;;GO TO USER ERROR ROUTINE
056344  012737  000443  000546          MOV     #$CRLF,MSGADR
056352  104401                          TYPE
056354                          20$:
056354  122737  000001  000650          CMPB    #APTENV,$ENV     ;;RUNNING IN APT MODE
056362  001007                          BNE     2$               ;;NO,SKIP APT ERROR REPORT
056364  113737  000550  056376          MOVB    ERR,21$          ;;SET ITEM NUMBER AS ERROR NUMBER
056372  004737  060150                  JSR     PC,$ATY4         ;;REPORT FATAL ERROR TO APT
056376     000                  21$:    .BYTE   0
056377     000                          .BYTE   0
```

```
056400  000777                          22$:    BR      22$                 ;;APT ERROR LOOP
056402  005777  122020                  2$:     TST     @SWR                ;;HALT ON ERROR
056406  100002                                  BPL     3$                  ;;SKIP IF CONTINUE
056410  000000                                  HALT                        ;;HALT ON ERROR!
056412  104406                                  CKSWR                       ;;TEST FOR CHANGE IN SOFT-SWR
056414                                  3$:
056414  022737  055214  000042                  CMP     #$ENDAD,@#42        ;;ACT-11 AUTO-ACCEPT?
056422  001001                                  BNE     6$                  ;;BRANCH IF NO
056424  000000                                  HALT                        ;;YES
056426                                  6$:
056426  000207                                  RTS     PC                  ;;RETURN

                                        ;;*****************************************************************
                                        .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
                                        ;;*****************************************************************
                                        ;*THIS ROUTINE USES THE "ERROR TYPE NUMBER" (ERR) TO DETERMINE WHICH
                                        ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
                                        ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.

056430                                  $ERRTYP:
056430  012737  061000  000546                  MOV     #ERRHDR,MSGADR              ;TYPE ERROR HEADER
056436  104401                                  TYPE
056440  013737  000550  000472                  MOV     ERR,ERRTMP                  ;TYPE APPROPRIATE ERROR MESSAGE
056446  005337  000472                          DEC     ERRTMP
056452  006337  000472                          ASL     ERRTMP
056456  062737  056562  000472                  ADD     #ERRTBL,ERRTMP
056464  017737  122002  000546                  MOV     @ERRTMP,MSGADR
056472  104401                                  TYPE
056474  012737  060660  000546                  MOV     #SPACE1,MSGADR              ;TYPE ONE SPACE
056502  104401                                  TYPE
056504  013746  000420                          MOV     $ERRPC,-(SP)                ;TYPE THE ERROR PC
056510  104402                                  TYPOC
056512  013737  000544  000472                  MOV     CTL,ERRTMP                  ;TYPE FAILING CONTROL CHIP NUMBER
056520  162737  000004  000472                  SUB     #4,ERRTMP
056526  006337  000472                          ASL     ERRTMP
056532  062737  056570  000472                  ADD     #CTLTBL,ERRTMP
056540  017737  121726  000546                  MOV     @ERRTMP,MSGADR
056546  104401                                  TYPE
056550  012737  000443  000546                  MOV     #$CRLF,MSGADR               ;TYPE CARRIAGE-RETURN/LINE-FEED
056556  104401                                  TYPE
056560  000207                                  RTS     PC

056562  061041                          ERRTBL: .WORD   ERR1                        ;ADDRESSES OF ERROR MESSAGES
056564  061072                                  .WORD   ERR2
056566  061121                                  .WORD   ERR3

056570  060662                          CTLTBL: .WORD   CTL4                        ;ADDRESSES OF CHIP NUMBER MESSAGES
056572  060677                                  .WORD   CTL5
056574  060714                                  .WORD   CTL6
056576  060731                                  .WORD   CTL7
056600  060746                                  .WORD   CTL8
056602  060763                                  .WORD   CTL9



                                        ;;*****************************************************************
                                        .SBTTL  TYPE ROUTINE
```

```
                                        ;;********************************************************************
                                        ;;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                        ;;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                        ;;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                        ;;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                        ;;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                        ;;*

056604  105737  000435                  $TYPE:  TSTB    $TPFLG                  ;;IS THERE A TERMINAL?
056610  100002                                  BPL     1$                      ;;BR IF YES
056612  000000                                  HALT                            ;;HALT HERE IF NO TERMINAL
056614  000425                                  BR      3$                      ;;LEAVE
056616  010046                          1$:     MOV     R0,-(SP)                ;;SAVE R0
056620  013700  000546                          MOV     MSGADR,R0               ;;GET ADDRESS OF ASCIZ STRING
056624  122737  000001  000650                  CMPB    #APTENV,$ENV            ;;RUNNING IN APT MODE
056632  001006                                  BNE     62$                     ;;NO,GO CHECK FOR APT CONSOLE
056634  132737  000100  000651                  BITB    #APTSPOOL,$ENVM         ;;SPOOL MESSAGE TO APT
056642  001402                                  BEQ     62$                     ;;NO,GO CHECK FOR CONSOLE
056644  004737  060140                          JSR     PC,$ATY3                ;;SPOOL MESSAGE TO APT
056650  132737  000040  000651          62$:    BITB    #APTCSUP,$ENVM          ;;APT CONSOLE SUPPRESSED
056656  001003                                  BNE     60$                     ;;YES,SKIP TYPE OUT
056660  112046                          2$:     MOVB    (R0)+,-(SP)             ;;PUSH CHARACTER TO BE TYPED ONTO STACK
056662  001003                                  BNE     4$                      ;;BR IF IT ISN'T THE TERMINATOR
056664  005726                                  TST     (SP)+                   ;;IF TERMINATOR POP IT OFF THE STACK
056666  012600                          60$:    MOV     (SP)+,R0                ;;RESTORE R0
056670  000002                          3$:     RTI                             ;;RETURN
056672  122716  000011                  4$:     CMPB    #HT,(SP)                ;;BRANCH IF <HT>
056676  001432                                  BEQ     8$
056700  122716  000200                          CMPB    #CRLF,(SP)              ;;BRANCH IF NOT <CRLF>
056704  001010                                  BNE     5$
056706  005726                                  TST     (SP)+                   ;;POP  <CR><LF> EQUIV
056710  012737  000443  000546                  MOV     #$CRLF,MSGADR
056716  104401                                  TYPE                            ;;TYPE A CR AND LF
056720  105037  057054                          CLRB    $CHARCNT                ;;CLEAR CHARACTER COUNT
056724  000755                                  BR      2$                      ;;GET NEXT CHARACTER
056726  004737  057010                  5$:     JSR     PC,$TYPEC               ;;GO TYPE THIS CHARACTER
056732  123726  000434                  6$:     CMPB    $FILLC,(SP)+            ;;IS IT TIME FOR FILLER CHARS.?
056736  001350                                  BNE     2$                      ;;IF NO GO GET NEXT CHAR.
056740  013746  000432                          MOV     $NULL,-(SP)             ;;GET # OF FILLER CHARS. NEEDED
                                                                                ;;AND THE NULL CHAR.
056744  105366  000001                  7$:     DECB    1(SP)                   ;;DOES A NULL NEED TO BE TYPED?
056750  002770                                  BLT     6$                      ;;BR IF NO--GO POP THE NULL OFF OF STACK
056752  004737  057010                          JSR     PC,$TYPEC               ;;GO TYPE A NULL
056756  105337  057054                          DECB    $CHARCNT                ;;DO NOT COUNT AS A COUNT
056762  000770                                  BR      7$                      ;;LOOP

                                        ;HORIZONTAL TAB PROCESSOR

056764  112716  000040                  8$:     MOVB    #' ,(SP)                ;;REPLACE TAB WITH SPACE
056770  004737  057010                  9$:     JSR     PC,$TYPEC               ;;TYPE A SPACE
056774  132737  000007  057054                  BITB    #7,$CHARCNT             ;;BRANCH IF NOT AT
057002  001372                                  BNE     9$                      ;;TAB STOP
057004  005726                                  TST     (SP)+                   ;;POP SPACE OFF STACK
057006  000724                                  BR      2$                      ;;GET NEXT CHARACTER
057010  105737  177564                  $TYPEC: TSTB    @#TPS                   ;;WAIT UNTIL PRINTER IS READY
057014  100375                                  BPL     $TYPEC
```

```
057016  116637  000002  177566              MOVB    2(SP),@#TPB         ;;LOAD CHAR TO BE TYPED INTO DATA REG.
057024  122766  000015  000002              CMPB    #CR,2(SP)           ;;IS CHARACTER A CARRIAGE RETURN?
057032  001003                              BNE     1$                  ;;BRANCH IF NO
057034  105037  057054                      CLRB    $CHARCNT            ;;YES--CLEAR CHARACTER COUNT
057040  000406                              BR      $TYPEX              ;;EXIT
057042  122766  000012  000002  1$:         CMPB    #LF,2(SP)           ;;IS CHARACTER A LINE FEED?
057050  001402                              BEQ     $TYPEX              ;;BRANCH IF YES
057052  105227                              INCB    (PC)+               ;;COUNT THE CHARACTER
057054  000000                      $CHARCNT:.WORD  0                   ;;CHARACTER COUNT STORAGE
057056  000207                      $TYPEX: RTS     PC

                                    ;;*******************************************************************
                                    .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
                                    ;;*******************************************************************
                                    ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                    ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                    ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                    ;*CALL:
                                    ;*      MOV     NUM,-(SP)           ;;NUMBER TO BE TYPED
                                    ;*      TYPOS                       ;;CALL FOR TYPEOUT
                                    ;*      .BYTE   N                   ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                    ;*      .BYTE   M                   ;;M=1 OR 0
                                    ;*                                          ;;1=TYPE LEADING ZEROS
                                    ;*                                          ;;0=SUPPRESS LEADING ZEROS
                                    ;*
                                    ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                    ;*$TYPOS OR $TYPOC
                                    ;*CALL:
                                    ;*      MOV     NUM,-(SP)           ;;NUMBER TO BE TYPED
                                    ;*      TYPON                       ;;CALL FOR TYPEOUT
                                    ;*
                                    ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                    ;*CALL:
                                    ;*      MOV     NUM,-(SP)           ;;NUMBER TO BE TYPED
                                    ;*      TYPOC                       ;;CALL FOR TYPEOUT

057060  017646  000000              $TYPOS: MOV     @(SP),-(SP)         ;;PICKUP THE MODE
057064  116637  000001  057307              MOVB    1(SP),$0FILL        ;;LOAD ZERO FILL SWITCH
057072  112637  057311                      MOVB    (SP)+,$OMODE+1      ;;NUMBER OF DIGITS TO TYPE
057076  062716  000002                      ADD     #2,(SP)             ;;ADJUST RETURN ADDRESS
057102  000406                              BR      $TYPON
057104  112737  000001  057307  $TYPOC: MOVB    #1,$0FILL           ;;SET THE ZERO FILL SWITCH
057112  112737  000006  057311              MOVB    #6,$OMODE+1         ;;SET FOR SIX(6) DIGITS
057120  112737  000005  057306  $TYPON: MOVB    #5,$OCNT            ;;SET THE ITERATION COUNT
057126  010346                              MOV     R3,-(SP)            ;;SAVE R3
057130  010446                              MOV     R4,-(SP)            ;;SAVE R4
057132  010546                              MOV     R5,-(SP)            ;;SAVE R5
057134  113704  057311                      MOVB    $OMODE+1,R4         ;;GET THE NUMBER OF DIGITS TO TYPE
057140  005404                              NEG     R4
057142  062704  000006                      ADD     #6,R4               ;;SUBTRACT IT FOR MAX. ALLOWED
057146  110437  057310                      MOVB    R4,$OMODE           ;;SAVE IT FOR USE
057152  113704  057307                      MOVB    $0FILL,R4           ;;GET THE ZERO FILL SWITCH
057156  016605  000012                      MOV     12(SP),R5           ;;PICKUP THE INPUT NUMBER
057162  005003                              CLR     R3                  ;;CLEAR THE OUTPUT WORD
057164  006105                      1$:     ROL     R5                  ;;ROTATE MSB INTO "C"
057166  000404                              BR      3$                  ;;GO DO MSB
```

