SDS 901519B
$2.25

DIAGNOSTIC PROGRAM MANUAL

SIGMA 5
CPU DIAGNOSTIC PROGRAM
(SUFFIX)

PROGRAM NO. 704174B

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LIST OF EFFECTIVE PAGES

Total number of pages is 64, as follows:

CONTENTS

RELATED PUBLICATIONS

The following publications contain information, supplementary to but not required, for a complete understanding of the Sigma 5 CPU Diagnostic Suffix Program.

Publication Title	Publication No.
Sigma 5 Computer, Reference Manual	900959
Sigma 5 Computer, Technical Manual	901172
Sigma Symbol and Meta-Symbol, Reference Manual	900952
Sigma 5/7 CPU Format Converter/CPU Loader Documentation, Reference Manual	901584*

*Not yet released

SECTION I
INTRODUCTION

1-1 SCOPE OF MANUAL

This manual describes the suffix program designed for the Sigma 5 Computer manufactured by Scientific Data Systems, Santa Monica, California.

This manual is made up of four sections. Section I is a general introduction to the suffix program. Section II contains a discussion of operating procedures. Section III is comprised of a detailed description of the program operation. Section IV contains the program's complete symbolic listing as generated by the Sigma metasymbol assembler.

1-2 PROGRAM OBJECTIVES

The purpose of the suffix program is to detect and diagnose malfunctions of the Sigma 5 CPU pertaining to multiple operand and push-down stack instructions. Specifically, the instruction set tested by suffix consists of the following:

LM	Load Multiple
STM	Store Multiple
MSP	Modify Stack Pointer
PSW	Push Word
PLW	Pull Word
PSM	Push Multiple
PLM	Pull Multiple
MMC	Move to Memory Control

Note that the MMC instruction is tested only to the extent that it modifies registers correctly. The memory protect diagnostic test verifies that it loads the write protection locks.

1-3 GENERAL SPECIFICATIONS

Table 1-1 lists the general specifications for this program.

Table 1-1. General Specifications

Computer configuration	Any Sigma 5 computer with card reader or paper tape reader for program input
Memory size	8K minimum (8192 words)
Optional equipment	Keyboard printer or line printer for printed output

Table 1-2 shows the testing that must have been successfully completed before the suffix program is run. Also listed are the testing prerequisites for the other Sigma 5 CPU diagnostic programs.

Table 1-2. Testing Prerequisites

Program	Prerequisite Program
Verify	None
Pattern	Verify
Auto	Verify, Pattern*
Suffix	Auto
Float	Auto
Interrupt	Auto
Memory protect	Suffix

*For the auto test to run, the block 0 register must be functioning correctly, as tested by the pattern program.

SECTION II
OPERATING INSTRUCTIONS

2-1 GENERAL

The suffix diagnostic program employs a data-gathering technique for its operation. The program consists of a driver or control section followed by a number of test modules. Each module contains eight or twelve words of data prescribing a test to be performed. The driver program accesses each module in sequence, sets up the prescribed conditions, executes the specified instruction, and then tests the results for possible errors. A report of each test or error may be printed out or displayed on the control panel indicators.

2-2 LOADING PROCEDURE

Table 2-1 shows the control panel switch settings to be used for loading the program. After the switches have been set up as indicated, the following procedure is required:

a. Clear the memory.

b. Perform the standard load procedure described in Section 5 of the Sigma 5 Computer reference manual.

Table 2-1. Switch Settings for Program Loading

Switch	Setting
CONTROL MODE	LOCAL
WATCHDOG TIMER	NORMAL
INTERLEAVE SELECT	NORMAL
PARITY ERROR MODE	CONT
AUDIO	ON
CLOCK MODE	CONT
ADDR STOP	Off
SENSE Switches	0

If the program is loaded with the switches set according to table 2-1, it will automatically branch to the starting location and begin running.

If SS1 is set to 1 when the program is loaded, a wait will occur at X'100' and the count pulse interrupts will not be armed (see R5 in table 2-4). To continue, set the COMPUTE switch to IDLE and then back to RUN.

2-3 PROGRAM LOADER

The suffix diagnostic program uses the dual loader described in appendix A. This program loader allows two modes of operation when furnished on punched cards to provide the best possible chance of a successful load.

2-4 OPERATING PROCEDURES

2-5 SUCCESS INDICATIONS

Provided that no errors occur, the program will run continuously through all test modules. After completing the last module it will start over, making another pass. A pass counter and error counter are maintained by the program. These may be examined by setting SENSE switch 3.

After completing each test module, the program reads SENSE switch 3 and makes a report if the switch is set. Reports are normally made through the keyboard printer, device address 001. However, if no device responds to a TIO to that address, the program halts at location X'1F6' with the report information contained in registers 1 through 4. The registers contain the following information:

- R1 The memory address of most recently completed test module
- R2 The error count
- R3 The pass count (bits 0-15), module count (bits 16-31)
- R4 The instruction tested

Figure 2-1 shows a typical printout from the keyboard printer resulting from setting SS3 after the program has made a number of successful passes.

2-6 ERROR INDICATIONS

When running with the sense switches on 0, the program will halt upon detecting an error. Before halting, however, the error will be reported via the keyboard printer. If the printing device does not respond to a TIO, the program will merely halt at location X'211' with the ALARM on. During the error halt, registers R1 through R8 contain the information shown in figure 2-2.

```
                                SUFFIX ERROR DISPLAY
  LIST     ERRORS    PASSES     INST   IDENTIFIER    IS    SHOULD BE    DIFF

00000634 00000000 00280037 0A0002F6
00000646 00000000 00280038 0A0002F6
00000652 00000000 00280039 0A0002F6
0000065E 00000000 0028003A 0A0002F6
0000066A 00000000 0028003B 0A8E02F4

                                                              901519A.201
```

Figure 2-1. Sample of Printout, No Errors

```
R1      CURRENT MODULE ADDRESS
R2      ERROR COUNTER
R3      PASS COUNTER (PASSES IN BITS 0-15, MODULES IN BITS 16-31)
R4      INSTRUCTION UNDER TEST
R5      ERROR IDENTIFIER AND ADDRESS:
        10000000  = INSTRUCTION
        20000000  = LOCATION+1 OF THE EXECUTION LOCATION
        3000WXYZ  = INDIRECT ADDRESS LOCATION
        5000000X  = PROGRAM STATUS WORD X;    X=1 OR 2
        6000000X  = REGISTER X;       X=0 THRU F
        7000WXYZ  = MEMORY WORD IN LOCATION WXYZ;     WXYZ=0000 THRU FFFF
        8000WXYZ  = STACK POINTER DOUBLEWORD LOCATIONS
R6      ERRONEOUS RESULT     (IS)
R7      PREDETERMINED RESULT  (SHOULD BE)
R8      DIFFERENCE BETWEEN R6 AND R7 (RESULT OF EXCLUSIVE-OR OF R6 WITH R7)

                                                              901519A.202
```

Figure 2-2. Error Halt Information, Registers R1 Through R-8

A typical error printout is shown in figure 2-3.

The halt-on-error feature may be disabled by setting SENSE switch 4. However, if the machine is operating in this mode and no printout device is available, there will be no error indications except for brief flickers of the ALARM indicator (which may be too fast to see when only one or a few modules are failing).

The error indications described in the previous paragraphs occur only for faults that result from executing the test instruction. If a trap or spurious interrupt occurs at any other time during the operation of the control program, a WAIT is executed with the program halting at location X'B6'. If the wait is cleared, the program will attempt to reinitialize and resume testing with the current test module.

If a memory parity error occurs, the program is interrupted to location X'56'. The interrupt routine reads the memory fault indicators and leaves the result in register 4. A WAIT is then executed, causing the program to halt at location X'C0'. If the wait is cleared, the program will attempt to reinitialize and resume testing with the current test module.

Table 2-2 summarizes the various halt locations in the program.

Table 2-2. Halt Locations

Location (Hex)	Reason for Halting
B6	Erroneous trap or interrupt
C0	Memory fault interrupt
CC	Control panel interrupt
100	SS1 set to 1 when loading
1F6	Report halt
211	Error halt

```
                              SUFFIX ERROR DISPLAY
LIST      ERRORS    PASSES     INST   IDENTIFIER    IS        SHOULD BE   DIFF
0000040E  00000001  000A0005  2B0002E6  700002E6  00000000  000C0804  000C0804
                                                                  901519A.203
```

Figure 2-3. Sample of Error Printout

2-7 OPTIONS

Several optional features are incorporated into the suffix program to give the operator a more flexible tool for diagnosing failures while providing a quick means of detecting faults with a minimum of operator intervention.

2-8 Sense Switches

The uses of SS3 and SS4 have already been mentioned. Further control is provided through SS1 and SS2, which allow the operator to repeatedly loop on a single test. Table 2-3 summarizes the functions of all four switches.

Table 2-3. Sense Switch Functions

Switch	Function
SS1	Short Loop. When SS1 is set, the program continuously repeats the same test module. A minimum of instructions are executed to set up the necessary register and memory areas. No testing of results or other sense switches takes place. If SS1 is set to 1 while the program is being loaded, the count pulse interrupts will not be automatically armed on the 100th successful pass as is usually done
SS2	Long Loop. When SS2 is set and SS1 reset, the program repeats the same module. All testing of results takes place and other sense switches are read
SS3	Report. When SS3 is set, the program reports at the completion of each test not otherwise reported as the result of an error
SS4	Suppress Error Halt. When SS4 is set, the program will not halt on errors. Errors will still be reported via the keyboard printer, if available. Printing may be suppressed by turning the device off

2-9 Control Panel Interrupt

Pressing the control panel INTERRUPT button at any time when the program is running allows the operator to conveniently change certain parameters in the program. When the INTERRUPT button is pressed, the computer comes to a wait with address X'CC' in the instruction address register. Changes may be made by entering information into any of the registers described in table 2-4, then reading out the instruction from the instruction address location and returning the COMPUTE switch to RUN.

Table 2-4. Register Contents at Time of Interrupt

Register	Contents
R0	The IOP device address of the unit used for report or error messages. The address is in bits 16-31 and is initially set to 1 when the program is loaded Device Selection. The program tests bits 0-15 to determine whether to use the keyboard printer or the line printer output routines. These bits are initially set to zero indicating that the output device is the keyboard printer. Setting a nonzero value in bits 0-15 and changing the address in bits 16-31 causes all messages to be put out on the line printer
R1	The memory address of the current or most recently completed test module Test Selection. When the machine is returned to RUN the program will begin testing with the module addressed by R1. The operator may insert any valid module address he wishes and then set SS1 or SS2 to loop on that module
R5	Register bits 16-19, used to arm and enable the count pulse interrupts. Count Pulse Interrupt Level Selection. Normally, if no errors have occurred, the program automatically arms and enables the four count pulse interrupt levels

(Continued)

Table 2-4. Register Contents at Time of Interrupt (Cont.)

Register	Contents
R5 (Cont.)	upon making the one hundredth pass. The operator may suppress this feature by clearing R5 when the wait occurs for the control panel interrupt, or by loading the program with SS1 set. He may selectively disable only some of the count pulse interrupts if he wishes. He also has the option of later re-enabling the levels by again interrupting and changing R5 Bits other than 16-19 of R5 have no effect on interrupt

2-10 TEST SELECTION

The operator may select any test module to begin running by using the control panel INTERRUPT as described in paragraph 2-9 and table 2-4. He may likewise loop on a selected test by setting SENSE switch 1 or 2 before running the test again.

The operator may also loop on a particular test by setting SS1 or SS2 when the test is being reported either by the keyboard printer or by a report halt or error halt.

2-11 RESTARTING THE PROGRAM

The program may be restarted from location X'100'. When loaded, the program inserts an unconditional branch to that location in address X'26' so that it can normally be restarted by pressing the CPU RESET button and putting the COMPUTE switch to RUN.

SECTION III
PROGRAM DESCRIPTION

3-1 GENERAL

A simplified flow chart is given in figure 3-1 to illustrate the general philosophy of the program's operation. When loaded, the suffix program automatically branches to its starting location and begins running. Initialization takes place where parameters are set up and a branch instruction is inserted in location X'26' to facilitate restarting if the CPU RESET button should be depressed.

The program accesses each test module in turn and sets up all the test conditions as prescribed by the module. The instruction contained in the module is executed and then SENSE switch 1 is tested to determine whether the short loop mode is in effect. If SS1 is set, the program repeats a minimum of the setup procedure for the same test module and again executes the instruction. No results are examined in the short-loop mode.

If not operating in the short loop (that is, if SS1 is reset), the program proceeds to compare the results of the test with the expected results. The resultant contents of all registers and memory operands (and stack pointer doubleword, if applicable) are prescribed by the test module. Other items are also tested, such as the instruction location, the location following the instruction, the indirect address location, and the program status doubleword.

When an error is detected or if SS3 is set, the program makes a report – normally through the keyboard printer. The reports may be switched over to a line printer, if desired (see Control Panel Interrupt in section II). When no printing device is available, the program makes its reports by executing a wait with the information stored in general registers 1 through 8.

After results have been checked and reports, if any, completed, SENSE switch 2 is read. If SS2 is set to 1, the program goes through the entire setup, test, and report procedure for the same test module that it just finished. If SS2 is reset to 0, then the module pointer is updated so that a new test is performed on the next cycle.

3-2 TEST MODULE

Each test performed by the suffix diagnostic program requires a test module in the following format:

Word 0 — A negative count indicating the number of words in the module, including the count word. If word 0 has a value of zero, it indicates the end of the module list

Word 1 — The instruction to be tested

Word 2 — Bits 0-11. These bits of the PSW1 are set up prior to executing the test instruction. The remainder of PSW1 is automatically set up by the program.
Bits 12-31. This is a linkage address given to the program enabling it to set up for expected traps

Word 3 — The value of PSW1 expected to be found in the location labeled RETURN after the test instruction has been executed (plus the subsequent XPSD)

Word 4 — A pointer which enables the program to access the appropriate table and load data into the registers before executing the test instruction

- Bits 0-15: Address of beginning of table
- Bits 16-23: Negative count of the number of registers to be loaded
- Bits 24-31: First register to be loaded

The pointer causes from 0 to 16 registers to be loaded. This pointer, as well as the pointers in words 5, 6, and 7 of the module, treat the load area as a circular set of 16 locations. Thus, if the pointer specifies that four locations are to be loaded beginning with the last location (in this case register 15), then the program loads location 15 from the first word of the data table and then loads the next three words of the data table into locations 0, 1, and 2 (registers 0, 1, and 2)

Word 5 — A pointer having the same format as word 4, but used to specify the expected contents of registers after the test instruction is executed

Word 6 — A pointer having the same format as word 4 but used to specify up to 16 memory operands. As with word 4, the load area is treated as a circular set of 16 locations

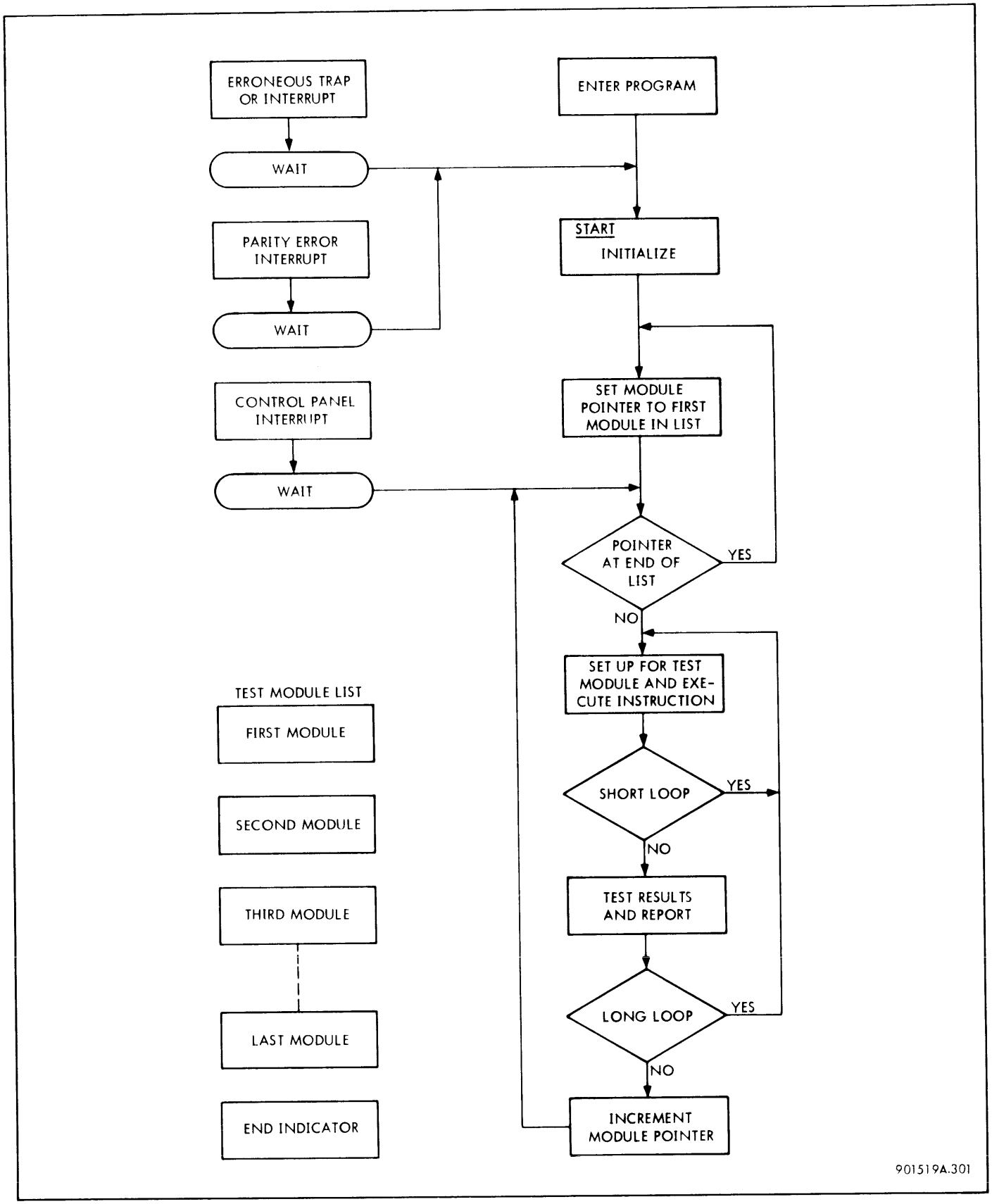

Figure 3-1. Sigma 5 Suffix Program, Simplified Flow Chart

Words 7	A pointer having the same format as word 4 but used to specify expected memory results of the test
Words 8, 9	The initial stack pointer doubleword for push-down instructions
Words 10, 11	The final stack pointer doubleword expected after a push-down instruction test

Not all words are required for every module. In the suffix programs test modules consist of words 0 through 5, words 0 through 7, or words 0 through 11. All data areas not specifically called out by the module are cleared to zero.

3-3 FLOW CHART

A detailed flow diagram of the entire program (excluding test modules) is given in figure 3-2. A study of figure 3-2 along with the program listing in section IV should provide the user with a clear understanding of the suffix program's operation.

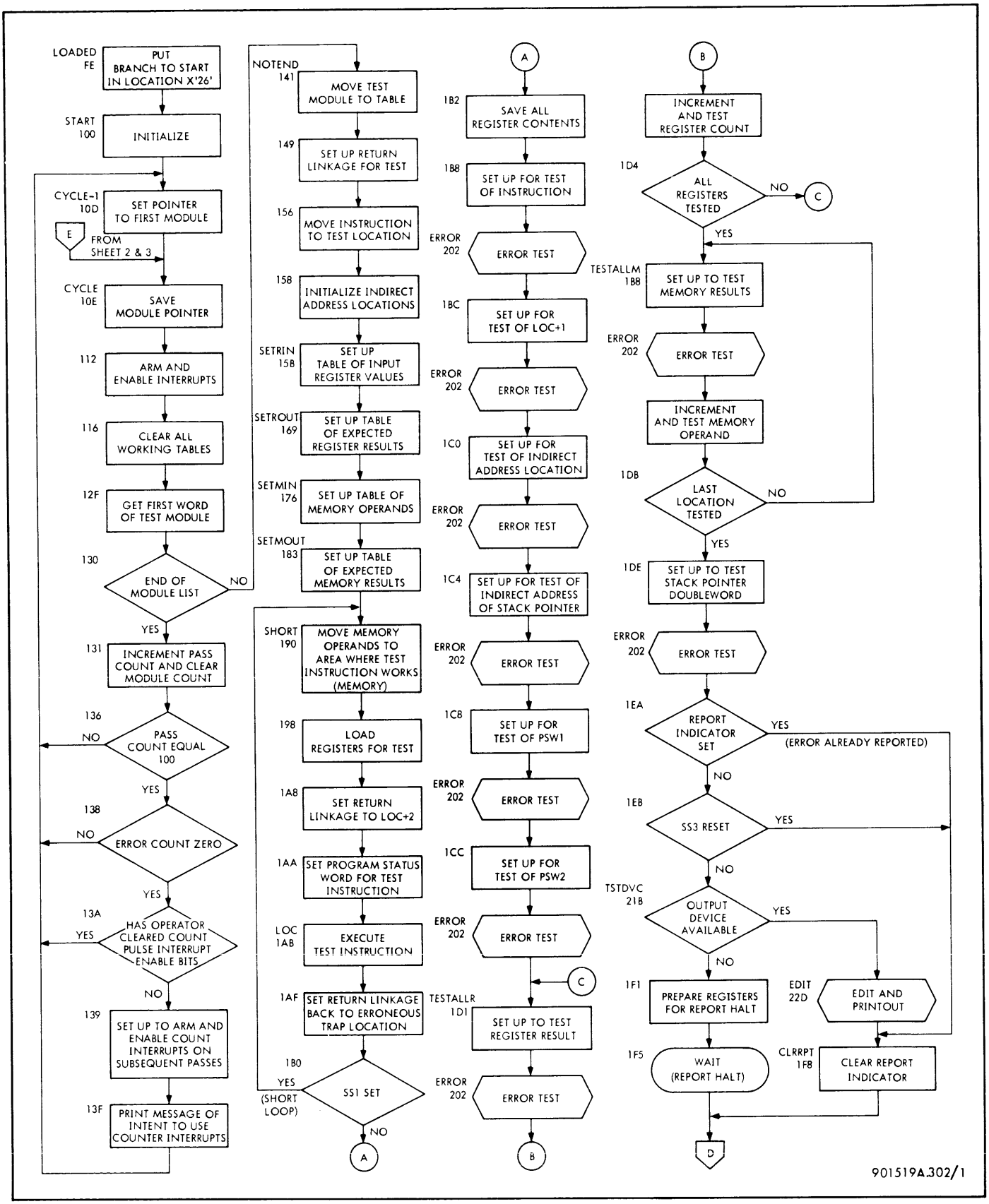

Figure 3-2. Sigma 5 Suffix Program, Detailed Flow Chart (Sheet 1 of 3 sheets)

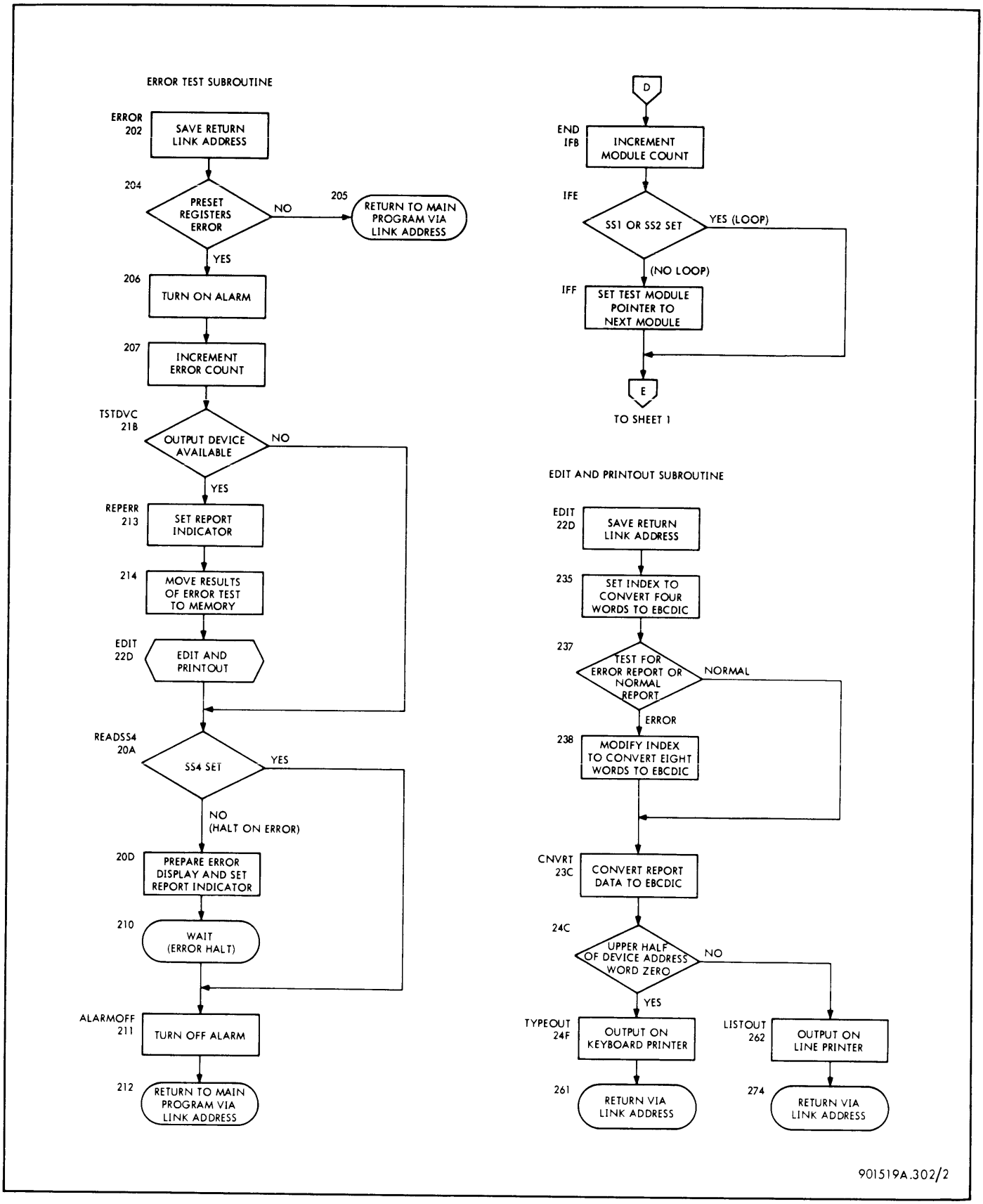

Figure 3-2. Sigma 5 Suffix Program, Detailed Flow Chart (Sheet 2 of 3 sheets)

