

SDS 901133B
\$2.00

DIAGNOSTIC PROGRAM MANUAL

SIGMA 5 AND 7
KEYBOARD-PRINTER
(KSR-ASR) TEST

September 1967

This Publication supersedes
SDS 901133A dated June 1967

LIST OF EFFECTIVE PAGES

Total number of pages is 62, as follows:

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LIST OF RELATED PUBLICATIONS

<u>Publication Title</u>	<u>Publication No.</u>
Diagnostic Control Program for Sigma 5 and 7 Computer Peripheral Devices, Diagnostic Program Manual	900712
Sigma 5 and 7 Relocatable Diagnostic Program Loader, Diagnostic Program Manual	900972
Sigma 7 Computer, Technical Manual	901060
Sigma 7 Computer, Reference Manual	900950
Sigma Keyboard-Printer Model 7010, Technical Manual	901065
Sigma Keyboard-Printer Model 7020, Technical Manual	901066

SECTION I
INTRODUCTION

1-1 SCOPE OF MANUAL

1-2 This manual provides a description of the keyboard-printer (KSR-ASR) test program catalog number 704059B. The operating instructions are explained in detail in section II. Section III contains a description of the sub-routines of the program. The program listing is in section IV, with a sample printout of a line and an explanation of what is contained in each column.

1-3 Figure 1-1 is a flow diagram of the manual mode operation.

1-4 PROGRAM OBJECTIVES

1-5 The Sigma 5 and 7 Keyboard-Printer (KSR-ASR), Models 7010, 7012, and 7020 test program provides a comprehensive diagnostic checkout and test of the keyboard-printer device.

1-6 The keyboard-printer test program operates in either manual mode or auto mode. The initial mode of operation must be specified by the operator prior to loading the program. However, dynamic mode transition is possible.

1-7 MANUAL MODE

1-8 In the manual mode program parameters are entered directly at the control console. Status and error information is displayed in specific machine registers. A limited test of the device independent of its environment is thereby obtained.

1-9 AUTO MODE

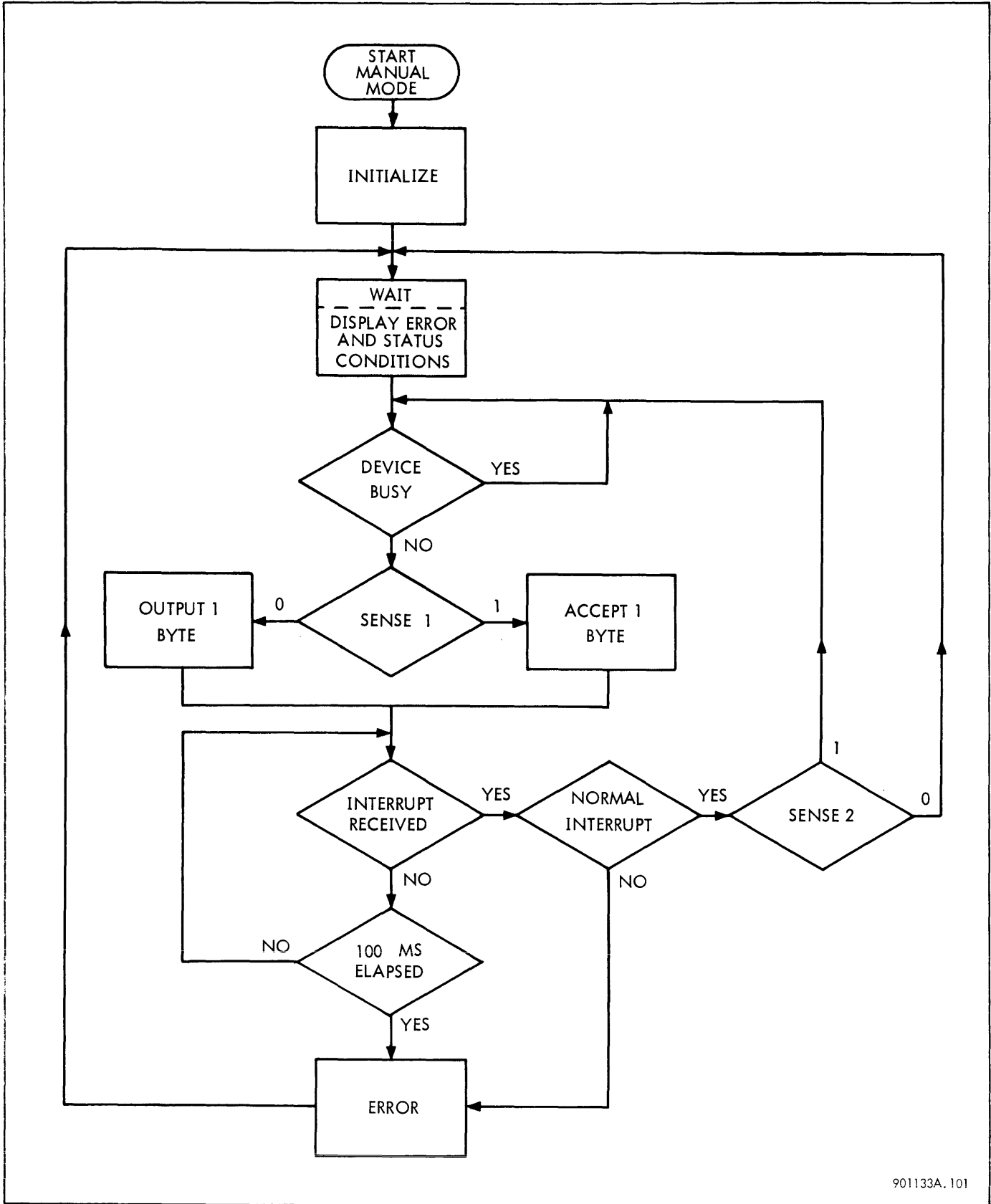
1-10 In the auto mode the test program operates in the environment of the Diagnostic Control Program (DCP) model number 704070-A00. Operator control of the test program is provided through the input of a syntax test language interpreted by the DCP as well as sense switch interrogation. With proper usage of the diagnostic test language the operator has full control over the sequence and activation of various keyboard-printer tests.

1-11 GENERAL SPECIFICATIONS

1-12 Table 1-1 lists the general specifications.

Table 1-1. General Specifications

Computer Configuration	Sigma 5 or 7 with a minimum 4K memory
Required Equipment	Keyboard-Printer, Models 7010, 7012, or 7020
Optional Equipment	Card reader, line printer
Prerequisites	The object keyboard-printer device must conform to equipment design specification drawing number 123383 or 131017.
Program Media	Self-loading paper tape or cards



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Figure 1-1. Magnetic Tape Test Program Flow Chart

SECTION II
OPERATING INSTRUCTIONS

2-1 PROGRAM LOADING PROCEDURE

2-2 This program uses the standard Sigma 5/7 Diagnostic Program Loader, Model Number 704356-A00. The user should acquaint himself with operation of this loader before loading the keyboard-printer test program (refer to SDS 900972).

2-3 PROGRAM OPERATING PROCEDURE

2-4 MANUAL MODE

2-5 This mode is selected by setting SENSE switch 4 to ON before loading, or setting SENSE switch 4 to ON and executing the mode directive when the program is in the auto mode of operation.