```
057170  006105                          2$:     ROL     R5                      ;;FORM THIS DIGIT
057172  006105                                  ROL     R5
057174  006105                                  ROL     R5
057176  010503                                  MOV     R5,R3
057200  006103                          3$:     ROL     R3                      ;;GET LSB OF THIS DIGIT
057202  105337  057310                          DECB    $OMODE                  ;;TYPE THIS DIGIT?
057206  100020                                  BPL     7$                      ;;BR IF NO
057210  042703  177770                          BIC     #177770,R3              ;;GET RID OF JUNK
057214  001002                                  BNE     4$                      ;;TEST FOR 0
057216  005704                                  TST     R4                      ;;SUPPRESS THIS 0?
057220  001403                                  BEQ     5$                      ;;BR IF YES
057222  005204                          4$:     INC     R4                      ;;DON'T SUPPRESS ANYMORE 0'S
057224  052703  000060                          BIS     #'0,R3                  ;;MAKE THIS DIGIT ASCII
057230  052703  000040                  5$:     BIS     #' ,R3                  ;;MAKE ASCII IF NOT ALREADY
057234  110337  057304                          MOVB    R3,8$                   ;;SAVE FOR TYPING
057240  012737  057304  000546                  MOV     #8$,MSGADR
057246  104401                                  TYPE                            ;;GO TYPE THIS DIGIT
057250  105337  057306                  7$:     DECB    $OCNT                   ;;COUNT BY 1
057254  003345                                  BGT     2$                      ;;BR IF MORE TO DO
057256  002402                                  BLT     6$                      ;;BR IF DONE
057260  005204                                  INC     R4                      ;;INSURE LAST DIGIT ISN'T A BLANK
057262  000742                                  BR      2$                      ;;GO DO THE LAST DIGIT
057264  012605                          6$:     MOV     (SP)+,R5                ;;RESTORE R5
057266  012604                                  MOV     (SP)+,R4                ;;RESTORE R4
057270  012603                                  MOV     (SP)+,R3                ;;RESTORE R3
057272  016666  000002  000004                  MOV     2(SP),4(SP)             ;;SET THE STACK FOR RETURNING
057300  012616                                  MOV     (SP)+,(SP)
057302  000002                                  RTI                             ;;RETURN
057304     000                          8$:     .BYTE   0                       ;;STORAGE FOR ASCII DIGIT
057305     000                                  .BYTE   0                       ;;TERMINATOR FOR TYPE ROUTINE
057306     000                          $OCNT:  .BYTE   0                       ;;OCTAL DIGIT COUNTER
057307     000                          $OFILL: .BYTE   0                       ;;ZERO FILL SWITCH
057310  000000                          $OMODE: .WORD   0                       ;;NUMBER OF DIGITS TO TYPE


                                        ;;*******************************************************************
                                        .SBTTL  TTY INPUT ROUTINE
                                        ;;*******************************************************************
                                        .ENABL  LSB

                                        ;;*******************************************************************
                                        ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
                                        ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
                                        ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
                                        ;*WHEN OPERATING IN TTY FLAG MODE.
057312  022737  000176  000426          $CKSWR: CMP     #SWREG,SWR              ;;IS THE SOFT-SWR SELECTED?
057320  001106                                  BNE     15$                     ;;BRANCH IF NO
057322  105737  177560                          TSTB    @#TKS                   ;;CHAR THERE?
057326  100103                                  BPL     15$                     ;;IF NO, DON'T WAIT AROUND
057330  113746  177562                          MOVB    @#TKB,-(SP)             ;;SAVE THE CHAR
057334  042716  177600                          BIC     #^C177,(SP)             ;;STRIP-OFF THE ASCII
057340  022726  000007                          CMP     #7,(SP)+                ;;IS IT A CONTROL G?
057344  001074                                  BNE     15$                     ;;NO, RETURN TO USER
057346  123727  000422  000001                  CMPB    $AUTOB,#1               ;;ARE WE RUNNING IN AUTO-MODE?
057354  001470                                  BEQ     15$                     ;;BRANCH IF YES
```

```
057356  012737  060103  000546            MOV     #$CNTLG,MSGADR
057364  104401                            TYPE                            ;;ECHO THE CONTROL-G (^G)
057366  012737  060110  000546  $GTSWR:   MOV     #$MSWR,MSGADR
057374  104401                            TYPE                            ;;TYPE CURRENT CONTENTS
057376  013746  000176                    MOV     SWREG,-(SP)             ;;SAVE SWREG FOR TYPEOUT
057402  104402                            TYPOC                           ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
057404  012737  060121  000546            MOV     #$MNEW,MSGADR
057412  104401                            TYPE                            ;;PROMPT FOR NEW SWR
057414  005046                  19$:      CLR     -(SP)                   ;;CLEAR COUNTER
057416  005046                            CLR     -(SP)                   ;;THE NEW SWR
057420  105737  177560          7$:       TSTB    @#TKS                   ;;CHAR THERE?
057424  100375                            BPL     7$                      ;;IF NOT TRY AGAIN

057426  113746  177562                    MOVB    @#TKB,-(SP)             ;;PICK UP CHAR
057432  042716  177600                    BIC     #^C177,(SP)             ;;MAKE IT 7-BIT ASCII



057436  021627  000025          9$:       CMP     (SP),#25                ;;IS IT A CONTROL-U?
057442  001007                            BNE     10$                     ;;BRANCH IF NOT
057444  012737  060076  000546            MOV     #$CNTLU,MSGADR
057452  104401                            TYPE                            ;;YES, ECHO CONTROL-U (^U)
057454  062706  000006          20$:      ADD     #6,SP                   ;;IGNORE PREVIOUS INPUT
057460  000755                            BR      19$                     ;;LET'S TRY IT AGAIN


057462  021627  000015          10$:      CMP     (SP),#15                ;;IS IT A <CR>?
057466  001024                            BNE     16$                     ;;BRANCH IF NO
057470  005766  000004                    TST     4(SP)                   ;;YES, IS IT THE FIRST CHAR?
057474  001403                            BEQ     11$                     ;;BRANCH IF YES
057476  016677  000002  120722            MOV     2(SP),@SWR              ;;SAVE NEW SWR
057504  062706  000006          11$:      ADD     #6,SP                   ;;CLEAR UP STACK
057510  012737  000443  000546  14$:      MOV     #$CRLF,MSGADR
057516  104401                            TYPE                            ;;ECHO <CR> AND <LF>
057520  123727  000423  000001            CMPB    $INTAG,#1               ;;RE-ENABLE TTY KBD INTERRUPTS?
057526  001003                            BNE     15$                     ;;BRANCH IF NOT
057530  012737  000100  177560            MOV     #100,@#TKS              ;;RE-ENABLE TTY KBD INTERRUPTS
057536  000002                  15$:      RTI                             ;;RETURN
057540  004737  057010          16$:      JSR     PC,$TYPEC               ;;ECHO CHAR
057544  021627  000060                    CMP     (SP),#60                ;;CHAR < 0?
057550  002420                            BLT     18$                     ;;BRANCH IF YES
057552  021627  000067                    CMP     (SP),#67                ;;CHAR > 7?
057556  003015                            BGT     18$                     ;;BRANCH IF YES
057560  042726  000060                    BIC     #60,(SP)+               ;;STRIP-OFF ASCII
057564  005766  000002                    TST     2(SP)                   ;;IS THIS THE FIRST CHAR
057570  001403                            BEQ     17$                     ;;BRANCH IF YES
057572  006316                            ASL     (SP)                    ;;NO, SHIFT PRESENT
057574  006316                            ASL     (SP)                    ;;   CHAR OVER TO MAKE
057576  006316                            ASL     (SP)                    ;;   ROOM FOR NEW ONE.
057600  005266  000002          17$:      INC     2(SP)                   ;;KEEP COUNT OF CHAR
057604  056616  177776                    BIS     -2(SP),(SP)             ;;SET IN NEW CHAR
057610  000703                            BR      7$                      ;;GET THE NEXT ONE
057612  012737  000442  000546  18$:      MOV     #$QUES,MSGADR
057620  104401                            TYPE                            ;;TYPE ?<CR><LF>
057622  000714                            BR      20$                     ;;SIMULATE CONTROL-U
                                .DSABL    LSB
```

```



                                        ;;*****************************************************************
                                        ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
                                        ;*CALL:
                                        ;*       RDCHR                          ;;INPUT A SINGLE CHARACTER FROM THE TTY
                                        ;*       RETURN HERE                    ;;CHARACTER IS ON THE STACK
                                        ;*                                      ;;WITH PARITY BIT STRIPPED OFF
                                        ;

057624  011646                          $RDCHR: MOV     (SP),-(SP)              ;;PUSH DOWN THE PC
057626  016666  000004  000002                  MOV     4(SP),2(SP)             ;;SAVE THE PS
057634  105737  177560                  1$:     TSTB    @#TKS                   ;;WAIT FOR
057640  100375                                  BPL     1$                      ;;A CHARACTER
057642  113766  177562  000004                  MOVB    @#TKB,4(SP)             ;;READ THE TTY
057650  042766  177600  000004                  BIC     #^C<177>,4(SP)          ;;GET RID OF JUNK IF ANY
057656  026627  000004  000023                  CMP     4(SP),#23               ;;IS IT A CONTROL-S?
057664  001013                                  BNE     3$                      ;;BRANCH IF NO
057666  105737  177560                  2$:     TSTB    @#TKS                   ;;WAIT FOR A CHARACTER
057672  100375                                  BPL     2$                      ;;LOOP UNTIL ITS THERE
057674  113746  177562                          MOVB    @#TKB,-(SP)             ;;GET CHARACTER
057700  042716  177600                          BIC     #^C177,(SP)             ;;MAKE IT 7-BIT ASCII
057704  022627  000021                          CMP     (SP)+,#21               ;;IS IT A CONTROL-Q?
057710  001366                                  BNE     2$                      ;;IF NOT DISCARD IT
057712  000750                                  BR      1$                      ;;YES, RESUME
057714  026627  000004  000140          3$:     CMP     4(SP),#140              ;;IS IT UPPER CASE?
057722  002407                                  BLT     4$                      ;;BRANCH IF YES
057724  026627  000004  000175                  CMP     4(SP),#175              ;;IS IT A SPECIAL CHAR?
057732  003003                                  BGT     4$                      ;;BRANCH IF YES
057734  042766  000040  000004                  BIC     #40,4(SP)               ;;MAKE IT UPPER CASE
057742  000002                          4$:     RTI                             ;;GO BACK TO USER
                                        ;;*****************************************************************
                                        ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
                                        ;*CALL:
                                        ;*       RDLIN                          ;;INPUT A STRING FROM THE TTY
                                        ;*       RETURN HERE                    ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
                                        ;*                                      ;;TERMINATOR WILL BE A BYTE OF ALL 0'S