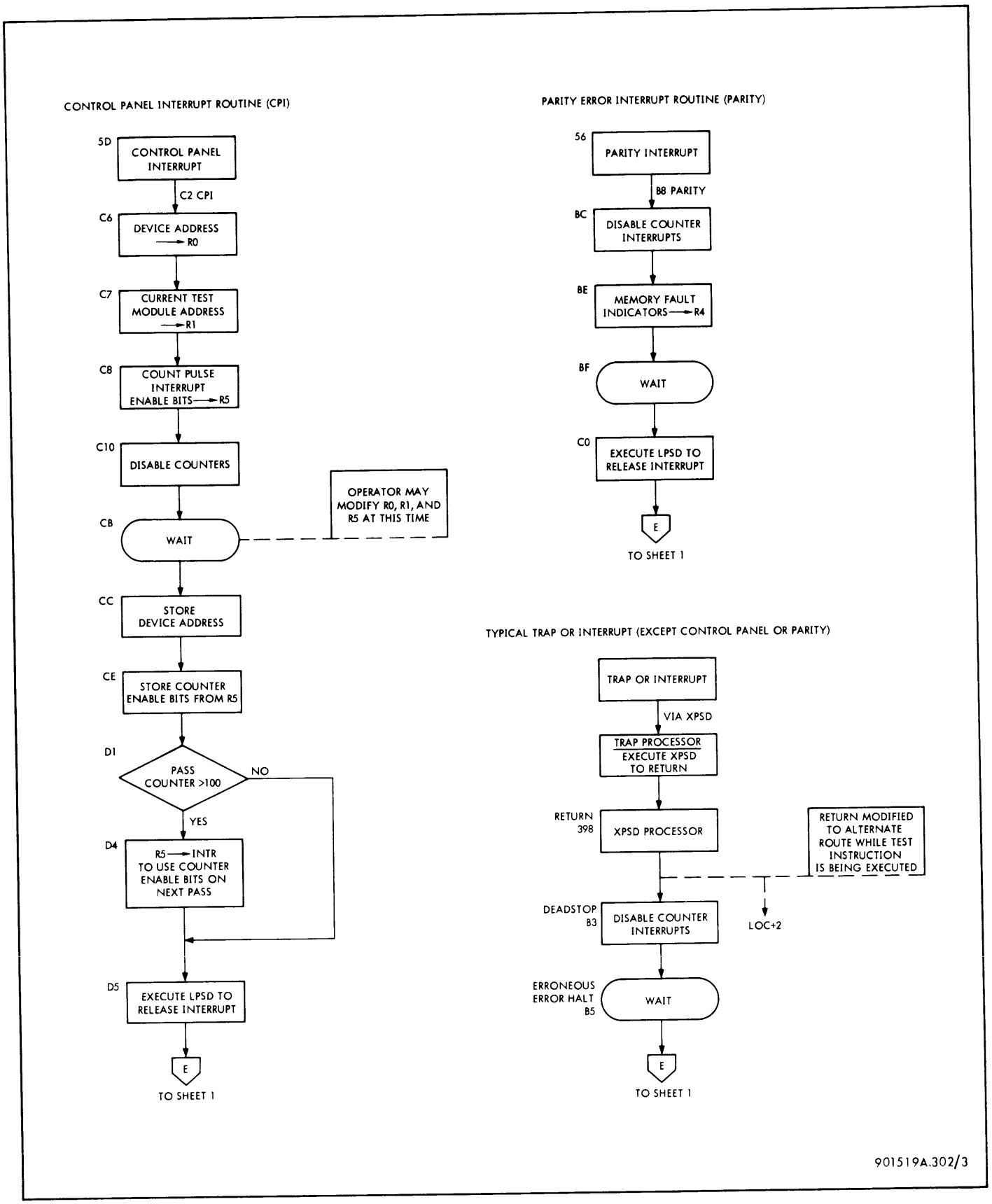

Figure 3-2. Sigma 5 Suffix Program, Detailed Flow Chart (Sheet 3 of 3 sheets)