2-6 All data transfer operations in the manual mode use a byte count of 1 and request interrupts at channel end and unusual end. Pressing the console INTERRUPT switch causes the program to interrogate SENSE switch 4 and continue in the manual mode if on, or select the auto mode if off. Figure 1-1 illustrates the program flow in this mode.

2-7 CONSOLE SENSE SWITCH OPTIONS (Manual Mode)

2-8 Table 2-1 lists the sense switch options.

Table 2-1. Sense Switch Options

Switch	Status	Function
SS 1	Off	Output to the printer section
	On	Input from the keyboard section
SS 2	Off	Single-step operation
	On	Repetitive operation
SS 4	Off	Select auto mode
	On	Continue in manual mode
INTERRUPT	On	Interrogate SENSE switch 4

2-9 PROGRAM CONTROL (Manual Mode)

2-10 In the manual mode the program will halt at location 005FD for control information to be entered into general

registers 0 and 1. This information has the following format:

a. Register 0

Bits 21-23 IOP number

Bits 24-31 Device number

b. Register 1

Bits 24-31 Last byte input or next byte for output (EBCDIC CODE).

2-11 Once the above control information is entered the operation may be started by clearing the wait condition (RUN-IDLE-RUN). Program execution will proceed as specified by console switch options (see table 2-1).

2-12 SUCCESS/ERROR INDICATIONS (Manual Mode)

2-13 Program Halts

2-14 The program halt is listed in table 2-2.

Table 2-2. Program Halt

Location	Indication	Description
005FD	See paragraph 2-15	Operation complete. Examine Condition Codes 1 thru 4 and general registers 0 thru 6 for results. Enter new control information and/or clear WAIT to repeat

2-15 Condition Codes

2-16 Condition Codes 1 through 4, with status and error information, are as follows:

<u>CC</u>				<u>Status and Error Information</u>
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	
0	0	0	0	Normal operation, no errors
0	0	0	1	Interrupt signal was not received within 100 milliseconds after operation was started
0	0	1	0	Status error, SIO was not accepted
0	1	0	0	Unusual condition interrupt occurred
1	0	0	0	Watchdog timer trap occurred

2-17 General Registers

2-18 General registers 0 through 6 with status indicated are as follows:

<u>Register</u>	<u>Status</u>
0	IOP and device number
1	Last byte input or next byte for output (EBCDIC CODE)
2 } 3 }	Last TIO status
4	Last AIO status
6	Trap error address

2-19 AUTO MODE

2-20 The auto mode is selected by setting SENSE switch 4 to OFF before loading the program, or when operating in the manual mode by setting SENSE switch 4 OFF and pressing the console INTERRUPT switch. Either method places the test program under the executive control of the DCP.

2-21 CONSOLE SWITCH OPTIONS (Auto Mode)

2-22 Table 2-3 lists the sense switch options.

Table 2-3. Sense Switch Options

Switch	Status	Function
SS 1	Off	Continue to cycle thru the current test language control line
	On	Terminate execution of the current control line and return to the input media for new test language inputs
SS 4	Off	Display error messages
	On	Suppress error message display
INTERRUPT	On	Abort execution and return to DCP for input

2-23 TEST LANGUAGE OPTIONS (Auto Mode)

2-24 Functional directives to the program are entered at the keyboard-printer or card reader. The basic function or operation is named by a unique mnemonic directive which identifies the operation. Most directives have optional or required parameters that follow the mnemonic call and optional iteration count or place mark parameters that precede the mnemonic directive.

2-25 Definition of Terms and Symbols

2-26 In table 2-4 and the test descriptions, trailing parameters are referred to as "x1, f1," etc. Leading parameters are shown as "i" or "m" representing iteration count or place mark, respectively. The phrase "the typewriter" refers to the keyboard-printer device named by the UNIT directive (refer to section III).

2-27 Table 2-4 defines the abbreviated terms and symbols used in describing the test language.

Table 2-4. Symbols and Definitions

Symbols	Definitions
i	Iteration count (1-99)
m	Place marker (1-99)
d	Decimal value (number 0-9)
x	Hexadecimal value (numeric 0-9, alpha A-F)
f	Flag ("Off" = 0, "On" = 1)
Opt'l	Optional (mode, immediate or control line; parameter is not required)
Req'd	Required (parameter is required)
\$	Immediate mode only

2-28 Directives

2-29 Table 2-5 is a summary of all the test language directives recognized by this program.

Table 2-5. Test Language Directives

Name	Format	Execution	ID	Definition	Mini- mum	Maxi- mum	Req'mnt	Standard	Ref.
Echo Test	iECHO	Opt'l	i	Iteration count	1	99	Opt'l	1	3-3
Issue HIO	iHIO	Opt'l	i	Iteration count	1	99	Opt'l	1	3-11
Change Mode	MODE	\$		None					3-18
Query Device Status	mQ, x1	Opt'l	m	Placemark	1	99	Opt'l		3-25
			x1	Flag mark	000	FFF	Opt'l	0	
Read Keyboard to EOM	iRK	Opt'l	i	Iteration count	1	99	Opt'l	1	3-34
Read Keyboard to Control Character	iRKC	Opt'l	i	Iteration count	1	99	Opt'l	1	3-42
Issue SIO	iSIO, x1	Opt'l	i	Iteration count	1	99	Opt'l	1	3-48
			x1	Device order byte	00	FF	Opt'l	0	
Issue TDV	iTDV, f1	Opt'l	i	Iteration count	1	99	Opt'l	1	3-56
			f1	Display status flag	0	>0	Opt'l	0	
Issue TIO	iTIO, f1	Opt'l	i	Iteration count	1	99	Opt'l	1	3-63
			f1	Display status flag	0	>0	Opt'l	0	
Type to Count or Break	iTYPE	Opt'l	i	Iteration count	1	99	Opt'l	1	3-70
Declare Device Address	UNIT, x1, x2	\$	x1	IOP number	0	7	Req'd	0	3-79
			x2	Device number	0	FF	Req'd	1	
Command Chain Test	iCOMC	Opt'l	i	Iteration count	1	99	Opt'l	1	3-84

(Continued)

Table 2-5. Test Language Directives (Cont.)

Name	Format	Execution	ID	Definition	Minimum	Maximum	Req'mnt	Standard	Ref
ASR Compatibility Test	iASR, d1, x2, x3, x4, x5	Opt'l	i	Iteration count	1	99	Opt'l	1	3-92
			d1	Byte count	1	255	Opt'l	1	
			x2	1st device order	1	FF	Opt'l	0	
			x3	2nd device order	1	FF	Opt'l	0	
			x4	3rd device order	1	FF	Opt'l	0	
			x5	4th device order	1	FF	Opt'l	0	

SECTION III
PROGRAM DESCRIPTION

3-1 GENERAL

3-2 The program tests are described in detail in 13 sub-routines. The significance of each parameter is listed and defined. A complete description of the action taken when the subroutine is activated is provided. Success and error indications are outlined to describe the results of each test.

3-3 ECHO TEST (iECHO)

3-4 PARAMETERS

3-5 The parameter i = Iteration count.

3-6 DESCRIPTION

3-7 This directive causes one byte of information to be accepted from the typewriter. This byte is then immediately output to the typewriter.

3-8 SUCCESS/ERROR INDICATIONS

3-9 Returned status information is not checked for error conditions. However, if the SIO is not accepted, the following message is typed:

SIO UNSUCCESSFUL - HIO ISSUED

HIO STATUS - SSSS CC = X

where SSSS is the status returned during the HIO operation, and X is the condition code settings immediately after the HIO operation.