057744  010346                          $RDLIN: MOV     R3,-(SP)                ;;SAVE R3
057746  012703  060066                  1$:     MOV     #$TTYIN,R3              ;;GET ADDRESS
057752  022703  060076                  2$:     CMP     #$TTYIN+8.,R3           ;;BUFFER FULL?
057756  101405                                  BLOS    4$                      ;;BR IF YES
057760  100407                                  RDCHR                           ;;GO READ ONE CHARACTER FROM THE TTY
057762  112613                                  MOVB    (SP)+,(R3)              ;;GET CHARACTER
057764  122713  000177                  10$:    CMPB    #177,(R3)               ;;IS IT A RUBOUT
057770  001005                                  BNE     3$                      ;;SKIP IF NOT
057772  013737  000442  000546          4$:     MOV     $QUES,MSGADR
060000  104401                                  TYPE                            ;;TYPE A '?'
060002  000761                                  BR      1$                      ;;CLEAR THE BUFFER AND LOOP
060004  111337  060064                  3$:     MOVB    (R3),9$                 ;;ECHO THE CHARACTER
060010  012737  060064  000546                  MOV     #9$,MSGADR
060016  104401                                  TYPE
060020  122723  000015                          CMPB    #15,(R3)+               ;;CHECK FOR RETURN
060024  001352                                  BNE     2$                      ;;LOOP IF NOT RETURN
060026  105063  177777                          CLRB    -1(R3)                  ;;CLEAR RETURN (THE 15)
060032  012737  000444  000546                  MOV     #$LF,MSGADR
```

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060040  104401                            TYPE                        ;;TYPE A LINE FEED
060042  012603                            MOV     (SP)+,R3            ;;RESTORE R3
060044  011646                            MOV     (SP),-(SP)          ;;ADJUST THE STACK AND PUT ADDRESS OF THE
060046  016666  000004  000002            MOV     4(SP),2(SP)         ;;      FIRST ASCII CHARACTER ON IT
060054  012766  060066  000004            MOV     #$TTYIN,4(SP)
060062  000002                            RTI                         ;;RETURN
060064     000                    9$:     .BYTE   0                   ;;STORAGE FOR ASCII CHAR. TO TYPE
060065     000                            .BYTE   0                   ;;TERMINATOR
060066  000010                    $TTYIN: .BLKB   8.                  ;;RESERVE 8 BYTES FOR TTY INPUT
060076  052536  005015     000    $CNTLU: .ASCIZ  /^U/<15><12>        ;;CONTROL 'U'
060103     136  006507  000012    $CNTLG: .ASCIZ  /^G/<15><12>        ;;CONTROL 'G'
060110  005015  053523  020122    $MSWR:  .ASCIZ  <15><12>/SWR = /
060116  020075     000
060121     040  047040  053505    $MNEW:  .ASCIZ  /  NEW = /
060126  036440  000040



                                  ;;*****************************************************************
                                  .SBTTL  APT COMMUNICATIONS ROUTINE
                                  ;;*****************************************************************
060132  112737  000001  060354    $ATY1:  MOVB    #1,$FFLG            ;;TO REPORT FATAL ERROR
060140  112737  000001  060352    $ATY3:  MOVB    #1,$MFLG            ;;TO TYPE A MESSAGE
060146  000403                            BR      $ATYC
060150  112737  000001  060354    $ATY4:  MOVB    #1,$FFLG            ;;TO ONLY REPORT FATAL ERROR
060156                            $ATYC:
060156  010046                            MOV     R0,-(SP)            ;;PUSH R0 ON STACK
060160  010146                            MOV     R1,-(SP)            ;;PUSH R1 ON STACK
060162  105737  060352                    TSTB    $MFLG               ;;SHOULD TYPE A MESSAGE?
060166  001437                            BEQ     10$                 ;;IF NOT:  BR
060170  122737  000001  000650            CMPB    #APTENV,$ENV        ;;OPERATING UNDER APT?
060176  001031                            BNE     3$                  ;;IF NOT:  BR
060200  132737  000100  000651            BITB    #APTSPOOL,$ENVM     ;;SHOULD SPOOL MESSAGES?
060206  001425                            BEQ     3$                  ;;IF NOT:  BR
060210  017600  000004                    MOV     @4(SP),R0           ;;GET MESSAGE ADDR.
060214  062766  000002  000004            ADD     #2,4(SP)                    ;;BUMP RETURN ADDR.
060222  005737  000630            1$:     TST     $MSGTYPE            ;;SEE IF DONE W/ LAST XMISSION?
060226  001375                            BNE     1$                  ;;IF NOT:  WAIT
060230  010037  000644                    MOV     R0,$MSGAD           ;;PUT ADDR IN MAILBOX
060234  105720                    2$:     TSTB    (R0)+               ;;FIND END OF MESSAGE
060236  001376                            BNE     2$
060240  163700  000644                    SUB     $MSGAD,R0           ;;SUB START OF MESSAGE
060244  006200                            ASR     R0                  ;;GET MESSAGE LNGTH IN WORDS
060246  010037  000646                    MOV     R0,$MSGLGT          ;;PUT LENGTH IN MAILBOX
060252  012737  000004  000630            MOV     #4,$MSGTYPE         ;;TELL APT TO TAKE MSG.
060260  000402                            BR      10$
060262  004737  056604            3$:     JSR     PC,$TYPE            ;;CALL TYPE MACRO
060266  105737  060354            10$:    TSTB    $FFLG               ;;SHOULD REPORT FATAL ERROR?
060272  001416                            BEQ     12$                 ;;IF NOT:  BR
060274  005737  000650                    TST     $ENV                ;;RUNNING UNDER APT?
060300  001413                            BEQ     12$                 ;;IF NOT:  BR
060302  005737  000630            11$:    TST     $MSGTYPE            ;;FINISHED LAST MESSAGE?
060306  001375                            BNE     11$                 ;;IF NOT:  WAIT
060310  017637  000004  000632            MOV     @4(SP),$FATAL       ;;GET ERROR #
060316  062766  000002  000004            ADD     #2,4(SP)                    ;;BUMP RETURN ADDR.
060324  005237  000630                    INC     $MSGTYPE            ;;TELL APT TO TAKE ERROR
060330  105037  060354            12$:    CLRB    $FFLG               ;;CLEAR FATAL FLAG
```

```
060334  105037  060353          CLRB    $LFLG                   ;;CLEAR LOG FLAG
060340  105037  060352          CLRB    $MFLG                   ;;CLEAR MESSAGE FLAG
060344  012601                  MOV     (SP)+,R1                ;;POP STACK INTO R1
060346  012600                  MOV     (SP)+,R0                ;;POP STACK INTO R0
060350  000207                  RTS     PC                      ;;RETURN
060352     000          $MFLG:  .BYTE   0                       ;;MESSG. FLAG
060353     000          $LFLG:  .BYTE   0                       ;;LOG FLAG
060354     000          $FFLG:  .BYTE   0                       ;;FATAL FLAG
        060356                  .EVEN
        000200          APTSIZE=200
        000001          APTENV=001
        000100          APTSPOOL=100
        000040          APTCSUP=040


                        ;;*****************************************************************
                        .SBTTL  TRAP DECODER
                        ;;*****************************************************************
                        ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE ''TRAP'' INSTRUCTION
                        ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                        ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                        ;*GO TO THAT ROUTINE.

060356  010046          $TRAP:  MOV     R0,-(SP)                ;;SAVE R0
060360  016600  000002          MOV     2(SP),R0                ;;GET TRAP ADDRESS
060364  005740                  TST     -(R0)                   ;;BACKUP BY 2
060366  111000                  MOVB    (R0),R0                 ;;GET RIGHT BYTE OF TRAP
060370  006300                  ASL     R0                      ;;POSITION FOR INDEXING
060372  016000  060412          MOV     $TRPAD(R0),R0           ;;INDEX TO TABLE
060376  000200                  RTS     R0                      ;;GO TO ROUTINE


                        ;;THIS IS USE TO HANDLE THE ''GETPRI'' MACRO

060400  011646          $TRAP2: MOV     (SP),-(SP)              ;;MOVE THE PC DOWN
060402  016666  000004  000002  MOV     4(SP),2(SP)             ;;MOVE THE PSW DOWN
060410  000002                  RTI                             ;;RESTORE THE PSW

                        .SBTTL  TRAP TABLE

                        ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                        ;*BY THE ''TRAP'' INSTRUCTION.

                        ;       ROUTINE
                        ;       -------
060412  060400          $TRPAD: .WORD   $TRAP2
060414  056604                  $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
060416  057104                  $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
060420  057060                  $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
060422  057120                  $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
060424  057366                  $GTSWR  ;;CALL=GTSWR    TRAP+5(104405)  GET SOFT-SWR SETTING
060426  057312                  $CKSWR  ;;CALL=CKSWR    TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
060430  057624                  $RDCHR  ;;CALL=RDCHR    TRAP+07(104407) TTY TYPEIN CHARACTER ROUTINE
060432  057744                  $RDLIN  ;;CALL=RDLIN    TRAP+10(104410) TTY TYPEIN STRING ROUTINE

                        ;;*****************************************************************
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                                          .SBTTL  TELETYPE MESSAGES
                                          ;;*************************************************************
060434  043200  030461  041440            TITLE:  .ASCIZ  <200>/F11 CIS DIAGNOSTIC TEST/<200>
060442  051511  042040  040511
060450  047107  051517  044524
060456  020103  042524  052123
060464  000200
060466  040600  020116  047125            TIMMSG: .ASCIZ  <200>/AN UNEXPECTED TIME-OUT TRAP OCCURRED/
060474  054105  042520  052103
060502  042105  052040  046511
060510  026505  052517  020124
060516  051124  050101  047440
060524  041503  051125  042522
060532  000104
060534  040600  020116  047125            ILLMSG: .ASCIZ  <200>/AN UNEXPECTED ILLEGAL & RESERVED INSTRUCTION TRAP OCCURRED/
060542  054105  042520  052103
060550  042105  044440  046114
060556  043505  046101  023040
060564  051040  051505  051105
060572  042526  020104  047111
060600  052123  052522  052103
060606  047511  020116  051124
060614  050101  047440  041503
060622  051125  042522  000104
060630  050200  053517  051105            PWRMSG: .ASCIZ  <200>/POWER FAILURE OCCURRED/
060636  043040  044501  052514
060644  042522  047440  041503
060652  051125  042522  000104
060660  000040                            SPACE1: .ASCIZ  / /
060662  020040  020040  020040            CTL4:   .ASCIZ  /       23-*04/
060670  031462  025055  032060
060676     000
060677     040  020040  020040            CTL5:   .ASCIZ  /       23-*05/
060704  031040  026463  030052
060712  000065
060714  020040  020040  020040            CTL6:   .ASCIZ  /       23-*06/
060722  031462  025055  033060
060730     000
060731     040  020040  020040            CTL7:   .ASCIZ  /       23-*07/
060736  031040  026463  030052
060744  000067
060746  020040  020040  020040            CTL8:   .ASCIZ  /       23-*08/
060754  031462  025055  034060
060762     000
060763     040  020040  020040            CTL9:   .ASCIZ  /       23-*09/
060770  031040  026463  030052
060776  000071



                                          ;;*************************************************************
                                          .SBTTL  TEST ERROR MESSAGES
                                          ;;*************************************************************
061000  100200  051105  047522            ERRHDR: .ASCIZ  <200><200>/ERROR PC     CTL CHIP #         /
061006  020122  041520  020040
061014  020040  052103  020114
061022  044103  050111  021440
```

```
061030  020040  020040  020040
061036  020040     000
061041     103  051511  044440   ERR1:   .ASCIZ  /CIS INSTRUCTION FAILURE/<200>
061046  051516  051124  041525
061054  044524  047117  043040
061062  044501  052514  042522
061070  000200
061072  044503  020123  047111   ERR2:   .ASCIZ  /CIS INTERRUPT FAILURE/<200>
061100  042524  051122  050125
061106  020124  040506  046111
061114  051125  100105     000
061121     116  020117  051124   ERR3:   .ASCIZ  /NO TRAP ON ILLEGAL CIS CLASS OPCODE/<200>
061126  050101  047440  020116
061134  046111  042514  040507
061142  020114  044503  020123
061150  046103  051501  020123
061156  050117  047503  042504
061164  000200


                                 .EVEN


                                 ;;*************************************************************
                                 .SBTTL  BUFFERS & TABLES
                                 ;;*************************************************************
                                 ;
061166  000100                   BUFF1:  .BLKB   100             ;CHARACTER STRING BUFFER 1
061266  000100                   BUFF2:  .BLKB   100             ;CHARACTER STRING BUFFER 2
061366  000400                   TRANS:  .BLKB   400             ;TRANSLATION TABLE
061766  000400                   CHRSET: .BLKB   400             ;CHARACTER SET TABLE


        062367                           .ODD
062367     000                           .BYTE   0                    ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
062370  000040                   DSBUF1: .BLKB   40              ;DECIMAL STRING BUFFER 1

        062431                           .ODD
062431     000                           .BYTE   0                    ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
062432  000040                   DSBUF2: .BLKB   40              ;DECIMAL STRING BUFFER 2

        062473                           .ODD
062473     000                           .BYTE   0                    ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
062474  000040                   DS.DST: .BLKB   40              ;DESTINATION DECIMAL STRING BUFFER

        062535                           .ODD
062535     000                           .BYTE   0                    ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
062536  000040                   DS.EXP: .BLKB   40              ;DECIMAL STRING BUFFER OF EXPECTED RESULTS


                                 ;;*************************************************************
                                 .SBTTL  TEST CASES FOR CMPN AND CMPP
                                 ;;*************************************************************
                                 ;

062576  000007                   TCMP:   .WORD   7                    ;# OF TEST CASES FOR CMPN & CMPP
```

```
062600  000000                                  .WORD   0                               ;SRC1 LENGTH
062602  062670                                  .WORD   CMP1                            ;SRC1 POINTER
062604  000000                                  .WORD   0                               ;SRC2 LENGTH
062606  062674                                  .WORD   CMP1A                           ;SRC2 POINTER

062610  000007                                  .WORD   7                       ;TEST CASE NUMBER 2
062612  062700                                  .WORD   CMP2
062614  000000                                  .WORD   0
062616  062712                                  .WORD   CMP2A

062620  000000                                  .WORD   0                       ;TEST CASE NUMBER 3
062622  062716                                  .WORD   CMP3
062624  000020                                  .WORD   20
062626  062722                                  .WORD   CMP3A

062630  000011                                  .WORD   11                      ;TEST CASE NUMBER 4
062632  062744                                  .WORD   CMP4
062634  000011                                  .WORD   11
062636  062760                                  .WORD   CMP4A

062640  000006                                  .WORD   6                       ;TEST CASE NUMBER 5
062642  062774                                  .WORD   CMP5
062644  000006                                  .WORD   6
062646  063004                                  .WORD   CMP5A

062650  000001                                  .WORD   1                       ;TEST CASE NUMBER 6
062652  063014                                  .WORD   CMP6
062654  000001                                  .WORD   1
062656  063020                                  .WORD   CMP6A

062660  000006                                  .WORD   6                       ;TEST CASE NUMBER 7
062662  063024                                  .WORD   CMP7
062664  000005                                  .WORD   5
062666  063034                                  .WORD   CMP7A


062670  000000                          CMP1:   .WORD   0                                       ;SRC1 SIGN
062672     000                                  .BYTE                                           ;DECIMAL STRING FOR SRC1
        062674                                  .EVEN
062674  000000                          CMP1A:  .WORD   0                                       ;SRC2 SIGN
062676     000                                  .BYTE                                           ;DECIMAL STRING FOR SRC2
        062700                                  .EVEN

062700  000000                          CMP2:   .WORD   0                                       ;SRC1 SIGN
062702     007      006      005                .BYTE   007,006,005,004,003,002,001             ;DECIMAL STRING FOR SRC1
062705     004      003      002
062710     001
        062712                                  .EVEN
062712  000000                          CMP2A:  .WORD   0                                       ;SRC2 SIGN
062714     000                                  .BYTE                                           ;DECIMAL STRING FOR SRC2
        062716                                  .EVEN

062716  177777                          CMP3:   .WORD   -1                                      ;SRC1 SIGN
062720     000                                  .BYTE                                           ;DECIMAL STRING FOR SRC1
        062722                                  .EVEN
```

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062722  177777                      CMP3A:  .WORD   -1                                          ;SRC2 SIGN
062724     001     000     011              .BYTE   001,000,011,000,002,000,010,000,003,000,007,000,004,000,004,000
062727     000     002     000
062732     010     000     003
062735     000     007     000
062740     004     000     004
062743     000
                                                                                                ;DECIMAL STRING FOR SRC2
                                            .EVEN