SECTION IV
PROGRAM LISTING

```
                                PAGE
                                SYSTEM   SIGSP
                          *
                          *
                          *
                          * REVISION B00 (10-19-68) CHANGES INDICATED BY *B IN COLUMNS71-72.    *B
                          * ADDITIONAL TEST CASES FOR MSP INSTRUCTION ARE INCLUDED FOR TESTING  *B
                          * THE P-REGISTER COUNT-DOWN LOGIC.                                    *B
                          * THE ADDRESS MASK IN THE STACK POINTER DOUBLEWORD TEST SECTION OF THE*B
                          * PROGRAM DRIVER IS DELETED IN ORDER TO TEST THE J-LEVEL LOGIC CHANGE *B
                          * WHICH WAS ADDED TO SUPPRESS K14 DURING PH1/G OF THE MSP INSTRUCTION**B
```



```
                                PAGE
                          *
                          *
                          *    ****SENSE SWITCH DEFINITIONS****
                          *
                          * SS1      SET-SHORT LOOP
                          *         RESET-NORMAL OPERATION
                          *
                          * SS2      SET-LONG LOOP
                          *         RESET-NORMAL OPERATION
                          *
                          * SS3      SET-REPORT
                          *         RESET-NORMAL OPERATION
                          *
                          * SS4      SET-NO HALT ON ERRORS
                          *         RESET-HALT ON ERRORS
                          *
                          * ****REGISTER CONTENTS ON ERROR HALT****
                          * R1       CURRENT MODULE ADDRESS
                          * R2       ERROR COUNTER
                          * R3       PASS COUNTER  (PASSES IN BITS 0-15,  MODULES IN BITS 16-31)
                          * R4       INSTRUCTION UNDER TEST
                          * R5       ERROR IDENTIFIER AND ADDRESS
                          *         10000XYZ - INSTRUCTION     (XYZ - EXECUTION LOCATION)
                          *         20000XYZ - LOCATION AFTER INSTRUCTION
                          *         30000XYZ - INDIRECT ADDRESS LOCATION
                          *         5000000X - PROGRAM STATUS WORD X)  X=1 OR 2
                          *         6000000X - REGISTER X)    X=0 THRU F
                          *         70000XYZ - MEMORY WORD IN LOCATION XYZ
                          *         80000XYZ - STACK POINTER DOUBLEWORD
                          * R6       ERRONEOUS RESULT          (IS)
                          * R7       PREDETERMINED RESULT      (SHOULD BE)
                          * R8       DIFFERENCE BETWEEN R6 AND R7  (RESULT OF EXCLUSIVE-OR
                          *                                                  OF R6 WITH R7)
```

```
                                        PAGE
                                        ORG     X'40'           TRAP LOCATIONS
                                        ORG     X'40'
                                *
                                *
01 00040 0F400060       NABTR   XPSD,4  NAB             NONALLOWED OPERATION
01 00041 0F000074       JIITR   XPSD,0  JII             UNIMPLEMENTED INSTRUCTION
01 00042 0F00007A       SLTR    XPSD,0  SL              STACK LIMIT
01 00043 0F000080       FXPBTR  XPSD,0  FXPB            FIXED POINT OVERFLOW
01 00044 0F000086       FLPFTR  XPSD,0  FLPF            FLOATING POINT FAULT
01 00045 0F00008C       DFTR    XPSD,0  DF              UNUSED TRAP LOCATION
01 00046 0F000092       WDTRTR  XPSD,0  WDTR            WATCHDOG TIMER RUNOUT
01 00047 0F0003BE       BRANCH  XPSD,0  RETURN          BRANCH RETURN
01 00048 0F000098       CAL1TR  XPSD,0  CAL1            CALL ONE
01 00049 0F00009E       CAL2TR  XPSD,0  CAL2            CALL TWO
01 0004A 0F0000A4       CAL3TR  XPSD,0  CAL3            CALL THREE
01 0004B 0F0000AA       CAL4TR  XPSD,0  CAL4            CALL FOUR
                                *
                                *
01 00052                        ORG     X'52'           INTERRUPT LOCATIONS
01 00052
                                *
01 00052 33100399               MTW,1   CNT1CP          COUNT PULSE INTERRUPT 1
01 00053 3310039A               MTW,1   CNT2CP          COUNT PULSE INTERRUPT 2
01 00054 3310039B               MTW,1   CNT3CP          COUNT PULSE INTERRUPT 3
01 00055 3310039C               MTW,1   CNT4CP          COUNT PULSE INTERRUPT 4
01 00056 0F0000B8               XPSD,0  PARITY          MEMORY PARITY
01 00057 0F0003BE               XPSD,0  RETURN
01 00058 0F0003BE               XPSD,0  RETURN
01 00059 0F0003BE               XPSD,0  RETURN
01 0005A 0F0003BE               XPSD,0  RETURN
01 0005B 0F0003BE               XPSD,0  RETURN
01 0005C 0F0003BE               XPSD,0  RETURN          I/O INTERRUPT IS NEVER ENABLED
01 0005D 0F0000CP               XPSD,0  CPI             CONTROL PANEL INTERRUPT
01 0005E 0F0003BE               XPSD,0  RETURN
01 0005F 0F0003BE               XPSD,0  RETURN
```



```
                                        PAGE
                                *                       ***NON-ALLOWED OPERATION TRAP***
01 00060 00000000 A     NAB     PZE
01 00061 00000000 A             PZE
01 00062 00000064               PZE,0   $+2
01 00063 00000000 A             PZE
01 00064 0F0003BE       NABRET  XPSD,0  RETURN          NONALLOWED OPERATION
01 00065 0F0003BE       MPVRET  XPSD,0  RETURN          MEMORY PROTECT VIOLATION
01 00066 0F0003BE       MVRET   XPSD,0  RETURN          MODE VIOLATION
01 00067 0F0003BE               XPSD,0  RETURN
01 00068 0F0003BE       NEARET  XPSD,0  RETURN          NONEXISTENT ADDRESS
01 00069 0F0003BE               XPSD,0  RETURN
01 0006A 0F0003BE               XPSD,0  RETURN
01 0006B 0F0003BE               XPSD,0  RETURN
01 0006C 0F0003BE       NEIRET  XPSD,0  RETURN          NONEXISTENT INSTRUCTION
01 0006D 0F0003BE               XPSD,0  RETURN
01 0006E 0F0003BE               XPSD,0  RETURN
01 0006F 0F0003BE               XPSD,0  RETURN
01 00070 0F0003BE               XPSD,0  RETURN
01 00071 0F0003BE               XPSD,0  RETURN
01 00072 0F0003BE               XPSD,0  RETURN
01 00073 0F0003BE               XPSD,0  RETURN
                                *                       ***UNIMPLIMENTED INSTRUCTION TRAP***
01 00074 00000000 A     JII     PZE
01 00075 00000000 A             PZE
01 00076 00000078               PZE,0   $+2
01 00077 00000000 A             PZE
01 00078 0F0003BE       JIIRET  XPSD,0  RETURN
                                *                       ***STACK LIMIT REACHED TRAP***
                                        BOUND 8
01 0007A 00000000 A     SL      PZE
01 00078 00000000 A             PZE
01 0007C 0000007E               PZE,0   $+2
01 0007D 00000000 A             PZE
01 0007E 7030007A               LCF,2   SL
01 0007F 0F0003BE       SLRET   XPSD,0  RETURN
```

```
                                                PAGE
                                        *               ***FIXED ARITHMETIC OVERFLOW TRAP***
                                                BOUND 8
01 00080      00000000 A      FXPB      PZE
01 00081      00000000 A                PZE
01 00082      00000084                  PZE,0       $+2
01 00083      00000000 A                PZE
01 00084      70300080                  LCF,2       FXPB
01 00085      0F0003BE        FPBRET    XPSD,0      RETURN
                                        *               ***FLOATING POINT ARITHMETIC FAULT TRAP***
                                                BOUND 8
01 00086      00000000 A      FLPF      PZE
01 00087      00000000 A                PZE
01 00088      0000008A                  PZE,0       $+2
01 00089      00000000 A                PZE
01 0008A      70300086                  LCF,2       FLPF
01 0008B      0F0003BE        FPFRET    XPSD,0      RETURN
                                        *               ***UNUSED TRAP LOCATION***
                                                BOUND 8
01 0008C      00000000 A      DF        PZE                       (DECIMAL TRAP ON SIGMA 7)
01 0008D      00000000 A                PZE
01 0008E      00000090                  PZE,0       $+2
01 0008F      00000000 A                PZE
01 00090      0F0003BE        DFRET     XPSD,0      RETURN
                                        *               ***WATCHDOG TIMER RUNOUT TRAP***
                                                BOUND 8
01 00092      00000000 A      WDTR      PZE
01 00093      00000000 A                PZE
01 00094      00000096                  PZE,0       $+2
01 00095      00000000 A                PZE
01 00096      0F0003BE        WDTRET    XPSD,0      RETURN
```



```
                                                PAGE
                                        *
                                        *               ***CALL 1 TRAP***
                                                BOUND 8
01 00098      00000000 A      CAL1      PZE
01 00099      00000000 A                PZE
01 0009A      0000009C                  PZE,0       $+2
01 0009B      00000000 A                PZE
01 0009C      0F0003BE        C1RET     XPSD,0      RETURN
                                        *
                                        *               ***CALL 2 TRAP***
                                                BOUND 8
01 0009E      00000000 A      CAL2      PZE
01 0009F      00000000 A                PZE
01 000A0      000000A2                  PZE,0       $+2
01 000A1      00000000 A                PZE
01 000A2      0F0003BE        C2RET     XPSD,0      RETURN
                                        *
                                        *               ***CALL 3 TRAP***
                                                BOUND 8
01 000A4      00000000 A      CAL3      PZE
01 000A5      00000000 A                PZE
01 000A6      000000A8                  PZE,0       $+2
01 000A7      00000000 A                PZE
01 000A8      0F0003BE        C3RET     XPSD,0      RETURN
                                        *
                                        *               ***CALL 4 TRAP***
                                                BOUND 8
01 000AA      00000000 A      CAL4      PZE
01 000AB      00000000 A                PZE
01 000AC      000000AE                  PZE,0       $+2
01 000AD      00000000 A                PZE
01 000AE      0F0003BE        C4RET     XPSD,0      RETURN
```

```
179                                     PAGE
180                             *
181                             * MODIFY STACK LIMIT TRAP PROCESSOR FOR THOSE MODULES EXPECTING TO TRAP
182                             * THIS INSERTS CONDITION CODE, FS, FZ, FN, MS, DM AND AM BITS INTO
183                             * THE PSW1 WHICH IS LOADED AFTER A TRAP
184                             *
185   01 000AF  484000B2        SLSW    EOR,4   SLAD
186   01 000B0  3540007C                STW,4   SL+2
187   01 000B1  680001S1                B       SETPSW
188   01 000B2  0000007E        SLAD    PZE     SL+4
189                             *
190                             *
191                             *
192                             * ERRONEOUS TRAP DURING OPERATION OF DRIVER PROGRAM STOPS HERE
193                             *
194   01 000B3  22A0F000 A      DEADSTOP LI,10   X'F000'
195   01 000B4  6DA01500 A               WD,10   X'1500'          DISABLE COUNT PULSE INTERRUPTS
196   01 000B5  2E000000 A               WAIT    0
197   01 000B6  321002AB                 LW,1    SAVE
198   01 000B7  0E0003B8                 LPSD,0  REPEAT
```



```
199                                     PAGE
200                             *
201                             * PARITY INTERRUPT SERVICE ROUTINE IS ENTERED FROM INTERRUPT LOC X'56',
202                             * MEMORY FAULT INDICATORS ARE STORED IN R4.  CONTENTS OF OTHER REGISTERS
203                             * ARE UNPREDICTABLE.  LOCATION LABELED 'PARITY' CONTAINS PROGRAM ADDRESS
204                             * AT TIME OF INTERRUPT, BUT THIS MAY BE A SHORT WAY AFTER THE INSTR
205                             * WHERE THE FAULT ACTUALLY OCCURED.  UPON CLEARING THE WAIT, AN ATTEMPT
206                             * IS MADE TO REPEAT THE SAME TEST MODULE.
207                             *
208                                     BOUND 8
209   01 000B8  00000000 A      PARITY  PZE
210   01 000B9  00000000 A              PZE
211   01 000BA  000000BC                PZE,0   $+2
212   01 000BB  00000000 A              PZE
213   01 000BC  22A0F000 A              LI,10   X'F000'
214   01 000BD  6DA01500 A              WD,10   X'1500'          DISABLE COUNT PULSE INTERRUPTS
215   01 000BE  6C400010 A              RD,4    X'10'            RECORD PARITY ERROR INDICATORS
216   01 000BF  2E000000 A              WAIT,0  0
217   01 000C0  0E3003B8                LPSD,3  REPEAT           RELEASE INTERRUPT
```

```
                                    PAGE
                              * CONTROL PANEL INTERRUPT ROUTINE IS ENTERED FROM LOCATION X'5D'.
                              * REGISTERS R0, R1, AND R5 ARE LOADED AND THEN A WAIT OCCURS.  THE
                              * OPERATOR MAY CHANGE THE CONTENTS OF ANY OF THESE REGISTERS TO
                              * MODIFY THE OPERATION OF THE PROGRAM, THEN CLEAR THE WAIT TO CONTINUE.
                              *           R0  BITS 21-31      OUTPUT DEVICE ADDRESS.
                              *               BITS  0-16      ZERO VALUE INDICATES TYPEWRITER,
                              *                               NONZERO VALUE INDICATES LINE PRINTER
                              *
                              *
                              *           R1                  CURRENT TEST MODULE ADDRESS.
                              *                               PROGRAM BEGINS WITH THIS MODULE
                              *                               WHEN WAIT IS CLEARED.
                              *
                              *
                              *           R5  BITS 16-19      CNT PLS INTRPT ARM AND ENABLE BITS.
                              *
                                    BOUND 8
01 000C2  00000000 A  CPI     PZE
01 000C3  00000000 A          PZE
01 000C4  000000C6            PZE,0     *+2
01 000C5  00000000 A          PZE
01 000C6  32000387            LW,0      DVC         LOAD R0 WITH DEVICE ADDRESS
01 000C7  321002A3            LW,1      SAVE        LOAD R1 WITH CURRENT MODULE ADDRESS
01 000C8  3250039E            LW,5      INTRC       LOAD R5 WITH CNT PULSE INTRPT BITS
01 000C9  22A0F000 A          LI,10     X'F000'
01 000CA  6DA01500 A          WD,10     X'1500'     DISABLE COUNT PULSE INTERRUPTS
01 000CB  2E000000 A          WAIT      0
01 000CC  35000387            STW,0     DVC         STORE DEVICE ADDRESS
01 000CD  4B50039F            AND,5     CNTRMASK
01 000CE  3550039E            STW,5     INTRC
01 000CF  324002AD            LW,4      PASSES
01 000D0  25400070 A          SLS,4     *16
01 000D1  21400064 A          CI,4      100         TEST PASS COUNT
01 000D2  682000D5            BLE       $+3
01 000D3  20500810 A          AI,5      X'810'
01 000D4  3550039D            STW,5     INTR
01 000D5  0E3003B8            LPSD,3    REPEAT      RELEASE PANEL INTERRUPT, REPEAT TEST
```



```
                                    PAGE
                              *      *****CONTROL PROGRAM BEGINS OPERATION HERE*****
                              *      ************************************************
                              *
                              *
01 000F9                            ORG       X'F9'
01 000F9                      *
01 000F9  320003A9      LOADED      LW,0      BTB100      PROGRAM ENTERS HERE WHEN LOADED
01 000FA  35000026 A                STW,0     X'26'       PUT BRANCH-TO-START IN LOC X'26'
01 000FB  60000000 A                RD,0      0
01 000FC  68800100                  BCR,8     START       TEST SS1
01 000FD  22000000 A                LI,0      0
01 000FE  3500039E                  STW,0     INTRC       CLEAR COUNTER ENABLE BITS
01 000FF  2E000000 A                WAIT      0
01 00100  220000B3      START       LI,0      DEADST0P
01 00101  350003C0                  STW,0     RETURN+2    INITIALIZE RETURN
01 00102  22100004 A                LI,1      4
01 00103  22000000 A                LI,0      0
01 00104  350202AA                  STW,0     DISPLAY+1,1 CLEAR 1ST 4 WORDS OF DISPLAY TABLE
01 00105  64100104                  BDR,1     $-1
01 00106  2200081C A                LI,0      X'810'
01 00107  3500039D                  STW,0     INTR        INIT REGISTER BITS FOR INTERRUPTS
01 00108  222FFFCD A                LI,2      -51
01 00109  352003A0                  STW,2     LINE        INITIALIZE LINE COUNT
01 0010A  222FFFFE A                LI,2      -2
01 0010B  352003A1                  STW,2     FIRST       INITIALIZE FIRST PASS INDICATORS
01 0010C  352003A2                  STW,2     FIRSTL                                        *8
01 0010D  6AF00281                  BAL,15    CORSIZE
01 0010E  22100400                  LI,1      LIST        INITIALIZE MODULE POINTER
01 0010F  220000B3      CYCLE       LI,0      DEADST0P
01 00110  350003C0                  STW,0     RETURN+2    REINITIALIZE RETURN
01 00111  351002AB                  STW,1     SAVE        SAVE MODULE POINTER
01 00112  6D000040 A                WD,0      X'40'       TURN OFF ALARM IF ON
01 00113  22AFFFFF A                LI,10     -1
01 00114  6DA01100 A                WD,10     X'1100'     DISARM ALL INTERRUPTS
01 00115  32A0039D                  LW,10     INTR
```

```
290   01 00116   6DA01200 A          WD,10   X'1200'          ARM AND ENABLE INTERRUPTS
```



```
                                      PAGE
291
292                                 * CLEAR WORKING TABLES PRIOR TO LOADING AS SPECIFIED IN MODULE
293                                 *
294   01 00117   22000000 A          LI,0    0
295   01 00118   22100000 A          LI,1    12
296   01 00119   3502029E            STW,0   TABLE-1,1        CLEAR MODULE STORAGE TABLE
297   01 0011A   64100119            BDR,1   *-1
298                                 *
299   01 00113   22100010 A          LI,1    16
300   01 0011C   350202B2            STW,0   RTABLIN-1,1      CLEAR RTABLIN
301   01 0011D   6410011C            BDR,1   *-1
302                                 *
303   01 0011E   22100010 A          LI,1    16
304   01 0011F   350202C2            STW,0   RTABLOUT-1,1     CLEAR RTABLOUT
305   01 00120   6410011F            BDR,1   *-1
306                                 *
307   01 00121   22100010 A          LI,1    16
308   01 00122   350202D2            STW,0   MTABLIN-1,1      CLEAR MTABLIN
309   01 00123   64100122            BDR,1   *-1
310                                 *
311   01 00124   22100012 A          LI,1    18
312   01 00125   350202E2            STW,0   MTABLOUT-1,1     CLEAR MTABLOUT AND STACK POINTER
313   01 00126   64100125            BDR,1   *-1
314                                 *
315   01 00127   22100010 A          LI,1    16
316   01 00128   350202F2            STW,0   RRESULT-1,1      CLEAR RRESULT
317   01 00129   6410012A            BDR,1   *-1
318                                 *
319   01 0012A   22100014 A          LI,1    20
320   01 00123   35020303            STW,0   MEMORY-1,1       CLEAR MEMORY, STACK POINTER AND IA
321   01 0012C   6410012B            BDR,1   *-1
322                                 *
323   01 0012D   22100004 A          LI,1    4
324   01 0012E   350202AE            STW,0   DISPLAY+3,1      CLEAR ERROR INDICATIONS FROM DISPLAY
325   01 0012F   6410012E            BDR,1   *-1
```

```
                                PAGE
                          * PICK UP FIRST WORD IN MODULE (COUNT WORD) AND TEST FOR END OF
                          * MODULE LIST.  THE END OF LIST IS INDICATED BY AN 'ALL-ZEROS' WORD
                          * AFTER THE LAST MODULE.
                          *
 01 00130  824002AB               LW,4    *SAVE           PICK UP COUNT
 01 00131  69300142               BNEZ    NOTEND          TEST FOR END INDICATOR
 01 00132  323002AD               LW,3    PASSES          GET PASS COUNTER
 01 00133  20310000 A             AI,3    X'10000'        INCREMENT PASS COUNT
 01 00134  483003AB               AND,3   WOT15           CLEAR MODULE COUNT WITH MASK
 01 00135  353002AD               STW,3   PASSES          PUT AWAY NEW COUNT
                          *
                          * TEST ERROR AND PASS COUNTERS.  IF 100 PASSES HAVE BEEN COMPLETED
                          * WITHOUT ERROR, MODIFY THE REGISTER WORD WHICH AN INSTRUCTION USES
                          * SO THAT COUNT PULSE INTERRUPTS WILL BE ARMED AND ENABLED FOR ALL
                          * SUBSEQUENT PASSES.
                          *
 01 00136  313003AF               CW,3    NUM
 01 00137  6930010E               BNE     CYCLE=1         TEST PASS COUNT
 01 00138  322002AC               LW,2    ERRORS
 01 00139  6930010E               BNEZ    CYCLE=1         TEST ERROR COUNT
 01 0013A  3250039E               LW,5    INTRC           TEST INTRC TO SEE IF OPERATOR HAS
 01 00139  6830010E               BEZ     CYCLE=1               ALREADY CLEARED ENABLING BITS
 01 0013C  4950039F               AND,5   CNTRMASK
 01 00130  20500810 A             AI,5    X'810'          INSERT BITS FOR CONTROL PANEL
 01 00130  35500390               STW,5   INTR                AND PARITY INTERRUPTS
 01 00130  220001ED               LI,0    DA(CNTRDW)
 01 00140  6AF0027B               BAL,15  PRINT
 01 00141  6800010E               B       CYCLE=1         START NEW PASS
```



```
                                PAGE
                          *
                          * MOVE MODULE TO TABLE  (COUNT WORD IS CURRENTLY IN R4)
                          *
 01 00142  326002AR     NOTEND   LW,6    SAVE            GET MODULE POINTER
 01 00143  38600004 A            SW,6    4               ADD COUNT
 01 00144  22100000 A            LI,1    0
 01 00145  356003A8              STW,6   NEXT            SAVE POINTER TO NEXT MODULE
 01 00146  327803A8              LW,7    *NEXT,4         MOVE CURRENT MODULE TO TABLE
 01 00147  35720299              STW,7   TABLE,1
 01 00148  20100001 A            AI,1    1
 01 00149  65400146              BIR,4   $-3
                          *
                          * SET UP TO EXECUTE TEST MODULE WHICH IS NOW RESIDING IN TABLE.
                          *
 01 00140  324003AA               LW,4    XPSD
 01 00148  354001AD               STW,4   LOC+1           INITIALIZE RETURN VEHICAL IN LOC+1
 01 00140  324002A1               LW,4    TABLE+2         PICK UP PSW1 IN FROM MODULE
 01 00140  434003AD               AND,4   LINKAD          SELECT LINK ADDRESS, DELETE MS BIT
 01 00141  354003BA               STW,4   TEMP
 01 00141  434003AE               AND,4   COND            CLEAR OUT ADDRESS
 01 00150  0E0003BA               LPSD,0  TEMP            GO TO SETPSW OR SET UP EXPECTED TRAP
 01 00151  324002A1     SETPSW    LW,4    TABLE+2         PICK UP PSW1 IN FROM MODULE
 01 00152  434003AE               AND,4   COND            CLEAR ADDRESS
 01 00153  484003BC               EOR,4   LOCADD          INSERT ADDRESS OF LOC
 01 00154  354003BC               STW,4   PSW1            SAVE PSW1 IN (WITH ADDRESS INSERTED)
 01 00155  324002A0               LW,4    TABLE+1         PICK UP ISTRUCTION
 01 00156  354002AE               STW,4   DISPLAY+3       INSERT INSTRUCTION IN DISPLAY TABLE
 01 00157  354001AC               STW,4   LOC             INSERT INSTRUCTION IN TEST LOCATION
 01 00158  325003B1               LW,5    INDA
 01 00159  35500316               STW,5   IA              INITIALIZE INDIRECT ADDRESS
 01 00150  32500382               LW,5    INDASP
 01 00155  35500317               STW,5   IASP            INIT. STACK POINTER INDIRECT ADDRESS
```

```
388                                     PAGE
389                             *
390                             * SET-UP REGISTER-IN TABLE (RTABLIN)
391                             *
392   01 0015C   22700001 A     SETRIN  LI,7    1               HALFWORD INDEX
393   01 0015D   522002A3               LH,2    TABLE+4         PICK UP REGISTER-IN POINTER(ADDRESS)
394   01 0015E   524E02A3               LH,4    TABLE+4,7       PICK UP COUNT AND 1ST REG INDICATOR
395   01 0015F   6830016A               BEZ     SETROUT
396   01 00160   25400578 A             SAD,4   =8              COUNT IN R4
397   01 00161   25500068 A             SLS,5   =24              FIRST REG INDICATOR IN R5
398   01 00162   38200004 A             SW,2    4               ADD COUNT TO ADDRESS
399   01 00163   32680002 A     FETCHRIN LW,6   *2,4             FETCH DATA
400   01 00164   21500010 A             CI,5    16
401   01 00165   69100167               BL      $+2
402   01 00166   22500000 A             LI,5    0               WRAP AROUND TO 0 IF R EXCEEDS 15
403   01 00167   356A02B3               STW,6   RTABLIN,5       FILL REGISTER-IN TABLE
404   01 00168   20500001 A             AI,5    1
405   01 00169   65400163               BIR,4   FETCHRIN
406                             *
407                             * SET-UP REGISTER-OUT TABLE (RTABLOUT)
408                             *
409   01 0016A   522002A4       SETROUT LH,2    TABLE+5         PICK UP REGISTER-OUT POINTER (ADDR)
410   01 00169   524E02A4               LH,4    TABLE+5,7       PICK-UP COUNT AND 1ST REG INDICATOR
411   01 0016C   68300177               BEZ     SETMIN
412   01 0016D   25400578 A             SAD,4   =8              COUNT IN R4
413   01 0016E   25500068 A             SLS,5   =24              FIRST REGISTER INDICATOR IN R5
414   01 0016F   38200004 A             SW,2    4               ADD COUNT TO ADDRESS
415   01 00170   32680002 A     FETCHRR LW,6    *2,4            FETCH DATA
416   01 00171   21500010 A             CI,5    16
417   01 00172   69100174               BL      $+2
418   01 00173   22500000 A             LI,5    0               WRAP AROUND TO 0 IF R EXCEEDS 15
419   01 00174   356A02C3               STW,6   RTABLOUT,5      FILL REGISTER-OUT TABLE
420   01 00175   20500001 A             AI,5    1
421   01 00176   65400170               BIR,4   FETCHRR
```



```
422                                     PAGE
423                             *
424                             * SET UP MEMORY-IN TABLE (MTABLIN)
425                             *
426   01 00177   522002A5       SETMIN  LH,2    TABLE+6         PICK UP MEMORY-IN POINTER (ADDRESS)
427   01 00178   524E02A5               LH,4    TABLE+6,7       PICK UP COUNT AND 1ST WORD INDICATOR
428   01 00179   68300184               BEZ     SETMOUT
429   01 0017A   25400578 A             SAD,4   =8              COUNT IN R4
430   01 0017B   25500068 A             SLS,5   =24              FIRST WORD INDICATOR IN R5
431   01 0017C   38200004 A             SW,2    4               ADD COUNT TO ADDRESS
432   01 0017D   32680002 A     FETCHMI LW,6    *2,4            FETCH DATA
433   01 0017E   21500010 A             CI,5    16
434   01 0017F   69100181               BL      $+2
435   01 00180   22500000 A             LI,5    0               WRAP AROUND IF WORD IND. EXCEEDS 15
436   01 00181   356A02D3               STW,6   MTABLIN,5       FILL MEMORY-IN TABLE
437   01 00182   20500001 A             AI,5    1               INCREMENT WORD INDICATOR  (INDEX)
438   01 00183   6540017D               BIR,4   FETCHMI
439                             *
440                             * SET UP MEMORY-OUT TABLE (MTABLOUT)
441                             *
442   01 00184   522002A6       SETMOUT LH,2    TABLE+7         PICK UP MEMORY-OUT POINTER (ADDRESS)
443   01 00185   524E02A6               LH,4    TABLE+7,7       PICK UP COUNT AND 1ST WORD INDICATOR
444   01 00186   68300191               BEZ     SHORT
445   01 00187   25400578 A             SAD,4   =8              COUNT IN R4
446   01 00188   25500068 A             SLS,5   =24              FIRST WORD INDICATOR IN R5
447   01 00189   38200004 A             SW,2    4               ADD COUNT TO ADDRESS
448   01 0018A   32680002 A     FETCHMO LW,6    *2,4            FETCH DATA
449   01 0018B   21500010 A             CI,5    16
450   01 0018C   6910018E               BL      $+2
451   01 0018D   22500000 A             LI,5    0               WRAP AROUND IF WORD IND. EXCEEDS 15
452   01 0018E   356A02E3               STW,6   MTABLOUT,5      FILL MEMORY-OUT TABLE
453   01 0018F   20500001 A             AI,5    1               INCREMENT WORD INDICATOR  (INDEX)
454   01 0019C   6540018A               BIR,4   FETCHMO
455                             *
```

```
                                PAGE
                          * SHORT LOOP OPERATION RETURNS HERE TO BEGIN EACH LOOP
                          *
459  01 00191  221FFFF0 A SHORT   LI,1    -16
460  01 00192  322202E3           LW,2    MTABLIN+16,1      MOVE MEMORY DATA
461  01 00193  35220314           STW,2   MEMORY+16,1
462  01 00194  65100192           BIR,1   *-2
463  01 00195  322002A7           LW,2    TABLE+8           MOVE
464  01 00196  35200314           STW,2   SP                 STACK
465  01 00197  322002A8           LW,2    TABLE+9             POINTER
466  01 00198  35200315           STW,2   SP+1                 DOUBLEWORD IN
467                               *
468                               * LOAD REGISTERS FROM RTABLIN
469                               *
470  01 00199  32F002C2           LW,15   RTABLIN+15
471  01 00194  32E002C1           LW,14   RTABLIN+14
472  01 00198  32D002C0           LW,13   RTABLIN+13
473  01 00190  32C002BF           LW,12   RTABLIN+12
474  01 00190  32B002BE           LW,11   RTABLIN+11
475  01 00195  32A002BD           LW,10   RTABLIN+10
476  01 00195  329002BC           LW,9    RTABLIN+9
477  01 001A0  328002BB           LW,8    RTABLIN+8
478  01 001A1  327002BA           LW,7    RTABLIN+7
479  01 001A2  326002B9           LW,6    RTABLIN+6
480  01 001A3  325002B8           LW,5    RTABLIN+5
481  01 001A4  324002B7           LW,4    RTABLIN+4
482  01 001A5  323002B6           LW,3    RTABLIN+3
483  01 001A6  322002B5           LW,2    RTABLIN+2
484  01 001A7  321002B4           LW,1    RTABLIN+1
485                               *
486                               * SET UP RETURN TO LOC+2
487                               *
488  01 001A8  220001AE           LI,0    LOC+2
489  01 001A9  350003C0           STW,0   RETURN+2
490  01 001AA  32000283           LW,0    RTABLIN
```



```
                                PAGE
491                               *
492                               * EXECUTION OF TEST INSTRUCTION PROCEEDS AS FOLLOWS:
493                               * THE PROGRAM STATUS DOUBLE WORD IS SET WITH ADDRESS OF LOC---OTHER
494                               * BITS OF PSW1 ARE SET AS SPECIFIED IN TEST MODULE.  THE TEST
495                               * INSTRUCTION IS THEN EXECUTED IN LOCATION LOC.  ALL RESULTS ARE SAVED
496                               * FOR TESTING UNLESS OPERATING IN THE SHORT LOOP MODE.
497                               *
498                               *
499  01 001AB  0E0003BC           LPSD,0  PSW1
500                               ********************************************************************
501  01 001AC  00000000 A LOC     PZE                       TEST INSTRUCTION INSERTED HERE
502                               ********************************************************************
503  01 001AD  0F0003BE           XPSD,0  RETURN            SAVE RESULTING PSDW
504  01 001AE  350002F3           STW,0   RRESULT           SAVE REGISTER 0 RESULTS
505                               *
506                               * MODIFY RETURN SO THAT ANY TRAPS AFTER THIS POINT GO TO DEADSTOP
507                               *
508  01 001AF  220000B3           LI,0    DEADSTOP
509  01 001B0  350003C0           STW,0   RETURN+2          SET RETURN TO DEADSTOP
510                               *
511  01 001B1  6C000000 A         RD,0    0                 READ SS1
512  01 001B2  69800191           BCS,8   SHORT             SHORT LOOP
513                               *
514                               * SAVE REGISTER 1 THRU 15 RESULTS
515                               *
516  01 001B3  32000383           LW,0    MOVER
517  01 001B4  350001B5           STW,0   *+1
518  01 001B5  351002F4           STW,1   RRESULT+1         INSTRUCTION MODIFIED WHILE RUNNING
519  01 001B6  30000384           AW,0    MOVERMOD
520  01 001B7  310003B5           CW,0    MOVERFIN
521  01 001B8  691001B4           BL      *+4
```

```
                                        PAGE
                              *
                              * BEGIN TESTING RESULTS
                              *
                              * IN EACH TEST, THE IDENTIFIER IS PLACED IN R5 AND THE TWO ITEMS TO
                              * BE COMPARED ARE PLACED IN R6 (ACTUAL RESULT) AND R7 (EXPECTED RESULT).
                              * A BRANCH IS THEN MADE TO THE ERROR ROUTINE WHICH COMPARES R6 AND R7.
                              *
                              *       TEST INSTRUCTION
                              *
01 00189   325003C6           LW,5    INSTID          PICK UP IDENTIFIER
01 0018A   326001AC           LW,6    L0C             IS
01 0018B   327002A0           LW,7    TABLE+1         SHOULD BE
01 0018C   6AF00202           BAL,15  ERROR
                              *
                              *       TEST LOCATION+1
                              *
01 0018D   325003C7           LW,5    XPSDID          PICK UP IDENTIFIER
01 0018E   326001AD           LW,6    L0C+1           IS
01 0018F   327003AA           LW,7    XPSD            SHOULD BE
01 001C0   6AF00202           BAL,15  ERROR
                              *
                              *       TEST INDIRECT ADDRESS LOCATION
                              *
01 001C1   325003C8           LW,5    IAID            PICK UP IDENTIFIER
01 001C2   32600316           LW,6    IA              IS
01 001C3   32700381           LW,7    INDA            SHOULD BE
01 001C4   6AF00202           BAL,15  ERROR
                              *
                              *       TEST STACK INDIRECT ADDRESS LOCATION
                              *
01 001C5   20500001 A         AI,5    1               INCREMENT IDENTIFIER
01 001C6   32600317           LW,6    IASP            IS
01 001C7   32700382           LW,7    INDASP          SHOULD BE
01 001C8   6AF00202           BAL,15  ERROR
```



```
                                        PAGE
                              *       TEST PSW1
                              *
01 001C9   325003C9           LW,5    PSDWID          PICK UP IDENTIFIER
01 001CA   3260038E           LW,6    RETURN          IS
01 001CB   327002A2           LW,7    TABLE+3         SHOULD BE
01 001CC   6AF00202           BAL,15  ERROR
                              *
                              *       TEST PSW2
                              *
01 001CD   20500001 A         AI,5    1               ADD 1 TO IDENTIFIER
01 001CE   3260038F           LW,6    RETURN+1        IS
01 001CF   327003B6           LW,7    PSW2            SHOULD BE (CONSTANT FOR ALL MODULES)
01 001D0   6AF00202           BAL,15  ERROR
                              *
                              *       TEST ALL REGISTER RESULTS
                              *
01 001D1   325003CA           LW,5    REGID           PICK UP IDENTIFIER
01 001D2   326A02F3     TESTALLR LW,6 RRESULT,5       IS
01 001D3   327A02C3           LW,7    RTABLOUT,5      SHOULD BE
01 001D4   6AF00202           BAL,15  ERROR
01 001D5   20500001 A         AI,5    1               INCREMENT IDENTIFIER
01 001D6   31500300           CW,5    REGIDFIN
01 001D7   69100102           BL      TESTALLR        NOT FINISHED
                              *
                              *       TEST ALL MEMORY RESULTS IN TABLE LABELED MEMORY
                              *
01 001D8   325003CB           LW,5    MEMID           PICK UP IDENTIFIER
01 001D9   326A0000 A   TESTALLM LW,6 0,5             IS
01 001DA   3273FFDF A         LW,7    MTABLOUT+MEMORY,5 SHOULD BE
01 001DB   6AF00202           BAL,15  ERROR
01 001DC   20500001 A         AI,5    1               INCREMENT IDENTIFIER
01 001DD   315003CE           CW,5    MEMIDFIN        TEST FOR END OF MEMORY TABLE
01 001DE   69300109           BNE     TESTALLM        NOT FINISHED
```

```
                                        PAGE
                                *
                                *       TEST STACK POINTER DOUBLEWORD
                                *
 01 001DF   325003CC                    LW,5    SPID            PICK UP IDENTIFIER
 01 001E0   32600314                    LW,6    SP              IS                              *B
                                * DELETED ONE INSTRUCTION
 01 001E1   327002A9                    LW,7    TABLE+10        SHOULD BE
 01 001E2   6AF00202                    BAL,15  ERROR
 01 001E3   20500001 A                  AI,5    1               INCREMENT IDENTIFIER
 01 001E4   32600315                    LW,6    SP+1            IS
 01 001E5   327002AA                    LW,7    TABLE+11        SHOULD BE
 01 001E6   6AF00202                    BAL,15  ERROR
```



```
                                        PAGE
                                *
                                * ALL TESTS HAVE BEEN COMPLETED AT THIS POINT.  CHECK REPORT INDICATOR
                                * TO SEE IF ANY ERRORS WERE REPORTED ON CURRENT MODULE.  IF YES, BYPASS
                                * READING OF SS3.  IF NO, READ SS3 AND PRINT REPORT IF SS3 SET.  CLEAR
                                * REPORT INDICATOR.
                                *
 01 001E7   22500000 A                  LI,5    0               CLEAR ERROR IDENTIFIER
 01 001E8   355002AF                    STW,5   DISPLAY+4
 01 001E9   32E003CF                    LW,14   RPTIND          PICK UP REPORT INDICATOR
 01 001EA   693001F8                    BNEZ    CLRRPT          TEST REPORT INDICATOR
 01 001EB   6C000000 A                  RD,0    0               READ SS3 (REQUEST FOR REPORT)
 01 001EC   692001F8                    BCR,2   CLRRPT
 01 001ED   6AF0021B                    BAL,15  TSTDVC          TEST OUTPUT DEVICE
 01 001EE   680001F7                    B       OUTRPT            RETURN HERE IF DEVICE IS AVAILABLE
 01 001EF   22B0F000 A                  LI,11   X'F000'           RETURN HERE IF DEVICE IS UNAVAIL.
 01 001F0   6DB01500 A                  WD,11   X'1500'         DISABLE COUNTER INTERRUPTS
 01 001F1   6AF00220                    BAL,15  LOAD4           LOAD REG. R1-R4 WITH DISPLAY INFO
 01 001F2   22600000 A                  LI,6    0               CLEAR R6
 01 001F3   22700000 A                  LI,7    0               CLEAR R7
 01 001F4   22800000 A                  LI,8    0               CLEAR R8
 01 001F5   2E000000 A                  WAIT    0               REPORT HALT
 01 001F6   680001F8                    B       END
 01 001F7   6AF00220            OUTRPT  BAL,15  EDIT            OUTPUT REPORT
 01 001F8   22E00000 A          CLRRPT  LI,14   0
 01 001F9   35E003CF                    STW,14  RPTIND          CLEAR REPORT INDICATOR
 01 001FA   321002AB                    LW,1    SAVE            GET CURRENT MODULE ADDRESS
 01 001FB   22200001 A          END     LI,2    1
 01 001FC   531402AD                    MTH,1   PASSES,2        INCREMENT MODULE COUNT
 01 001FD   6C000000 A                  RD,0    0
 01 001FE   69C0010F                    BCS,12  CYCLE           READ SS1 AND SS2 (LOOP)
 01 001FF   321003A8                    LW,1    NEXT            GET NEXT MODULE ADDRESS IF NO LOOP
 01 00200   6800010F                    B       CYCLE
```

```
      637                                    PAGE
      638                              *
      639                              * ERROR ROUTINE COMPARES R6 AND R7 USING AN EOR INSTRUCTION.  IF NO
      640                              * ONES RESULT FROM EOR (IE: NO ERROR) RETURN IS MADE TO TEST SEQUENCE.
      641                              * IF AN ERROR IS DETECTED, AN ATTEMPT TO REPORT IS MADE AND THE ALARM
      642                              * IS TURNED ON.
      643                              *
      644   01 00201    00000000 A    ERRLINK  PZE
      645   01 00202    35F00201      ERROR    STW,15   ERRLINK          SAVE RETURN LINK
      646   01 00203    32800006 A               LW,8     6               PICK UP RESULT
      647   01 00204    48800007 A               EOR,8    7               COMPARE WITH PREDETERMINED RESULT
      648   01 00205    E8300201                 BEZ      *ERRLINK        NO ERROR
      649   01 00206    6D000041 A               WD,0     X'41'           TURN ON ALARM
      650   01 00207    331002AC                 MTW,1    ERRORS          INCREMENT ERROR COUNTER
      651   01 00208    6AF00218                 BAL,15   TSTDVC          TEST DEVICE
      652   01 00209    68000213                 B        REPERR            RETURN HERE IF DEVICE AVAILABLE
      653   01 0020A    6C000000 A    READSS4  RD,0     0                 RETURN HERE IF DEVICE UNAVAIL.
      654   01 0020B    69100211                 BCS,1    ALRMOFF         READ SS4
      655   01 0020C    22B0F000 A               LI,11    X'F000'
      656   01 0020D    331003CF                 MTW,1    RPTIND          SET REPORT INDICATOR
      657   01 0020E    6DB01500 A               WD,11    X'1500'         DISABLE COUNTER INTERRUPTS
      658   01 0020F    6AF00220                 BAL,15   LOAD4           LOAD REG, R1-R4 WITH DISPLAY INFO
      659   01 00210    2E000000 A               WAIT     0               HALT ON ERROR
      660   01 00211    6D000040 A    ALRMOFF  WD,0     X'40'           TURN OFF ALARM
      661   01 00212    E8000201                 B        *ERRLINK        NEXT TEST
      662   01 00213    331003CF      REPERR   MTW,1    RPTIND          SET REPORT INDICATOR
      663   01 00214    355002AF                 STW,5    DISPLAY+4
      664   01 00215    356002B0                 STW,6    DISPLAY+5
      665   01 00216    357002B1                 STW,7    DISPLAY+6
      666   01 00217    358002B2                 STW,8    DISPLAY+7
      667   01 00218    6AF00220                 BAL,15   EDIT            OUTPUT ERROR MESSAGE
      668   01 00219    6AF00225                 BAL,15   LOAD5           LOAD R5 THRU R8
      669   01 0021A    6800020A                 B        READSS4
```



```
      670                                    PAGE
      671                              *
      672                              * TSTDVC TESTS OUTPUT DEVICE AVAILABILITY.  IF AVAILABLE, RETURN IS TO
      673                              * ADDRESS IN LINK.    IF UNAVAILABLE, RETURN IS TO ADDRESS+1.
      674                              *
      675   01 00218    CF0003B7      TSTDVC   HIO,0    *DVC
      676   01 0021C    CD3003B7               TIO,11   *DVC
      677   01 0021D    ERC0000F A             BCR,12   *15             SIO POSSIBLE
      678   01 0021E    2AF00001 A             AI,15    1
      679   01 0021F    ER00000F A             B        *15             UNAVAILABLE OR NOT OPERATIONAL
      680                              *
      681                              *
      682                              * THIS ROUTINE LOADS REGISTERS R1-R4 FROM THE FIRST 4 WORDS OF DISPLAY.
      683                              *
      684   01 00220    3210028B      LOAD4    LW,1     DISPLAY
      685   01 00221    3220028C               LW,2     DISPLAY+1
      686   01 00222    3230028D               LW,3     DISPLAY+2
      687   01 00223    3240028E               LW,4     DISPLAY+3
      688   01 00224    ER00000F A             B        *15
      689                              *
      690                              *
      691                              * THIS ROUTINE LOADS REGISTERS R5-R8 FROM THE LAST 4 WORDS OF DISPLAY
      692                              *
      693   01 00225    325002AF      LOAD5    LW,5     DISPLAY+4
      694   01 00226    326002B0               LW,6     DISPLAY+5
      695   01 00227    327002B1               LW,7     DISPLAY+6
      696   01 00228    328002B2               LW,8     DISPLAY+7
      697   01 00229    E800000F A             B        *15
```

```
                                        PAGE
                                *
                                * EDIT ROUTINE TESTS IDENTIFIER IN R5 TO DETERMINE IF PRINTOUT IS
                                * DUE TO ERROR OR IF IT IS RESPONSE TO REPORT REQUEST (SS3 SET).
                                *
                                *       IF FOR ERROR, THEN CONTENTS OF R1 THRU R8 ARE CONVERTED TO
                                *       EBCDIC FOR PRINTOUT.
                                *
                                *       IF REPORTING AND NO ERROR, THEN CONTENTS OF ONLY R1 THRU R4
                                *       ARE CONVERTED TO EBCDIC FOR PRINTOUT.
                                *
01 0022A  00000000 A  EDITLINK PZE
01 00229  3580028Z    EDMLAST  STW,8   DISPLAY+7
01 0022C  354002AE    EDMOVE   STW,4   DISPLAY+3
01 0022D  35F0022A    EDIT     STW,15  EDITLINK          SAVE RETURN LINK
01 0022E  3200022C            LW,0    EDMOVE
01 0022F  300003B4            AW,0    MOVERMOD
01 00230  35000232            STW,0   *+2
01 00231  31000228            CW,0    EDMLAST
                                                        MOVE R5-R8 TO DISPLAY TABLE FOR CONV
01 00232  00000000 A          PZE
01 00233  6810022F            BGE     *-4               NOT FINISHED
01 00234  22E002AF            LI,14   DISPLAY+4         SET UP TO CONVERT 4 WORDS
01 00235  222FFFFC A          LI,2    *4
01 00236  32F002AF            LW,15   DISPLAY+4         GET ERROR IDENTIFIER
01 00237  6830023A            BCR,3   *+3               TEST FOR ERROR
01 00238  20E00004 A          AI,14   4                 IF ERROR, MODIFY SET UP FOR 8 WORDS
01 00239  202FFFFC A          AI,2    *4
01 0023A  22500000 A          LI,5    0                 SET BYTE INDEX FOR STORING IMAGE
01 00238  32000350            LW,0    BLANK
01 0023C  22400002 A  CNVRT    LI,4    2
01 0023D  750A033C            STB,0   IMAGE+1,5         INSERT 2 BLANKS BETWEEN WORDS
01 0023E  20500001 A          AI,5    1                 INCREMENT BYTE INDEX
01 0023F  64400230            BDR,4   *-2
01 00240  22600008 A          LI,6    8
01 00241  B2A4000E A          LW,10   *14,2             GET WORD TO BE CONVERTED
```



```
                                        PAGE
                                *
01 00242  22B00000 A  CNVRTMOR LI,11   0                 CLEAR R11
01 00243  25A00304 A           SCD,10  4                 HEX CHAR, INTO R11
01 00244  21B00009 A           CI,11   9
01 00245  69200247             BCS,2   *+2
01 00246  20B00039 A           AI,11   X'39'
01 00247  20B00087 A           AI,11   X'87'             CONVERT HEX CHAR TO EBCDIC BYTE
01 00248  75BA033C            STB,11  IMAGE+1,5
01 00249  20500001 A          AI,5    1                 INCREMENT BYTE INDEX
01 0024A  64600242            BDR,6   CNVRTMOR
01 0024B  65200230            BIR,2   CNVRT             BRANCH TO CONVERT ANOTHER WORD
                                *
                                *
                                *
                                * TEST MOST SIGNIFICANT HALF OF DEVICE ADDRESS WORD.
                                *       ZERO    - USE TYPEWRITER
                                *       NONZERO - USE LINE PRINTER
                                *
01 0024C  52600387            LH,6    DVC
01 0024D  69300262            BNEZ    LISTOUT           USE LINE PRINTER
01 0024E  6B00024F            B       TYPEOUT           USE TYPEWRITER
```

```
                                        PAGE
                                *       TYPEWRITER OUTPUT ROUTINE
                                *
                                * THE FOLLOWING CODE TESTS THE FIRST PASS INDICATOR AND THE LINE COUNT.
                                * IF FIRST TIME THRU, TITLE AND HEADING ARE PRINTED.  IF AT BOTTOM OF
                                * PAGE, PAPER IS UPSPACED TO NEW PAGE THEN TITLE AND HEADING ARE PRINTED
                                *
0000024F  01 0024F  32C003A0    TYPEOUT LW,12   LINE            GET LINE COUNT (INITIALLY=-51)
00000250  01 00250  32D003A1            LW,13   FIRST           GET FIRST PASS INDICATOR
00000251  01 00251  65D00255            BIR,13  SKIP6          FIRST TIME THRU
00000252  01 00252  65C0025A            BIR,12  MSGOUT         LINE COUNT NOT ZERO
00000253  01 00253  220001E8            LI,0    DA(DSIXNL)
00000254  01 00254  6AF00278            BAL,15  PRINT           UPSPACE 6 LINES
00000255  01 00255  220001E9    SKIP6   LI,0    DA(DTITLE)
00000256  01 00256  6AF00278            BAL,15  PRINT           NEW PAGE TITLE
00000257  01 00257  220001EA            LI,0    DA(DHEAD)
00000258  01 00258  6AF00278            BAL,15  PRINT           NEW HEADING
00000259  01 00259  22CFFFCD A          LI,12   -51             RESET LINE COUNT
0000025A  01 0025A  220001EB    MSGOUT  LI,0    DA(DSHRTL)
0000025B  01 0025B  321002AF            LW,1    DISPLAY+4       GET IDENTIFIER
0000025C  01 0025C  6830025E            BEZ     $+2             REPORT AND NO ERROR
0000025D  01 0025D  20000001 A          AI,0    1
0000025E  01 0025E  6AF00278            BAL,15  PRINT           PRINT REPORT OR ERROR
0000025F  01 0025F  35C003A0            STW,12  LINE            SAVE NEW LINE COUNT
00000260  01 00260  35D003A1            STW,13  FIRST           SAVE NEW FIRST PASS INDICATOR
00000261  01 00261  E800022A            B       *EDITLINK
```



```
                                        PAGE
                                *       LINE PRINTER OUTPUT ROUTINE
                                *
                                * THE FIRST PASS INDICATOR IS MODIFIED AND TESTED.  IF ON FIRST PASS,
                                * THE PRINTER IS SET TO TOP OF PAGE AND THE TITLE AND HEADING ARE
                                * PRINTED.  IF NOT ON FIRST PASS, THE PRINTER IS TESTED FOR TOP OF
                                * PAGE SO THAT THE TITLE AND HEADING MAY BE PRINTED AT THE TOP OF
                                * EVERY PAGE.  THE ERROR OR REPORT MESSAGE IS THEN PRINTED.
                                *
00000262  01 00262  32D003A2    LISTOUT LW,13   FIRSTL          GET FIRST PASS INDICATOR
00000263  01 00263  65D00275            BIR,13  TOPSET          FIRST PASS
00000264  01 00264  CEB003B7            TDV,11  *DVC
00000265  01 00265  6B800268            BCR,8   $+3
00000266  01 00266  6B400264            BCR,4   $-2             SIOP BUSY, TRY AGAIN
00000267  01 00267  E800022A            B       *EDITLINK       NO DEVICE RECOGNITION
00000268  01 00268  31B003A5            CW,11   MOVEBIT         TEST FOR PAPER IN MOTION
00000269  01 00269  69400264            BCS,4   $-5
0000026A  01 0026A  31B003A6            CW,11   TOPBIT          TEST FOR TOP OF PAGE
0000026B  01 0026B  6B40026E            BCR,4   LISTMSG
0000026C  01 0026C  220001EF            LI,0    DA(LTTL)
0000026D  01 0026D  6AF00278            BAL,15  PRINT           PRINT TITLE AND HEADING
0000026E  01 0026E  220001F4    LISTMSG LI,0    DA(LMSG)        LOAD RO FOR REPORT
0000026F  01 0026F  32B002AF            LW,11   DISPLAY+4       TEST ERROR IDENTIFIER
00000270  01 00270  6B300272            BEZ     $+2
00000271  01 00271  20000002 A          AI,0    2               REVISE RO FOR ERROR MESSAGE
00000272  01 00272  6AF00278            BAL,15  PRINT           PRINT MESSAGE
00000273  01 00273  35D003A2            STW,13  FIRSTL          SAVE FIRST PASS INDICATOR
00000274  01 00274  E800022A            B       *EDITLINK
00000275  01 00275  220001EE    TOPSET  LI,0    DA(LTOP)        GO TO TOP OF PAGE AND THEN
00000276  01 00276  6AF00278            BAL,15  PRINT           PRINT TITLE AND HEADING
00000277  01 00277  6800026E            B       LISTMSG         NOW PRINT THE REPORT
```

```
                                        PAGE
                                *
                                * PRINT ROUTINE ASSUMES PROGRAM HAS ALREADY LOADED RO FOR OUTPUT
                                * OPERATION.  SIO IS ISSUED TO START OUTPUT DEVICE FOLLOWED BY TIO
                                * TO TEST STATUS.  ROUTINE LOOPS ON TIO UNTIL STATUS INDICATES
                                * THAT DEVICE IS NO LONGER BUSY OR IS UNAVAILABLE OR INOPERATIVE.
                                * ENTRY INTO ROUTINE IS MADE VIA THE INSTRUCTION --- BAL,15  PRINT
                                *
 820  01 00278  CC0003B7  PRINT   SIO,0   *DVC
 821  01 00279  CDB003B7  TESTIO  TIO,11  *DVC
 822  01 0027A  68800270          BCR,8   *+3
 823  01 0027B  68400279          BCR,4   *-2                 BRANCH IF SIGP BUSY
 824  01 0027C  E800000F A        B       *15                 NO DEVICE RECOGNITION
 825  01 0027D  49B003A3          AND,11  BUSYSTAT
 826  01 0027E  31B003A3          CW,11   BUSYSTAT
 827  01 0027F  68300279          BE      TESTIO
 828  01 00280  E800000F A        B       *15                 EXIT
```



```
                                        PAGE                                    *B
                                *                                               *B
                                * DETERMINE CORE SIZE, INITALIZE APPLICABLE MODULES OF P-REGISTER  *B
                                * COUNT DOWN LOGIC TEST, AND STORE REQUIRED 2 WORD STACKS        *B
                                *                                               *B
 834  01 00281  32000290  CORSIZE  LW,0   ADDTRAP          SET NON-EXISTENT MEMORY RETURN  *B
 835  01 00282  35000068          STW,0   NEARET                                 *B
 836  01 00283  22002000 A        LI,0    X'2000'         GREATER THAN 8K         *B
 837  01 00284  221FFFFF A        LI,1    *1                                      *B
 838  01 00285  22200000 A        LI,2    0                                       *B
 839  01 00286  223FFFF4 A        LI,3    *12             MODULE COUNT            *B
 840  01 00287  32400000 A  ADDTEST LW,4   *0             TRY ADDRESS             *B
 841  01 00288  3240035A          LW,4    DTA1+1          ADDRESS OK              *B
 842  01 00289  B5400000 A        STW,4   *0              STORE STACK             *B
 843  01 0028A  32400359          LW,4    DTA1                                    *B
 844  01 0028B  B5420000 A        STW,4   *0,1                                    *B
 845  01 0028C  6704C299          EXU     STOCNT,2        STORE MODULE COUNT      *B
 846  01 0028D  20200001 A        AI,2    1                                       *B
 847  01 0028E  25000001 A        SLS,0   1               DOUBLE TEST ADDRESS     *B
 848  01 0028F  68000287          B       ADDTEST                                 *B
 849  01 00290  3200029E  ADDRET  LW,0    ADDTRAP+1       RESTORE NON-EXISTENT MEMORY RETURN*B
 850  01 00291  35000068          STW,0   NEARET                                 *B
 851  01 00292  32400359          LW,4    DTA1            STORE P19 & P20 STACKS  *B
 852  01 00293  354007FF A        STW,4   X'7FF'                                  *B
 853  01 00294  35400FFF A        STW,4   X'FFF'                                  *B
 854  01 00295  3240035A          LW,4    DTA1+1                                  *B
 855  01 00296  35400800 A        STW,4   X'800'                                  *B
 856  01 00297  35401000 A        STW,4   X'1000'                                 *B
 857  01 00298  E800000F A        B       *15                                     *B
 858                            *                                               *B
 859                            *                                               *B
 860                            *                                               *B
 861  01 00299  353007BE  STOCNT  STW,3   DECP18                                  *B
 862  01 0029A  353007CA          STW,3   DECP17                                  *B
 863  01 0029B  353007D6          STW,3   DECP16                                  *B
 864  01 0029C  353007E2          STW,3   DECP15                                  *B
 865                            *                                               *B
```

```
      866                               *                                                    *B
      867                               *                                                    *B
      868   01 0029D    0F0003C2        ADDTRAP  XPSD,0   SIZRET                           *B
      869   01 0029E    0F0003BE                 XPSD,0   RETURN                           *B
```



```
      870                                        PAGE
      871                               *
      872                               *     ************CONSTANTS AND WORKING STORAGE************
      873                               *
      874                               * MODULE UNDER TEST IS MOVED TO THIS TABLE BEFORE USING
      875                               *
      876   01 0029F    00000000 A      TABLE    DATA     0,0,0,0,0,0,0,0,0,0,0,0
            01 002A0    00000000 A
            01 002A1    00000000 A
            01 002A2    00000000 A
            01 002A3    00000000 A
            01 002A4    00000000 A
            01 002A5    00000000 A
            01 002A6    00000000 A
            01 002A7    00000000 A
            01 002A8    00000000 A
            01 002A9    00000000 A
            01 002AA    00000000 A
      877                               *
      878                               * TABLE WHERE CONTENTS OF REGISTERS R1 THRU R8 ARE STORED
      879                               *
      880   01 002AB    00000000 A      DISPLAY  DATA     0,0,0,0,0,0,0,0
            01 002AC    00000000 A
            01 002AD    00000000 A
            01 002AE    00000000 A
            01 002AF    00000000 A
            01 002B0    00000000 A
            01 002B1    00000000 A
            01 002B2    00000000 A
      881                               *
      882         01 002AB            SAVE     EQU      DISPLAY
      883         01 002AC            ERRORS   EQU      DISPLAY+1
      884         01 002AD            PASSES   EQU      DISPLAY+2
```

```
      885                                          PAGE
      886                                * TABLE USED TO STORE REGISTER CONTENTS PRIOR TO TEST
      887    01 002B3    00000000 A     RTABLIN  DATA     0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
             01 002B4    00000000 A
             01 002B5    00000000 A
             01 002B6    00000000 A
             01 002B7    00000000 A
             01 002B8    00000000 A
             01 002B9    00000000 A
             01 002BA    00000000 A
             01 002BB    00000000 A
             01 002BC    00000000 A
             01 002BD    00000000 A
             01 002BE    00000000 A
             01 002BF    00000000 A
             01 002C0    00000000 A
             01 002C1    00000000 A
             01 002C2    00000000 A
      888                                * TABLE USED TO STORE EXPECTED REGISTER VALUES
      889    01 002C3    00000000 A     RTABLOUT DATA     0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
             01 002C4    00000000 A
             01 002C5    00000000 A
             01 002C6    00000000 A
             01 002C7    00000000 A
             01 002C8    00000000 A
             01 002C9    00000000 A
             01 002CA    00000000 A
             01 002CB    00000000 A
             01 002CC    00000000 A
             01 002CD    00000000 A
             01 002CE    00000000 A
             01 002CF    00000000 A
             01 002D0    00000000 A
             01 002D1    00000000 A
             01 002D2    00000000 A
```



```
      890                                          PAGE
      891                                * TABLE USED TO STORE UP TO 16 MEMORY OPERANDS USED BY INSTRUCTION
      892    01 002D3    00000000 A     MTABLIN  DATA     0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
             01 002D4    00000000 A
             01 002D5    00000000 A
             01 002D6    00000000 A
             01 002D7    00000000 A
             01 002D8    00000000 A
             01 002D9    00000000 A
             01 002DA    00000000 A
             01 002DB    00000000 A
             01 002DC    00000000 A
             01 002DD    00000000 A
             01 002DE    00000000 A
             01 002DF    00000000 A
             01 002E0    00000000 A
             01 002E1    00000000 A
             01 002E2    00000000 A
      893                                * TABLE USED TO STORE UP TO 16 MEMORY RESULTS EXPECTED AFTER TEST
      894    01 002E3    00000000 A     MTABLOUT DATA     0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
             01 002E4    00000000 A
             01 002E5    00000000 A
             01 002E6    00000000 A
             01 002E7    00000000 A
             01 002E8    00000000 A
             01 002E9    00000000 A
             01 002EA    00000000 A
             01 002EB    00000000 A
             01 002EC    00000000 A
             01 002ED    00000000 A
             01 002EE    00000000 A
             01 002EF    00000000 A
             01 002F0    00000000 A
             01 002F1    00000000 A
             01 002F2    00000000 A
```

```
                                        PAGE
                                *
                                * TABLE WHERE REGISTER RESULTS ARE STORED AFTER TEST
                                *
   01 002F3    00000000 A   RRESULT  DATA     0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
   01 002F4    00000000 A
   01 002F5    00000000 A
   01 002F6    00000000 A
   01 002F7    00000000 A
   01 002F8    00000000 A
   01 002F9    00000000 A
   01 002FA    00000000 A
   01 002FB    00000000 A
   01 002FC    00000000 A
   01 002FD    00000000 A
   01 002FE    00000000 A
   01 002FF    00000000 A
   01 00300    00000000 A
   01 00301    00000000 A
   01 00302    00000000 A
```



```
                                        PAGE
                                *
                                *
                                * TABLE OF MEMORY OPERANDS
                                * INSTRUCTION UNDER TEST OPERATES ON DATA IN THIS AREA
                                *
                                        BOUND 8
   01 00304    00000000 A   MEMORY   DATA     0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
   01 00305    00000000 A
   01 00306    00000000 A
   01 00307    00000000 A
   01 00308    00000000 A
   01 00309    00000000 A
   01 0030A    00000000 A
   01 0030B    00000000 A
   01 0030C    00000000 A
   01 0030D    00000000 A
   01 0030E    00000000 A
   01 0030F    00000000 A
   01 00310    00000000 A
   01 00311    00000000 A
   01 00312    00000000 A
   01 00313    00000000 A
   01 00314    00000000 A   SP       PZE,0    0              STACK POINTER DOUBLE WORD
   01 00315    00000000 A            PZE
   01 00316    00000000 A   IA       PZE                     INDIRECT ADDRESS LOCATION
   01 00317    00000000 A   IASP     PZE                     STACK POINTER INDIRECT ADDRESS
```

```
                                                    PAGE
      912
      913   01 00318    15151515 A   TTL      TEXT     'NNNNNNN                                SUFFIX'
            01 00319    15151540 A
            01 0031A    40404040 A
            01 00318    40404040 A
            01 0031C    40404040 A
            01 0031D    40404040 A
            01 0031E    40404040 A
            01 0031F    40404040 A
            01 00320    40404040 A
            01 00321    4040E2E4 A
            01 00322    C6C6C9E7 A
      914   01 00323    40C5D9D9 A            TEXT     ' ERROR DISPLAY'
            01 00324    D6D940C4 A
            01 00325    C9E2D7D3 A
            01 00326    C1E84040 A
      915   01 00327    15404040 A   HDG      TEXT     'N    LIST     ERRORS    PASSES     INST '
            01 00328    40D3C9E2 A
            01 00329    E3404040 A
            01 0032A    4040C5D9 A
            01 00328    D9D6D9E2 A
            01 0032C    40404040 A
            01 0032D    D7C1E2E2 A
            01 0032E    C5E24040 A
            01 0032F    404040C9 A
            01 00330    D5E2E340 A
      916   01 00331    4040C9C4 A            TEXT     '  IDENTIFIER    IS    SHOULD BE    DIFFN'
            01 00332    C5D5E3C9 A
            01 00333    C6C9C5D9 A
            01 00334    40404040 A
            01 00335    C9E24040 A
            01 00336    4040E2C8 A
            01 00337    D6E4D3C4 A
            01 00338    40C2C540 A
            01 00339    404040C4 A
            01 0033A    C9C6C615 A
```