3-10 If an unusual condition interrupt occurs during the echo test, the following message is typed:

UNUSUAL CONDITION INTERRUPT

AIO STATUS - SSSS CC = X

where SSSS and X are the status and condition code settings returned from the AIO operation.

3-11 ISSUE HIO (iHIO)
 3-12 PARAMETERS
 3-13 The parameter i = Iteration count.
 3-14 DESCRIPTION
 3-15 This directive causes an HIO instruction to be executed.

3-16 SUCCESS/ERROR INDICATIONS
 3-17 If the device is not operating at the time the HIO is given, no timeout occurs. If the device is operating, the following message is typed:

HIO STATUS SSSS CC = X

where SSSS and X are the status and condition code information returned from the HIO operation.

3-18 CHANGE MODE (MODE)
 3-19 PARAMETERS
 3-20 Parameters are not allowed.
 3-21 DESCRIPTION
 3-22 This directive causes the program mode to be changed in response to the setting of SENSE switch 4 as follows:

SENSE 4 OFF – Auto mode
 ON – Manual mode

3-23 SUCCESS/ERROR INDICATIONS
 3-24 If SENSE switch 4 is set at 1, the program will wait in the manual mode at location 005FD.
 3-25 QUERY DEVICE STATUS (mQ, x1)
 3-26 PARAMETERS
 3-27 Parameters – x1 = Hex – 0 ≤ x1 ≤ FFF
 m = Place marker

3-28 DESCRIPTION
 3-29 This directive causes a TIO and TDV instruction to be executed and the returned status to be tested.
 3-30 Tests may be requested by using the following values for parameter x1:

<u>x1</u>	<u>Test</u>
01	Device interrupt pending
02	Transmission data error
04	No I/O address recognition (Continued)

<u>x1</u>	<u>Test</u>
08	SIO not possible
10	Device unusual end
20	Device controller busy
40	Device busy
80	Device rate error

3-31 Parameter x1 indicates which status information is to be tested. If any of the test results are true, the place mark branch is taken. If a not true condition prevails on all tests requested, the branch does not occur, and the next directive in the control line sequence is executed.

3-32 Combinations of tests may be requested by merging their respective call parameters (for example, x1 = 82 would test for transmission data error and device rate error).

3-33 READ KEYBOARD TO EOM (iRK)

3-34 PARAMETERS
 3-35 Parameter i = Iteration count.
 3-36 DESCRIPTION
 3-37 This directive causes information to be accepted from the typewriter until an EOM character is sent or until 255 bytes are received. The information received is stored for subsequent output by the TYPE directive.

3-38 SUCCESS/ERROR INDICATIONS
 3-39 Status information is not checked. However, if the SIO is not accepted, the following message is typed:

SIO UNSUCCESSFUL – HIO ISSUED
 HIO STATUS = SSSS CC = X

where SSSS and X are the status and condition code settings returned by the AIO instruction.

3-40 If an unusual condition interrupt occurs, the following message is typed:
 UNUSUAL CONDITION INTERRUPT
 AIO STATUS = SSSS CC = X

where SSSS and X are the status and condition code settings returned by the AIO instruction.

3-41 READ KEYBOARD TO CONTROL CHARACTER (iRKC)

3-42 PARAMETERS
 3-43 The parameter i = Iteration count.

3-44 DESCRIPTION

3-45 This directive is the same as read keyboard to EOM (paragraph 3-33), except that if the device is equipped with the read to control character function, the control characters NEW LINE (NL) and TAB (HT) in addition to EOM will terminate input.

3-46 SUCCESS/ERROR INDICATIONS

3-47 See paragraph 3-38.

3-48 ISSUE SIO (iSIO, x1)

3-49 PARAMETERS

3-50 Parameters – i = Iteration count
x1 = Hex - $0 \leq P1 \leq FF$

3-51 DESCRIPTION

3-52 This directive causes an SIO instruction to be issued. The two hex digits input in x1 will be used in the order field of the SIO command pair with a byte count of one and ICE and IUE interrupt flags coded.

3-53 SUCCESS/ERROR INDICATIONS

3-54 If the SIO is not accepted, the following message is typed:

SIO UNSUCCESSFUL – HIO ISSUED

HIO STATUS = SSSS CC = X

where SSSS and X are the status and condition code settings returned by the HIO instruction.

3-55 If an unusual condition interrupt occurs, the following message is typed:

UNUSUAL CONDITION INTERRUPT

AIO STATUS = SSSS CC = X

where SSSS and X are the status and condition code settings returned by the AIO instruction.

3-56 ISSUE TDV (iTDV, f1)

3-57 PARAMETERS

3-58 Parameters – i = Iteration count

f1 = Hex - $0 \leq P1 \leq F$

3-59 DESCRIPTION

3-60 This directive causes a TDV instruction to be executed.

3-61 SUCCESS/ERROR INDICATIONS

3-62 If parameter f1 is nonzero, the returned status is typed on the typewriter in the following format:

TDV STATUS = SSSS CC = X

where SSSS and X are the returned status and condition code settings.

3-63 ISSUE TIO (iTIO, f1)

3-64 PARAMETERS

3-65 Parameters – i = Iteration count

f1 = Hex - $0 \leq P1 \leq F$

3-66 DESCRIPTION

3-67 This directive causes a TIO instruction to be executed.

3-68 SUCCESS/ERROR INDICATIONS

3-69 If parameter P1 is nonzero, the returned status is typed in the following format:

TIO STATUS = SSSS CC = X

where SSSS and X are the returned status and condition code settings.

3-70 TYPE TO COUNT OR BREAK (iTYPE)

3-71 PARAMETERS

3-72 The parameter i = Iteration count.

3-73 DESCRIPTION

3-74 This directive causes the last N bytes of information input by the RK (paragraph 3-33) or RKC (paragraph 3-41) directives to be typed on the typewriter. N is equal to the number of bytes input including the terminating control byte.

3-75 SUCCESS/ERROR INDICATIONS

3-76 Returned status is not checked for errors. However, if the SIO is not accepted, the following message is typed:

SIO UNSUCCESSFUL – HIO ISSUED

HIO STATUS = SSSS CC = X

where SSSS and X are the returned status and condition code settings after HIO operation.

3-77 If the program detects an unusual condition interrupt, the following message is typed:

```
UNUSUAL CONDITION INTERRUPT
AIO STATUS = SSSS   CC = X
```

where SSSS and X are the returned status and condition code settings after the AIO operation.

3-78 If the BREAK key at the typewriter is actuated during output, transmission is terminated, and an unusual condition interrupt should be reported.

3-79 DECLARE DEVICE ADDRESS (UNIT, x1, x2)

3-80 PARAMETERS

3-81 Parameter - x1 = Octal - 0 ≤ P1 ≤ 7

x2 = Hex - 0 ≤ P2 ≤ FF

no leading parameter allowed

3-82 DESCRIPTION

3-83 This directive assigns the unit address to be used for subsequent communication with the keyboard-printer device. Parameter x1 specifies to which IOP the device is connected. Parameter x2 specifies the device I/O address. The program is initialized with IOP "0" and I/O address of "1" (IOP number 0, Device number 1).

3-84 COMMAND CHAIN TEST (iCOMC)

3-85 PARAMETERS

3-86 Parameter i = Iteration count.