062744  177777                      CMP4:   .WORD   -1                                  ;SRC1 SIGN
062746     001     002     003              .BYTE   001,002,003,000,005,006,007,010,011 ;DECIMAL STRING FOR SRC1
062751     000     005     006
062754     007     010     011
        062760                              .EVEN
062760  177777                      CMP4A:  .WORD   -1                                  ;SRC2 SIGN
062762     001     002     003              .BYTE   001,002,003,004,005,006,007,010,011 ;DECIMAL STRING FOR SRC2
062765     004     005     006
062770     007     010     011
        062774                              .EVEN

062774  000000                      CMP5:   .WORD   0                                   ;SRC1 SIGN
062776     002     001     004              .BYTE   002,001,004,011,040,007             ;DECIMAL STRING FOR SRC1
063001     011     040     007
                                            .EVEN
063004  000000                      CMP5A:  .WORD   0                                   ;SRC2 SIGN
063006     002     001     004              .BYTE   002,001,004,011,040,007             ;DECIMAL STRING FOR SRC2
063011     011     040     007
                                            .EVEN

063014  177777                      CMP6:   .WORD   -1                                  ;SRC1 SIGN
063016     004                              .BYTE   004                                 ;DECIMAL STRING FOR SRC1
        063020                              .EVEN
063020  000000                      CMP6A:  .WORD   0                                   ;SRC2 SIGN
063022     004                              .BYTE   004                                 ;DECIMAL STRING FOR SRC2
        063024                              .EVEN

063024  000000                      CMP7:   .WORD   0                                   ;SRC1 SIGN
063026     002     003     004              .BYTE   002,003,004,005,006,007             ;DECIMAL STRING FOR SRC1
063031     005     006     007
                                            .EVEN
063034  000000                      CMP7A:  .WORD   0                                   ;SRC2 SIGN
063036     003     004     005              .BYTE   003,004,005,006,007                 ;DECIMAL STRING FOR SRC2
063041     006     007
        063044                              .EVEN





                                    .SBTTL  TEST CASES FOR ASHN AND ASHP
                                    ;**************************************************************
                                    ;
                                    ; TABLE OF TEST CASES FOR ASHN AND ASHP
                                    ;
                                    ;**************************************************************

```

```
063044  000017          TASH:   .WORD   15.             ;# OF TEST CASES FOR ASHN & ASHP

063046  000005                  .WORD   5                       ;SRC LENGTH
063050  000005                  .WORD   5                       ;DST LENGTH
063052     000                  .BYTE   0                       ;SHIFT COUNT
063053     000                  .BYTE   0                       ;ROUNDING DIGIT

063054  000000                  .WORD   0               ;TEST CASE NUMBER 2
063056  000017                  .WORD   17
063060     000                  .BYTE   0
063061     000                  .BYTE   0

063062  000032                  .WORD   32              ;TEST CASE NUMBER 3
063064  000032                  .WORD   32
063066     000                  .BYTE   0
063067     007                  .BYTE   7

063070  000025                  .WORD   25              ;TEST CASE NUMBER 4
063072  000025                  .WORD   25
063074     377                  .BYTE   -1
063075     005                  .BYTE   5

063076  000014                  .WORD   14              ;TEST CASE NUMBER 5
063100  000014                  .WORD   14
063102     377                  .BYTE   -1
063103     006                  .BYTE   6

063104  000006                  .WORD   6               ;TEST CASE NUMBER 6
063106  000006                  .WORD   6
063110     001                  .BYTE   1
063111     006                  .BYTE   6

063112  000010                  .WORD   10              ;TEST CASE NUMBER 7
063114  000011                  .WORD   11
063116     001                  .BYTE   1
063117     000                  .BYTE   0

063120  000005                  .WORD   5               ;TEST CASE NUMBER 8
063122  000006                  .WORD   6
063124     002                  .BYTE   2
063125     000                  .BYTE   0

063126  000016                  .WORD   16              ;TEST CASE NUMBER 9
063130  000004                  .WORD   4
063132     363                  .BYTE   -15
063133     000                  .BYTE   0

063134  000020                  .WORD   20              ;TEST CASE NUMBER 10
063136  000010                  .WORD   10
063140     360                  .BYTE   -20
063141     000                  .BYTE   0

063142  000012                  .WORD   12              ;TEST CASE NUMBER 11
063144  000007                  .WORD   7
063146     006                  .BYTE   6
063147     000                  .BYTE   0
```

```

063150  000037          .WORD   37          ;TEST CASE NUMBER 12
063152  000030          .WORD   30
063154     030          .BYTE   30
063155     000          .BYTE   0

063156  000020          .WORD   20          ;TEST CASE NUMBER 13
063160  000010          .WORD   10
063162     373          .BYTE   -5
063163     000          .BYTE   0

063164  000005          .WORD   5           ;TEST CASE NUMBER 14
063166  000005          .WORD   5
063170     373          .BYTE   -5
063171     006          .BYTE   6

063172  000007          .WORD   7           ;TEST CASE NUMBER 15
063174  000007          .WORD   7
063176     366          .BYTE   -12
063177     006          .BYTE   6


```

```
                                .SBTTL  ADDN/SUBN TEST DATA
                                ;;*************************************************************
                                ;
                                ;       TABLES FOR ADDN AND SUBN
                                ;
                                ;;*************************************************************

063200  000006                  TADD:   .WORD   6               ;# OF TEST CASES

063202  000020                          .WORD   16.             ;SRC1 LENGTH
063204  063356                          .WORD   ADD1            ;SRC1 PTR
063206  000021                          .WORD   17.             ;SRC2 LENGTH
063210  063400                          .WORD   ADD1A           ;SRC2 PTR
063212  000024                          .WORD   20.             ;DEST LENGTH
063214  063424                          .WORD   ADD1B           ;DEST PTR (SUM)
063216  000000                          .WORD   0               ;CC.EXP (SUM)
063220  063452                          .WORD   ADD1C           ;DEST PTR (DIFF)
063222  000000                          .WORD   0               ;CC.EXP (DIFF)

063224  000012                          .WORD   10.             ;SRC1 >SRC2, SUM +,DIFF -
063226  063500                          .WORD   ADD2
063230  000012                          .WORD   10.
063232  063514                          .WORD   ADD2A
063234  000012                          .WORD   10.
063236  063530                          .WORD   ADD2B
063240  000000                          .WORD   0
063242  063544                          .WORD   ADD2C
063244  000010                          .WORD   10

063246  000013                          .WORD   11.             ;SRC1 +,SRC2 -, SUM & DIFF -
063250  063560                          .WORD   ADD3
063252  000013                          .WORD   11.
063254  063576                          .WORD   ADD3A
063256  000014                          .WORD   12.
063260  063614                          .WORD   ADD3B
063262  000010                          .WORD   10
063264  063632                          .WORD   ADD3C
063266  000010                          .WORD   10

063270  000020                          .WORD   16.             ;SRC1 -,SRC2 -,SUM -, DIFF +
063272  063650                          .WORD   ADD4
063274  000003                          .WORD   3
063276  063672                          .WORD   ADD4A
063300  000020                          .WORD   16.
063302  063700                          .WORD   ADD4B
063304  000010                          .WORD   10
063306  063722                          .WORD   ADD4C
063310  000000                          .WORD   0

063312  000016                          .WORD   14.             ;SRC1 = +,SRC2 0,DEST TRUNCATED WITH
                                                                ;SUM = +,DIFF = -
063314  063744                          .WORD   ADD5
063316  000001                          .WORD   1
063320  063764                          .WORD   ADD5A
063322  000011                          .WORD   9.
```

```
063324  063770                          .WORD   ADD5B
063326  000002                          .WORD   2
063330  064004                          .WORD   ADD5C
063332  000012                          .WORD   12

063334  000010                          .WORD   8.              ;DEST LENGTH = 0
063336  064020                          .WORD   ADD6
063340  000011                          .WORD   9.
063342  064032                          .WORD   ADD6A
063344  000000                          .WORD   0
063346  064046                          .WORD   ADD6B
063350  000006                          .WORD   6
063352  064046                          .WORD   ADD6B
063354  000006                          .WORD   6

063356  000000                  ADD1:   .WORD   0               ;SIGN1
063360     005     011     007          .BYTE   5,9.,7,4,3,8.,1,6,6,7,8.,1,2,9.,0,6
063363     004     003     010
063366     001     006     006
063371     007     010     001
063374     002     011     000
063377     006
                                                                ;SOURCE STRING 1

                                        .EVEN
063400  000000                  ADD1A:  .WORD   0               ;SIGN2
063402     001     007     004          .BYTE   1,7,4,3,2,1,6,9.,5,3,4,7,9.,4,1,6,2
063405     003     002     001
063410     006     011     005
063413     003     004     007
063416     011     004     001
063421     006     002
                                                                ;SOURCE STRING 2

        063424                          .EVEN
063424  000000                  ADD1B:  .WORD   0               ;SIGN3
063426     000     000     000          .BYTE   0,0,0,2,3,4,0,6,5,5,1,2,0,2
063431     002     003     004
063434     000     006     005
063437     005     001     002
063442     000     002
063444     006     000     007          .BYTE   6,0,7,0,6,8.
063447     000     006     010
                                                                ;DEST STRING
                                        .EVEN

063452  000000                  ADD1C:  .WORD   0
063454     000     000     000          .BYTE   0,0,0,1,1,4,5,7,7,8.,7,8.,6
063457     001     001     004
063462     005     007     007
063465     010     007     010
063470     006
063471     006     011     010          .BYTE   6,9.,8.,1,2,5,6
063474     001     002     005
063477     006
                                        .EVEN
```

```

063500  000000                          ADD2:   .WORD   0
063502     003     001     005                  .BYTE   3,1,5,9.,2,6,5,3,8.,0
063505     011     002     006
063510     005     003     010
063513     000
                                                .EVEN

063514  000000                          ADD2A:  .WORD   0
063516     001     007     006                  .BYTE   1,7,6,3,2,1,4,1,7,2
063521     003     002     001
063524     004     001     007
063527     002
                                                .EVEN

063530  000000                          ADD2B:  .WORD   0
063532     004     011     002                  .BYTE   4,9.,2,2,4,7,9.,5,5,2
063535     002     004     007
063540     011     005     005
063543     002
                                                .EVEN

063544  177777                          ADD2C:  .WORD   -1
063546     001     003     011                  .BYTE   1,3,9.,6,0,5,1,2,0,8.
063551     006     000     005
063554     001     002     000
063557     010
                                                .EVEN

063560  000000                          ADD3:   .WORD   0
063562     004     002     003                  .BYTE   4,2,3,1,1,7,9.,6,7,9.,6
063565     001     001     007
063570     011     006     007
063573     011     006
        063576                                  .EVEN

063576  177777                          ADD3A:  .WORD   -1
063600     007     011     003                  .BYTE   7,9.,3,6,5,2,2,2,7,8.,1
063603     006     005     002
063606     002     002     007
063611     010     001
        063614                                  .EVEN

063614  177777                          ADD3B:  .WORD   -1
063616     000     003     007                  .BYTE   0,3,7,0,5,3,4,2,5,9.,8.,5
063621     000     005     003
063624     004     002     005
063627     011     010     005
                                                .EVEN

063632  177777                          ADD3C:  .WORD   -1
063634     001     002     001                  .BYTE   1,2,1,6,7,7,0,1,9.,5,7,7
063637     006     007     007
063642     000     001     011
063645     005     007     007
                                                .EVEN
```

```

063650  177777                      ADD4:   .WORD   -1
063652     004     007     002              .BYTE   4,7,2,9.,3,2,7,7,1,6,1,7,9.,2,8.,4
063655     011     003     002
063660     007     007     001
063663     006     001     007
063666     011     002     010
063671     004
                                            .EVEN

063672  177777                      ADD4A:  .WORD   -1
063674     011     003     007              .BYTE   9.,3,7
        063700                              .EVEN

063700  177777                      ADD4B:  .WORD   -1
063702     004     007     002              .BYTE   4,7,2,9.,3,2,7,7,1,6
063705     011     003     002
063710     007     007     001
063713     006
063714     001     010     000              .BYTE   1,8.,0,2,2,1
063717     002     002     001
                                            .EVEN

063722  000000                      ADD4C:  .WORD   0
063724     004     007     002              .BYTE   4,7,2,9.,3,2,7,7,1,6
063727     011     003     002
063732     007     007     001
063735     006
063736     001     007     010              .BYTE   1,7,8.,3,4,7
063741     003     004     007
                                            .EVEN

063744  000000                      ADD5:   .WORD   0
063746     004     000     001              .BYTE   4,0,1,7,7,7,9.,6,3,2,5,8.,8.,1
063751     007     007     007
063754     011     006     003
063757     002     005     010
063762     010     001
                                            .EVEN

063764  000000                      ADD5A:  .WORD   0
063766     000                              .BYTE   0
        063770                              .EVEN

063770  000000                      ADD5B:  .WORD   0
063772     007     011     006              .BYTE   7,9.,6,3,2,5,8.,8.,1
063775     003     002     005
064000     010     010     001
        064004                              .EVEN

064004  177777                      ADD5C:  .WORD   -1
064006     007     011     006              .BYTE   7,9.,6,3,2,5,8.,8.,1
064011     003     002     005
064014     010     010     001
        064020                              .EVEN

```