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                                                    PAGE
      917
      918                                 *
      919                                 *  *** REPORT OR ERROR MESSAGE FOR PRINTOUT ***
      920                                 *
      921   01 00333    40404015 A   IMAGE    DATA     X'40404015'
      922   01 00338    00000000 A            DATA     0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
            01 0033D    00000000 A
            01 0033E    00000000 A
            01 0033F    00000000 A
            01 00340    00000000 A
            01 00341    00000000 A
            01 00342    00000000 A
            01 00343    00000000 A
            01 00344    00000000 A
            01 00345    00000000 A
            01 00346    00000000 A
            01 00347    00000000 A
            01 00348    00000000 A
            01 00349    00000000 A
            01 0034A    00000000 A
            01 0034B    00000000 A
            01 0034C    00000000 A
            01 0034D    00000000 A
            01 0034E    00000000 A
            01 0034F    00000000 A
      923   01 00350    40404040 A   BLANK    DATA     X'40404040'       BLANK EBCDIC CHARACTERS
      924                                 *
      925   01 00351    000C0804 A   DTA0     DATA     X'000C0804'       DATA TABLE 0
      926   01 00352    C10D0905 A            DATA     X'C10D0905'
      927   01 00353    020E0A06 A            DATA     X'020E0A06'
      928   01 00354    030F0B07 A            DATA     X'030F0B07'
      929   01 00355    04000C08 A            DATA     X'04000C08'
      930   01 00356    05010D09 A            DATA     X'05010D09'
      931   01 00357    06020E0A A            DATA     X'06020E0A'
      932   01 00358    07030F0B A            DATA     X'07030F0B'
```

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      933                                        PAGE
      934                                  *
      935   01 00359   000C0804 A   DTA1    DATA     X'000C0804'       DATA TABLE 1
      936   01 0035A   010D0905 A             DATA     X'010D0905'         +1
      937   01 00358   020E0A06 A             DATA     X'020E0A06'         +2
      938   01 0035C   030F0B07 A             DATA     X'030F0B07'         +3
      939   01 0035D   04000C08 A             DATA     X'04000C08'         +4
      940   01 0035E   05010D09 A             DATA     X'05010D09'         +5
      941   01 0035F   06020E0A A             DATA     X'06020E0A'         +6
      942   01 00360   07030F0B A             DATA     X'07030F0B'         +7
      943   01 00361   0804000C A             DATA     X'0804000C'         +8
      944   01 00362   09050100 A             DATA     X'09050100'         +9
      945   01 00363   0A06020E A             DATA     X'0A06020E'         +10
      946   01 00364   0B07030F A             DATA     X'0B07030F'         +11
      947   01 00365   0C080400 A             DATA     X'0C080400'         +12
      948   01 00366   0D090501 A             DATA     X'0D090501'         +13
      949   01 00367   0E0A0602 A             DATA     X'0E0A0602'         +14
      950   01 00368   0F0B0703 A             DATA     X'0F0B0703'         +15
      951                                  *
      952   01 00369   AAA00001 A   DTA2    DATA     X'AAA00001'       DATA TABLE 2
      953   01 0036A   11111111 A             DATA     X'11111111'         +1
      954   01 00368   99900002 A             DATA     X'99900002'         +2
      955   01 0036C   22222222 A             DATA     X'22222222'         +3
      956   01 0036D   33333333 A             DATA     X'33333333'         +4
      957   01 0036E   66600003 A             DATA     X'66600003'         +5
      958   01 0036F   44444444 A             DATA     X'44444444'         +6
      959   01 00370   55555555 A             DATA     X'55555555'         +7
      960   01 00371   66666666 A             DATA     X'66666666'         +8
      961   01 00372   55500004 A             DATA     X'55500004'         +9
      962   01 00373   77777777 A             DATA     X'77777777'         +10
      963   01 00374   88888888 A             DATA     X'88888888'         +11
      964   01 00375   99999999 A             DATA     X'99999999'         +12
      965   01 00376   AAAAAAAA A             DATA     X'AAAAAAAA'         +13
      966   01 00377   BBBBBBBB A             DATA     X'BBBBBBBB'         +14
      967   01 00378   33300005 A             DATA     X'33300005'         +15
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      968                                        PAGE
      969                                  *
      970   01 00379   00008000 A             DATA     X'8000'             -5
      971   01 0037A   FFFFFFF8 A             DATA     -8                  -4
      972   01 00373   FFFFFFFC A             DATA     -4                  -3
      973   01 0037C   FFFFFFFE A             DATA     -2                  -2
      974   01 0037D   FFFFFFFF A             DATA     -1                  -1
      975   01 0037E   00000000 A   DTA3    DATA     0                 DATA TABLE 3
      976   01 0037F   00000001 A             DATA     1                   +1
      977   01 00380   00000002 A             DATA     2                   +2
      978   01 00381   00000004 A             DATA     4                   +3
      979   01 00382   00000008 A             DATA     8                   +4
      980   01 00383   00007FFF A             DATA     X'7FFF'             +5
      981   01 00384   00000000 A   ZERBS   DATA     0
      982                                  *
      983   01 00385   15C3D5E3 A   CNTRMSG  TEXT     'NCNT PULSE INTERRUPTS ARMED ON NEXT PASS, --'
            01 00386   40D7E4D3 A
            01 00387   E2C540C9 A
            01 00388   D5E3C5D9 A
            01 00389   D9E4D7E3 A
            01 0038A   E840C1D9 A
            01 00383   D4C5C440 A
            01 0038C   D6D540D5 A
            01 0038D   C5E7E340 A
            01 0038E   D7C1E2E2 A
            01 0038F   4340606D A
      984   01 00390   40C9D5E3 A             TEXT     ' INTERRUPT AND CLEAR R5 TO DISARM.'
            01 00391   C5D9D3E4 A
            01 00392   D7E340C1 A
            01 00393   D5C440C3 A
            01 00394   D3C5C1D9 A
            01 00395   40D9F540 A
            01 00396   E3D640C4 A
            01 00397   C9E2C1D9 A
            01 00398   D4434040 A
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      985                                    PAGE
      986                              *
      987   01 00399  00000000 A   CNT1CP  DATA    0
      988   01 0039A  00000000 A   CNT2CP  DATA    0
      989   01 0039B  00000000 A   CNT3CP  DATA    0
      990   01 0039C  00000000 A   CNT4CP  DATA    0
      991   01 0039D  00000000 A   INTR    DATA    0
      992   01 0039E  0000F000 A   INTRC   DATA    X'0000F000'       CNT PULSE INTR, ARM AND ENABLE BITS
      993   01 0039F  0000F000 A   CNTRMASK DATA   X'0000F000'
      994   01 003A0  FFFFFFCD A   LINE    DATA    -51               LINE COUNTER
      995   01 003A1  FFFFFFFE A   FIRST   DATA    -2                FIRST PASS INDICATOR
      996   01 003A2  FFFFFFFE A   FIRSTL  DATA    -2
      997   01 003A3  60000000 A   BUSYSTAT DATA   X'60000000'
      998   01 003A4  10000000 A   AUTOSTAT DATA   X'10000000'       AUTOMATIC STATUS BIT
      999   01 003A5  08000000 A   MOVEBIT DATA    X'08000000'       PAPER IN MOTION STATUS BIT
     1000   01 003A6  10000000 A   TOPBIT  DATA    X'10000000'       TOP OF PAGE STATUS BIT
     1001   01 003A7  F1C10000 A   TOPFORM DATA    X'F1C10000'       LINE PRINTER FORMAT CHARACTERS
     1002   01 003A8  00000000 A   NEXT    DATA    0                 ADDRESS OF NEXT MODULE SAVED HERE
     1003   01 003A9  63000100     BTOI00  B       START
     1004   01 003AA  0F0003BE     XPSD    XPSD,0  RETURN
     1005   01 003AB  FFFF0000 A   WOT15   DATA    X'FFFF0000'       MASK
     1006   01 003AC  0001FFFF A   W15T31  DATA    X'1FFFF'          MASK
     1007   01 003AD  FF3FFFFF A   LINKAD  DATA    X'FF3FFFFF'       MASK
     1008   01 003AE  FFF00000 A   COND    DATA    X'FFF00000'       MASK
     1009   01 003AF  00640000 A   NUM     GEN,16,16 100,0
     1010   01 003B0  000001AC     LOCADD  PZE,0   LOC
     1011   01 003B1  00000304     INDA    PZE,0   MEMORY            INDIRECT ADDRESS
     1012   01 003B2  00000314     INDASP  PZE,0   SP                INDIRECT ADDRESS (FOR SOME STACKS)
     1013   01 003B3  351002F4     MOVER   STW,1   RRESULT+1
     1014   01 003B4  00100001 A   MOVERMOD DATA    X'00100001'
     1015   01 003B5  36000303 N   MOVERFIN GEN,16,16 X'3600',RRESULT+16
     1016   01 003B6  00000000 A   PSW2    PZE
     1017   01 003B7  00000001 A   DVC     DATA    1                 OUTPUT DEVICE ADDRESS
```



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     1018                                    PAGE
     1019                                    BOUND 8
     1020   01 003B8  0000010F     REPEAT  PZE,0   CYCLE
     1021   01 003B9  00000000 A           PZE     0
     1022   01 003BA  00000000 A   TEMP    PZE
     1023   01 003BB  00000000 A           PZE
     1024   01 003BC  00000000 A   PSW1    PZE
     1025   01 003BD  00000000 A           PZE
     1026   01 003BE  00000000 A   RETURN  PZE
     1027   01 003BF  00000000 A           PZE
     1028   01 003C0  00000083             PZE,0   DEADSTOP
     1029   01 003C1  00000000 A           PZE
     1030   01 003C2  00000000 A   SIZRET  PZE                                                      *B
     1031   01 003C3  00000000 A           PZE                                                      *B
     1032   01 003C4  00000290             PZE,0   ADDRET                                           *B
     1033   01 003C5  00000000 A           PZE                                                      *B
     1034                              *
     1035                              *       ERROR TYPE INDICATORS
     1036                              *
     1037   01 003C6  100001AC     INSTID  GEN,4,28 1,LOC            INSTRUCTION IDENTIFIER
     1038   01 003C7  200001AD     XPSDID  GEN,4,28 2,LOC+1          LOC+1 IDENTIFIER
     1039   01 003C8  30000316     IAID    GEN,4,28 3,IA             INDIRECT ADDRESS IDENTIFIER
     1040   01 003C9  50000001 A   PSDWID  DATA    X'50000001'       PSDW IDENTIFIER
     1041   01 003CA  60000000 A   REGID   DATA    X'60000000'       REGISTER IDENTIFIER
     1042   01 003CB  70000304     MEMID   GEN,4,28 7,MEMORY         MEMORY WORD IDENTIFIER
     1043   01 003CC  80000314     SPID    GEN,4,28 8,SP             STACK POINTER IDENTIFIER
     1044                              *
     1045   01 003CD  60000010 A   REGIDFIN DATA    X'60000010'       IDENTIFIES END OF REGISTER BLOCK
     1046   01 003CE  70000314     MEMIDFIN GEN,4,28 7,SP            IDENTIFIES END OF MEMORY TABLE
     1047                              *
     1048   01 003CF  00000000 A   RPTIND  DATA    0                 ERROR REPORTED INDICATOR
```

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1049                                        PAGE
1050                                 *
1051                                 *      COMMAND DOUBLEWORDS FOR TYPEOUT
1052                                 *
1053                                 *
1054                                        BOUND 8
1055   01 003D0   05000C60     DSIXNL  GEN,8,24 5,BA(TTL)          SIX NEW LINE CHARACTERS
1056   01 003D1   08000006 A          GEN,8,24 8,6
1057   01 003D2   05000C60     DTITLE  GEN,8,24 5,BA(TTL)          TITLE
1058   01 003D3   0800003A A          GEN,8,24 8,58
1059   01 003D4   05000C9C     DHEAD   GEN,8,24 5,BA(HDG)          HEADING
1060   01 003D5   08000050 A          GEN,8,24 8,80
1061   01 003D6   05000CEC     DSHRTL  GEN,8,24 5,BA(IMAGE)        SHORT LINE (4 WORDS)
1062   01 003D7   0800002C A          GEN,8,24 8,44
1063   01 003D8   05000CEC            GEN,8,24 5,BA(IMAGE)        LONG LINE (8 WORDS)
1064   01 003D9   08000054 A          GEN,8,24 8,84
1065   01 003DA   05000E14     CNTRDW  GEN,8,24 5,BA(CNTRMSG)   COMMAND DOUBLEWORD FOR
1066   01 003DB   0200004E A          DATA     X'0200004E'     COUNTER INTERRUPT MESSAGE
```