3-87 DESCRIPTION

3-88 This directive is included to test the response of the device controller to command chain operations. When executed, an SIO instruction is issued which will cause one byte to be typed on the keyboard-printer. In addition, command chaining is specified which causes the same byte to be output again.

3-89 SUCCESS/ERROR INDICATIONS

3-90 Returned status is not checked for errors. However, if the SIO is not accepted the following message is typed:

```
SIO UNSUCCESSFUL - HIO ISSUED
HIO STATUS - SSSS   CC = X
```

where SSSS and X are the returned status and condition code settings after the HIO operation.

3-91 If the program detects an unusual condition interrupt, the following message is typed:

```
UNUSUAL CONDITION INTERRUPT
AIO STATUS = SSSS   CC = X
```

where SSSS and X are the returned status and condition code settings after the AIO operation.

3-92 ASR COMPATIBILITY TEST (iASR, d1, x2, x3, x4, x5)

3-93 PARAMETERS

3-94 Parameters - i = Iteration count (1-99)

d1 = Byte count (numeric 0-9, 1 ≤ d1 ≤ 256). A decimal value specifying the maximum number of bytes to be transmitted during compatible IO operations (optional - standard value d1 = 1 if omitted).

x2, x3, x4, x5 device orders 1 through 4, respectively (numeric 0-9, alpha A-F, 1 ≤ x n ≤ FF). Hexadecimal values to be issued to the ASR device as ordered bytes. Orders are issued in the order of appearance (optional - "no operation" if omitted).

<u>xn</u>	<u>Function</u>
01	Punch paper tape
02	Read paper tape with leader
05	Type out
06	Read keyboard
82	Read paper tape immediate
86	Read keyboard to control character

3-95 DESCRIPTION

3-96 This directive tests for interaction between the keyboard-printer and paper tape reader-punch sections of

the ASR teletype. A common storage buffer is addressed for all operations. The size of the storage buffer is determined by the byte count parameter d1. A chain of commands is generated containing (a) the sequence of device order bytes specified in parameters x2 through x5, (b) the byte count specified in parameters d1, and (c) the word address of the common storage buffer. An SIO is then executed using the device IO address specified by the address assignment directive to start the chain of commands (refer to paragraph 3-79). The specified byte count is not adjusted in the event of device-initiated premature termination such as BREAK, EOM, NL or HT. The complete operation is monitored by the program until the ASR indicates "Ready".

3-97 SUCCESS/ERROR INDICATIONS

3-98 Upon completion of all operations the ASR status is examined and error conditions are reported in the following message format:

```
ASR COMPAT ERROR TIO = XXXXXXXX
TDV = YYYYYYYY
ORDER = ZZ
```

where X and Y are the status flags returned by the device in response to a TIO and TDV instruction, respectively, and ZZ is the last device order issued to the ASR.

SECTION IV
PROGRAM LISTING

4-1 GENERAL

4-2 The program listing that follows details the content of this program. It contains a list of memory locations and the contents of each location.

4-3 A sample printout of a line from a program listing, with an explanation of what is contained in each column is shown in figure 4-1. (There may be as many as nine columns in the program listing, but not every column will appear in every listing.)

1301	1	00482	B2C00588		ZDMP20	LW, R12	*P1	DUPLICATE	
a	b	c	d	e	f	g	h	i	
a.	Line number				f.	Field label			
b.	Indication of memory protection key				g.	Operation			
c.	Memory address				h.	Operand			
d.	Routine instruction and data				i.	Comments			
e.	Indication whether of absolute origin or not								

Figure 4-1. Example of Program Printout

1 SYSTEM SIG7FDP
2 *
3 *
4 *
5 *
6 *

7 PAGE
8 * RELEASED VERSION NR. 01A (01-1A) AUG 1, 1966
9 1 00040 SRG 64
10 * SIGMA 5/7 DIAGNOSTIC CONTROL PROGRAM
11 *
12 * ASSIGN MNEMONIC NAMES TO INDEX REGISTERS
13 *
14 00000001 X1 EQU 1
15 00000002 X2 EQU 2
16 00000003 X3 EQU 3
17 00000004 X4 EQU 4
18 00000005 X5 EQU 5
19 00000006 X6 EQU 6
20 00000007 X7 EQU 7
21 *
22 * ASSIGN MNEMONIC NAMES TO GENERAL REGISTERS
23 *
24 00000000 R0 EQU 0
25 00000001 R1 EQU 1
26 00000002 R2 EQU 2
27 00000003 R3 EQU 3
28 00000004 R4 EQU 4
29 00000005 R5 EQU 5
30 00000006 R6 EQU 6
31 00000007 R7 EQU 7
32 00000008 R8 EQU 8
33 00000009 R9 EQU 9
34 0000000A R10 EQU X'1A'
35 0000000B R11 EQU X'1B'
36 0000000C R12 EQU X'1C'
37 0000000D R13 EQU X'1D'
38 0000000E R14 EQU X'1E'
39 0000000F R15 EQU X'1F'


```

40                                     PAGE
41                                     *
42                                     * EQUATE STATEMENTS TO UTILIZE UNASSIGNED MEMORY LOCATIONS
43                                     *
44 00000010 ZML10 EQU X'10' LOCATIONS 10-IF UTILIZED
45 00000014 ZML14 EQU X'14' BY COMMON TYPE/PRINT ROUTINE
46 0000001E ZML1E EQU X'1E'
47 0000001F ZML1F EQU X'1F'
48 00000022 ZCLLNK EQU X'22' TEMPORARY
49 00000023 ZEQLNK EQU X'23' LINK STORAGE
50 00000024 ZMSLNK EQU X'24' FOR TRANSLATOR
51 00000025 ZLPLNK EQU X'25' SUBROUTINES
52 00000025 ZRPLNK EQU X'25'
53                                     * CPU RESET RECOVERY LOCATION
54 00000027 ZPDLNK EQU X'27'
55 00000028 ZASLNK EQU X'28'
56 00000029 ZPMLNK EQU X'29'
57 0000002A ZCBLNK EQU X'2A'
58 0000002B ZFSLNK EQU X'2B'
59 0000002C ZPLLNK EQU X'2C'
60 0000002D ZUDFPM EQU X'2D'
61 0000002E ZPTY EQU X'2E'
62 0000002F ZPCNT EQU X'2F'
63 00000030 ZPCHK EQU X'30'
64 00000031 ZPCHK1 EQU X'31'
65 00000032 ZDSLNK EQU X'32'
66 00000033 ZDSPTR EQU X'33'
67 00000034 ZCFRLNK EQU X'34'
68 00000035 ZCFRCA EQU X'35'
69 00000036 ZPC7LNK EQU X'36'
70 00000037 ZMFRLNK EQU X'37'
71 0000003A ZTSTLNK EQU X'38'
72 00000039 ZCHAR EQU X'39'
73 0000003A ZLSTCH EQU X'3A'
74 0000003C ZFTF EQU X'3C'
75 0000003D ZDSFLG EQU X'3D'
    
```

```

76                                     PAGE
77                                     *
78                                     * FORM DIRECTIVES FOR FORMATTED WORDS
79                                     *
80 ZFCP FORM 8,24 ORDER, BYTE ADDRESS/COUNT
81 ZFOT FORM 8,7,17 OPERATOR, UNASSIGNED, ADDRESS
82                                     *
83                                     * PROCEDURE FOR GENERATION OF FORMATTED MESSAGE WORDS
84                                     *
85 00000000 ZFMW CNAME
86 PRBC
87 LF GEN,4,4,8,16 ABSVAL(AF(1)),ABSVAL(AF(2)),ABSVAL(AF(3)),;
88 ABSVAL(AF(4))
89 PEND
90                                     *
91                                     * PROCEDURE FOR GENERATION OF FORMATTED SUBROUTINE CONTROL TABLE
92                                     *
93 00000000 ZFST2 CNAME
94 PRBC
95 LF GEN,4,2,9,17 ABSVAL(AF(1)),ABSVAL(AF(2)),ABSVAL(AF(3)),;
96 ABSVAL(AF(4))
97 PEND
98                                     *
99                                     * PROCEDURE FOR GENERATION OF FORMATTED PARAMETER WORDS
100                                     *
101 00000000 ZFSAT CNAME
102 PRBC
103 LF GEN,4,2,2,7,17 ABSVAL(AF(1)),ABSVAL(AF(2)),;
104 ABSVAL(AF(3)),ABSVAL(AF(4)),ABSVAL(AF(5))
105 PEND
106                                     *
107                                     * PROCEDURE FOR GENERATION OF FORMATTED HALF-WORDS
108                                     *
109 00000000 ZAP1 CNAME
110 PRBC
111 LF GEN,16,16 ABSVAL(AF(1)),ABSVAL(AF(2))
112 PEND
    
```