```
064020  000000                          ADD6:   .WORD   0
064022     001      007      011                .BYTE   1,7,9.,3,3,9.,8.,1
064025     003      003      011
064030     010      001
                                                .EVEN
064032  000000                          ADD6A:  .WORD   0
064034     010      010      003                .BYTE   8.,8.,3,9.,2,7,6,4,9.
064037     011      002      007
064042     006      004      011
        064046                                  .EVEN
064046  000000                          ADD6B:  .WORD   0
064050     000                                  .BYTE   0
        064052                                  .EVEN
                                        ;+
                                        ;       INLINE TEST CASE        (ADDNI & SUBNI)
                                        ;-
064052  010020                          TADDI:  .WORD   010020          ;SRC1 DESCRIPTOR
064054  062370                                  .WORD   #DSBUF1
064056  010021                                  .WORD   010021          ;SRC2 DESCRIPTOR
064060  062432                                  .WORD   #DSBUF2
064062  010024                                  .WORD   010024          ;DEST DESCRIPTOR
064064  062474                                  .WORD   #DS.DST
                                        ;+
                                        ;       INLINE TEST CASE        (ADDPI & SUBPI)
                                        ;-
064066  070020                          TADDPI: .WORD   070020
064070  062370                                  .WORD   #DSBUF1
064072  070021                                  .WORD   070021
064074  062432                                  .WORD   #DSBUF2
064076  070024                                  .WORD   070024
064100  062474                                  .WORD   #DS.DST
064102                                  INLINE  <SPACE: .BLKW   2000>
064102  002000                                                                  SPACE:  .BLKW   2000
070102                                  INLINE  <SPACEY:>
070102                                                                          SPACEY:
        000001                          .END
```

```
ADDN   = 076050        191#    9935
ADDNI  = 076150        200#   10110
ADDP   = 076070        211#   12966
ADDPI  = 076170        220#   13124
ADD1     063356      10061   10980   17122   17182#
ADD1A    063400      10077   10996   17124   17192#
ADD1B    063424      10093   17126   17202#
ADD1C    063452      11012   17128   17213#
ADD2     063500      17132   17224#
ADD2A    063514      17134   17231#
ADD2B    063530      17136   17238#
ADD2C    063544      17138   17245#
ADD3     063560      17142   17252#
ADD3A    063576      17144   17259#
ADD3B    063614      17146   17266#
ADD3C    063632      17148   17273#
ADD4     063650      17152   17280#
ADD4A    063672      17154   17289#
ADD4B    063700      17156   17293#
ADD4C    063722      17158   17302#
ADD5     063744      17163   17311#
ADD5A    063764      17165   17319#
ADD5B    063770      17167   17323#
ADD5C    064004      17169   17329#
ADD6     064020      17173   17335#
ADD6A    064032      17175   17341#
ADD6B    064046      17177   17179   17347#
ADR.A    002172        565     574     663     746#    785     794
ALPHA    002200        615     622     746     749#    835     842
ALTBUF   055454       1072    1096    1688    1712    2183    2207   16005#
APTCSU=  000040      16436   16765#
APTENV=  000001      16355   16431   16726   16763#
APTSIZ=  000200        454   16762#
APTSPO=  000100      16433   16728   16764#
ASHN   = 076056        197#  12544
ASHNI  = 076156        206#  12697
ASHP   = 076076        217#  14511
ASHPI  = 076176        226#  14634
ASSEMB=  000010          1
ASWREG=  000000        130#
BEGIN    001510        481     484#  15837
BETA     002204        629     636     747     751#    849     856
BFADRS   000540        353#   1054*   1078*   1319*   1323*   1670*   1694*   1914*   1918*   2165*   2189*   2438*   2442*
                      2698*   2790*   2984*   3076*   3264*   3372*   3577*   3682*   3856*   3860*   4017*   4021*   4204*
                      4208*   4364*   4368*  15937   15974   16011
BF.EXP   000536        352#   1105*   1110*   1201    1224    1269*   1274*   1286    1718*   1878    2213*   2405
BIT0   = 000001        115#    520
BIT00  = 000001        105#    115    2644    2930    3214    3527    3838    4182   13851   13923   14187   14361   14461
                     16209
BIT01  = 000002        104#    114
BIT02  = 000004        103#    113
BIT03  = 000010        102#    112
BIT04  = 000020        101#    111
BIT05  = 000040        100#    110
BIT06  = 000100         99#    109
BIT07  = 000200         98#    108    4544    6429    6439   11894   11952   12027   12223   12320   12381   12444   12507
```

```
                        14230    14292    14406    14413
BIT08 = 000400             97#      107
BIT09 = 001000             96#      106
BIT1  = 000002            114#     4726
BIT10 = 002000             95#
BIT11 = 004000             94#    16266
BIT12 = 010000             93#
BIT13 = 020000             92#    16349
BIT14 = 040000             91#    16264
BIT15 = 100000             90#
BIT2  = 000004            113#     9258
BIT3  = 000010            112#    12830
BIT4  = 000020            111#    14766
BIT5  = 000040            110#    15181
BIT6  = 000100            109#     4554
BIT7  = 000200            108#
BIT8  = 000400            107#     4615
BIT9  = 001000            106#
BPTVEC= 000014            122#
BUFF1   061166           1319     1446     1454     1462     1470     1478     1486     1494     1500     1508     1516     1524     1532
                         1540     1548     1556     1565     1914     2040     2048     2054     2062     2064     2070     2438     2567
                         2575     2581     2589     2597     2640     2670     2679     2698     2702     2790     2796     2826     2883
                         2926     2956     2965     2984     2988     3076     3082     3113     3166     3208     3236     3245     3264
                         3268     3372     3376     3424     3478     3521     3549     3558     3577     3581     3682     3686     3731
                         3785     3828     3856     3868     4017     4027     4135     4176     4204     4221     4227     4364     4372
                         4378     4406     4470    16892#
BUFF2   061266           1323     1401     1408     1415     1417     1444     1452     1460     1468     1476     1484     1492     1502
                         1510     1518     1526     1534     1542     1550     1558     1567     1918     1996     2003     2012     2023
                         2038     2046     2056     2072     2442     2522     2529     2536     2550     2565     2573     2583     2591
                         2599     3832     3860     3876     4021     4137     4180     4208     4368     4472    16893#
BUFLEN= 000100             25#     1263     1282     1418     1477     1507     1870     1886     2023     2393     2397     2550     2817
                         2882     3103     3165     3415     3470     3473     3474     3477     3722     3777     3780     3781     3784
CBIT  = 000001             59#     1028     1644     2139     6018     6498
CC      000516            344#      582*     584*     596      606      802*     804*     816      826     1126*    1128*    1130     1732*
                         1734*    1736     2253*    2255*    2257     2719*    2721*    2723     3005*    3007*    3009     3301*    3303*
                         3305     3611*    3613*    3615     3946*    3948*    3950     4293*    4295*    4297     4389*    4391     5000*
                         5002*    5004     5108*    5110*    5112     5584*    5586*    5588     5692*    5694*    5696     6054*    6056*
                         6058     6134*    6136*    6138     6530*    6532*    6534     6610*    6612*    6614     7549*    7551*    7553
                         7658*    7660*    7662     8278*    8280*    8282     8382*    8384*    8386     9942*    9944*    9946    10118*
                        10120*   10122    10860*   10862*   10864    11037*   11039*   11041    11662*   11664*   11666    11772*   11774*
                        11776    12551*   12553*   12555    12705*   12707*   12709    12973*   12975*   12977    13132*   13134*   13136
                        13341*   13343*   13345    13502*   13504*   13506    13995*   13997*   13999    14067*   14069*   14071    14514*
                        14516*   14518    14642*   14644*   14646    14910*   14912*   14914    15068*   15070*   15072    15330*   15332*
                        15334    15492*   15494*   15496
CC.EXP  000520            345#     1024*    1026*    1028     1030     1130     1640*    1642*    1644     1646     1736     2135*    2137*
                         2139     2141     2257     2694*    2696*    2723     2980*    2982*    3009     3260*    3262*    3305     3573*
                         3575*    3615     3870*    3878*    3930*    3950     4277*    4279*    4297     4788*    4796*    4803*    4824*
                         4849*    4936*    5004     5317*    5328*    5333*    5350*    5369*    5397*    5437*    5456*    5490*    5517*
                         5588     5902*    5914*    5999*    6018*    6058     6325*    6339*    6388*    6432*    6462*    6490*    6498*
                         6534     7079*    7255*    7272*    7285*    7375     7406*    7420*    7432*    7466     7487     7511     7553
                         7847*    8109*    8127*    8140*    8282     9334*    9946    10246*   10250*   10864    11128*   11214*   11224*
                        11234*   11253*   11267*   11277*   11316*   11326*   11335*   11666    11846*   11911*   11944*   11976*   11985*
                        12018*   12036*   12043*   12100    12103*   12208    12239*   12271    12274*   12305    12366    12429    12456*
                        12492    12519*   12555    12906*   12977    13269*   13273*   13345    13460*   13602*   13684*   13694*   13704*
                        13723*   13737*   13747*   13786*   13796*   13805*   13999    14143*   14247*   14284*   14322*   14324*   14341*
                        14343*   14396*   14422*   14429*   14431*   14518    14843*   14914    15258*   15262*   15334    15449*
```