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1067                                        PAGE
1068                                 *
1069                                 *      COMMAND DOUBLEWORDS FOR LINE PRINTER
1070                                 *
1071                                 *
1072   01 003DC   03000E9C     LTOP    GEN,8,24 3,BA(TOPFORM)      TOP OF PAGE ORDER
1073   01 003DD   28000001 A          DATA     X'28000001'        COMMAND CHAIN
1074   01 003DE   01000D40     LTTL    GEN,8,24 1,BA(BLANK)        SKIP
1075   01 003DF   83000006 A          DATA     X'83000006'        DATA CHAIN
1076   01 003E0   01000C67           GEN,8,24 1,BA(TTL)+7        TITLE
1077   01 003E1   2A000025 A          DATA     X'2A000025'        COMMAND CHAIN
1078   01 003E2   01000D40     LHEAD   GEN,8,24 1,BA(BLANK)        SKIP
1079   01 003E3   83000006 A          DATA     X'83000006'        DATA CHAIN
1080   01 003E4   01000C9D           GEN,8,24 1,BA(HDG)+1        HEADING
1081   01 003E5   2A00004E A          DATA     X'2A00004E'        COMMAND CHAIN
1082   01 003E6   03000E9D           GEN,8,24 3,BA(TOPFORM)+1    SPACE 1 LINE
1083   01 003E7   08000001 A          DATA     X'08000001'
1084   01 003E8   01000D40     LMSG    GEN,8,24 1,BA(BLANK)        NORMAL REPORT ORDERS
1085   01 003E9   83000006 A          DATA     X'83000006'        SKIP, DATA CHAIN
1086   01 003EA   01000CF0           GEN,8,24 1,BA(IMAGE+1)
1087   01 003EB   0A000028 A          DATA     X'0A000028'
1088   01 003EC   01000D40           GEN,8,24 1,BA(BLANK)        ERROR REPORT ORDERS
1089   01 003ED   83000006 A          DATA     X'83000006'        SKIP, DATA CHAIN
1090   01 003EE   01000CF0           GEN,8,24 1,BA(IMAGE+1)
1091   01 003EF   0A000050 A          DATA     X'0A000050'
```

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1092                                    PAGE
1093                                *
1094                                *  *** DATA TABLE FOR MMC INSTRUCTION TEST ***
1095                                *
1096                                *
1097   01 003F0   00000304         MMCR1   DATA    MEMORY
1098   01 003F1   01000000 A               DATA    X'01000000'
1099   01 003F2   00000305         MMCR1F  DATA    MEMORY+1
1100   01 003F3   00002000 A               DATA    X'2000'
1101   01 003F4   00000304         MMCR2   DATA    MEMORY
1102   01 003F5   08001800 A               DATA    X'08001800'
1103   01 003F6   00000308         MMCR2F  DATA    MEMORY+8
1104   01 003F7   00011800 A               DATA    X'11800'
1105   01 003F8   00000304         MMCR3   DATA    MEMORY
1106   01 003F9   02000000 A               DATA    X'02000000'
1107   01 003FA   00000306         MMCR3F  DATA    MEMORY+2
1108   01 003FB   00004000 A               DATA    X'4000'
1109   01 003FC   00000304         MMCR4   DATA    MEMORY
1110   01 003FD   0F001800 A               DATA    X'0F001800'
1111   01 003FE   00000313         MMCR4F  DATA    MEMORY+15
1112   01 003FF   0001F800 A               DATA    X'1F800'
```



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1113                                    PAGE
1114                                *
1115                                ********** BEGINNING OF TEST MODULE LIST **********
1116                                ***************************************************************************
1117                                *
1118          01 00400              LIST    EQU     $
1119                                *
1120                                *
1121                                * MODULE FORMAT AND CORRESPONDING TABLE LOCATIONS ARE AS FOLLOWS:
1122                                *
1123                                *       TABLE + 0     NEGATIVE COUNT
1124                                *               1     INSTRUCTION
1125                                *               2     PSW1 IN
1126                                *                       BITS  0-11:  BITS 0-11 OF PSW1
1127                                *                       BITS 12-31:  LINKAGE ADDRESS
1128                                *               3     PSW1 OUT
1129                                *               4     REGISTER-IN POINTER
1130                                *                       BITS  0-15:  SOURCE ADDRESS OF DATA TABLE
1131                                *                       BITS 16-23:  NEGATIVE WORD COUNT
1132                                *                       BITS 24-31:  1ST REGISTER OR MEMORY LOCATION
1133                                *               5     REGISTER-OUT POINTER
1134                                *                       SAME FORMAT AS REGISTER IN POINTER
1135                                *               6     MEMORY-IN POINTER
1136                                *                       SAME FORMAT AS REGISTER IN POINTER
1137                                *               7     MEMORY-OUT POINTER
1138                                *                       SAME FORMAT AS REGISTER IN POINTER
1139                                *               8,9   STACK POINTER DOUBLEWORD IN
1140                                *               10,11 STACK POINTER DOUBLEWORD OUT
1141                                *
1142                                * THE FOLLOWING SYMBOLIC DIRECTIVES ARE USED IN THE TEST MODULES TO
1143                                * GENERATE PSW1-IN, PSW1-OUT AND THE REGISTER AND MEMORY POINTERS:
1144                                *
1145                                K       COM,4,4,4,20 AF(1),AF(2),AF(3),AF(4)
1146                                *
1147                                P       COM,16,8,8 AF(1),AF(2),AF(3)
```

```
1148                                    PAGE
1149                          ********************************************************************  LM
1150                          *                                   CC=1
1151                          *                                   LOAD MEMORY+2 INTO R4
1152  01 00400  FFFFFFF8 A       DATA    =8                      COUNT
1153  01 00401  2A400306        LM,4    MEMORY+2                INSTRUCTION
1154  01 00402  10000151        K       1,0,0,SETPSW            PSW1 IN
1155  01 00403  100001AE        K       1,0,0,LOC+2             PSW1 OUT
1156  01 00404  03840000 N      P       ZEROS,0,0               R IN
1157  01 00405  0359FF04 N      P       DTA1,-1,4               R OUT
1158  01 00406  0359FF02 N      P       DTA1,-1,2               MEM IN
1159  01 00407  0359FF02 N      P       DTA1,-1,2               MEM OUT
1160                          ********************************************************************  LM
1161                          *                                   CC=0 (COUNT OF 16)
1162                          *                                   LOAD ALL REGISTERS
1163                          *                                     BEGINNING WITH R0
1164  01 00408  FFFFFFF8 A       DATA    =8                      COUNT
1165  01 00409  2A000304        LM,0    MEMORY                  INSTRUCTION
1166  01 0040A  00000151        K       0,0,0,SETPSW            PSW1 IN
1167  01 0040B  000001AE        K       0,0,0,LOC+2             PSW1 OUT
1168  01 0040C  03840000 N      P       ZEROS,0,0               R IN
1169  01 0040D  0359F000 N      P       DTA1,-16,0              R OUT
1170  01 0040E  0359F000 N      P       DTA1,-16,0              MEM IN
1171  01 0040F  0359F000 N      P       DTA1,-16,0              MEM OUT
1172                          ********************************************************************  LM
1173                          *                                   CC=0 (COUNT OF 16)
1174                          *                                   LOAD ALL REGISTERS
1175                          *                                     BEGINNING WITH R9
1176  01 00410  FFFFFFF8 A       DATA    =8                      COUNT
1177  01 00411  2A900304        LM,9    MEMORY                  INSTRUCTION
1178  01 00412  00000151        K       0,0,0,SETPSW            PSW1 IN
1179  01 00413  000001AE        K       0,0,0,LOC+2             PSW1 OUT
1180  01 00414  03840000 N      P       ZEROS,0,0               R IN
1181  01 00415  0359F009 N      P       DTA1,-16,9              R OUT
1182  01 00416  0359F000 N      P       DTA1,-16,0              MEM IN
1183  01 00417  0359F000 N      P       DTA1,-16,0              MEM OUT
```



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1184                                    PAGE
1185                          ********************************************************************  LM
1186                          *                                   CC=2      INDEXED
1187                          *                                   LOAD R5,R6      INDEX REGISTER=R4
1188                          *
1189  01 00418  FFFFFFF8 A       DATA    =8                      COUNT
1190  01 00419  2A5F0304        LM,5    MEMORY,4                INSTRUCTION
1191  01 0041A  20000151        K       2,0,0,SETPSW            PSW1 IN
1192  01 0041B  200001AE        K       2,0,0,LOC+2             PSW1 OUT
1193  01 0041C  0363FF04 N      P       DTA2+2,-1,4             R IN
1194  01 0041D  0363FF04 N      P       DTA2+2,-3,4             R OUT
1195  01 0041E  0362FFC2 N      P       DTA2+3,-2,2             MEM IN
1196  01 0041F  0362FFC2 N      P       DTA2+3,-2,2             MEM OUT
1197                          ********************************************************************  LM
1198                          *                                   CC=4      INDIRECTLY ADDRESSED
1199                          *                                   LOAD R7=R10
1200                          *
1201  01 00420  FFFFFFF8 A       DATA    =8                      COUNT
1202  01 00421  AA700316        LM,7    *1A                     INSTRUCTION
1203  01 00422  40000151        K       4,0,0,SETPSW            PSW1 IN
1204  01 00423  400001AE        K       4,0,0,LOC+2             PSW1 OUT
1205  01 00424  03840000 N      P       ZEROS,0,0               R IN
1206  01 00425  0359FFC7 N      P       DTA1,-4,7               R OUT
1207  01 00426  0359FFC0 N      P       DTA1,-4,0               MEM IN
1208  01 00427  0359FFC0 N      P       DTA1,-4,0               MEM OUT
1209                          ********************************************************************  LM
1210                          *                                   CC=8   INDIRECTLY ADDRESSED, INDEXED
1211                          *                                   LOAD R2=R9      INDEX REGISTER=R1
1212  01 00428  FFFFFFF8 A       DATA    =8                      COUNT
1213  01 00429  AA2F0316        LM,2    *1A,1                   INSTRUCTION
1214  01 0042A  87300151        K       8,7,3,SETPSW            PSW1 IN
1215  01 0042B  873001AE        K       8,7,3,LOC+2             PSW1 OUT
1216  01 0042C  0369FFC1 N      P       DTA2,-1,1               R IN
1217  01 0042D  0369FFC1 N      P       DTA2,-9,1               R OUT
1218  01 0042E  0364FFC1 N      P       DTA2+1,-8,1             MEM IN
1219  01 0042F  0364FFC1 N      P       DTA2+1,-8,1             MEM OUT
```

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                                         PAGE
                                  ***********************************************************   STM
                                  *                                 CC=1
                                  *                                 STORE R4 IN MEMORY+2
01 00430   FFFFFFF8 A                    DATA     -8                COUNT
01 00431   23400306                      STM,4    MEMORY+2          INSTRUCTION
01 00432   10000151                      K        1,0,0,SETPSW      PSW1 IN
01 00433   100001AE                      K        1,0,0,LOC+2       PSW1 OUT
01 00434   0359FF04 N                    P        DTA1,-1,4         R IN
01 00435   0359FF04 N                    P        DTA1,-1,4         R OUT
01 00436   03840000 N                    P        ZEROS,0,0         MEM IN
01 00437   0359FF02 N                    P        DTA1,-1,2         MEM OUT
                                  ***********************************************************   STM
                                  *                                 CC=0 (COUNT OF 16)
                                  *                                 STORE ALL REGISTERS
                                  *                                   BEGINNING WITH R0
01 00438   FFFFFFF8 A                    DATA     -8                COUNT
01 00439   23000304                      STM,0    MEMORY            INSTRUCTION
01 0043A   00000151                      K        0,0,0,SETPSW      PSW1 IN
01 0043B   000001AE                      K        0,0,0,LOC+2       PSW1 OUT
01 0043C   0359F000 N                    P        DTA1,-16,0        R IN
01 0043D   0359F000 N                    P        DTA1,-16,0        R OUT
01 0043E   03840000 N                    P        ZEROS,0,0         MEM IN
01 0043F   0359F000 N                    P        DTA1,-16,0        MEM OUT
                                  ***********************************************************   STM
                                  *                                 CC=0 (COUNT OF 16)
                                  *                                 STORE ALL REGISTERS
                                  *                                   BEGINNING WITH R9
01 00440   FFFFFFF8 A                    DATA     -8                COUNT
01 00441   23900304                      STM,9    MEMORY            INSTRUCTION
01 00442   00000151                      K        0,0,0,SETPSW      PSW1 IN
01 00443   000001AE                      K        0,0,0,LOC+2       PSW1 OUT
01 00444   0359F000 N                    P        DTA1,-16,0        R IN
01 00445   0359F000 N                    P        DTA1,-16,0        R OUT
01 00446   03840000 N                    P        ZEROS,0,0         MEM IN
01 00447   0359F007 N                    P        DTA1,-16,7        MEM OUT
```



```
                                         PAGE
                                  ***********************************************************   STM
                                  *                                 CC=2     INDEXED
                                  *                                 STORE R5,R6    INDEX REGISTER=R3
                                  *
01 00448   FFFFFFF8 A                    DATA     -8                COUNT
01 00449   23560304                      STM,5    MEMORY,3          INSTRUCTION
01 0044A   20000151                      K        2,0,0,SETPSW      PSW1 IN
01 0044B   200001AE                      K        2,0,0,LOC+2       PSW1 OUT
01 0044C   0363FC03 N                    P        DTA2+2,-4,3       R IN
01 0044D   0363FC03 N                    P        DTA2+2,-4,3       R OUT
01 0044E   03840000 N                    P        ZEROS,0,0         MEM IN
01 0044F   036DFE02 N                    P        DTA2+4,-2,2       MEM OUT
                                  ***********************************************************   STM
                                  *                                 CC=4     INDIRECTLY ADDRESSED
                                  *                                 STORE R7-R10
                                  *
01 00450   FFFFFFF8 A                    DATA     -8                COUNT
01 00451   A3700316                      STM,7    *IA               INSTRUCTION
01 00452   40000151                      K        4,0,0,SETPSW      PSW1 IN
01 00453   400001AE                      K        4,0,0,LOC+2       PSW1 OUT
01 00454   0359FC07 N                    P        DTA1,-4,7         R IN
01 00455   0359FC07 N                    P        DTA1,-4,7         R OUT
01 00456   03840000 N                    P        ZEROS,0,0         MEM IN
01 00457   0359FC00 N                    P        DTA1,-4,0         MEM OUT
                                  ***********************************************************   STM
                                  *                                 CC=8   INDERECTLY_ADDRESSED, INDEXED
                                  *                                 STORE R2-R9     INDEX REGISTER=R1
01 00458   FFFFFFF8 A                    DATA     -8                COUNT
01 00459   A3220316                      STM,2    *IA,1             INSTRUCTION
01 0045A   87300151                      K        8,7,3,SETPSW      PSW1 IN
01 0045B   873001AE                      K        8,7,3,LOC+2       PSW1 OUT
01 0045C   0369F701 N                    P        DTA2,-9,1         R IN
01 0045D   0369F701 N                    P        DTA2,-9,1         R OUT
01 0045E   03840000 N                    P        ZEROS,0,0         MEM IN
01 0045F   036AF801 N                    P        DTA2+1,-8,1       MEM OUT
```

```
                                          PAGE
                                *
                                *                    TESTS OF REGISTER TO REGISTER OPERATIONS
                                *
                                ************************************************************  LM
                                *                                   CC=8
                                *                                   LOAD R8-R15 INTO R0-R7
01 00460     FFFFFFFA A               DATA      -6                  COUNT
01 00461     2A000008 A               LM,0      8                   INSTRUCTION
01 00462     80000151                 <         8,0,0,SETPSW        PSW1 IN
01 00463     800001AE                 <         8,0,0,LOC+2         PSW1 OUT
01 00464     0351F808 N               P         DTA0,-8,8           R IN
01 00465     0351F000 N               P         DTA0,-16,0          R OUT
                                ************************************************************  STM
                                *                                   CC=8
                                *                                   STORE R8-R15 INTO R0-R7
01 00466     FFFFFFFA A               DATA      -6                  COUNT
01 00467     23800000 A               STM,8     0                   INSTRUCTION
01 00468     80000151                 <         8,0,0,SETPSW        PSW1 IN
01 00469     800001AE                 <         8,0,0,LOC+2         PSW1 OUT
01 0046A     0351F808 N               P         DTA0,-8,8           R IN
01 0046B     0351F000 N               P         DTA0,-16,0          R OUT
```



```
                                          PAGE
                                ************************************************************  MSP
                                *                                   MODIFIER=0;     NO OVERFLOW
01 0046C     FFFFFFF4 A               DATA      -12                 COUNT
01 0046D     13300314                 MSP,3     SP                  INSTRUCTION
01 0046E     F7300151                 <         15,7,3,SETPSW       PSW1 IN
01 0046F     073001AE                 <         0,7,3,LOC+2         PSW1 OUT
01 00470     03840000 N               P         ZEROS,0,0           R IN
01 00471     03840000 N               P         ZEROS,0,0           R OUT
01 00472     0359F000 N               P         DTA1,-16,0          MEM IN
01 00473     0359F000 N               P         DTA1,-16,0          MEM OUT
01 00474     0000030C                 DATA      MEMORY+8            STACK POINTER
01 00475     00050005 A               DATA      X'00050005'           DOUBLEWORD IN
01 00476     0000030C                 DATA      MEMORY+8            STACK POINTER
01 00477     00050005 A               DATA      X'00050005'           DOUBLEWORD OUT
                                ************************************************************  MSP
                                *                                   MODIFIER=0,   TS=0,   TW=0
                                *                                   WORD COUNT =0
                                *                                   SPACE COUNT=0
01 00478     FFFFFFF4 A               DATA      -12                 COUNT
01 00479     13600314                 MSP,6     SP                  INSTRUCTION
01 0047A     00000151                 <         0,0,0,SETPSW        PSW1 IN
01 0047B     500001AE                 <         5,0,0,LOC+2         PSW1 OUT
01 0047C     03840000 N               P         ZEROS,0,0           R IN
01 0047D     03840000 N               P         ZEROS,0,0           R OUT
01 0047E     0359F000 N               P         DTA1,-16,0          MEM IN
01 0047F     0359F000 N               P         DTA1,-16,0          MEM OUT
01 00480     00000304                 DATA      MEMORY              STACK POINTER
01 00481     00000000 A               DATA      0                     DOUBLEWORD IN
01 00482     00000304                 DATA      MEMORY              STACK POINTER
01 00483     00000000 A               DATA      0                     DOUBLEWORD OUT
```

```
1345                                    PAGE
1346                                ********************************************************************** MSP
1347                                *                                       MODIFIER=1
1348                                *                                       SPACE COUNT GOES TO ZERO
1349                                *                                       WORD COUNT GOES TO MAXIMUM
1350   01 00484   FFFFFFF4 A              DATA    =12                     COUNT
1351   01 00485   13400314                MSP,4   SP                      INSTRUCTION
1352   01 00486   F0000151                K       15,0,0,SETPSW           PSW1 IN
1353   01 00487   400001AE                K       4,0,0,LOC+2             PSW1 OUT
1354   01 00488   037FFF04 N              P       DTA3+1,-1,4             R IN
1355   01 00489   037FFF04 N              P       DTA3+1,-1,4             R OUT
1356   01 0048A   0359F000 N              P       DTA1,-16,0              MEM IN
1357   01 00483   0359F000 N              P       DTA1,-16,0              MEM OUT
1358   01 0048C   0000030C                DATA    MEMORY+8                STACK POINTER
1359   01 0048D   8001FFFE A              DATA    X'8001FFFE'               DOUBLEWORD IN
1360   01 0048E   00000300                DATA    MEMORY+9                STACK POINTER
1361   01 0048F   8000FFFF A              DATA    X'8000FFFF'               DOUBLEWORD OUT
1362                                ********************************************************************** MSP
1363                                *                                       MODIFIER=-1
1364                                *                                       SPACE COUNT GOES TO MAXIMUM
1365                                *                                       WORD COUNT GOES TO ZERO
1366   01 00490   FFFFFFF4 A              DATA    =12                     COUNT
1367   01 00491   13000314                MSP,0   SP                      INSTRUCTION
1368   01 00492   00000151                K       0,0,0,SETPSW            PSW1 IN
1369   01 00493   100001AE                K       1,0,0,LOC+2             PSW1 OUT
1370   01 00494   037DFF00 N              P       DTA3-1,-1,0             R IN
1371   01 00495   037DFF00 N              P       DTA3-1,-1,0             R OUT
1372   01 00496   0359F000 N              P       DTA1,-16,0              MEM IN
1373   01 00497   0359F000 N              P       DTA1,-16,0              MEM OUT
1374   01 00498   0000030C                DATA    MEMORY+8                STACK POINTER
1375   01 00499   FFFE8001 A              DATA    X'FFFE8001'               DOUBLEWORD IN
1376   01 0049A   00000308                DATA    MEMORY+7                STACK POINTER
1377   01 0049B   FFFF8000 A              DATA    X'FFFF8000'               DOUBLEWORD OUT
```



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1378                                    PAGE
1379                                ********************************************************************** MSP
1380                                *                                       MODIFIER=8;   WORD CNT OVERFLOW
1381                                *                                       TRAP INHIBITED BY TW
1382   01 0049C   FFFFFFF4 A              DATA    =12                     COUNT
1383   01 0049D   13F00314                MSP,15  SP                      INSTRUCTION
1384   01 0049E   D0000151                K       13,0,0,SETPSW           PSW1 IN
1385   01 0049F   200001AE                K       2,0,0,LOC+2             PSW1 OUT
1386   01 004A0   0382FF0F N              P       DTA3+4,-1,15            R IN
1387   01 004A1   0382FF0F N              P       DTA3+4,-1,15            R OUT
1388   01 004A2   0359F000 N              P       DTA1,-16,0              MEM IN
1389   01 004A3   0359F000 N              P       DTA1,-16,0              MEM OUT
1390   01 004A4   0000030C                DATA    MEMORY+8                STACK POINTER
1391   01 004A5   0050FFFA A              DATA    X'0050FFFA'               DOUBLEWORD IN
1392   01 004A6   0000030C                DATA    MEMORY+8                STACK POINTER
1393   01 004A7   0050FFFA A              DATA    X'0050FFFA'               DOUBLEWORD OUT
1394                                ********************************************************************** MSP
1395                                *                                       MODIFIER=8;   WORD COUNT UNDERFLOW
1396                                *                                       TRAP INHIBITED BY TW
1397   01 004A8   FFFFFFF4 A              DATA    =12                     COUNT
1398   01 004A9   13B00314                MSP,11  SP                      INSTRUCTION
1399   01 004AA   B0000151                K       13,0,0,SETPSW           PSW1 IN
1400   01 004AB   200001AE                K       2,0,0,LOC+2             PSW1 OUT
1401   01 004AC   037AFF0B N              P       DTA3-4,-1,11            R IN
1402   01 004AD   037AFF0B N              P       DTA3-4,-1,11            R OUT
1403   01 004AE   0359F000 N              P       DTA1,-16,0              MEM IN
1404   01 004AF   0359F000 N              P       DTA1,-16,0              MEM OUT
1405   01 00480   0000030C                DATA    MEMORY+8                STACK POINTER
1406   01 00481   05008004 A              DATA    X'05008004'               DOUBLEWORD IN
1407   01 00482   0000030C                DATA    MEMORY+8                STACK POINTER
1408   01 00483   05008004 A              DATA    X'05008004'               DOUBLEWORD OUT
```

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1409                                    PAGE
1410                            ********************************************************************  MSP
1411                            *                                       MODIFIER=4; SPACE COUNT UNDERFLOW
1412                            *                                       TRAP INHIBITED BY TS
1413   01 00434  FFFFFFF4 A              DATA    -12                     COUNT
1414   01 00435  13300314                MSP,3   SP                      INSTRUCTION
1415   01 00436  70000151                K       7,0,0,SETPSW            PSW1 IN
1416   01 00437  800001AE                K       8,0,0,LOC+2             PSW1 OUT
1417   01 00438  0381FF03 N              P       DTA3+3,-1,3             R IN
1418   01 00439  0381FF03 N              P       DTA3+3,-1,3             R OUT
1419   01 0043A  03840000 N              P       ZEROS,0,0               MEM IN
1420   01 0043B  03840000 N              P       ZEROS,0,0               MEM OUT
1421   01 0043C  0000030C                DATA    MEMORY+8                STACK POINTER
1422   01 0043D  80020050 A              DATA    X'80020050'               DOUBLEWORD IN
1423   01 0043E  0000030C                DATA    MEMORY+8                STACK POINTER
1424   01 0043F  80020050 A              DATA    X'80020050'               DOUBLEWORD OUT
1425                            ********************************************************************  MSP
1426                            *                                       MODIFIER=-4; SPACE COUNT OVERFLOW
1427                            *                                       TRAP INHIBITED BY TS
1428   01 004C0  FFFFFFF4 A              DATA    -12                     COUNT
1429   01 004C1  13700314                MSP,7   SP                      INSTRUCTION
1430   01 004C2  70000151                K       7,0,0,SETPSW            PSW1 IN
1431   01 004C3  800001AE                K       8,0,0,LOC+2             PSW1 OUT
1432   01 004C4  0373FF07 N              P       DTA3-3,-1,7             R IN
1433   01 004C5  0373FF07 N              P       DTA3-3,-1,7             R OUT
1434   01 004C6  03840000 N              P       ZEROS,0,0               MEM IN
1435   01 004C7  03840000 N              P       ZEROS,0,0               MEM OUT
1436   01 004C8  0000030C                DATA    MEMORY+8                STACK POINTER
1437   01 004C9  FFFC0050 A              DATA    X'FFFC0050'               DOUBLEWORD IN
1438   01 004CA  0000030C                DATA    MEMORY+8                STACK POINTER
1439   01 004CB  FFFC0050 A              DATA    X'FFFC0050'               DOUBLEWORD OUT
```



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1440                                    PAGE
1441                            ********************************************************************  MSP
1442                            *                                       MODIFIER= MAX POSITIVE VALUE
1443                            *                                       WORD COUNT OVERFLOWS BY 1
1444                            *                                       TRAP
1445   01 004CC  FFFFFFF4 A              DATA    -12                     COUNT
1446   01 004CD  13E00314                MSP,14  SP                      INSTRUCTION
1447   01 004CE  000000AF                K       0,0,0,SLSW              PSW1 IN
1448   01 004CF  00000080                K       0,0,0,SLRET+1           PSW1 OUT
1449   01 004D0  0383FF0E N              P       DTA3+5,-1,14            R IN
1450   01 004D1  0383FF0E N              P       DTA3+5,-1,14            R OUT
1451   01 004D2  0359F000 N              P       DTA1,-16,0              MEM IN
1452   01 004D3  0359F000 N              P       DTA1,-16,0              MEM OUT
1453   01 004D4  00000304                DATA    MEMORY                  STACK POINTER
1454   01 004D5  FFFF0001 A              DATA    X'FFFF0001'               DOUBLEWORD IN
1455   01 004D6  00000304                DATA    MEMORY                  STACK POINTER
1456   01 004D7  FFFF0001 A              DATA    X'FFFF0001'               DOUBLEWORD OUT
1457                            ********************************************************************  MSP
1458                            *                                       MODIFIER= MAX NEGATIVE VALUE
1459                            *                                       WORD COUNT UNDERFLOWS BY 1
1460                            *                                       TRAP
1461   01 004D8  FFFFFFF4 A              DATA    -12                     COUNT
1462   01 004D9  13D00314                MSP,13  SP                      INSTRUCTION
1463   01 004DA  F73000AF                K       15,7,3,SLSW             PSW1 IN
1464   01 004DB  F7300080                K       15,7,3,SLRET+1          PSW1 OUT
1465   01 004DC  0379FF0D N              P       DTA3+5,-1,13            R IN
1466   01 004DD  0379FF0D N              P       DTA3+5,-1,13            R OUT
1467   01 004DE  0359F000 N              P       DTA1,-16,0              MEM IN
1468   01 004DF  0359F000 N              P       DTA1,-16,0              MEM OUT
1469   01 004E0  00000304                DATA    MEMORY                  STACK POINTER
1470   01 004E1  80007FFF A              DATA    X'80007FFF'               DOUBLEWORD IN
1471   01 004E2  00000304                DATA    MEMORY                  STACK POINTER
1472   01 004E3  80007FFF A              DATA    X'80007FFF'               DOUBLEWORD OUT
```