		PAGE	
113			
114	*		
115	* SYNTAX ERROR CODE MESSAGES		
116	* NO. MEANING		
117	* --- -----		
118	* 001 UNDEFINED SPECIAL CHARACTER		
119	* 010 COMMENTS LINE INITIATOR (ASTERISK) NOT PRECEDED		
120	* BY NEW LINE CHARACTER		
121	* 020 DECIMAL RE-ITERATION COUNT AND/OR PLACE MARKER		
122	* IDENTIFIER SUB-FIELD GREATER OR LESS THAN AND/OR		
123	* NOT PERMITTED BY DIRECTIVE		
124	* 021 ALPHABETIC CHARACTERS ENCOUNTERED IN DECIMAL SUB-		
125	* FIELD OR ABSENCE OF FIELD SEPARATOR		
126	* 030 PLACE MARKER IDENTIFIER TABLE OVERFLOW		
127	* DBUBLY DEFINED PLACE MARKER IDENTIFIERS		
128	* 032 UNDEFINED PLACE MARKER IDENTIFIERS AT EXECUTE TIME		
129	* 040 CL0SE LOOP OPERATION WITHOUT PRIOR OPEN LOOP OPER.		
130	* 041 OPEN LOOP OPERATIONS EXIST AT EXECUTE TIME		
131	* 050 UNDEFINED MNEMONIC DIRECTIVE		
132	* 051 DIRECTIVE NON-EXECUTABLE IN CONTROL LINE MODE		
133	* 052 DIRECTIVE NON-EXECUTABLE IN IMMEDIATE MODE		
134	* 053 UNDEFINED AND/OR DBUBLY DEFINED MNEMONIC DIRECTIVE		
135	* NAME FOR MNEMONIC NAME RE-DEFINITION		
136	* 054 ILLEGAL FIELD SEPARATOR FOLLOWING DIRECTIVE		
137	* 055 FIELD SEPARATOR ENTERED PRIOR TO REQUIRED PARAMETER		
138	* 100 EXECUTE TABLE OVERFLOW-UNCONDITIONAL ABORT		
139	* 101 EXECUTE TABLE UNDERFLOW-UNCONDITIONAL ABORT		
140	* 105 GO ERROR UNCONDITIONAL ABORT		
141	* 110 LINK TABLE OVERFLOW-UNCONDITIONAL ABORT		
142	* 111 LINK TABLE UNDERFLOW-UNCONDITIONAL ABORT		
143	* 120 SYMBOLIC INPUT OVERFLOW-UNCONDITIONAL ABORT		

		PAGE	
144			
145	*		
146	* PRE-INITIALIZATION OF CPU TRAP LOCATIONS		
147	*		
148	1 00040 0F0005AA XPSD,0 ZCMST40 40 NON-ALLOWED OPERATION		
149	1 00041 0F000144 XPSD,0 ZT41 41 UNIMPLEMENTED INSTRUCTION		
150	1 00042 0F00015E XPSD,0 ZCTL 42 PUSHDOWN STACK LIMIT		
151	1 00043 0F000148 XPSD,0 ZT43 43 FIXED POINT OVERFLOW		
152	1 00044 0F000158 XPSD,0 ZCTL 44 FLOATING POINT FAULT		
153	1 00045 0F000158 XPSD,0 ZCTL 45 DECIMAL ARITHMETIC FAULT		
154	1 00046 0F00014C XPSD,0 ZT46 46 WATCHDOG TIMER RUNOUT		
155	1 00047 0F000158 XPSD,0 ZCTL 47 UNASSIGNED		
156	1 00048 0F000158 XPSD,0 ZCTL 48 CALL 1		
157	1 00049 0F000158 XPSD,0 ZCTL 49 CALL 2		
158	1 0004A 0F000158 XPSD,0 ZCTL 4A CALL 3		
159	1 00043 0F000158 XPSD,0 ZCTL 4B CALL 4		
160	1 0004C 0F000158 XPSD,0 ZCTL 4C CURRENT		
161	1 0004D 0F000158 XPSD,0 ZCTL 4D UNASSIGNED		
162	1 0004E 0F000158 XPSD,0 ZCTL 4E TRAP		
163	1 0004F 0F000158 XPSD,0 ZCTL 4F LOCATIONS		

164 PAGE 7
 165 *
 166 * PRE-INITIALIZATION OF INTERRUPT LOCATIONS
 167 *
 168 1 00050 0F0C0158 XPSD,0 ZCTL 50 OPTIONAL POWER ON
 169 1 00051 0F0C0158 XPSD,0 ZCTL 51 POWER OFF INTERRUPTS
 170 1 00052 0F0C0158 XPSD,0 ZCTL 52 OPTIONAL COUNTER
 171 1 00053 0F0C0158 XPSD,0 ZCTL 53 1-3 COUNT
 172 1 00054 0F000158 XPSD,0 ZCTL 54 PULSES
 173 1 00055 0F0C0158 XPSD,0 ZCTL 55 STANDARD COUNTER & PULSE
 174 1 00056 0F000150 XPSD,0 ZI56 56 MEMORY PARITY
 175 1 00057 0F0C0158 XPSD,C ZCTL 57 UNASSIGNED
 176 1 00058 0F0C0158 XPSD,0 ZCTL 58 OPTIONAL COUNTER
 177 1 00059 0F0C0158 XPSD,0 ZCTL 59 1-3 INTERRUPT
 178 1 0005A 0F0C0158 XPSD,0 ZCTL 5A LOCATIONS
 179 1 0005B 0F0C0158 XPSD,0 ZCTL 5B STANDARD COUNTER & INT.
 180 1 0005C 0F0C0158 XPSD,0 ZCTL 5C INPUT/OUTPUT INTERRUPT
 181 1 0005D 0F0C0154 XPSD,C ZI5D 5D CONSOLE INTERRUPT
 182 1 0005E 0F0C0158 XPSD,0 ZCTL 5E CURRENTLY
 183 1 0005F 0F0C0158 ZIL5F XPSD,0 ZCTL 5F UNASSIGNED
 184 * INTERRUPT LOCATIONS INITIALIZED 60 OPTIONAL EXTERNAL GROUPS
 185 * AT LOAD TIME TO XPSD,0 ZCTL 61 2-15 LOCATIONS 60-13F