```
CHRSET  061766      3212    3274    3282    3284    3381    3384    3392    3480    3525    3587    3595    3597*   3691
                    3694    3704*   3787   12913   13096   13280   13469   14850   15034   15269   15458   16895#
CIS4EN  015716       523    4661    4687#
CIS5EN  031700      4729    8438    9220#
CIS6EN  044432      9261   12777   12792#
CIS7EN  052020     12833   14714   14729#
CIS8EN  053140     14769   15145#
CIS9EN  055114     15184   15568   15800#
CKSWR = 104406       139#  16263   16342   16365
CLRBUF  055346      1059    1083    1325    1675    1699    1920    2170    2194    2440    2700    3266    3374    3579
                    3684    4019    4023    4210   15931#
CLRDSB  055520      4780    5100    5309    5684    5900    5928    6126    6602    7077    7650    7845    7864    8374
                    9313   10054   10225   10973   11126   11863   12670   12885   13070   13248   13439   13600   13823
                   14141   14624   14822   15008   15237   15428   16043#
CLRREG  055330       560     780    2794    3080    3397    3702    4025    4381    5098    5682    6124    6600    7648
                    8372   10107   11026   13120   13492   14632   15057   15481   15902#
CMPC  = 076044       176#   3939
CMPCI = 076144       186#   4032
CMPN  = 076052       193#  11655
CMPNI = 076152       202#  11766
CMPNI1  041376     11815   11817   11819#
CMPP  = 076072       213#  13988
CMPPI = 076172       222#  14061
CMPPI1  050216     14111   14113   14115#
CMP1    062670     16923   16958#
CMP1A   062674     16925   16961#
CMP2    062700     16928   16965#
CMP2A   062712     16930   16970#
CMP3    062716     16933   16974#
CMP3A   062722     16935   16977#
CMP4    062744     16938   16987#
CMP4A   062760     16940   16992#
CMP5    062774     16943   16998#
CMP5A   063004     16945   17002#
CMP6    063014     16948   17007#
CMP6A   063020     16950   17010#
CMP7    063024     16953   17014#
CMP7A   063034     16955   17018#
COUNT   000466       332#    550*    562     593     650     672*    674     770*    782     813     877*    879     965*
                    1010    1303*   1306    1582*   1626    1898*   1901    2086*   2422*   2425    2613*   2644    2774*
                    2777    2897*   2930    3060*   3063    3181*   3214    3356*   3359    3494*   3527    3666*   3669
                    3801*   3838    4001*   4004    4151*   4182    4348*   4351    4755*   4959    5083*   5086    5284*
                    5543    5667*   5670    5848*   5875    6110*   6113    6273*   6300    6586*   6589    7020*   7051
                    7634*   7637    7819*   8357*   8360    9288*  10039*  10042   10200*  10958*  10961   11119*  11738*
                   11741   11837*  12652*  12657   12860*  13055*  13058   13223*  13424*  13427   13593*  14032*  14035
                   14132*  14605*  14610   14797*  14993*  14996   15212*  15413*  15416
CR    = 000015        19#  16474
CRLF  = 000200        20#  16445
CTL     000544       355#    530*   4735*   9267*  12839*  14775*  15190*  16393
CTLTBL  056570     16396   16407#
CTL4    060662     16407   16838#
CTL5    060677     16408   16841#
CTL6    060714     16409   16844#
CTL7    060731     16410   16847#
CTL8    060746     16411   16850#
CTL9    060763     16412   16853#
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CVTIL    031266    5982   6485   8980#
CVTLI    030362    4786   5315   8578#
CVTLN  = 076057     198#  5576
CVTLNI=  076157     207#  5686
CVTLP  = 076077     218#  4992
CVTLPI=  076177     227#  5102
CVTNAA   024267    6818   6963#
CVTNBB   024272    6821   6966#
CVTNCC   024275    6824   6969#
CVTNDD   024300    6827   6972#
CVTNEE   024303    6830   6975#
CVTNFF   024306    6833   6978#
CVTNGG   024311    6836   6981#
CVTNHH   024314    6839   6984#
CVTNII   024317    6842   6987#
CVTNJJ   024322    6845   6990#
CVTNL  = 076053     194#  6522
CVTNLA   024141    6740   6882#
CVTNLB   024154    6743   6888#
CVTNLC   024157    6746   6891#
CVTNLD   024162    6749   6894#
CVTNLE   024165    6752   6897#
CVTNLF   024170    6755   6900#
CVTNLG   024173    6758   6903#
CVTNLH   024176    6761   6906#
CVTNLI=  076153     203#  6604
CVTNLJ   024204    6767   6912#
CVTNLK   024207    6770   6915#
CVTNLL   024212    6773   6918#
CVTNLM   024215    6776   6921#
CVTNLN   024220    6779   6924#
CVTNLO   024223    6782   6927#
CVTNLP   024226    6785   6930#
CVTNLQ   024231    6788   6933#
CVTNLR   024234    6791   6936#
CVTNLS   024237    6794   6939#
CVTNLT   024242    6797   6942#
CVTNLU   024245    6800   6945#
CVTNLV   024250    6803   6948#
CVTNLW   024253    6806   6951#
CVTNLX   024256    6809   6954#
CVTNLY   024261    6812   6957#
CVTNLZ   024264    6815   6960#
CVTNL$   024201    6764   6909#
CVTNL1   024065    6713   6848#
CVTNL2   024067    6716   6851#
CVTNL3   024071    6719   6854#
CVTNL4   024077    6722   6858#
CVTNL5   024104    6725   6862#
CVTNL6   024114    6728   6867#
CVTNL7   024117    6731   6870#
CVTNL8   024125    6734   6874#
CVTNL9   024133    6737   6878#
CVTNP  = 076055     196#  8271
CVTNPI=  076155     205#  8376
CVTNP1   030216    8449   8485#
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CVTNP2  030222      8453    8489#
CVTNP3  030226      8457    8493#
CVTNP4  030232      8461    8497#
CVTNP5  030260      8465    8507#
CVTNP6  030272      8469    8513#
CVTNP7  030306      8473    8519#
CVTNP8  030330      8477    8527#
CVTNP9  030340      8481    8532#
CVTPL = 076073       214#   6046
CVTPLI= 076173       223#   6128
CVTPL1  022250      6212    6230#
CVTPL2  022251      6215    6232#
CVTPL3  022254      6218    6234#
CVTPL4  022257      6221    6236#
CVTPL5  022265      6224    6239#
CVTPL6  022271      6227    6242#
CVTPN = 076054       195#   7541
CVTPNI= 076154       204#   7652
CVTPN1  026352      7732    7770#
CVTPN2  026353      7736    7772#
CVTPN3  026354      7740    7774#
CVTPN4  026357      7745    7776#
CVTPN5  026372      7749    7781#
CVTPN6  026376      7753    7784#
CVTPN7  026402      7757    7787#
CVTPN8  026405      7761    7789#
CVTPN9  026413      7765    7792#
DATA00  000560       364#    979*   1000    1190    1216    1237    1240    1596*   1616    1794    1800    1835    1847
                    2100*   2121    2321    2347    2369    2372    2626*   2638    2665    2671    2676    2911*   2924
                    2951    2957    2962    3195*   3206    3231    3237    3242    3508*   3519    3544    3550    3555
                    3815*   3826    3864    3905    3925    4165*   4178    4248    4254    4769*   4790    4915    4951
                    5298*   5319    5322    5535    5862*   5908    5984    6033    6287*   6333    6365    6509    7034*
                    7088    7108    7530    7833*   7872    7894    8055    8247    9322*   9341    9348    9433    9478
                    9500    9520    9538    9557    9579   10234*  10257   10264   10349   10394   10416   10436   10454
                   10473   10495   11141*  11161   11174   11209   11219   11242   11262   11272   11283   11291   11370
                   11379   11402   11406   11431   11460   11494   11642   11857*  11870   11908   11938   11955   12030
                   12079   12145   12151   12176   12180   12206   12221   12241   12245   12266   12279   12303   12318
                   12342   12364   12379   12407   12442   12505   12530   12894*  12916   12941   13079*  13099   13257*
                   13283   13309   13448*  13472   13615*  13636   13679   13689   13712   13732   13742   13753   13761
                   13831   13975   14152*  14167   14244   14262   14278   14288   14298   14402   14416   14450   14497
                   14831*  14853   14878   15017*  15037   15246*  15272   15298   15437*  15461
DATA01  000562       365#    981*   1002    1184    1598*   1618    1670    1799    1843    2102*   2123    2165    2313
                    2628*   2642    2705    2913*   2991    3197*   3231    3243    3246    3269    3510*   3544    3556
                    3559    3582    3817*   3830    3864    3915    3927    4167*   4212    4215    4252    4266    4269
                    4771*   4782    4955    5300*   5311    5539    5864*   5906    6035    6289*   6329    6446    6511
                    7036*   7103    7168    7532    7835*   7855    7866    8069    8176    9324*   9344   10236*  10260
                   11143*  11154   11231   11247   11250   11260   11381   11408   11436   11462   11481   11859*  11918
                   11928   11940   11959   11963   12033   12040   12052   12064   12113   12158   12164   12198   12202
                   12251   12255   12295   12299   12359   12425   12453   12466   12471   12516   12535   12574   12896*
                   12917   13081*  13100   13259*  13284   13450*  13473   13617*  13629   13701   13717   13720   13730
                   13828   13836   13881   14154*  14254   14280   14290   14301   14309   14326   14345   14404   14419
                   14426   14441   14452   14502   14545   14833*  14854   15019*  15038   15248*  15273   15439*  15462
DATA02  000564       366#    983*   1004    1102    1190    1193    1236    1263    1278    1600*   1620    1794    1797
                    1801    1834    1846    1850    1870    1874    2104*   2125    2321    2324    2371    2393    2401
                    2630*   2665    2677    2680    2703    2915*   2951    2963    2966    2989    3819*   3836    3890
                    3893    3896    3899    3905    3915    3925    3927    4773*   4784    4957    5302*   5313    5541
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                         7038*   7091    7161    7299    7352    7356    7369    7373    7396    7400    7424    7437    7460
                         7485    7507    7534    7837*   8038    8046    8058    8251    9326*   9370    9377    9440    9622
                         9644    9664    9682    9700    9722    10238*  10286   10293   10356   10540   10562   10582   10600
                         10618   10640   11145*  11188   11211   11229   11244   11262   11272   11283   11516   11525   11549
                         11596   11630   11647   11861*  11892   11952   11968   11999   12027   12221   12223   12318   12320
                         12379   12381   12442   12444   12505   12507   12540   12898*  12923   12946   13083*  13106   13261*
                         13290   13314   13452*  13479   13619*  13658   13681   13699   13714   13732   13742   13753   13903
                         13980   14156*  14228   14292   14314   14368   14406   14413   14507   14835*  14860   14883   15021*
                         15044   15250*  15279   15303   15441*  15468
DATA03   000566          367#    985*    1006    1186    1239    1279    1281    1602*   1622    1694    1718    1792    1833
                         1845    1849    1873    1885    2106*   2127    2189    2213    2311    2368    2396    2400    9328*
                         9373    10240*  10289   11147*  11181   11221   11247   11527   11551   11574   11598   11617   12900*
                         12924   13085*  13107   13263*  13291   13454*  13480   13621*  13651   13691   13717   13900   13908
                         13953   14837*  14861   15023*  15045   15252*  15280   15443*  15469
DATA04   000570          368#    987*    1008    1244    1604*   1624    1826    2108*   2129    2376    9330*   9399    9406
                         9447    9765    9787    9789    9812    9815    9837    9840    9862    9884    10242*  10315   10322
                         10363   10683   10705   10707   10730   10733   10755   10758   10780   10802   12902*  12930   12951
                         13087*  13113   13265*  13297   13319   13456*  13486   14839*  14867   14888   15025*  15051   15254*
                         15286   15308   15445*  15475
DATA05   000572          369#    989*    1056    1064    1606*   1672    1680    2110*   2167    2175    9332*   9402    10244*
                         10248*  10318   12904*  12931   13089*  13114   13267*  13271*  13298   13458*  13462*  13487   14841*
                         14868   15027*  15052   15256*  15260*  15287   15447*  15451*  15476
DATA06   000574          370#    991*    1080    1088    1266    1274    1608*   1696    1704    2112*   2191    2199
DATTYP   000462          330#    5322*   5323*   5337    5356    5451    5464    5466    5470    5498    5500    5504    5984*
                         5985*   5987    6365*   6366*   6372    6374    6394    6396    6400    6443    6451    6453    7313*
                         7336*   7340    7364    7393    7412    7457    7481    7503    7535    7894*   7895*   7900    7927
                         7944    7970    7994    8014    8071    8099    9746*   9748*   9750    9774    10664*  10666*  10668
                         10692   11132*  11359   11362*  11375   11399   11428   11456   11476   11641   11725*  11728   11848*
                         12126*  12132*  12136   12171   12236   12263   12339   12400   12462   12531   12536   12575   13606*
DELAY    000470          333#    4501*   4507    4583*   4584*
DESCR0   000614          379#    9500*   9520*   9521*   9538*   9539*   9557*   9558*   9579*   9580*   9919    10416*  10436*
                         10437*  10454*  10455*  10473*  10474*  10495*  10496*  10837
DESCR1   000616          380#    9451*   9921    10367*  10839
DESCR2   000620          381#    9644*   9664*   9665*   9682*   9683*   9700*   9701*   9722*   9723*   9923    10562*  10582*
                         10583*  10600*  10601*  10618*  10619*  10640*  10641*  10841
DESCR3   000622          382#    9453*   9925    10369*  10843
DESCR4   000624          383#    9787*   9812*   9813*   9837*   9838*   9862*   9863*   9884*   9885*   9927    10705*  10730*
                         10731*  10755*  10756*  10780*  10781*  10802*  10803*  10845
DESCR5   000626          384#    9455*   9929    10371*  10847
DIAGMC=  000000          1
DISPLA   000430          312#    451*    16279*  16345*
DISPRE   000174          246#    312     451
DIVP   = 076075          216#    15323
DIVPI  = 076175          225#    15484
DOIT     036566          10833#  10835
DOIT1    033776          9915#   9917
DSBUF1   062370          4832    4843    4870    5406    5448    5904    5923    6327    6348    6408    6471    6476    7870
                         7976    7985*   8020*   8025*   8249    8621    8674    8943    8954    8993    9350    9430    9432
                         9451    9475*   9477    9514*   9550*   9590*   9595*   10066   10266   10346   10348   10367   10391*
                         10393   10430*  10466*  10506*  10511*  10985   11157   11293   11367*  11369   11378   11393   11405
                         11434   11459   11479   11493   11644   11872   12148*  12150   12174*  12179   12244   12278   12348*
                         12353*  12406   12481*  12486*  12533   12673   12785   12918   12944   13101   13285   13312   13474
                         13632   13763   13826   13977   14165   14500   14626*  14628*  14630*  14724   14855   14881   15039
                         15274   15301   15463   15793   16049   16900#  17356   17367
DSBUF2   062432          9379    9437    9439    9453    9619*   9621    9658*   9694*   9733*   9738*   10082   10295   10353
                         10355   10369   10530   10537*  10539   10576*  10612*  10651*  10656*  11001   11184   11295   11513*
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                       11515    11524    11539    11548    11572    11595    11615    11629    11649    12925    12949    13108    13292
                       13317    13481    13654    13765    13898    13982    14862    14886    15046    15281    15306    15470    15795
                       16904#   17358    17369
DSLEN1   000512          342#    4800     4812     4829     4834     4840     4851*    4855     4858     4872     4877     4880     4885*
                        4892     4904*    5330     5379     5403     5408     5412     5416     5431     5434     5908*    5909*    5911
                        5925     5930     5937*    5942     5964*    6333*    6334*    6336     6350     6352     6369     6410     7088*
                        7089*    7099     7110     7140     7143     7164     7266     7282     7427     7872*    7873*    7880     7903
                        7930     7947     7973     8055*    8056*    8061     8121     8137     8151     8154     8177     8589*    8643*
                        8956*    8957*
DSLEN2   000514          343#    4790*    4791*    4793     4809     4815     4829     4840     4845     4851     4855     4862     5319*
                        5320*    5325     5377     5384     5401     5412     5415     5431     5435     7091*    7140     7148     7250
                        7268     7282     7415     8058*    8059*    8106     8123     8137     8151     8159     8170
DSTADR=  000000        16168#   16169
DSTMP0   000552          358#    7296*    7350     7463     9430*    9475     9541    10346*   10391    10457    11159*   11367    12110*
                       12161    13634*
DSTMP1   000553          359#    7302*    7358     7439     9435*    9480     9523    10351*   10396    10439    11177*   11372    12116*
                       12166    13649*
DSTMP2   000554          360#    9437*    9619     9685    10353*   10537    10603    11186*   11513    13656*
DSTMP3   000555          361#    9442*    9624     9667    10358*   10542    10585    11201*   11518    13671*
DSTMP4   000556          362#    9444*    9762     9843    10360*   10680    10761
DSTMP5   000557          363#    9449*    9767     9818    10365*   10685    10736
DS.DST   062474         4953     5059     5066     5161     5179     5200     5266     5537     5643     5650     5745     5765     5831
                        7049     7322     7325     7537     7606     7693     7700     7707     7714     7802     8253     8335     8342
                        8417     8424     8431     8542     9455     9911    10000    10007    10163    10170    10371    10829    10919
                       10926    11082    11089    12470    12538    12584    12596    12741    12762    12787    12954    13031    13038
                       13177    13193    13322    13400    13407    13547    13563    14505    14555    14568    14678    14699    14726
                       14891    14969    14976    15113    15129    15311    15389    15396    15537    15553    15797    16908#   17360
                       17371
DS.EXP   062536         4798*    4819     4836     4847     4866     5061     5343*    5348*    5362*    5367*    5382     5410     5418
                        5478     5507     5645     7160     7236     7296     7298     7350*    7355     7367*    7372     7399     7436
                        7473*    7484     7506     7514*    7519*    7604     7611     8043     8174     8337     9408     9444     9446
                        9762*    9764     9804*    9854*    9895*    9900*   10002    10098    10165    10324    10360    10362    10680*
                       10682    10722*   10772*   10813*   10818*   10921    11017    11084    11921    11958    12045    12063    12082
                       12110    12112    12161*   12163    12196*   12201    12254    12298    12390    12394*   12424    12465    12496*
                       12501*   12512*   12598    12631    12636    12932    13033    13115    13179    13186    13299    13402    13488
                       13549    13556    14258    14305    14330    14349    14445    14566    14869    14971    15053    15115    15122
                       15288    15391    15477    15539    15546    16912#
EMTVEC=  000030          125#
END1     034246         9466    10035#
END2     034242         9610    10030#
END21    037036        10382    10954#
END22    037032        10526    10949#
END23    037026        10671    10944#
END3     034236         9753    10025#
ERR      000550          357#     586*     806*    4490*    4647*    4741*    9273*   12845*   14781*   15196*   16357    16383
ERRFLG   000454          327#     532*    1188*    1198     1221     1255     1261*    1295     1339*    1431     1790*    1806     1839
                        1855     1890     1934*    2010*    2025     2319*    2329     2352     2387     2414     2539*    2552     4645*
                        4670     4678*    4737*    5063*    5068     5189*    5202     5647*    5652     5754*    5767     7608*    7613
                        8333*    8340     9269*   10004*   10009    10167*   10172    10923*   10928    11086*   11091    12592*   12603
                       12609*   12618    12757*   12760    12770*   12841*   13035*   13040    13190*   13195    13404*   13409    13560*
                       13565    14570*   14575    14581*   14590    14694*   14697    14705*   14777*   14973*   14978    15126*   15131
                       15192*   15393*   15398    15550*   15555    16278*   16343*
ERRHDR   061000        16381    16861#
ERROR    056274          599      609      618      625      632      639      646      656      666      696      701      708      715
                         722      729      736      819      829      838      845      852      859      866      873      899      904
                         911      918      925      932      939      946     1133     1140     1147     1154     1161     1168     1175
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                          1204     1227     1247     1289     1353     1362     1369     1376     1383     1390     1397     1404     1411
                          1425     1739     1746     1753     1760     1767     1774     1781     1812     1829     1861     1881     1948
                          1957     1964     1971     1978     1985     1992     1999     2006     2019     2260     2267     2274     2281
                          2288     2295     2302     2335     2358     2379     2408     2474     2483     2490     2497     2504     2511
                          2518     2525     2532     2546     2726     2733     2740     2747     2754     2761     2768     2813     2822
                          2829     2836     2843     2850     2857     3012     3019     3026     3033     3040     3047     3054     3099
                          3109     3116     3123     3130     3137     3144     3308     3315     3322     3329     3336     3343     3350
                          3411     3420     3427     3434     3441     3448     3455     3618     3625     3632     3639     3646     3653
                          3660     3718     3727     3734     3741     3748     3755     3762     3953     3960     3967     3974     3981
                          3988     3995     4047     4054     4061     4068     4075     4082     4089     4300     4307     4314     4321
                          4328     4335     4342     4395     4402     4409     4416     4423     4430     4437     4444     4575     4657
                          5007     5014     5021     5028     5035     5042     5049     5074     5115     5122     5129     5136     5143
                          5150     5157     5166     5175     5185     5196     5591     5598     5605     5612     5619     5626     5633
                          5658     5699     5706     5713     5720     5727     5734     5741     5750     5761     6061     6068     6075
                          6082     6089     6096     6103     6141     6148     6155     6162     6169     6176     6183     6190     6197
                          6537     6544     6551     6558     6565     6572     6579     6617     6629     6641     6648     6655     7556
                          7563     7570     7577     7584     7591     7598     7619     7665     7677     7689     7696     7703     7710
                          7717     8285     8292     8299     8306     8313     8320     8327     8348     8389     8401     8413     8420
                          8427     8434     9949     9956     9963     9970     9977     9984     9991    10015    10125    10142    10154
                         10178    10867    10874    10881    10888    10895    10902    10909    10934    11044    11061    11073    11097
                         11669    11676    11683    11690    11697    11704    11711    11779    11791    11803    12558    12570    12580
                         12587    12621    12712    12724    12736    12746    12753    12768    12980    12987    12994    13001    13008
                         13015    13022    13046    13139    13156    13168    13201    13348    13355    13362    13369    13376    13383
                         13390    13415    13509    13526    13538    13571    14002    14014    14026    14074    14086    14098    14521
                         14531    14541    14551    14558    14593    14649    14661    14673    14683    14690    14707    14917    14924
                         14931    14938    14945    14952    14959    14984    15075    15092    15104    15137    15337    15344    15351
                         15358    15365    15372    15379    15404    15499    15516    15528    15561    16341#
ERRTBL   056562          16386    16403#
ERRTMP   000472            334#   16383*   16384*   16385*   16386*   16387    16393*   16394*   16395*   16396*   16397
ERRVEC=  000004            118#     435*     436*
ERR1     061041          16403    16867#
ERR2     061072          16404    16872#
ERR3     061121          16405    16876#
GAMMA    002210            748      753#     863      870
GTSWR =  104405            138#     482
HT    =  000011             17#   16443
ILLMSG   060534          15889    16823#
ILLOP =  076033            231#    4655
ILLRES   055314            437     4659     4682    15889#
ILLTST   015574           4602     4639#
INC1     032404           9461#   10033
INC2     032770           9605#   10028
INC21    035170          10377#   10952
INC22    035554          10521#   10947
INC23    036144          10666#   10942
INC3     033354           9748#   10023
INTFLG   000456            328#
INTPAS   000460            329#    4498     4503*
INTST    015202           4448     4484#
IOTVEC=  000020            123#     439*     440*
LENGTH=  000004          16168#   16173
LF    =  000012             18#   16478
LKS   =  177546             24#
LOCC  =  076040            172#    2712
LOCCI =  076140            182#    2801
LOOP2    015402           4558#    4562
```