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                                             PAGE
                              ****************************************************************   MSP
                              *                                  MODIFIER= MAXIMUM POSITIVE VALUE
                              *                                  SPACE COUNT UNDERFLOWS BY 1
                              *                                  TRAP
 01 004E4    FFFFFFF4 A            DATA      -12                 COUNT
 01 004E5    13900314              MSP,9     SP                  INSTRUCTION
 01 004E6    873000AF              K         11,7,3,SLSW         PSW1 IN
 01 004E7    87300080              K         11,7,3,SLRET+1      PSW1 OUT
 01 004E8    0383FF09 N            P         DTA3+5,-1,9         R IN
 01 004E9    0383FF09 N            P         DTA3+5,-1,9         R OUT
 01 004EA    0359F000 N            P         DTA1,-16,0          MEM IN
 01 004EB    0359F000 N            P         DTA1,-16,0          MEM OUT
 01 004EC    00000304              DATA      MEMORY              STACK POINTER
 01 004ED    7FFE0000 A            DATA      X'7FFE0000'           DOUBLEWORD IN
 01 004EE    00000304              DATA      MEMORY              STACK POINTER
 01 004EF    7FFE0000 A            DATA      X'7FFE0000'           DOUBLEWORD OUT
                              ****************************************************************   MSP
                              *                                  MODIFIER= MAXIMUM NEGATIVE VALUE
                              *                                  SPACE COUNT OVERFLOWS BY 1
                              *                                  TRAP
 01 004F0    FFFFFFF4 A            DATA      -12                 COUNT
 01 004F1    13500314              MSP,5     SP                  INSTRUCTION
 01 004F2    500000AF              K         5,0,0,SLSW          PSW1 IN
 01 004F3    50000080              K         5,0,0,SLRET+1       PSW1 OUT
 01 004F4    0379FF05 N            P         DTA3-5,-1,5         R IN
 01 004F5    0379FF05 N            P         DTA3-5,-1,5         R OUT
 01 004F6    03840000 N            P         ZEROS,0,0           MEM IN
 01 004F7    03840000 N            P         ZEROS,0,0           MEM OUT
 01 004F8    00000304              DATA      MEMORY              STACK POINTER
 01 004F9    0000FFFF A            DATA      X'0000FFFF'           DOUBLEWORD IN
 01 004FA    00000304              DATA      MEMORY              STACK POINTER
 01 004FB    0000FFFF A            DATA      X'0000FFFF'           DOUBLEWORD OUT
```



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                                             PAGE
                              ****************************************************************   MSP
                              *                                  INDEXED     INDEX VALUE OF 1 IN R7
                              *                                  MODIFIER=2 IN R8
 01 004FC    FFFFFFF4 A            DATA      -12                 COUNT
 01 004FD    138E0312              MSP,8     SP-2,7              INSTRUCTION
 01 004FE    B0000151              K         11,0,0,SETPSW       PSW1 IN
 01 004FF    400001AE              K         4,0,0,LOC+2         PSW1 OUT
 01 00500    037FFE07 N            P         DTA3+1,-2,7         R IN
 01 00501    037FFE07 N            P         DTA3+1,-2,7         R OUT
 01 00502    0359F000 N            P         DTA1,-16,0          MEM IN
 01 00503    0359F000 N            P         DTA1,-16,0          MEM OUT
 01 00504    00000304              DATA      MEMORY              STACK POINTER
 01 00505    00020000 A            DATA      X'00020000'           DOUBLEWORD IN
 01 00506    00000306              DATA      MEMORY+2            STACK POINTER
 01 00507    00000002 A            DATA      X'00000002'           DOUBLEWORD OUT
                              ****************************************************************   MSP
                              *                                  INDIRECTLY ADDRESSED
                              *                                  MODIFIER=-2 IN R1
 01 00508    FFFFFFF4 A            DATA      -12                 COUNT
 01 00509    93100317              MSP,1     *IASP               INSTRUCTION
 01 0050A    00000151              K         0,0,0,SETPSW        PSW1 IN
 01 0050B    100001AE              K         1,0,0,LOC+2         PSW1 OUT
 01 0050C    037CFE01 N            P         DTA3-2,-2,1         R IN
 01 0050D    037CFE01 N            P         DTA3-2,-2,1         R OUT
 01 0050E    03840000 N            P         ZEROS,0,0           MEM IN
 01 0050F    03840000 N            P         ZEROS,0,0           MEM OUT
 01 00510    00000306              DATA      MEMORY+2            STACK POINTER
 01 00511    00000002 A            DATA      X'00000002'           DOUBLEWORD IN
 01 00512    00000304              DATA      MEMORY              STACK POINTER
 01 00513    00020000 A            DATA      X'00020000'           DOUBLEWORD OUT
```

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1537                                    PAGE
1538                          ********************************************************************  MSP
1539                          *                                         INDEXED;   INDIRECTLY ADDRESSED
1540                          *                                         MODIFIER=4     INDEX VALUE=8 IN R3
1541   01 00514   FFFFFFF4 A          DATA    -12                       COUNT
1542   01 00515   93260316           MSP,2   *IA,3                     INSTRUCTION
1543   01 00516   80000151           K       11,0,0,SETPSW             PSW1 IN
1544   01 00517   4000001AE          K       4,0,0,LOC+2               PSW1 OUT
1545   01 00518   0381FE02 N         P       DTA3+3,-2,2               R IN
1546   01 00519   0381FE02 N         P       DTA3+3,-2,2               R OUT
1547   01 0051A   03840000 N         P       ZEROS,0,0                 MEM IN
1548   01 0051B   03840000 N         P       ZEROS,0,0                 MEM OUT
1549   01 0051C   00000304           DATA    MEMORY                    STACK POINTER
1550   01 0051D   80048000 A         DATA    X'80048000'                 DOUBLEWORD IN
1551   01 0051E   00000308           DATA    MEMORY+4                  STACK POINTER
1552   01 0051F   80008004 A         DATA    X'80008004'                 DOUBLEWORD OUT
```



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1553                                    PAGE
1554                          ********************************************************************  PSW
1555                          *                                         PUSH WORD INTO STACK FROM R6,
1556                          *                                         NO OVERFLOW OR UNDERFLOW.
1557   01 00520   FFFFFFF4 A          DATA    -12                       COUNT
1558   01 00521   03600314           PSW,6   SP                        INSTRUCTION
1559   01 00522   F7300151           K       15,7,3,SETPSW             PSW1 IN
1560   01 00523   073001AE           K       0,7,3,LOC+2               PSW1 OUT
1561   01 00524   0359F000 N         P       DTA1,-16,0                R IN
1562   01 00525   0359F000 N         P       DTA1,-16,0                R OUT
1563   01 00526   03840000 N         P       ZEROS,0,0                 MEM IN
1564   01 00527   035FFF01 N         P       DTA1+6,-1,1               MEM OUT
1565   01 00528   00000304           DATA    MEMORY                    STACK POINTER
1566   01 00529   40008FFF A         DATA    X'40008FFF'                 DOUBLEWORD IN
1567   01 0052A   00000305           DATA    MEMORY+1                  STACK POINTER
1568   01 0052B   3FFFC000 A         DATA    X'3FFFC000'                 DOUBLEWORD OUT
1569                          ********************************************************************  PSW
1570                          *                                         PUSH WORD INTO STACK FROM R5
1571                          *                                         NO OVERFLOW OR UNDERFLOW,  TS SET
1572                          *                                         SPACE COUNT GOES TO ZERO
1573   01 0052C   FFFFFFF4 A          DATA    -12                       COUNT
1574   01 0052D   09500314           PSW,5   SP                        INSTRUCTION
1575   01 0052E   B7300151           K       11,7,3,SETPSW             PSW1 IN
1576   01 0052F   473001AE           K       4,7,3,LOC+2               PSW1 OUT
1577   01 00530   0359F000 N         P       DTA1,-16,0                R IN
1578   01 00531   0359F000 N         P       DTA1,-16,0                R OUT
1579   01 00532   03840000 N         P       ZEROS,0,0                 MEM IN
1580   01 00533   035EFF02 N         P       DTA1+5,-1,2               MEM OUT
1581   01 00534   00000305           DATA    MEMORY+1                  STACK POINTER
1582   01 00535   80017FFE A         DATA    X'80017FFE'                 DOUBLEWORD IN
1583   01 00536   00000306           DATA    MEMORY+2                  STACK POINTER
1584   01 00537   80007FFF A         DATA    X'80007FFF'                 DOUBLEWORD OUT
```

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                                PAGE
1585
1586                    ********************************************************************  PSW
1587                    *                                       SPACE COUNT UNDERFLOW
1588                    *                                       TS SET, NO TRAP
1589  01 00538  FFFFFFF4 A         DATA    -12                   COUNT
1590  01 00539  09800314          PSW,8   SP                    INSTRUCTION
1591  01 0053A  20000151          K       2,0,0,SETPSW          PSW1 IN
1592  01 00533  D00001AE          K       13,0,0,LOC+2          PSW1 OUT
1593  01 0053C  0359F000 N        P       DTA1,-16,0            R IN
1594  01 0053D  0359F000 N        P       DTA1,-16,0            R OUT
1595  01 0053E  03840000 N        P       ZEROS,0,0             MEM IN
1596  01 0053F  03840000 N        P       ZEROS,0,0             MEM OUT
1597  01 00540  00000304          DATA    MEMORY                STACK POINTER
1598  01 00541  80000000 A        DATA    X'80000000'             DOUBLEWORD IN
1599  01 00542  00000304          DATA    MEMORY                STACK POINTER
1600  01 00543  80000000 A        DATA    X'80000000'             DOUBLEWORD OUT
1601                    ********************************************************************  PSW
1602                    *                                       SPACE COUNT UNDERFLOW
1603                    *                                       TS NOT SET, TRAP
1604  01 00544  FFFFFFF4 A         DATA    -12                   COUNT
1605  01 00545  09FC0314          PSW,15  SP                    INSTRUCTION
1606  01 00546  000000AF          K       0,0,0,SLSW            PSW1 IN
1607  01 00547  00000080          K       0,0,0,SLRET+1         PSW1 OUT
1608  01 00548  0359F000 N        P       DTA1,-16,0            R IN
1609  01 00549  0359F000 N        P       DTA1,-16,0            R OUT
1610  01 0054A  03840000 N        P       ZEROS,0,0             MEM IN
1611  01 0054B  03840000 N        P       ZEROS,0,0             MEM OUT
1612  01 0054C  00000304          DATA    MEMORY                STACK POINTER
1613  01 0054D  00008000 A        DATA    X'00008000'             DOUBLEWORD IN
1614  01 0054E  00000304          DATA    MEMORY                STACK POINTER
1615  01 0054F  00008000 A        DATA    X'00008000'             DOUBLEWORD OUT
```



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                                PAGE
1616                    ********************************************************************  PSW
1617                    *                                       WORD COUNT OVERFLOW
1618                    *                                       TW SET, NO TRAP
1619  01 00550  FFFFFFF4 A         DATA    -12                   COUNT
1620  01 00551  09000314          PSW,0   SP                    INSTRUCTION
1621  01 00552  D0000151          K       13,0,0,SETPSW         PSW1 IN
1622  01 00553  200001AE          K       2,0,0,LOC+2           PSW1 OUT
1623  01 00554  03840000 N        P       ZEROS,0,0             R IN
1624  01 00555  03840000 N        P       ZEROS,0,0             R OUT
1625  01 00556  0359F000 N        P       DTA1,-16,0            MEM IN
1626  01 00557  0359F000 N        P       DTA1,-16,0            MEM OUT
1627  01 00558  00000304          DATA    MEMORY                STACK POINTER
1628  01 00559  000FFFFF A        DATA    X'000FFFFF'             DOUBLEWORD IN
1629  01 0055A  00000304          DATA    MEMORY                STACK POINTER
1630  01 0055B  000FFFFF A        DATA    X'000FFFFF'             DOUBLEWORD OUT
1631                    ********************************************************************  PSW
1632                    *                                       WORD COUNT OVERFLOW
1633                    *                                       TW NOT SET, TRAP
1634  01 0055C  FFFFFFF4 A         DATA    -12                   COUNT
1635  01 0055D  09000314          PSW,0   SP                    INSTRUCTION
1636  01 0055E  F73C00AF          K       15,7,3,SLSW           PSW1 IN
1637  01 0055F  F7300080          K       15,7,3,SLRET+1        PSW1 OUT
1638  01 00560  0359F000 N        P       DTA1,-16,0            R IN
1639  01 00561  0359F000 N        P       DTA1,-16,0            R OUT
1640  01 00562  03840000 N        P       ZEROS,0,0             MEM IN
1641  01 00563  03840000 N        P       ZEROS,0,0             MEM OUT
1642  01 00564  00000304          DATA    MEMORY                STACK POINTER
1643  01 00565  000F7FFF A        DATA    X'000F7FFF'             DOUBLEWORD IN
1644  01 00566  00000304          DATA    MEMORY                STACK POINTER
1645  01 00567  000F7FFF A        DATA    X'000F7FFF'             DOUBLEWORD OUT
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1647                                    PAGE
1648                            ********************************************************************  PSW
1649                            *                                       WORD COUNT OVERFLOW
1650                            *                                       SPACE COUNT UNDERFLOW
1651                            *                                       TS NOT SET, TW SET,  TRAP
1652   01 00568   FFFFFFF4 A            DATA    -12                     COUNT
1653   01 00569   09100314             PSW,1   SP                      INSTRUCTION
1654   01 00569   F73000AF             K       15,7,3,SLSW             PSW1 IN
1655   01 00568   F7300080             K       15,7,3,SLRET+1          PSW1 OUT
1656   01 0056C   03840000 N           P       ZEROS,0,0               R IN
1657   01 0056D   03840000 N           P       ZEROS,0,0               R OUT
1658   01 0056E   0359F000 N           P       DTA1,-16,0              MEM IN
1659   01 0056F   0359F000 N           P       DTA1,-16,0              MEM OUT
1660   01 00570   00000304             DATA    MEMORY                  STACK POINTER
1661   01 00571   0000FFFF A           DATA    X'0000FFFF'               DOUBLEWORD IN
1662   01 00572   00000304             DATA    MEMORY                  STACK POINTER
1663   01 00573   0000FFFF A           DATA    X'0000FFFF'               DOUBLEWORD OUT
1664                            ********************************************************************  PSW
1665                            *                                       WORD COUNT OVERFLOW
1666                            *                                       SPACE COUNT UNDERFLOW
1667                            *                                       TS SET, TW NOT SET,  TRAP
1668   01 00574   FFFFFFF4 A            DATA    -12                     COUNT
1669   01 00575   09100314             PSW,1   SP                      INSTRUCTION
1670   01 00576   073000AF             K       0,7,3,SLSW              PSW1 IN
1671   01 00577   07300080             K       0,7,3,SLRET+1           PSW1 OUT
1672   01 00578   03840000 N           P       ZEROS,0,0               R IN
1673   01 00579   03840000 N           P       ZEROS,0,0               R OUT
1674   01 0057A   0359F000 N           P       DTA1,-16,0              MEM IN
1675   01 00579   0359F000 N           P       DTA1,-16,0              MEM OUT
1676   01 0057C   00000304             DATA    MEMORY                  STACK POINTER
1677   01 0057D   80007FFF A           DATA    X'80007FFF'               DOUBLEWORD IN
1678   01 0057E   00000304             DATA    MEMORY                  STACK POINTER
1679   01 0057F   80007FFF A           DATA    X'80007FFF'               DOUBLEWORD OUT
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1680                                    PAGE
1681                            ********************************************************************  PSW
1682                            *                                       INDEXED, INDEX VALUE OF 1 IN R1
1683                            *                                       PUSH WORD INTO STACK FROM R2
1684   01 00580   FFFFFFF4 A            DATA    -12                     COUNT
1685   01 00581   09220312             PSW,2   SP-2,1                  INSTRUCTION
1686   01 00582   30000151             K       11,0,0,SETPSW           PSW1 IN
1687   01 00583   400001AE             K       4,0,0,LOC+2             PSW1 OUT
1688   01 00584   037FFE01 N           P       DTA3+1,-2,1             R IN
1689   01 00585   037FFE01 N           P       DTA3+1,-2,1             R OUT
1690   01 00586   03840000 N           P       ZEROS,0,0               MEM IN
1691   01 00587   0380FF01 N           P       DTA3+2,-1,1             MEM OUT
1692   01 00588   00000304             DATA    MEMORY                  STACK POINTER
1693   01 00589   00010000 A           DATA    X'00010000'               DOUBLEWORD IN
1694   01 0058A   00000305             DATA    MEMORY+1                STACK POINTER
1695   01 00583   00000001 A           DATA    X'00000001'               DOUBLEWORD OUT
1696                            ********************************************************************  PSW
1697                            *                                       INDIRECTLY ADDRESSED
1698                            *                                       PUSH WORD FROM R0
1699   01 0058C   FFFFFFF4 A            DATA    -12                     COUNT
1700   01 0058D   89000317             PSW,0   *IASP                   INSTRUCTION
1701   01 0058E   F0000151             K       15,0,0,SETPSW           PSW1 IN
1702   01 0058F   000001AE             K       0,0,0,LOC+2             PSW1 OUT
1703   01 00590   0359F000 N           P       DTA1,-16,0              R IN
1704   01 00591   0359F000 N           P       DTA1,-16,0              R OUT
1705   01 00592   03840000 N           P       ZEROS,0,0               MEM IN
1706   01 00593   0359FF01 N           P       DTA1,-1,1               MEM OUT
1707   01 00594   00000304             DATA    MEMORY                  STACK POINTER
1708   01 00595   80078007 A           DATA    X'80078007'               DOUBLEWORD IN
1709   01 00596   00000305             DATA    MEMORY+1                STACK POINTER
1710   01 00597   80068008 A           DATA    X'80068008'               DOUBLEWORD OUT
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1711                                    PAGE
1712                          ********************************************************************  PSW
1713                          *                                         INDEXED, INDEX VALUE OF 8 IN R5
1714                          *                                         INDIRECTLY ADDRESSED
1715   01 00598  FFFFFFF4 A            DATA    -12                     COUNT
1716   01 00599  896A0316               PSW,6   -1A,5                   INSTRUCTION
1717   01 0059A  17300151               K       1,7,3,$ETPSW            PSW1 IN
1718   01 0059B  073001AE               K       0,7,3,L0C+2             PSW1 OUT
1719   01 0059C  0382FE05 N             P       DTA3+4,-2,5             R IN
1720   01 0059D  0382FE05 N             P       DTA3+4,-2,5             R OUT
1721   01 0059E  03840000 N             P       ZEROS,0,0               MEM IN
1722   01 0059F  0383FF00 N             P       DTA3+5,-1,0             MEM OUT
1723   01 005A0  00000303               DATA    MEMORY+1                STACK POINTER
1724   01 005A1  80028000 A             DATA    X'80028000'               DOUBLEWORD IN
1725   01 005A2  00000304               DATA    MEMORY                  STACK POINTER
1726   01 005A3  80018001 A             DATA    X'80018001'               DOUBLEWORD OUT
1727                          ********************************************************************  PLW
1728                          *                                         PULL WORD INTO R0
1729                          *                                         NO OVERFLOW OR UNDERFLOW
1730   01 005A4  FFFFFFF4 A            DATA    -12                     COUNT
1731   01 005A5  08000314               PLW,0   SP                      INSTRUCTION
1732   01 005A6  F7300151               K       15,7,3,$ETPSW           PSW1 IN
1733   01 005A7  073001AE               K       0,7,3,L0C+2             PSW1 OUT
1734   01 005A8  03840000 N             P       ZEROS,0,0               R IN
1735   01 005A9  035AFF00 N             P       DTA1+1,-1,0             R OUT
1736   01 005AA  0359F000 N             P       DTA1,-16,0              MEM IN
1737   01 005AB  0359F000 N             P       DTA1,-16,0              MEM OUT
1738   01 005AC  00000305               DATA    MEMORY+1                STACK POINTER
1739   01 005AD  00020003 A             DATA    X'00020003'               DOUBLEWORD IN
1740   01 005AE  00000304               DATA    MEMORY                  STACK POINTER
1741   01 005AF  00030002 A             DATA    X'00030002'               DOUBLEWORD OUT
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1742                                    PAGE
1743                          ********************************************************************  PLW
1744                          *                                         PULL WORD INTO R15
1745                          *                                         SPACE COUNT GOES TO MAXIMUM
1746                          *                                         WORD COUNT GOES TO ZERO
1747   01 00580  FFFFFFF4 A            DATA    -12                     COUNT
1748   01 00581  08F00314               PLW,15  SP                      INSTRUCTION
1749   01 00582  E0000151               K       14,0,0,$ETPSW           PSW1 IN
1750   01 00583  100001AE               K       1,0,0,L0C+2             PSW1 OUT
1751   01 00584  03840000 N             P       ZEROS,0,0               R IN
1752   01 00585  0368FF0F N             P       DTA1+15,-1,15           R OUT
1753   01 00586  0359F000 N             P       DTA1,-16,0              MEM IN
1754   01 00587  0359F000 N             P       DTA1,-16,0              MEM OUT
1755   01 00588  00000313               DATA    MEMORY+15               STACK POINTER
1756   01 00589  FFFE8001 A             DATA    X'FFFE8001'               DOUBLEWORD IN
1757   01 0058A  00000312               DATA    MEMORY+14               STACK POINTER
1758   01 0058B  FFFF8000 A             DATA    X'FFFF8000'               DOUBLEWORD OUT
1759                          ********************************************************************  PLW
1760                          *                                         SPACE COUNT OVERFLOW
1761                          *                                         TS SET, ABORT
1762   01 0058C  FFFFFFF4 A            DATA    -12                     COUNT
1763   01 0058D  08100314               PLW,1   SP                      INSTRUCTION
1764   01 0058E  70000151               K       7,0,0,$ETPSW            PSW1 IN
1765   01 0058F  800001AE               K       8,0,0,L0C+2             PSW1 OUT
1766   01 005C0  0359F000 N             P       DTA1,-16,0              R IN
1767   01 005C1  0359F000 N             P       DTA1,-16,0              R OUT
1768   01 005C2  03840000 N             P       ZEROS,0,0               MEM IN
1769   01 005C3  03840000 N             P       ZEROS,0,0               MEM OUT
1770   01 005C4  00000304               DATA    MEMORY                  STACK POINTER
1771   01 005C5  FFFF0001 A             DATA    X'FFFF0001'               DOUBLEWORD IN
1772   01 005C6  00000304               DATA    MEMORY                  STACK POINTER
1773   01 005C7  FFFF0001 A             DATA    X'FFFF0001'               DOUBLEWORD OUT
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1774                                    PAGE
1775                                ********************************************************************  PLW
1776                                *                                   SPACE COUNT OVERFLOW
1777                                *                                   TS NOT SET,  TRAP
1778   01 005C8    FFFFFFF4 A              DATA    -12                 COUNT
1779   01 005C9    08100314                PLW,1   SP                  INSTRUCTION
1780   01 005CA    000000AF                K       0,0,0,SLSW          PSW1 IN
1781   01 005CB    00000080                K       0,0,0,SLRET+1       PSW1 OUT
1782   01 005CC    0359F000 N              P       DTA1,-16,0          R IN
1783   01 005CD    0359F000 N              P       DTA1,-16,0          R OUT
1784   01 005CE    03840000 N              P       ZEROS,0,0           MEM IN
1785   01 005CF    03840000 N              P       ZEROS,0,0           MEM OUT
1786   01 005D0    00000304                DATA    MEMORY              STACK POINTER
1787   01 005D1    7FFF0001 A              DATA    X'7FFF0001'           DOUBLEWORD IN
1788   01 005D2    00000304                DATA    MEMORY              STACK POINTER
1789   01 005D3    7FFF0001 A              DATA    X'7FFF0001'           DOUBLEWORD OUT
1790                                ********************************************************************  PLW
1791                                *                                   WORD COUNT UNDERFLOW
1792                                *                                   TW SET, ABORT
1793   01 005D4    FFFFFFF4 A              DATA    -12                 COUNT
1794   01 005D5    08100314                PLW,1   SP                  INSTRUCTION
1795   01 005D6    80000151                K       8,0,0,SETPSW        PSW1 IN
1796   01 005D7    700001AE                K       7,0,0,L8C+2         PSW1 OUT
1797   01 005D8    03840000 N              P       ZEROS,0,0           R IN
1798   01 005D9    03840000 N              P       ZEROS,0,0           R OUT
1799   01 005DA    0359F000 N              P       DTA1,-16,0          MEM IN
1800   01 005DB    0359F000 N              P       DTA1,-16,0          MEM OUT
1801   01 005DC    00000304                DATA    MEMORY              STACK POINTER
1802   01 005DD    00008000 A              DATA    X'00008000'           DOUBLEWORD IN
1803   01 005DE    00000304                DATA    MEMORY              STACK POINTER
1804   01 005DF    00008000 A              DATA    X'00008000'           DOUBLEWORD OUT
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1805                                    PAGE
1806                                ********************************************************************  PLW
1807                                *                                   WORD COUNT UNDERFLOW
1808                                *                                   TW NOT SET,  TRAP
1809   01 005E0    FFFFFFF4 A              DATA    -12                 COUNT
1810   01 005E1    08100314                PLW,1   SP                  INSTRUCTION
1811   01 005E2    F00000AF                K       15,0,0,SLSW         PSW1 IN
1812   01 005E3    F0000080                K       15,0,0,SLRET+1      PSW1 OUT
1813   01 005E4    03840000 N              P       ZEROS,0,0           R IN
1814   01 005E5    03840000 N              P       ZEROS,0,0           R OUT
1815   01 005E6    0359F000 N              P       DTA1,-16,0          MEM IN
1816   01 005E7    0359F000 N              P       DTA1,-16,0          MEM OUT
1817   01 005E8    00000304                DATA    MEMORY              STACK POINTER
1818   01 005E9    00000000 A              DATA    X'00000000'           DOUBLEWORD IN
1819   01 005EA    00000304                DATA    MEMORY              STACK POINTER
1820   01 005EB    00000000 A              DATA    X'00000000'           DOUBLEWORD OUT
1821                                ********************************************************************  PLW
1822                                *                                   WORD COUNT UNDERFLOW
1823                                *                                   SPACE COUNT OVERFLOW
1824                                *                                   TS SET, TW NOT SET, TRAP
1825   01 005EC    FFFFFFF4 A              DATA    -12                 COUNT
1826   01 005ED    08100314                PLW,1   SP                  INSTRUCTION
1827   01 005EE    073000AF                K       0,7,3,SLSW          PSW1 IN
1828   01 005EF    07300080                K       0,7,3,SLRET+1       PSW1 OUT
1829   01 005F0    03840000 N              P       ZEROS,0,0           R IN
1830   01 005F1    03840000 N              P       ZEROS,0,0           R OUT
1831   01 005F2    0359F000 N              P       DTA1,-16,0          MEM IN
1832   01 005F3    0359F000 N              P       DTA1,-16,0          MEM OUT
1833   01 005F4    00000304                DATA    MEMORY              STACK POINTER
1834   01 005F5    FFFF0000 A              DATA    X'FFFF0000'           DOUBLEWORD IN
1835   01 005F6    00000304                DATA    MEMORY              STACK POINTER
1836   01 005F7    FFFF0000 A              DATA    X'FFFF0000'           DOUBLEWORD OUT
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                                        PAGE
1837
1838                                ********************************************************************  PLW
1839                                *                                   WORD COUNT UNDERFLOW
1840                                *                                   SPACE COUNT OVERFLOW
1841                                *                                   TS NOT SET, TW SET, TRAP
1842  01 005F8  FFFFFFF4 A             DATA    -12                     COUNT
1843  01 005F9  08100314               PLW,1   SP                      INSTRUCTION
1844  01 005FA  F73000AF               K       15,7,3,SLSW             PSW1 IN
1845  01 005FB  F7300080               K       15,7,3,SLRET+1          PSW1 OUT
1846  01 005FC  03840000 N             P       ZEROS,0,0               R IN
1847  01 005FD  03840000 N             P       ZEROS,0,0               R OUT
1848  01 005FE  0359F000 N             P       DTA1,-16,0              MEM IN
1849  01 005FF  0359F000 N             P       DTA1,-16,0              MEM OUT
1850  01 00600  00000304               DATA    MEMORY                  STACK POINTER
1851  01 00601  7FFF8000 A             DATA    X'7FFF8000'               DOUBLEWORD IN
1852  01 00602  00000304               DATA    MEMORY                  STACK POINTER
1853  01 00603  7FFF8000 A             DATA    X'7FFF8000'               DOUBLEWORD OUT
1854                                ********************************************************************  PLW
1855                                *                                   WORD COUNT UNDERFLOW
1856                                *                                   SPACE COUNT OVERFLOW
1857                                *                                   TS SET, TW SET,  ABORT
1858  01 00604  FFFFFFF4 A             DATA    -12                     COUNT
1859  01 00605  08000314               PLW,0   SP                      INSTRUCTION
1860  01 00606  10000151               K       1,0,0,SETPSW            PSW1 IN
1861  01 00607  B00001AE               K       11,0,0,L0C+2            PSW1 OUT
1862  01 00608  03840000 N             P       ZEROS,0,0               R IN
1863  01 00609  03840000 N             P       ZEROS,0,0               R OUT
1864  01 0060A  0359F000 N             P       DTA1,-16,0              MEM IN
1865  01 0060B  0359F000 N             P       DTA1,-16,0              MEM OUT
1866  01 0060C  00000305               DATA    MEMORY+1                STACK POINTER
1867  01 0060D  FFFF8000 A             DATA    X'FFFF8000'               DOUBLEWORD IN
1868  01 0060E  00000305               DATA    MEMORY+1                STACK POINTER
1869  01 0060F  FFFF8000 A             DATA    X'FFFF8000'               DOUBLEWORD OUT
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                                        PAGE
1870
1871                                ********************************************************************  PLM
1872                                *                                   PULL 1 WORD INTO R8
1873                                *                                   TS=0, TW=0
1874                                *                                   STARTS WITH MAXIMUM WORD COUNT
1875  01 00610  FFFFFFF4 A             DATA    -12                     COUNT
1876  01 00611  0A800314               PLM,8   SP                      INSTRUCTION
1877  01 00612  10000151               K       1,0,0,SETPSW            PSW1 IN
1878  01 00613  000001AE               K       0,0,0,L0C+2             PSW1 OUT
1879  01 00614  03840000 N             P       ZEROS,0,0               R IN
1880  01 00615  035A0108 N             P       DTA1+1,1,8              R OUT
1881  01 00616  0359F000 N             P       DTA1,-16,0              MEM IN
1882  01 00617  0359F000 N             P       DTA1,-16,0              MEM OUT
1883  01 00618  00000305               DATA    MEMORY+1                STACK POINTER
1884  01 00619  003F7FFF A             DATA    X'003F7FFF'             DOUBLEWORD IN
1885  01 0061A  00000304               DATA    MEMORY                  STACK POINTER
1886  01 0061B  00407FFE A             DATA    X'00407FFE'               DOUBLEWORD OUT
1887                                ********************************************************************  PLM
1888                                *                                   PULL 2 WORD INTO R4,R5
1889                                *                                   RS=0, TW=1
1890                                *                                   STARTS WITH ZERO SPACE COUNT
1891  01 0061C  FFFFFFF4 A             DATA    -12                     COUNT
1892  01 0061D  0A400314               PLM,4   SP                      INSTRUCTION
1893  01 0061E  27300151               K       2,7,3,SETPSW            PSW1 IN
1894  01 0061F  073001AE               K       0,7,3,L0C+2             PSW1 OUT
1895  01 00620  03840000 N             P       ZEROS,0,0               R IN
1896  01 00621  035AFE04 N             P       DTA1+1,-2,4             R OUT
1897  01 00622  0359F000 N             P       DTA1,-16,0              MEM IN
1898  01 00623  0359F000 N             P       DTA1,-16,0              MEM OUT
1899  01 00624  00000306               DATA    MEMORY+2                STACK POINTER
1900  01 00625  00008312 A             DATA    X'00008312'               DOUBLEWORD IN
1901  01 00626  00000304               DATA    MEMORY                  STACK POINTER
1902  01 00627  00028310 A             DATA    X'00028310'               DOUBLEWORD OUT
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1903                                    PAGE
1904                            ********************************************************************  PLM
1905                            *                                       PULL 4 WORDS INTO R2-R5
1906                            *                                       TS=1, TW=0
1907   01 00628   FFFFFFF4 A              DATA    -12                     COUNT
1908   01 00629   0A200314                 PLM,2   SP                      INSTRUCTION
1909   01 0062A   47300151                 K       4,7,3,SETPSW            PSW1 IN
1910   01 0062B   073001AE                 K       0,7,3,LOC+2             PSW1 OUT
1911   01 0062C   03840000 N               P       ZEROS,0,0               R IN
1912   01 0062D   0359FC02 N               P       DTA1,-4,2               R OUT
1913   01 0062E   0359F000 N               P       DTA1,-16,0              MEM IN
1914   01 0062F   0359F000 N               P       DTA1,-16,0              MEM OUT
1915   01 00630   00000307                 DATA    MEMORY+3                STACK POINTER
1916   01 00631   807F7766 A               DATA    X'807F7766'               DOUBLEWORD IN
1917   01 00632   00000303                 DATA    MEMORY+1                STACK POINTER
1918   01 00633   80837762 A               DATA    X'80837762'               DOUBLEWORD OUT
1919                            ********************************************************************  PLM
1920                            *                                       PULL 8 WORDS INTO R1-R8
1921                            *                                       TS=1, TW=1
1922   01 00634   FFFFFFF4 A              DATA    -12                     COUNT
1923   01 00635   0A100314                 PLM,1   SP                      INSTRUCTION
1924   01 00636   87300151                 K       8,7,3,SETPSW            PSW1 IN
1925   01 00637   073001AE                 K       0,7,3,LOC+2             PSW1 OUT
1926   01 00638   03840000 N               P       ZEROS,0,0               R IN
1927   01 00639   035AF801 N               P       DTA1+1,-8,1             R OUT
1928   01 0063A   0359F000 N               P       DTA1,-16,0              MEM IN
1929   01 0063B   0359F000 N               P       DTA1,-16,0              MEM OUT
1930   01 0063C   00000300                 DATA    MEMORY+8                STACK POINTER
1931   01 0063D   800A800A A               DATA    X'800A800A'               DOUBLEWORD IN
1932   01 0063E   00000304                 DATA    MEMORY                  STACK POINTER
1933   01 0063F   80128002 A               DATA    X'80128002'               DOUBLEWORD OUT
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1934                                    PAGE
1935                            ********************************************************************  PLM
1936                            *                                       PULL 16 WORDS INTO R0-R15
1937                            *                                       TS=1, TW=1
1938   01 00640   FFFFFFF4 A              DATA    -12                     COUNT
1939   01 00641   0A000314                 PLM,0   SP                      INSTRUCTION
1940   01 00642   07300151                 K       0,7,3,SETPSW            PSW1 IN
1941   01 00643   173001AE                 K       1,7,3,LOC+2             PSW1 OUT
1942   01 00644   03840000 N               P       ZEROS,0,0               R IN
1943   01 00645   0359F000 N               P       DTA1,-16,0              R OUT
1944   01 00646   0359F000 N               P       DTA1,-16,0              MEM IN
1945   01 00647   0359F000 N               P       DTA1,-16,0              MEM OUT
1946   01 00648   00000313                 DATA    MEMORY+15               STACK POINTER
1947   01 00649   80008010 A               DATA    X'80008010'             DOUBLEWORD IN
1948   01 0064A   00000303                 DATA    MEMORY+1                STACK POINTER
1949   01 0064B   80108000 A               DATA    X'80108000'               DOUBLEWORD OUT
1950                            ********************************************************************  PLM
1951                            *                                       PULL 16 WORDS INT R0-R15 BEGINNING
1952                            *                                       WITH R1,  WORD CNT GOES TO ZERO.
1953                            *                                       TS=0, TW=0
1954   01 0064C   FFFFFFF4 A              DATA    -12                     COUNT
1955   01 0064D   0A100314                 PLM,1   SP                      INSTRUCTION
1956   01 0064E   00000151                 K       0,0,0,SETPSW            PSW1 IN
1957   01 0064F   100001AE                 K       1,0,0,LOC+2             PSW1 OUT
1958   01 00650   03840000 N               P       ZEROS,0,0               R IN
1959   01 00651   0359F001 N               P       DTA1,-16,1              R OUT
1960   01 00652   0359F000 N               P       DTA1,-16,0              MEM IN
1961   01 00653   0359F000 N               P       DTA1,-16,0              MEM OUT
1962   01 00654   00000313                 DATA    MEMORY+15               STACK POINTER
1963   01 00655   7FEF0010 A               DATA    X'7FEF0010'               DOUBLEWORD IN
1964   01 00656   00000303                 DATA    MEMORY+1                STACK POINTER
1965   01 00657   7FFF0000 A               DATA    X'7FFF0000'               DOUBLEWORD OUT
```