186 PAGE 8
 187 *
 188 * PRE-INITIALIZED CPU TRAP RECOVERY
 189 *
 190 1 00140 00000000 A ZT40 DATA 0
 191 1 00140 00000000 A ZT40 DATA 0
 192 1 00141 00000000 A DATA 0
 193 1 00142 0000015C DATA ZTL40
 194 1 00143 00000000 A DATA 0
 195 1 00144 00000000 A ZT41 DATA 0
 196 1 00145 00000000 A DATA 0
 197 1 00146 0000016E DATA ZTL41
 198 1 00147 00000000 A DATA 0
 199 1 00148 00000000 A ZT43 DATA 0
 200 1 00149 00000000 A DATA 0
 201 1 0014A 00000170 DATA ZTL43
 202 1 0014B 00000000 A DATA 0
 203 1 0014C 00000000 A ZT46 DATA 0
 204 1 0014D 00000000 A DATA 0
 205 1 0014E 00000175 DATA ZTL46
 206 1 0014F 00000000 A DATA 0
 207 1 00150 00000000 A ZI56 DATA 0
 208 1 00151 00000000 A DATA 0
 209 1 00152 0000017C DATA ZIL56
 210 1 00153 00000000 A DATA 0
 211 1 00154 00000000 A ZI5D DATA 0
 212 1 00155 00000000 A DATA 0
 213 1 00156 00000542 DATA ZCONINT
 214 1 00157 00000300 A DATA 0
 215 1 00158 00000300 A ZCTL DATA 0
 216 1 00159 00000000 A DATA 0
 217 1 0015A 00000182 DATA ZTLHLT
 218 1 0015B 00000000 A DATA 0
 219 1 0015C 740C0C07 A ZTL40 STCF R7
 220 1 0015D 72700C07 A LB,R7 R7
 221 1 0015E 257C047C A SAS,R7 -4

222	1	0015F	320E0162		LW,R0	ZTL40M,X7
223	1	00160	3200016E		LW,R12	ZTL40M+3
224	1	00161	6400017E		B	ZTLMSG
225	1	00162	C9E2C640 A	ZTL40M	TEXT	'ISF'
226	1	00163	D4D7E540 A		TEXT	'MPV'
227	1	00164	D7C9E2D4 A		TEXT	'PISM'
228	1	00165	40E3F4F0 A		TEXT	'T40'
229	1	00166	D5CED4C1 A		TEXT	'NEMA'
230	1	00167	C7D6D6C6 A	ZTL40M1	TEXT	'GB8F'
231	1	00168	40D6C6C6 A		TEXT	'8FF'
232	1	00169	2008C59C A		ZFMW	2,0,8,BA(ZTL40M1)
233	1	0016A	D5C5C940 A		TEXT	'NEI'
234	1	0016B	3200016E	ZTL41	LW,R0	ZTL41M
235	1	0016C	3200016F		LW,R12	ZTL41M+1
236	1	0016D	6400017E		B	ZTLMSG
237	1	0016E	E4C9C940 A	ZTL41M	TEXT	'UII'
238	1	0016F	40E3F4F1 A		TEXT	'T41'
239	1	00170	32000173	ZTL43	LW,R0	ZTL43M
240	1	00171	32000174		LW,R12	ZTL43M+1
241	1	00172	6800017E		B	ZTLMSG
242	1	00173	C6D7D640 A	ZTL43M	TEXT	'FP8'
243	1	00174	40E3F4F3 A		TEXT	'T43'
244	1	00175	32000178	ZTL46	LW,R0	ZTL46M
245	1	00176	32000179		LW,R12	ZTL46M+1
246	1	00177	6800017E		B	ZTLMSG
247	1	00178	E6C4E340 A	ZTL46M	TEXT	'WDT'
248	1	00179	40E3F4F6 A		TEXT	'T46'
249	1	0017A	D4D7C640 A	ZIL56M	TEXT	'MPF'
250	1	0017B	40C9F5F6 A		TEXT	'I56'
251	1	0017C	3200017A	ZIL56	LW,R0	ZIL56M
252	1	0017D	3200017B		LW,R12	ZIL56M+1
253	1	0017E	35000167	ZTLMSG	STW,R0	ZTL40M+5
254	1	0017F	35000168		STW,R12	ZTL40M+6
255	1	00180	32000169		LW,R12	ZTL40M+7
256	1	00181	6AF004BF		BAL,R15	ZSML40
257	1	00182	2E000000 A	ZTLHLT	WAIT	

258						PAGE
259						*
260						* INITIALIZATION FOR MAIN-LINE TRANSLATOR
261						*
262	1	00183	6AF0041C	ZPC010	BAL,R15	ZSCIR
263	1	00184	32F00199		LW,R15	ZRECBV
264	1	00185	35F00026 A		STW,R15	X'26'
265	1	00186	22F00800 A		LI,R15	X'800'
266	1	00187	6DF01200 A		WD,R15	X'1200'
267	1	00188	32F00580		LW,R15	ZMFR16AD
268	1	00189	25F00402 A		SAS,R15	2
269	1	0018A	55F20354		STH,R15	ZMFRX7,X1
270	1	0018B	55F20355		STH,R15	ZMFRNBA,X1
271	1	0018C	52F20424		LH,R15	ZDKB+1,X1
272	1	0018D	55F20369		STH,R15	ZMFRDA,X1
273	1	0018E	32C00198	ZPC020	LW,R12	ZPC050
274	1	0018F	6AF004BC		BAL,R15	ZTMNCR
275	1	00190	22900000 A		LI,R9	0
276	1	00191	6AF001DB		BAL,R15	ZDSTRN
277	1	00192	68000193		B	#+1
278	1	00193	22F00196		LI,R15	ZPC030
279	1	00194	55F201C2		STH,R15	ZTRN60,X1
280	1	00195	640001A8		B	ZPC210
281	1	00196	6AF001E8	ZPC030	BAL,R15	ZDSSET
282	1	00197	6800018E		B	ZPC020
283	1	00198	10010730 A	ZPC050	ZFMW	1,0,1,BA(ZDS)
284	1	00199	68000183	ZRECBV	B	ZPC010

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285                                     PAGE
286
287 *
288 * CLEAR EXISTENT EXECUTE TABLE AND CONSTRUCT NEW TABLE
289 *
289 1 0019A 6AF0041C ZPC200 BAL,R15 ZSCIR
290 1 0019B 3500002D A STW,R0 ZUCFPM
291 1 0019C 3500003D A STW,R0 ZDSFLG
292 1 0019D 22B001AD LI,R11 ZTRN10
293 1 0019E 55B201C2 STH,R11 ZTRN60,X1
294 1 0019F 32B0057E LW,R11 ZPMADR
295 1 001AC 35B0057F STW,R11 ZPMPTR
296 1 001A1 32B0057C LW,R11 ZLKADR
297 1 001A2 35B0057D STW,R11 ZLKPTR
298 1 001A3 32B0083A LW,R11 ZEXADR
299 1 001A4 6AF0039C BAL,R15 ZSTPTR
300 1 001A5 32B0057A LW,R11 ZLBADR
301 1 001A6 35B0057B STW,R11 ZLBPTR
302 1 001A7 22B00556 LI,R11 ZGBERR
303 1 001A8 55B20555 STH,R11 ZG0PR0,X1
304 1 001A9 32C001C4 LW,R12 ZTRN100
305 1 001AA 6AF004BC BAL,R15 ZTMNCR
306 1 001AB 72A001C8 ZPC210 LB,R10 ZNL
307 1 001AC 35A00039 A STW,R10 ZCHAR
    