```
LTCVEC= 000100      129#    447*
L2D0  = 076020      149#    569
L2D1  = 076021      150#
L2D2  = 076022      151#
L2D3  = 076023      152#
L2D4  = 076024      153#    578
L2D5  = 076025      154#
L2D6  = 076026      155#
L2D7  = 076027      156#    686
L3D0  = 076060      158#
L3D1  = 076061      159#
L3D2  = 076062      160#
L3D3  = 076063      161#    789
L3D4  = 076064      162#
L3D5  = 076065      163#    798
L3D6  = 076066      164#
L3D7  = 076067      165#    887
MATC  = 076045      177#   4286
MATCI = 076145      187#   4383
MFPT  = 000007      146#
MOVC  = 076030      169#   1119
MOVCI = 076130      179#   1341
MOVRC = 076031      170#   1725
MOVRCI= 076131      180#   1936
MOVTC = 076032      171#   2246    4564
MOVTCI= 076132      181#   2460
MSGADR  000546      356#    477*  15821*  15827*  15877*  15889*  16319*  16352*  16381*  16387*  16389*  16397*  16399*
                  16430   16448*  16544*  16585*  16587*  16591*  16605*  16617*  16637*  16687*  16691*  16696*
MULP  = 076074      215#  14903
MULPI = 076174      224#  15060
MUL1    054504    15575   15644#
MUL1A   054526    15577   15652#
MUL1B   054552    15579   15661#
MUL1C   054614    15581   15675#
MUL2    054656    15585   15689#
MUL2A   054664    15587   15694#
MUL2B   054676    15589   15699#
MUL2C   054714    15591   15706#
MUL3    054732    15595   15713#
MUL3A   054742    15597   15718#
MUL3B   054746    15599   15722#
MUL3C   054756    15601   15727#
MUL4    054766    15605   15625   15732#
MUL4A   054776    15607   15627   15737#
MUL4B   055002    15609   15629   15741#
MUL4C   055006    15611   15631   15745#
MUL5    055012    15615   15749#
MUL5A   055016    15617   15753#
MUL5B   055026    15619   15758#
MUL5C   055032    15621   15762#
MUL7    055036    15635   15768#
MUL7A   055046    15637   15772#
MUL7B   055054    15639   15776#
MUL7C   055066    15641   15781#
NBIT  = 000010       56#   4936    5350    5369    5456    5490    5517    5999    6388    6432    6462    6490    7255
                   7375    7406    7420    7432    7466    7487    7511    8109   11224   11234   11253   11267   11277
```

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                      11316   11326   11911   12103   12239   12274   13694   13704   13723   13737   13747   13786   13796
                      14247   14324   14343   14431
NL1       024334       6997    7001#
NP1       030354       8540    8544#
OFFSET    000510        341#   3836*   3867    3875
OVPNCH    055254       5494    7449    7473    7961    7985    9532    9550    9676    9694    9829    9854   10448   10466
                      10594   10612   10747   10772   11422   11450   11565   11588   12333   12394   15849#
PACK      055646      12919   12926   12933   13102   13109   13116   13286   13293   13300   13475   13482   13489   14856
                      14863   14870   15040   15047   15054   15275   15282   15289   15464   15471   15478   16167#
PHALT     056266      16322   16328#
PLI       022304       6250    6254#
PN1       026426       7800    7804#
PR0     = 000000         46#   4556
PR1     = 000040         47#
PR2     = 000100         48#
PR3     = 000140         49#
PR4     = 000200         50#
PR5     = 000240         51#
PR6     = 000300         52#
PR7     = 000340         53#   4494    4518    4590    4651
PS      = 177776         21#     22
PSW     = 177776         22#    534*    582     802    1024    1126    1640    1732    2135    2253    2694    2719    2807
                       2980    3005    3093    3260    3301    3405    3573    3611    3712    3946    4040    4277    4293
                       4389    4492    4494*   4556*   4590*   4600*   4649    4651*   4680*   4739*   5000    5108    5584
                       5692    6054    6134    6530    6610    7549    7658    8278    8382    9271*   9942   10118   10860
                      11037   11662   11772   12551   12705   12843*  12973   13132   13341   13502   13995   14067   14514
                      14642   14779*  14910   15068   15194*  15330   15492
PWRMSG    060630      16319   16833#
PWRVEC= 000024          124#    443*    444*  16289*  16290*  16299*  16305*  16317*  16318*
RDCHR = 100407          140#  16683
RDLIN = 104410          141#
RESREG    055614       4598    8959    9213   16106#
RESRTN    015660       4653    4668#
RESVEC= 000010          119#    437*    438*   4653*   4659*   4682*
R0.EXP    000522        346#   1034*   1039*   1040*   1137    1650*   1655*   1656*   1743    2145*   2150*   2151*   2264
                       2668*   2676*   2677*   2692    2730    2954*   2962*   2963*   2978    3016    3234*   3242*   3243*
                       3258    3312    3547*   3555*   3556*   3571    3622    3889*   3890*   3908*   3957    4236*   4257*
                       4265*   4266*   4275    4304    4975*   5011    5559*   5595    5871*   6065    6296*   6541    7045*
                       7560    8259*   8289    9305*   9953   10217*  10871   12877*  12984   13240*  13352   14814*  14921
                      15229*  15341
R1.EXP    000524        347#   1044*   1144    1660*   1750    2155*   2271    2670*   2671*   2679*   2680*   2737    2956*
                       2957*   2965*   2966*   3023    3236*   3237*   3245*   3246*   3319    3549*   3550*   3558*   3559*
                       3629    3892*   3893*   3910*   3911*   3964    4238*   4259*   4260*   4268*   4269*   4311    4977*
                       5018    5561*   5602    5873*   6072    6298*   6548    7047*   7567    8261*   8296    9960   10878
                      12991   13359   14928   15348
R2.EXP    000526        348#   1046*   1151    1662*   1757    2157*   2278    2684*   2744    2970*   3030    3250*   3326
                       3563*   3636    3895*   3896*   3918*   3971    4240*   4318    4979*   5025    5563*   5609    5916*
                       6003*   6008*   6012    6079    6341*   6492    6555    7539*   7574    8263*   8303    8989*   9007*
                       9009*   9029*   9031*   9051*   9053*   9073*   9075*   9095*   9097*   9117*   9137*   9157*   9177*
                       9195*   9202*   9207*   9967   10885   12998   13366   14935   15355
R3.EXP    000530        349#   1048*   1158    1664*   1764    2159*   2285    2686*   2751    2972*   3037    3252*   3333
                       3565*   3643    3898*   3899*   3920*   3921*   3978    4242*   4325    4981*   5032    5565*   5616
                       5918*   6001*   6005    6014    6086    6343*   6494    6562    7049*   7581    8265*   8310    8991*
                       9005*   9027*   9049*   9071*   9093*   9115*   9135*   9155*   9175*   9193*   9200*   9204    9974
                      10892   13005   13373   14942   15362
R4.EXP    000532        350#   1050*   1165    1666*   1771    2161*   2292    2688*   2758    2974*   3044    3254*   3340
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                            3567*    3650     3901*    3985     4244*    4332     4983*    5039     5567*    5623     5891*    6093     6316*
                            6569     7067*    7588     8267*    8317     9931*    9981    10849*   10899    12962*   13012    13330*   13380
                           14899*   14949    15319*   15369
R5.EXP   000534              351#    1052*    1172     1668*    1778     2163*    2299     2690*    2765     2976*    3051     3256*    3347
                            3569*    3657     3903*    3992     4246*    4339     4985*    5046     5569*    5630     5893*    6100     6318*
                            6576     7069*    7595     8269*    8324     9933*    9988    10851*   10906    12964*   13019    13332*   13387
                           14901*   14956    15321*   15376
SAVPSW   000612              378#    4492*    4600     4649*    4680
SAVREG   055562             4525     8585     8987    16079#
SAVR0    000576              372#   15933*   15950    15970*   15987    16007*   16024    16045*   16062    16081*   16108
SAVR1    000600              373#   15935*   15952    15972*   15989    16009*   16026    16047*   16064    16083*   16110
SAVR2    000602              374#   16085*   16112
SAVR3    000604              375#   16087*   16114
SAVR4    000606              376#   16089*   16116
SAVR5    000610              377#   16091*   16118
SCANC  = 076042              174#    3294
SCANCI=  076142              184#    3399
SETBUF   055410             1067     1091     1321     1683     1707     1916     2178     2202     2444     2792     2986     3078     3858
                            3862     4206     4366     4370    15968#
SGNDGT   023470             6416     6668#
SIGN0    000446              324#    4924     5340     5359     5453     5485     5512     6331*    6386*    6434*    6460*    6487     7114*
                            7122*    7127*    7252     7417     7429     7442     7855*    7908     7954     7978     7997     8017     8587*
                            8600*    8612     8658     9197     9346*    9361*    9502     9525     9543     9563     9587    10262*   10277*
                           10418    10441    10459    10479    10503    11130*   11260*   11264    11274    11313    11323    11841*   11906
                           12182    12204    12225    12269    12281    12301    12322    12345    12362    12383    12409    12427    12446
                           12478    12490    12509    12644*   12647    13604*   13730*   13734    13744    13783    13793    14136*   14172
                           14207    14242    14260    14597*   14600
SIGN1    000450              325#    9375*    9390*    9646     9669     9687     9706     9730    10291*   10306*   10564    10587    10605
                           10624    10648
SIGN2    000452              326#    9404*    9421*    9792     9822     9847     9868     9892    10320*   10337*   10710    10740    10765
                           10786    10810
SKPC   = 076041              173#    2998
SKPCI  = 076141              183#    3087
SPACE    064102             4535    17377#
SPACEY   070102            17379#
SPACE1   060660            16389    16837#
SPANC  = 076043              175#    3604
SPANCI=  076143              185#    3706
SRCADR=  000002            16168#   16171
STACK  = 000776               12#
START    001200              255       425#  16329
STKLMT=  177774               23#
SUBN   = 076051              192#   10853
SUBNI  = 076151              201#   11029
SUBP   = 076071              212#   13334
SUBPI  = 076171              221#   13494
SWR      000426              311#     431      450*     456*     514     4720     9252    12824    14760    15175    16264    16266    16297
                           16310*   16349    16362    16574    16615*
SWREG    000176              247#     311      450    16574    16589
SW0    = 000001               87#
SW00   = 000001               77#      87
SW01   = 000002               76#      86
SW02   = 000004               75#      85
SW03   = 000010               74#      84
SW04   = 000020               73#      83
SW05   = 000040               72#      82
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SW06   = 000100      71#     81
SW07   = 000200      70#     80
SW08   = 000400      69#     79
SW09   = 001000      68#     78
SW1    = 000002      86#
SW10   = 002000      67#
SW11   = 004000      66#
SW12   = 010000      65#
SW13   = 020000      64#
SW14   = 040000      63#
SW15   = 100000      62#
SW2    = 000004      85#
SW3    = 000010      84#
SW4    = 000020      83#
SW5    = 000040      82#
SW6    = 000100      81#
SW7    = 000200      80#
SW8    = 000400      79#
SW9    = 001000      78#
TAB89    054304    14797    14799    15015    15212    15214    15435    15572#
TADD     063200     9288     9290    10200    10202    12860    12862    13077    13223    13225    13446    17119#
TADDI    064052    10063    10079    10095    10112    10114    10116    10982    10998    11014    11031    11033    11035    17355#
TADDPI   064066    13126    13128    13130    13181    13496    13498    13500    13551    17366#
TASH     063044    11837    11839    14132    14134    17033#
TASHNI   044422    12699    12701    12784#
TASHPI   052010    14636    14638    14723#
TBITVE=  000014      120#
TCMP     062576    11119    11121    13593    13595    16920#
TCMPC    014152     3801     3803     4099#
TCMPCI   014234     4034     4036     4134#
TCMPNI   041366    11768    11770    11814#
TCMPPI   050206    14063    14065    14110#
TCVLNI   021164     5688     5690     5829#
TCVLPI   017426     5104     5106     5264#
TCVNLI   024324     6606     6608     6645     6995#
TCVNPI   030344     8378     8380     8538#
TCVPLI   022274     6130     6132     6187     6194     6248#    6652
TCVPNI   026416     7654     7656     7798#
TCVTLN   021052     5284     5286     5778#
TCVTLP   017314     4755     4757     5213#
TCVTNL   023576     6273     6275     6710#
TCVTNP   030126     7819     7821     8446#
TCVTPL   022216     5848     5850     6209#
TCVTPN   026262     7020     7022     7729#
TEMPO    000474      335#     514*     515*     517      520     1281*    1282*    1293     1417*    1418*    1429     1833*    1834*
                    1835*    1837     1849*    1850*    1853     1885*    1886*    1888     2220*    2223*    2225     2396*    2397*
                    2398*    2412     2702*    2703*    2705*    2796*    2797*    2799*    2807*    2809     2817*    2819     2988*
                    2989*    2991*    3082*    3083*    3085*    3093*    3095     3103*    3104*    3106     3268*    3269*    3271*
                    3284*    3285*    3287*    3376*    3377*    3379*    3392*    3393*    3395*    3405*    3407     3415*    3417
                    3581*    3582*    3584*    3686*    3687*    3689*    3712*    3714     3722*    3724     3867*    3868*    3875*
                    3876*    3882*    4027*    4028*    4030*    4040*    4042*    4044     4221*    4222*    4224     4251*    4252*
                    4254     4496*    4566     4572     4618*    4673*    4674*    4720*    4721*    4723     4726     4815*    4817*
                    4820     4858*    4860*    4868     4899*    4900*    4902     5443*    5444*    5446     6352*    6358*    6360
                    6380*    6381*    6383     6414*    6424     8604*    8605*    8609     9252*    9253*    9255     9258     9432*
                    9433*    9435     9439*    9440*    9442     9446*    9447*    9449     9459*    9461*    9463     9487    10348*
                   10349*   10351    10355*   10356*   10358    10362*   10363*   10365    10375*   10377*   10379    10403    11892*
```