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1966                                  ********************************************************************** PLM
1967                                  *                                    PULL 1 WORD
1968                                  *                                    WORD COUNT UNDERFLOW
1969                                  *                                    TS=1, TW=0    TRAP
1970                                  *
1971  01 00658  FFFFFFF4 A           DATA    -12                          COUNT
1972  01 00659  0A000314            PLM,0   SP                           INSTRUCTION
1973  01 00659  100000AF            K       1,0,0,SLSW                   PSW1 IN
1974  01 00658  10000080            K       1,0,0,SLRET+1                PSW1 OUT
1975  01 0065C  03840000 N          P       ZEROS,0,0                    R IN
1976  01 0065D  03840000 N          P       ZEROS,0,0                    R OUT
1977  01 0065E  0359F000 N          P       DTA1,-16,0                   MEM IN
1978  01 0065F  0359F000 N          P       DTA1,-16,0                   MEM OUT
1979  01 00660  00000304            DATA    MEMORY                       STACK POINTER
1980  01 00661  F2100000 A          DATA    X'F2100000'                    DOUBLEWORD IN
1981  01 00662  00000304            DATA    MEMORY                       STACK POINTER
1982  01 00663  F2100000 A          DATA    X'F2100000'                    DOUBLWORD OUT
1983                                  ********************************************************************** PLM
1984                                  *                                    PULL 1 WORD
1985                                  *                                    WORD COUNT UNDERFLOW
1986                                  *                                    TS=1, TW=1    ABORT
1987  01 00664  FFFFFFF4 A           DATA    -12                          COUNT
1988  01 00665  0A000314            PLM,0   SP                           INSTRUCTION
1989  01 00666  10000151            K       1,0,0,SETPSW                 PSW1 IN
1990  01 00667  300001AE            K       3,0,0,LOC+2                  PSW1 OUT
1991  01 00668  03840000 N          P       ZEROS,0,0                    R IN
1992  01 00669  03840000 N          P       ZEROS,0,0                    R OUT
1993  01 0066A  0359F000 N          P       DTA1,-16,0                   MEM IN
1994  01 0066B  0359F000 N          P       DTA1,-16,0                   MEM OUT
1995  01 0066C  00000304            DATA    MEMORY                       STACK POINTER
1996  01 0066D  F2108000 A          DATA    X'F2108000'                    DOUBLWORD IN
1997  01 0066E  00000304            DATA    MEMORY                       STACK POINTER
1998  01 0066F  F2108000 A          DATA    X'F2108000'                    DOUBLEWORD OUT
```



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1999                                  ********************************************************************** PLM
2000                                  *                                    PULL 1 WORD
2001                                  *                                    SPACE COUNT OVERFLOW
2002                                  *                                    TS=0, TW=1    TRAP
2003                                  *
2004  01 00670  FFFFFFF4 A           DATA    -12                          COUNT
2005  01 00671  0A000314            PLM,0   SP                           INSTRUCTION
2006  01 00672  173000AF            K       1,7,3,SLSW                   PSW1 IN
2007  01 00673  17300080            K       1,7,3,SLRET+1                PSW1 OUT
2008  01 00674  03840000 N          P       ZEROS,0,0                    R IN
2009  01 00675  03840000 N          P       ZEROS,0,0                    R OUT
2010  01 00676  0359F000 N          P       DTA1,-16,0                   MEM IN
2011  01 00677  0359F000 N          P       DTA1,-16,0                   MEM OUT
2012  01 00678  00000304            DATA    MEMORY                       STACK POINTER
2013  01 00679  7FFF8100 A          DATA    X'7FFF8100'                    DOUBLEWORD IN
2014  01 0067A  00000304            DATA    MEMORY                       STACK POINTER
2015  01 00678  7FFF8100 A          DATA    X'7FFF8100'                  DOUBLEWORD OUT
2016                                  ********************************************************************** PLM
2017                                  *                                    PULL 1 WORD
2018                                  *                                    SPACE COUNT OVERFLOW
2019                                  *                                    TS=1, TW=0    ABORT
2020  01 0067C  FFFFFFF4 A           DATA    -12                          COUNT
2021  01 0067D  0A000314            PLM,0   SP                           INSTRUCTION
2022  01 0067E  17300151            K       1,7,3,SETPSW                 PSW1 IN
2023  01 0067F  873001AE            K       8,7,3,LOC+2                  PSW1 OUT
2024  01 00680  03840000 N          P       ZEROS,0,0                    R IN
2025  01 00681  03840000 N          P       ZEROS,0,0                    R OUT
2026  01 00682  0359F000 N          P       DTA1,-16,0                   MEM IN
2027  01 00683  0359F000 N          P       DTA1,-16,0                   MEM OUT
2028  01 00684  00000304            DATA    MEMORY                       STACK POINTER
2029  01 00685  FFFF0001 A          DATA    X'FFFF0001'                  DOUBLEWORD IN
2030  01 00686  00000304            DATA    MEMORY                       STACK POINTER
2031  01 00687  FFFF0001 A          DATA    X'FFFF0001'                    DOUBLEWORD OUT
```

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                                                  PAGE
                                    ************************************************************  PLM
                                    *                                        WORD COUNT UNDERFLOW
                                    *                                        SPACE COUNT OVERFLOW
                                    *                                        TS=1   TW=1   ABORT
 01 00688    FFFFFFF4 A                           DATA       -12             COUNT
 01 00689    0A000314                             PLM,0      SP              INSTRUCTION
 01 0068A    10000151                             <          1,0,0,SETPSW    PSW1 IN
 01 0068B    B00001AE                             <          11,0,0,LBC+2    PSW1 OUT
 01 0068C    03840000 N                           P          ZEROS,0,0       R IN
 01 0068D    03840000 N                           P          ZEROS,0,0       R OUT
 01 0068E    0359F000 N                           P          DTA1,-16,0      MEM IN
 01 0068F    0359F000 N                           P          DTA1,-16,0      MEM OUT
 01 00690    00000304                             DATA       MEMORY          STACK POINTER
 01 00691    FFFF8000 A                           DATA       X'FFFF8000'       DOUBLEWORD IN
 01 00692    00000304                             DATA       MEMORY          STACK POINTER
 01 00693    FFFF8000 A                           DATA       X'FFFF8000'       DOUBLEWORD OUT
                                    ************************************************************  PLM
                                    *                                        WORD COUNT UNDERFLOW
                                    *                                        SPACE COUNT OVERFLOW
                                    *                                        TS=0, TW=0    TRAP
 01 00694    FFFFFFF4 A                           DATA       -12             COUNT
 01 00695    0A000314                             PLM,0      SP              INSTRUCTION
 01 00696    073000AF                             <          0,7,3,SLSW      PSW1 IN
 01 00697    07300080                             <          0,7,3,SLRET+1   PSW1 OUT
 01 00698    03840000 N                           P          ZEROS,0,0       R IN
 01 00699    03840000 N                           P          ZEROS,0,0       R OUT
 01 0069A    0359F000 N                           P          DTA1,-16,0      MEM IN
 01 0069B    0359F000 N                           P          DTA1,-16,0      MEM OUT
 01 0069C    00000304                             DATA       MEMORY          STACK POINTER
 01 0069D    7FF0000F A                           DATA       X'7FF0000F'       DOUBLEWORD IN
 01 0069E    00000304                             DATA       MEMORY          STACK POINTER
 01 0069F    7FF0000F A                           DATA       X'7FF0000F'       DOUBLEWORD OUT
```



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                                                  PAGE
                                    ************************************************************  PLM
                                    *                                        INDEXED,  INDEX VALUE=1 IN R7
                                    *                                        PULL 15 WORDS; START LOADING INTO
                                    *                                        REGISTER R8.     TS=0, TW=0
 01 006A0    FFFFFFF4 A                           DATA       -12             COUNT
 01 006A1    0A8E0312                             PLM,8      SP-2,7          INSTRUCTION
 01 006A2    F0000151                             <          15,0,0,SETPSW   PSW1 IN
 01 006A3    100001AE                             <          1,0,0,LBC+2     PSW1 OUT
 01 006A4    0369FF07 N                           P          DTA2,-1,7       R IN
 01 006A5    0369F007 N                           P          DTA2,-16,7      R OUT
 01 006A6    036AF000 N                           P          DTA2+1,-16,0    MEM IN
 01 006A7    036AF000 N                           P          DTA2+1,-16,0    MEM OUT
 01 006A8    00000312                             DATA       MEMORY+14       STACK POINTER
 01 006A9    0000000F A                           DATA       X'0000000F'       DOUBLEWORD IN
 01 006AA    00000303                             DATA       MEMORY-1        STACK POINTER
 01 006AB    000F0000 A                           DATA       X'000F0000'       DOUBLEWORD OUT
                                    ************************************************************  PLM
                                    *                                        INDIRECTLY ADDRESSED
                                    *                                        WORD COUNT UNDERFLOW
                                    *                                        TS=0, TW=0,  TRAP
 01 006AC    FFFFFFF4 A                           DATA       -12             COUNT
 01 006AD    8A000317                             PLM,       *IASP           INSTRUCTION
 01 006AE    100000AF                             <          1,0,0,SLSW      PSW1 IN
 01 006AF    10000080                             <          1,0,0,SLRET+1   PSW1 OUT
 01 006B0    03840000 N                           P          ZEROS,0,0       R IN
 01 006B1    03840000 N                           P          ZEROS,0,0       R OUT
 01 006B2    0359F000 N                           P          DTA1,-16,0      MEM IN
 01 006B3    0359F000 N                           P          DTA1,-16,0      MEM OUT
 01 006B4    00000305                             DATA       MEMORY+1        STACK POINTER
 01 006B5    00000000 A                           DATA       00000000          DOUBLEWORD IN
 01 006B6    00000305                             DATA       MEMORY+1        STACK POINTER
 01 006B7    00000000 A                           DATA       00000000          DOUBLEWORD OUT
```

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                                    PAGE
2098                                ********************************************************************** PSM
2099                                *                                   PUSH 1 WORD FROM R8
2100                                *                                   TS=0, TW=0
2101                                *                                   STARTS WITH 0 WORD COUNT
2102
2103   01 006B8   FFFFFFF4 A            DATA    =12                    COUNT
2104   01 006B9   03800314              PSM,8   SP                     INSTRUCTION
2105   01 006BA   10000151              K       1,0,0,SETPSW           PSW1 IN
2106   01 006BB   000001AE              K       0,0,0,LOC+2            PSW1 OUT
2107   01 006BC   0359F000 N            P       DTA1,-16,0             R IN
2108   01 006BD   0359F000 N            P       DTA1,-16,0             R OUT
2109   01 006BE   03840000 N            P       ZEROS,0,0              MEM IN
2110   01 006BF   0361FF01 N            P       DTA1+8,-1,1            MEM OUT
2111   01 006C0   00000304              DATA    MEMORY                 STACK POINTER
2112   01 006C1   01000000 A            DATA    X'01000000'              DOUBLEWORD IN
2113   01 006C2   00000305              DATA    MEMORY+1               STACK POINTER
2114   01 006C3   00FF0001 A            DATA    X'00FF0001'              DOUBLEWORD OUT
2115                                ********************************************************************** PSM
2116                                *                                   PUSH 2 WORDS FROM R4,R5
2117                                *                                   TS=0, TW=1
2118                                *                                   STARTS WITH MAXIMUM SPACE COUNT
2119   01 006C4   FFFFFFF4 A            DATA    =12                    COUNT
2120   01 006C5   03400314              PSM,4   SP                     INSTRUCTION
2121   01 006C6   27300151              K       2,7,3,SETPSW           PSW1 IN
2122   01 006C7   073001AE              K       0,7,3,LOC+2            PSW1 OUT
2123   01 006C8   0359F000 N            P       DTA1,-16,0             R IN
2124   01 006C9   0359F000 N            P       DTA1,-16,0             R OUT
2125   01 006CA   03840000 N            P       ZEROS,0,0              MEM IN
2126   01 006CB   035DFE01 N            P       DTA1+4,-2,1            MEM OUT
2127   01 006CC   00000304              DATA    MEMORY                 STACK POINTER
2128   01 006CD   7FFFFFFD A            DATA    X'7FFFFFFD'              DOUBLEWORD IN
2129   01 006CE   00000306              DATA    MEMORY+2               STACK POINTER
2130   01 006CF   7FFDFFFF A            DATA    X'7FFDFFFF'              DOUBLEWORD OUT
```



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                                    PAGE
2131                                ********************************************************************** PSM
2132                                *                                   PUSH 4 WORDS FROM R2=R5
2133                                *                                   TS=1, TW=0
2134                                *
2135
2136   01 006D0   FFFFFFF4 A            DATA    =12                    COUNT
2137   01 006D1   03200314              PSM,2   SP                     INSTRUCTION
2138   01 006D2   47300151              K       4,7,3,SETPSW           PSW1 IN
2139   01 006D3   073001AE              K       0,7,3,LOC+2            PSW1 OUT
2140   01 006D4   0359F000 N            P       DTA1,-16,0             R IN
2141   01 006D5   0359F000 N            P       DTA1,-16,0             R OUT
2142   01 006D6   03840000 N            P       ZEROS,0,0              MEM IN
2143   01 006D7   0353FC01 N            P       DTA1+2,-4,1            MEM OUT
2144   01 006D8   00000304              DATA    MEMORY                 STACK POINTER
2145   01 006D9   80050001 A            DATA    X'80050001'              DOUBLEWORD IN
2146   01 006DA   00000308              DATA    MEMORY+4               STACK POINTER
2147   01 006DB   80010005 A            DATA    X'80010005'              DOUBLEWORD OUT
2148                                ********************************************************************** PSM
2149                                *                                   PUSH 8 WORDS FROM R1=R8
2150                                *                                   TS=1, TW=1
2151   01 006DC   FFFFFFF4 A            DATA    =12                    COUNT
2152   01 006DD   03100314              PSM,1   SP                     INSTRUCTION
2153   01 006DE   87300151              K       8,7,3,SETPSW           PSW1 IN
2154   01 006DF   073001AE              K       0,7,3,LOC+2            PSW1 OUT
2155   01 006E0   0359F000 N            P       DTA1,-16,0             R IN
2156   01 006E1   0359F000 N            P       DTA1,-16,0             R OUT
2157   01 006E2   03840000 N            P       ZEROS,0,0              MEM IN
2158   01 006E3   035AF801 N            P       DTA1+1,-8,1            MEM OUT
2159   01 006E4   00000304              DATA    MEMORY                 STACK POINTER
2160   01 006E5   FFFF8000 A            DATA    X'FFFF8000'              DOUBLEWORD IN
2161   01 006E6   0000030C              DATA    MEMORY+8               STACK POINTER
2162   01 006E7   FFF78008 A            DATA    X'FFF78008'              DOUBLEWORD OUT
```