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308                                     PAGE
309
310 *
311 * MAIN-LINE TRANSLATOR
312 *
312 1 001AD 22800000 A ZTRN10 LI,R8 0
313 1 001AE 6AF0032E BAL,R15 ZFNDB
314 1 001AF 227FFFEA A LI,X7 -Z0PLEN
315 1 001B0 32BE01CB LW,R11 Z0PTBL,X7
316 1 001B1 71A0000B A CB,R10 R11
317 1 001B2 683001C1 BCR,3 ZTRN50
318 1 001B3 657001B0 BIR,X7 *-3
319 1 001B4 21A000C1 A CI,R10 X'C1'
320 1 001B5 691001BF BCS,1 ZTRN40
321 1 001B6 21A000E9 A CI,R10 X'E9'
322 1 001B7 692001BF BCS,2 ZTRN40
323 1 001B8 32B0000A A LW,R8 R10
324 1 001B9 6AF0033E BAL,R15 ZFA+1
325 1 001BA 227FFFEA A LI,X7 -Z0PLEN
326 1 001BB 32BE01CB LW,R11 Z0PTBL,X7
327 1 001BC 71A0000B A CB,R10 R11
328 1 001BD 683001C1 BCR,3 ZTRN50
329 1 001BE 657001B0 BIR,X7 *-3
330 1 001BF 22C00001 A ZTRN40 LI,R12 X'01'
331 1 001C0 68000377 B ZSNER
332 1 001C1 6AF0000B A ZTRN50 BAL,R15 *R11
333 1 001C2 6AF001AD ZTRN6C BAL,R15 ZTRN1C
334 1 001C3 680001AD B ZTRN10
335 1 001C4 0010720 A ZTRN100 ZFMW 0,0,1,3A(ZNL)
    
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336                                     PAGE
337
338 * SYNTAX TEST LANGUAGE TABLE CONTAINING ALL SPECIAL CHARACTERS
339 * ONE WORD PER SYNTAX OR SPECIAL CHARACTER
340 * BITS 0-7 SYNTAX OR SPECIAL CHARACTER
341 * BITS 8-14 RESERVED
342 * BITS 15-31 SYNTAX PROCESSOR SUBROUTINE ADDRESS
343
344 1 001C5 Z0PBEG EQU $
345 1 001C5 50000228 ZRP ZF0T X'5D',0,ZRPTRN ) CLOSE LOOP
346 1 001C6 610002EE ZFS ZF0T X'61',0,ZFSTRN / RELEASE TO EXECUTE
347 1 001C7 41000281 ZSP ZF0T X'40',0,ZPLTRN FIELD SEPARATORS
348 1 001C8 15000281 ZNL ZF0T X'15',0,ZPLTRN NL
349 1 001C9 4F000281 ZPL ZF0T X'4E',0,ZPLTRN +
350 1 001CA 57000281 ZF0T X'50',0,ZPLTRN +
351 1 001CB 66000282 ZMS ZF0T X'60',0,ZMSTRN - FIELD DELETOR
352 1 001CC Z0PTR2 EQU $
353 00000007 Z0PLN2 EQU $-Z0PBEG
354 1 001CC 5000010B ZDS ZF0T X'5B',0,ZDSTRN $ IMMEDIATE EXECUTION
355 1 001CD 4000021E ZLP ZF0T X'40',0,ZLPTRN ( OPEN LOOP
356 1 001CE 7000023B ZAS ZF0T X'7C',0,ZASTRN / TRANSFER OR LINK
357 1 001CF 60000281 ZCB ZF0T X'6B',0,ZPLTRN , PARAMETER SEPARATOR
358 1 001D0 4B000236 ZPD ZF0T X'4B',0,ZPPTRN . PLACE MARKER
359 1 001D1 500001F9 ZCL ZF0T X'5C',0,ZCLTRN * COMMENTS LINE
360 1 001D2 7E00020A ZEQ ZF0T X'7E',0,ZECTRN = MNEMONIC REDEFINITION
361 1 001D3 7A0001BF ZF0T X'7A',0,ZTRN40 ) CURRENTLY
362 1 001D4 730001BF 7F0T X'7B',0,ZTRN40 = UNDEFINED
363 1 001D5 4C0001BF ZF0T X'4C',0,ZTRN40 < SPECIAL
364 1 001D6 600001BF ZF0T X'6C',0,ZTRN40 ( CHARACTERS
365 1 001D7 5E0001BF ZF0T X'5E',0,ZTRN40 )
366 1 001D8 6E00013F ZF0T X'6E',0,ZTRN40 >
367 1 001D9 4F0001BF ZF0T X'4F',0,ZTRN40 1
368 1 001DA 700001BF ZF0T X'7D',0,ZTRN40 '
369 1 001D3 Z0PTRL EQU $
370 0000014 Z0PLEN EQU $-Z0PBEG
    
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371                                     PAGE
372
373 * DOLLAR SIGN TRANSLATOR PROCESSOR TO INITIALIZE TRANSLATOR
374
375 1 001D5 35F00032 A ZDSTRN STW,R15 ZDSLNK
376 1 001DC 64F003C5 BAL,R15 ZTST3
377 1 001DD 35900587 STW,R9 PO
378 1 001DE 3300003D A MTW,C ZDSFLG
379 1 001DF 623001E2 BCS,3 $+3
380 1 001E0 35F00583 LW,R15 ZEXPT0
381 1 001E1 35F00033 A STW,R15 ZDSPTR
382 1 001E2 22B00587 LI,R11 PO
383 1 001E3 64F00390 BAL,R15 ZSTPTR
384 1 001E4 3590003D A STW,R11 ZDSFLG
385 1 001E5 22B001E8 LI,R11 ZDSSET
386 1 001E6 55B201C2 STH,R11 ZTRN60,X1
387 1 001E7 64B20032 A B *ZDSLNK,X1
388
389 * IMMEDIATE EXECUTION OF DIRECTIVE
390
391 1 001E8 35F00032 A ZDSSET STW,R15 ZDSLNK
392 1 001E9 64F0041C BAL,R15 ZSC1R
393 1 001EA 33000587 MTW,C PO
394 1 001EB 630001F3 BCR,3 ZDSSET10
395 1 001EC 22B00587 LI,R11 PO
396 1 001ED 64F00390 BAL,R15 ZSTPTR
397 1 001EE 64F00518 BAL,R15 ZMPTWA
398 1 001EF B2300583 LW,R11 *ZFXPT0
399 1 001F0 64F0000B A BAL,R15 *R11
400 1 001F1 640001F2 B $+1
401 1 001F2 64F0041C BAL,R15 ZSC1R
402 1 001F3 3590003D A ZDSSET10 STW,R0 ZDSFLG
403 1 001F4 22B001AD LI,R11 ZTRN10
404 1 001F5 55B201C2 STH,R11 ZTRN60,X1
405 1 001F6 32B00033 A LW,R11 ZDSPTR
406 1 001F7 64F00390 BAL,R15 ZSTPTR
407 1 001F8 64000032 A B *ZDSLNK
    