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                     11894   11897*  11901*  11956   12031   12040   12071   12406*  12407*  12412*  12417*  12424*  12425*
                     12433*  12438*  12449*  12465*  12466*  12468*  12470*  12471*  12473*  12574*  12575*  12577   12824*
                     12825*  12827   12830   14228*  14230   14233*  14237*  14299   14417   14426   14436   14448   14453
                     14545*  14546*  14548   14760*  14761*  14763   14766   15175*  15176*  15178   15181
TEMP1     000476       336#   4529*   4560*   4862*   4864*   4867    6420*   6424    8046*   8047*   8086    8101    9603*
                      9605*   9607    9631   10519*  10521*  10523   10549   11500*  11505   11508*  11521   11545   11569
                     11592   11612   11646   11715*  11718   12030*  12031*  12033   14416*  14417*  14419
TEMP2     000500       337#   9477*   9478*   9480*   9505*   9510*   9532*   9560    9582   10393*  10394*  10396*  10421*
                     10426*  10448*  10476   10498
TEMP3     000502       338#   9621*   9622*   9624*   9649*   9654*   9676*   9703    9725   10539*  10540*  10542*  10567*
                     10572*  10594*  10621   10643
TEMP4     000504       339#   4507*   4529    4568    4583    4623*   9764*   9765*   9767*   9795*   9800*   9829*   9865
                      9887   10682*  10683*  10685*  10713*  10718*  10747*  10783   10805
TEMP5     000506       340#   4613*   4615    5990*   5991*   5993    5995
TIMMSG    060466     15877   16816#
TIMOUT    055300       435   15877#
TITLE     060434       477   16811#
TKB     = 177562        29#  16578   16598   16655   16661
TKS     = 177560        28#  16576   16595   16621*  16653   16659
TKVEC   = 000060       127#
TLOCC     010372      2613    2615    2867#
TLOCCI    010416      2803    2882#
TMATC     015150      4151    4153    4454#
TMATCI    015172      4385    4387    4469#
TMOVC     004134       965     967    1441#
TMOVCI    004460      1343    1345    1564#
TMOVRC    006000      1582    1584    2035#
TMOVTC    007436      2086    2088    2562#
TMULPI    055100     15062   15064   15066   15117   15486   15488   15490   15541   15792#
TMVRCI    006072      1938    1940    2069#
TMVTCI    007530      2462    2464    2596#
TPB     = 177566        31#   4550*   4552*  16473*
TPS     = 177564        30#   4514*   4544    4554*   4596*   4611*  16471
TPSRVC    015532      4516    4609#
TPVEC   = 000064       128#   4516*   4518*   4592*   4594*
TRANS     061366      2131    2233    2317    2458*   2468    4541   16894#
TRAPVE= 000034         126#    441*    442*
TRTVEC= 000014         121#
TSCANC    012230      3181    3183    3465#
TSCNCI    012246      3401    3403    3477#
TSKPC     011262      2897    2899    3154#
TSKPCI    011300      3089    3165#
TSPANC    013152      3494    3496    3772#
TSPNCI    013170      3708    3710    3784#
TSTCAS    000542       354#    967*    977    1301*   1584*   1594    1896*   2088*   2098    2420*   2615*   2624    2772*
                      2899*   2909    3058*   3183*   3193    3354*   3496*   3506    3664*   3803*   3813    3999*   4153*
                      4163    4346*   4757*   4767    5081*   5286*   5296    5665*   5850*   5860    6108*   6275*   6285
                      6584*   7022*   7032    7632*   7821*   7831    8355*   9290*   9320   10037*  10202*  10232   10956*
                     11121*  11139   11736*  11839*  11855   12650*  12862*  12892   13053*  13225*  13255   13422*  13595*
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TYPON   = 104404       137#
TYPOS   = 104403       136#  15824
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                      685      696#    701#    708#    715#    722#    729#    736#    768#    769     770#    771     780#
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$TSK5 = 052207        9492#   9498    9499#   9600    9636#   9642    9643#   9743    9779#   9785    9786#   9905   10408#
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                     13795#  13798   14463#  14469   14470#  14473
$TSK6 = 051444        9492#   9517    9535    9554    9576    9599    9636#   9661    9679    9697    9719    9742    9779#
                      9809    9834    9859    9881    9904   10408#  10433   10451   10470   10492   10515   10554#  10579
                     10597   10615   10637   10660   10697#  10727   10752   10777   10799   10822
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                   10820
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$TYPON   057120    16513   16516#  16802
$TYPOS   057060    16509#  16801
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$UNITM   000310     288#
$USWR    000654     408#
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	10413	10432	10450	10469	10491	10559	10578	10596	10614	10636	10702	10726	10751	10776	10798
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	14183	14211	14267	14318	14376	14432	14467	16185	16205						
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	14203	14387	14480	14586	14710	14987	15140	15407	15564	16231					
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	709	716	723	730	737	799	820	830	832	839	846	853	860	867	874
	905	912	919	926	933	940	947	1019	1041	1073	1075	1097	1099	1111	1134
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$$SETT    9498#   9499    9517#   9519    9535#   9537    9554#   9556    9576#   9578    9642#   9643    9661#   9663    9679#
          9681    9697#   9699    9719#   9721    9785#   9786    9809#   9811    9834#   9836    9859#   9861    9881#   9883
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         10599   10615#  10617   10637#  10639   10703#  10704   10727#  10729   10752#  10754   10777#  10779   10799#  10801

. ABS.  070102      000

 ERRORS DETECTED:  0

 CJKDGA.BIN,CJKDGA.LST/CRF/SOL/NL:TOC=SPMAC.MLB/ML,SETUP,CJKDGA.P11,END
 RUN-TIME: 1604 1708 172 SECONDS
 RUN-TIME RATIO: 4143/3485=1.1
 CORE USED:  102K  (203 PAGES)
```