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2163                                    PAGE
2164                            ********************************************************************  PSM
2165                            *                                       PUSH 16 WORDS FROM R0-R15
2166                            *                                       TS=0, TW=0
2167   01 006E8   FFFFFFF4 A           DATA    -12                     COUNT
2168   01 006E9   03000314             PSM,0   SP                      INSTRUCTION
2169   01 006EA   00000151             K       0,0,0,SETPSW            PSW1 IN
2170   01 006EB   400001AE             K       4,0,0,LOC+2             PSW1 OUT
2171   01 006EC   0359F000 N           P       DTA1,-16,0              R IN
2172   01 006ED   0359F000 N           P       DTA1,-16,0              R OUT
2173   01 006EE   03840000 N           P       ZEROS,0,0               MEM IN
2174   01 006EF   0359F000 N           P       DTA1,-16,0              MEM OUT
2175   01 006F0   00000303             DATA    MEMORY-1                STACK POINTER
2176   01 006F1   00100000 A           DATA    X'00100000'               DOUBLEWORD IN
2177   01 006F2   00000313             DATA    MEMORY+15               STACK POINTER
2178   01 006F3   00000010 A           DATA    X'00000010'               DOUBLEWORD OUT
2179                            ********************************************************************  PSM
2180                            *                                       PUSH 16 WORDS FROM R0-R15 BEGINNING
2181                            *                                       WITH R15
2182                            *                                       TS=1, TW=1
2183   01 006F4   FFFFFFF4 A           DATA    -12                     COUNT
2184   01 006F5   03F00314             PSM,15  SP                      INSTRUCTION
2185   01 006F6   00000151             K       0,0,0,SETPSW            PSW1 IN
2186   01 006F7   400001AE             K       4,0,0,LOC+2             PSW1 OUT
2187   01 006F8   0359F000 N           P       DTA1,-16,0              R IN
2188   01 006F9   0359F000 N           P       DTA1,-16,0              R OUT
2189   01 006FA   03840000 N           P       ZEROS,0,0               MEM IN
2190   01 006FB   0359F001 N           P       DTA1,-16,1              MEM OUT
2191   01 006FC   00000303             DATA    MEMORY-1                STACK POINTER
2192   01 006FD   8010FFEF A           DATA    X'8010FFEF'               DOUBLEWORD IN
2193   01 006FE   00000313             DATA    MEMORY+15               STACK POINTER
2194   01 006FF   8000FFFF A           DATA    X'8000FFFF'               DOUBLEWORD OUT
```



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2195                                    PAGE
2196                            ********************************************************************  PSM
2197                            *                                       PUSH 1 WORD
2198                            *                                       WORD COUNT OVERFLOW
2199                            *                                       TS=1, TW=0,   TRAP
2200   01 00700   FFFFFFF4 A           DATA    -12                     COUNT
2201   01 00701   03100314             PSM,1   SP                      INSTRUCTION
2202   01 00702   173000AF             K       1,7,3,SLSW              PSW1 IN
2203   01 00703   17300080             K       1,7,3,SLRET+1           PSW1 OUT
2204   01 00704   0359F000 N           P       DTA1,-16,0              R IN
2205   01 00705   0359F000 N           P       DTA1,-16,0              R OUT
2206   01 00706   03840000 N           P       ZEROS,0,0               MEM IN
2207   01 00707   03840000 N           P       ZEROS,0,0               MEM OUT
2208   01 00708   00000304             DATA    MEMORY                  STACK POINTER
2209   01 00709   80007FFF A           DATA    X'80007FFF'               DOUBLEWORD IN
2210   01 0070A   00000304             DATA    MEMORY                  STACK POINTER
2211   01 0070B   80007FFF A           DATA    X'80007FFF'               DOUBLEWORD OUT
2212                            ********************************************************************  PSM
2213                            *                                       PUSH 3 WORDS
2214                            *                                       WORD COUNT OVERFLOW
2215                            *                                       TS=1, TW=1,   ABORT
2216   01 0070C   FFFFFFF4 A           DATA    -12                     COUNT
2217   01 0070D   03100314             PSM,1   SP                      INSTRUCTION
2218   01 0070E   37300151             K       3,7,3,SETPSW            PSW1 IN
2219   01 0070F   E73001AE             K       14,7,3,LOC+2            PSW1 OUT
2220   01 00710   0359F000 N           P       DTA1,-16,0              R IN
2221   01 00711   0359F000 N           P       DTA1,-16,0              R OUT
2222   01 00712   03840000 N           P       ZEROS,0,0               MEM IN
2223   01 00713   03840000 N           P       ZEROS,0,0               MEM OUT
2224   01 00714   00000304             DATA    MEMORY                  STACK POINTER
2225   01 00715   8000FFFF A           DATA    X'8000FFFF'               DOUBLEWORD IN
2226   01 00716   00000304             DATA    MEMORY                  STACK POINTER
2227   01 00717   8000FFFF A           DATA    X'8000FFFF'               DOUBLEWORD OUT
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2228                                    PAGE
2229                                ********************************************************************  PSM
2230                                *                                   PUSH 1 WORD
2231                                *                                   SPACE COUNT UNDERFLOW
2232                                *                                   TS=0, TW=1    TRAP
2233   01 00718   FFFFFFF4 A             DATA    =12                   COUNT
2234   01 00719   09200314               PSM,2   SP                    INSTRUCTION
2235   01 0071A   100000AF                K      1,0,0,SLSW            PSW1 IN
2236   01 0071B   10000080                K      1,0,0,SLRET+1         PSW1 OUT
2237   01 0071C   0359F000 N              P      DTA1,-16,0            R IN
2238   01 0071D   0359F000 N              P      DTA1,-16,0            R OUT
2239   01 0071E   03840000 N              P      ZEROS,0,0             MEM IN
2240   01 0071F   03840000 N              P      ZEROS,0,0             MEM OUT
2241   01 00720   00000304               DATA    MEMORY                STACK POINTER
2242   01 00721   0000FFF0 A             DATA    X'0000FFF0'             DOUBLEWORD IN
2243   01 00722   00000304               DATA    MEMORY                STACK POINTER
2244   01 00723   0000FFF0 A             DATA    X'0000FFF0'             DOUBLEWORD OUT
2245                                ********************************************************************  PSM
2246                                *                                   PUSH 16 WORDS
2247                                *                                   SPACE COUNT UNDERFLOW
2248                                *                                   TS=1, TW=1    ABORT
2249   01 00724   FFFFFFF4 A             DATA    =12                   COUNT
2250   01 00725   09600314               PSM,6   SP                    INSTRUCTION
2251   01 00726   00000151                K      0,0,0,SETPSW          PSW1 IN
2252   01 00727   D00001AE                K      13,0,0,LOC+2          PSW1 OUT
2253   01 00728   0359F000 N              P      DTA1,-16,0            R IN
2254   01 00729   0359F000 N              P      DTA1,-16,0            R OUT
2255   01 0072A   03840000 N              P      ZEROS,0,0             MEM IN
2256   01 0072B   03840000 N              P      ZEROS,0,0             MEM OUT
2257   01 0072C   00000304               DATA    MEMORY                STACK POINTER
2258   01 0072D   80008000 A             DATA    X'80008000'             DOUBLEWORD IN
2259   01 0072E   00000304               DATA    MEMORY                STACK POINTER
2260   01 0072F   80008000 A             DATA    X'80008000'             DOUBLEWORD OUT
```



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2261                                    PAGE
2262                                ********************************************************************  PSM
2263                                *                                   WORD COUNT OVERFLOW
2264                                *                                   SPACE COUNT UNDERFLOW
2265                                *                                   TS=1, TW=1,   ABORT
2266   01 00730   FFFFFFF4 A             DATA    =12                   COUNT
2267   01 00731   09100314               PSM,1   SP                    INSTRUCTION
2268   01 00732   10000151                K      1,0,0,SETPSW          PSW1 IN
2269   01 00733   E00001AE                K      14,0,0,LOC+2          PSW1 OUT
2270   01 00734   0359F000 N              P      DTA1,-16,0            R IN
2271   01 00735   0359F000 N              P      DTA1,-16,0            R OUT
2272   01 00736   03840000 N              P      ZEROS,0,0             MEM IN
2273   01 00737   03840000 N              P      ZEROS,0,0             MEM OUT
2274   01 00738   00000304               DATA    MEMORY                STACK POINTER
2275   01 00739   8000FFFF A             DATA    X'8000FFFF'             DOUBLEWORD IN
2276   01 0073A   00000304               DATA    MEMORY                STACK POINTER
2277   01 0073B   8000FFFF A             DATA    X'8000FFFF'             DOUBLEWORD OUT
2278                                ********************************************************************  PSM
2279                                *                                   WORD COUNT OVERFLOW
2280                                *                                   SPACE COUNT UNDERFLOW
2281                                *                                   TS=0, TW=1,   TRAP
2282   01 0073C   FFFFFFF4 A             DATA    =12                   COUNT
2283   01 0073D   09100314               PSM,1   SP                    INSTRUCTION
2284   01 0073E   200000AF                K      2,0,0,SLSW            PSW1 IN
2285   01 0073F   20000080                K      2,0,0,SLRET+1         PSW1 OUT
2286   01 00740   0359F000 N              P      DTA1,-16,0            R IN
2287   01 00741   0359F000 N              P      DTA1,-16,0            R OUT
2288   01 00742   03840000 N              P      ZEROS,0,0             MEM IN
2289   01 00743   03840000 N              P      ZEROS,0,0             MEM OUT
2290   01 00744   00000304               DATA    MEMORY                STACK POINTER
2291   01 00745   0001FFFE A             DATA    X'0001FFFE'             DOUBLEWORD IN
2292   01 00746   00000304               DATA    MEMORY                STACK POINTER
2293   01 00747   0001FFFE A             DATA    X'0001FFFE'             DOUBLEWORD OUT
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2294                                    PAGE
2295                                ********************************************************************  PSM
2296                                *                                   WORD COUNT OVERFLOW
2297                                *                                   SPACE COUNT UNDERFLOW
2298                                *                                   TS=1, TW=0,   TRAP
2299   01 00748   FFFFFFF4 A                DATA    -12                 COUNT
2300   01 00749   08100314                 PSM,1   SP                  INSTRUCTION
2301   01 00744   100000AF                 K       1,0,0,SLSW          PSW1 IN
2302   01 00743   10000080                 K       1,0,0,SLRET+1       PSW1 OUT
2303   01 0074C   0359F000 N               P       DTA1,-16,0          R IN
2304   01 0074D   0359F000 N               P       DTA1,-16,0          R OUT
2305   01 0074E   03840000 N               P       ZEROS,0,0           MEM IN
2306   01 0074F   03840000 N               P       ZEROS,0,0           MEM OUT
2307   01 00750   00000304                 DATA    MEMORY              STACK POINTER
2308   01 00751   80007FFF A               DATA    X'80007FFF'           DOUBLEWORD IN
2309   01 00752   00000304                 DATA    MEMORY              STACK POINTER
2310   01 00753   80007FFF A               DATA    X'80007FFF'           DOUBLEWORD OUT
2311                                ********************************************************************  PSM
2312                                *                                   INDEXED,  INDEX=4 IN R7
2313                                *                                   TS=0, TW=0
2314   01 00754   FFFFFFF4 A                DATA    -12                 COUNT
2315   01 00755   038E030C                 PSM,8   SP-8,7              INSTRUCTION
2316   01 00756   50000151                 K       5,0,0,SETPSW        PSW1 IN
2317   01 00757   000001AE                 K       0,0,0,L80+2         PSW1 OUT
2318   01 00758   0372FA07 N               P       DTA2+9,-6,7         R IN
2319   01 00759   0372FA07 N               P       DTA2+9,-6,7         R OUT
2320   01 0075A   03840000 N               P       ZEROS,0,0           MEM IN
2321   01 0075B   0373F801 N               P       DTA2+10,-5,1        MEM OUT
2322   01 0075C   00000304                 DATA    MEMORY              STACK POINTER
2323   01 0075D   00067FFA A               DATA    X'00067FFA'           DOUBLEWORD IN
2324   01 0075E   00000309                 DATA    MEMORY+5            STACK POINTER
2325   01 0075F   00017FFF A               DATA    X'00017FFF'           DOUBLEWORD OUT
```



```
2326                                    PAGE
2327                                ********************************************************************  PSM
2328                                *                                   INDIRECTLY ADDRESSED
2329                                *                                   TS=0, TW=0
2330                                *                                   PUSHES FROM R15 AND R0
2331   01 00760   FFFFFFF4 A                DATA    -12                 COUNT
2332   01 00761   83F00317                 PSM,15  *IASP               INSTRUCTION
2333   01 00762   20000151                 K       2,0,0,SETPSW        PSW1 IN
2334   01 00763   000001AE                 K       0,0,0,L80+2         PSW1 OUT
2335   01 00764   0359F00F N               P       DTA1,-16,15         R IN
2336   01 00765   0359F00F N               P       DTA1,-16,15         R OUT
2337   01 00766   03840000 N               P       ZEROS,0,0           MEM IN
2338   01 00767   0359FE00 N               P       DTA1,-2,0           MEM OUT
2339   01 00768   00000303                 DATA    MEMORY-1            STACK POINTER
2340   01 00769   00800080 A               DATA    X'00800080'           DOUBLEWORD IN
2341   01 0076A   00000305                 DATA    MEMORY+1            STACK POINTER
2342   01 0076B   007E0082 A               DATA    X'007E0082'           DOUBLEWORD OUT
```

```
                                                  PAGE
                                             ************************************************************  MMC
                                             *                                  COUNT = 1 WORD
                                             *                                  CONTROL START = 0
01 0076C        FFFFFFF8 A                    DATA        -8                    COUNT
01 0076D        6F420000 A                    MMC,4       1                     INSTRUCTION
01 0076E        00000151                      K           0,0,0,SETPSW          PSW1 IN
01 0076F        000001AE                      K           0,0,0,LOC+2           PSW1 OUT
01 00770        03F0FE04 N                    P           MMCR1,-2,4            R IN
01 00771        03F2FE04 N                    P           MMCR1F,-2,4           R OUT
01 00772        03840000 N                    P           ZEROS,0,0             MEM IN
01 00773        03840000 N                    P           ZEROS,0,0             MEM OUT
                                             ************************************************************  MMC
                                             *                                  COUNT = 8 WORDS
                                             *                                  CONTROL START = 000011
01 00774        FFFFFFF8 A                    DATA        -8                    COUNT
01 00775        6F420000 A                    MMC,4       1                     INSTRUCTION
01 00776        F7300151                      K           15,7,3,SETPSW         PSW1 IN
01 00777        F73001AE                      K           15,7,3,LOC+2          PSW1 OUT
01 00778        03F4FE04 N                    P           MMCR2,-2,4            R IN
01 00779        03F6FE04 N                    P           MMCR2F,-2,4           R OUT
01 0077A        0359F000 N                    P           DTA1,-16,0            MEM IN
01 0077B        0359F000 N                    P           DTA1,-16,0            MEM OUT
                                             ************************************************************  MMC
                                             *                                  COUNT =1, CONTROL START = 0
                                             *                                  SLAVE MODE
01 0077C        FFFFFFF8 A                    DATA        -8                    COUNT
01 0077D        6F420000 A                    MMC,4       1                     INSTRUCTION
01 0077E        00800151                      K           0,0,8,SETPSW          PSW1 IN
01 0077F        20000067                      K           2,0,0,MVRET+1         PSW1 OUT
01 00780        03F0FE04 N                    P           MMCR1,-2,4            R IN
01 00781        03F0FE04 N                    P           MMCR1,-2,4            R OUT
01 00782        0359F000 N                    P           DTA1,-16,0            MEM IN
01 00783        0359F000 N                    P           DTA1,-16,0            MEM OUT
```



```
                                                  PAGE
                                             ************************************************************  MMC
                                             *                                  COUNT = 2 WORDS
                                             *                                  CONTROL START = 0
01 00784        FFFFFFFA A                    DATA        -6                    COUNT
01 00785        6F420000 A                    MMC,4       1                     INSTRUCTION
01 00786        00000151                      K           0,0,0,SETPSW          PSW1 IN
01 00787        000001AE                      K           0,0,0,LOC+2           PSW1 OUT
01 00788        03F8FE04 N                    P           MMCR3,-2,4            R IN
01 00789        03FAFE04 N                    P           MMCR3F,-2,4           R OUT
                                             ************************************************************  MMC
                                             *                                  COUNT = 15 WORDS
                                             *                                  CONTROL START = 000011
01 0078A        FFFFFFFA A                    DATA        -6                    COUNT
01 0078B        6F020000 A                    MMC,0       1                     INSTRUCTION
01 0078C        F0000151                      K           15,0,0,SETPSW         PSW1 IN
01 0078D        F00001AE                      K           15,0,0,LOC+2          PSW1 OUT
01 0078E        03FCFE00 N                    P           MMCR4,-2,0            R IN
01 0078F        03FEFE00 N                    P           MMCR4F,-2,0           R OUT
                                             ************************************************************  MMC
                                             *                                  COUNT = 1 WORD, CONTROL START =0
                                             *                                  INDIRECTLY ADDRESSED
01 00790        FFFFFFFA A                    DATA        -6                    COUNT
01 00791        EF420000 A                    DATA        X'EF420000'           INSTRUCTION
01 00792        00000151                      K           0,0,0,SETPSW          PSW1 IN
01 00793        000001AE                      K           0,0,0,LOC+2           PSW1 OUT
01 00794        03F0FE04 N                    P           MMCR1,-2,4            R IN
01 00795        03F2FE04 N                    P           MMCR1F,-2,4           R OUT
```

```
                                                  PAGE
                                           ************************************************************  MMC
                                           *                             ILLEGAL INSTRUCTION TRAP
01 00796      FFFFFFF8 A                   DATA      -8                  COUNT
01 00797      6F440000 A                   MMC,4     2                   INSTRUCTION
01 00798      00000151                     <         0,0,0,SETPSW        PSW1 IN
01 00799      8000006D                     <         8,0,0,NEIRET+1      PSW1 OUT
01 0079A      03F0FE04 N                   P         MMCR1,-2,4          R IN
01 0079B      03F0FE04 N                   P         MMCR1,-2,4          R OUT
01 0079C      0359F000 N                   P         DTA1,-16,0          MEM IN
01 0079D      0359F000 N                   P         DTA1,-16,0          MEM OUT
                                           ************************************************************  MMC
                                           *                             ILLEGAL INSTRUCTION TRAP
01 0079E      FFFFFFF8 A                   DATA      -8                  COUNT
01 0079F      6F480000 A                   MMC,4     4                   INSTRUCTION
01 007A0      00000151                     <         0,0,0,SETPSW        PSW1 IN
01 007A1      8000006D                     <         8,0,0,NEIRET+1      PSW1 OUT
01 007A2      03F0FE04 N                   P         MMCR1,-2,4          R IN
01 007A3      03F0FE04 N                   P         MMCR1,-2,4          R OUT
01 007A4      0359F000 N                   P         DTA1,-16,0          MEM IN
01 007A5      0359F000 N                   P         DTA1,-16,0          MEM OUT
                                           *****************************************************************
```



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                                                PAGE
                                       * THE FOLLOWING 6 MODULES WILL TEST THE P-REGISTER COUNT DOWN LOGIC   *B
                                       ************************************************************ PLM     *B
                                       *                               PULL 2 WORDS FROM 7FF & 800          *B
                                       *                               NO OVERFLOW OR UNDERFLOW             *B
                                       *                               R/P20-NP21,NP22,PDC22                *B
                                       *                                   PDC22-PDC29,P2329Z               *B
                                       *                                   PDC29-PDC31,PDC3033,NP30,        *B
                                       *                                       NP31                         *B
01 007A6      FFFFFFF4 A       DECP20  DATA      -12                   COUNT                                *B
01 007A7      0A000314                 PLM,0     SP                    INSTRUCTION                          *B
01 007A8      20000151                 <         2,0,0,SETPSW          PSW1 IN                              *B
01 007A9      100001AE                 <         1,0,0,LOC+2           PSW1 OUT                             *B
01 007AA      03840000 N               P         ZEROS,0,0             R IN                                 *B
01 007AB      0359FE00 N               P         DTA1,-2,0             R OUT                                *B
01 007AC      0359F000 N               P         DTA1,-16,0            MEM IN                               *B
01 007AD      0359F000 N               P         DTA1,-16,0            MEM OUT                              *B
01 007AE      00000800 A               DATA      X'800'                STACK POINTER                        *B
01 007AF      00000002 A               DATA      X'00000002'              DOUBLEWORD IN                     *B
01 007B0      000007FE A               DATA      X'7FE'                STACK POINTER                        *B
01 007B1      00020000 A               DATA      X'00020000'              DOUBLEWORD OUT                    *B
                                       ************************************************************ PLM     *B
                                       *                               PULL 2 WORDS FROM FFF & 1000         *B
                                       *                               NO OVERFLOW OR UNDERFLOW             *B
                                       *                               R/P19-NP20,NP21,NP22,PDC22           *B
01 007B2      FFFFFFF4 A       DECP19  DATA      -12                   COUNT                                *B
01 007B3      0A000314                 PLM,0     SP                    INSTRUCTION                          *B
01 007B4      20000151                 <         2,0,0,SETPSW          PSW1 IN                              *B
01 007B5      100001AE                 <         1,0,0,LOC+2           PSW1 OUT                             *B
01 007B6      03840000 N               P         ZEROS,0,0             R IN                                 *B
01 007B7      0359FE00 N               P         DTA1,-2,0             R OUT                                *B
01 007B8      0359F000 N               P         DTA1,-16,0            MEM IN                               *B
01 007B9      0359F000 N               P         DTA1,-16,0            MEM OUT                              *B
01 007BA      00001000 A               DATA      X'1000'               STACK POINTER                        *B
01 007BB      00000002 A               DATA      X'00000002'              DOUBLEWORD IN                     *B
01 007BC      00000FFE A               DATA      X'FFE'                STACK POINTER                        *B
01 007BD      00020000 A               DATA      X'00020000'              DOUBLEWORD OUT                    *B
```

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                                   PAGE
                                   ***************************************************************** PLM *B
                                   *                                        PULL 2 WORDS FROM 1FFF & 2000   *B
                                   *                                        NO OVERFLOW OR UNDERFLOW         *B
                                   *                                        R/P18-PDC18-PDC29-P2329Z-NP19-   *B
                                   *                                                 NP20-NP21-NP22          *B
01 0073E    00000000 A   DECP18    DATA      0                           COUNT SUPPLIED BY DRIVER         *B
01 0073F    0A000314               PLM,0     SP                          INSTRUCTION                      *B
01 007C0    20000151               K         2,0,0,SETPSW                PSW1 IN                          *B
01 007C1    100001AE               K         1,0,0,LOC+2                 PSW1 OUT                         *B
01 007C2    03840000 N             P         ZEROS,0,0                   R IN                             *B
01 007C3    0359FE00 N             P         DTA1,-2,0                   R OUT                            *B
01 007C4    0359F000 N             P         DTA1,-16,0                  MEM IN                           *B
01 007C5    0359F000 N             P         DTA1,-16,0                  MEM OUT                          *B
01 007C6    00002000 A             DATA      X'2000'                     STACK POINTER                    *B
01 007C7    00000002 A             DATA      X'00000002'                    DOUBLEWORD IN                 *B
01 007C8    00001FFE A             DATA      X'1FFE'                     STACK POINTER                    *B
01 007C9    00020000 A             DATA      X'00020000'                    DOUBLEWORD OUT                *B
                                   ***************************************************************** PLM *B
                                   *                                        PULL 2 WORDS FROM 3FFF & 4000   *B
                                   *                                        NO OVERFLOW OR UNDERFLOW         *B
                                   *                                        R/P17-NP18-PDC18                 *B
01 007CA    00000000 A   DECP17    DATA      0                           COUNT SUPPLIED BY DRIVER         *B
01 007CB    0A000314               PLM,0     SP                          INSTRUCTION                      *B
01 007CC    20000151               K         2,0,0,SETPSW                PSW1 IN                          *B
01 007CD    100001AE               K         1,0,0,LOC+2                 PSW1 OUT                         *B
01 007CE    03840000 N             P         ZEROS,0,0                   R IN                             *B
01 007CF    0359FE00 N             P         DTA1,-2,0                   R OUT                            *B
01 007D0    0359F000 N             P         DTA1,-16,0                  MEM IN                           *B
01 007D1    0359F000 N             P         DTA1,-16,0                  MEM OUT                          *B
01 007D2    00004000 A             DATA      X'4000'                     STACK POINTER                    *B
01 007D3    00000002 A             DATA      X'00000002'                    DOUBLEWORD IN                 *B
01 007D4    00003FFE A             DATA      X'3FFE'                     STACK POINTER                    *B
01 007D5    00020000 A             DATA      X'00020000'                    DOUBLEWORD OUT                *B
```



```
                                   PAGE
                                   ***************************************************************** PLM *B
                                   *                                        PULL 2 WORDS FROM 7FFF & 8000   *B
                                   *                                        NO OVERFLOW OR UNDERFLOW         *B
                                   *                                        R/P16-NP17-NP18-PDC18            *B
01 007D6    00000000 A   DECP16    DATA      0                           COUNT SUPPLIED BY DRIVER         *B
01 007D7    0A000314               PLM,0     SP                          INSTRUCTION                      *B
01 007D8    20000151               K         2,0,0,SETPSW                PSW1 IN                          *B
01 007D9    100001AE               K         1,0,0,LOC+2                 PSW1 OUT                         *B
01 007DA    03840000 N             P         ZEROS,0,0                   R IN                             *B
01 007DB    0359FE00 N             P         DTA1,-2,0                   R OUT                            *B
01 007DC    0359F000 N             P         DTA1,-16,0                  MEM IN                           *B
01 007DD    0359F000 N             P         DTA1,-16,0                  MEM OUT                          *B
01 007DE    00008000 A             DATA      X'8000'                     STACK POINTER                    *B
01 007DF    00000002 A             DATA      X'00000002'                    DOUBLEWORD IN                 *B
01 007E0    00007FFE A             DATA      X'7FFE'                     STACK POINTER                    *B
01 007E1    00020000 A             DATA      X'00020000'                    DOUBLEWORD OUT                *B
                                   ***************************************************************** PLM *B
                                   *                                        PULL 2 WORDS FROM FFFF & 10000  *B
                                   *                                        NO OVERFLOW OR UNDERFLOW         *B
                                   *                                        R/P15-NP16-NP17-PDC18            *B
01 007E2    00000000 A   DECP15    DATA      0                           COUNT SUPPLIED BY DRIVER         *B
01 007E3    0A000314               PLM,0     SP                          INSTRUCTION                      *B
01 007E4    20000151               K         2,0,0,SETPSW                PSW1 IN                          *B
01 007E5    100001AE               K         1,0,0,LOC+2                 PSW1 OUT                         *B
01 007E6    03840000 N             P         ZEROS,0,0                   R IN                             *B
01 007E7    0359FE00 N             P         DTA1,-2,0                   R OUT                            *B
01 007E8    0359F000 N             P         DTA1,-16,0                  MEM IN                           *B
01 007E9    0359F000 N             P         DTA1,-16,0                  MEM OUT                          *B
01 007EA    00010000 A             DATA      X'10000'                    STACK POINTER                    *B
01 007EB    00000002 A             DATA      X'00000002'                    DOUBLEWORD IN                 *B
01 007EC    0000FFFE A             DATA      X'FFFE'                     STACK POINTER                    *B
01 007ED    00020000 A             DATA      X'00020000'                    DOUBLEWORD OUT                *B
                                   * END OF TEST MODULE LIST
                                   *
01 007EE    00000000 A             DATA      0                           END OF LIST INDICATOR
                                   ***********************************************************************
```

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2535          01 000F9                    END       LOADED
```

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