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408 PAGE
 409 *
 410 * ASTERISK TRANSLATOR PROCESSOR, VERIFIES LEGAL COMMENTS LINE
 411 * OR AN ERRONEOUS ENTRY, IF LEGAL WAIT FOR NL TO TERMINATE
 412 * COMMENTS LINE AND RETURN TO MAIN-LINE TRANSLATOR, IF ILLEGAL
 413 * DELETE CURRENT FIELD AND OUTPUT ERROR MESSAGE AND RETURN TO
 414 * MAIN-LINE TRANSLATOR FOR RE-ENTRY OF SAME FIELD
 415 * NO EXECUTE TABLE ENTRY
 416 *
 417 1 001F9 35F00022 A ZCLTRN STW,R15 ZCLLNK
 418 1 001FA 22C00010 A LI,R12 X'10'
 419 1 001FB 32F0003A A LW,R15 ZLSTCH
 420 1 001FC 71F001C0 CB,R15 ZNL
 421 1 001FD 69300377 BCS,3 ZSNBR
 422 1 001FE 6AF00351 BAL,R15 ZFBC
 423 1 001FF 71A001C8 CB,R10 ZNL
 424 1 00200 693001FE BCS,3 *-2
 425 1 00201 E8000022 A B *ZCLLNK
 426 *
 427 * MINUS SIGN TRANSLATOR PROCESSOR
 428 * DELETES CURRENT FIELD FOR RE-ENTRY
 429 * NO EXECUTE TABLE ENTRY
 430 *
 431 1 00202 35F00024 A ZMSTRN STW,R15 ZMSLNK
 432 1 00203 32B00583 LW,R11 ZEXPT0
 433 1 00204 6AF00390 BAL,R15 ZSTPTR
 434 1 00205 22C00000 A LI,R12 0
 435 1 00206 B5C00583 STW,R12 *ZEXPT0
 436 1 00207 32C001C4 LW,R12 ZTRN100
 437 1 00208 6AF004BC BAL,R15 ZTMNCR
 438 1 00209 E8000024 A B *ZMSLNK

439 PAGE
 440 *
 441 * EQUAL TRANSLATOR PROCESSOR, NO EXECUTE TABLE ENTRY
 442 * RE-ASSIGN MNEMONIC SUB-ROUTINE, ALPHA CHARACTERS ONLY
 443 * VERIFIES MNEMONIC EXISTS AND RE-ASSIGN MNEMONIC NON-EXISTENT
 444 * REPLACES (DELETES) CURRENT MNEMONIC NAME
 445 * INSERTS NEW MNEMONIC INTO SUBROUTINE DICTIONARY
 446 *
 447 1 0020A 35F00023 A ZEQTRN STW,R15 ZEQLNK
 448 1 0020B 6AF003C5 BAL,R15 ZTST3
 449 1 0020C 32900008 A LW,R9 R8
 450 1 0020D 6AF0033D BAL,R15 ZFA
 451 1 0020E 33000003 A MTW,0 R8
 452 1 0020F 68300217 BCR,3 ZEQTRN10
 453 1 00210 227FFFEB A LI,X7 -ZSRLEN
 454 1 00211 35700006 A STW,X7 X6
 455 1 00212 318E05D0 CW,R8 ZSRTEL,X7
 456 1 00213 68300217 BCR,3 ZEQTRN10
 457 1 00214 319E05D0 CW,R9 ZSRTEL,X7
 458 1 00215 6830021B BCR,3 ZEQTRN20
 459 1 00216 65700211 BIR,X7 *-5
 460 1 00217 22C00053 A ZEQTRN10 LI,R12 X'153'
 461 1 00218 68000377 B ZSNBR
 462 1 00219 319E05D0 CW,R9 ZSRTEL,X7
 463 1 0021A 68300217 HCR,3 ZEQTRN10
 464 1 0021B 65700219 ZEQTRN20 BIR,X7 *-2
 465 1 0021C 358C0500 STW,R8 ZSRTEL,X6
 466 1 0021D E8000023 A B *ZEQLNK

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467                                     PAGE
468
469                                     *
470                                     * LEFT PARAM TRANSLATOR PROCESSOR FOR OPEN LOOP
471                                     * EXECUTE TABLE ENTRY EQUALS ONE WORD FOR RE-ITERATION
472                                     * COUNT LESS THAN TWO, TWO WORDS FOR RE-ITERATION GREATER
473                                     * THAN ONE, SECOND WORD IS RE-ITERATION COUNT FIELD
474                                     *
475 1 0021E 38F00025 A ZLPTRN STW,R15 ZLPLNK
476 1 0021F 6AF0030C BAL,R15 ZTST7
477 1 00220 32F00547 LW,R15 ZLPPR0
478 1 00221 B5F00583 STW,R15 *ZEXPT0
479 1 00222 6AF003A5 BAL,R15 ZTST1
480 1 00223 32F00583 LW,R15 ZEXPT0
481 1 00224 B5F00578 STW,R15 *ZLBPTR
482 1 00225 33100078 MTW,1 ZLBPTR
483 1 00227 6AF0038C BAL,R15 ZADPTR
484                                     B *ZLPLNK
485                                     *
486                                     * RIGHT PARAM TRANSLATOR PROCESSOR FOR CLOSE LOOP
487                                     * EXECUTE TABLE ENTRY EQUALS TWO WORDS
488                                     * SECOND WORD CONTAINS ADDRESS OF BASE WORD FOR START OF LOOP
489                                     *
490 1 00228 35F00028 A ZRPTRN STW,R15 ZRPLNK
491 1 00229 6AF00281 BAL,R15 ZPLTRN
492 1 0022A 6AF0030C BAL,R15 ZTST7
493 1 0022B 22C00040 A LI,R12 X1401
494 1 0022C 32F00078 LW,R15 ZLBPTR
495 1 0022D 31F0057A CW,R15 ZLBADR
496 1 0022E 64300077 BCR,3 ZSNBR
497 1 0022F 32F00546 LW,R15 ZRPPR0-1
498 1 00230 B5F005A8 STW,R15 *ZEXPT0
499 1 00231 33F00578 MTW,X'F' ZLRPTR
500 1 00232 B2F00578 LW,R15 *ZLBPTR
501 1 00233 B5F00584 STW,R15 *ZEXPT1
502 1 00234 6AF0038C BAL,R15 ZADPTR
503                                     B *ZRPLNK

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503                                     PAGE
504
505                                     *
506                                     * PERIOD, PLACE MARKER, TRANSLATOR PROCESSOR
507                                     * LEGAL IF NON-ZERO PLACE MARKER, MARK PLACE IN CONTROL LINE
508                                     * ILLEGAL IF ZERO PLACE MARKER AND/OR PREVIOUSLY DEFINED
509                                     * NO EXECUTE TABLE ENTRY, ENTRY TO PLACE MARKER TABLE
510                                     *
511 1 00236 35F00027 A ZPDTRN STW,R15 ZPDLNK
512 1 00237 6AF0030C BAL,R15 ZTST7
513 1 00238 6AF0036F BAL,R15 ZTST2
514 1 00239 6AF00242 BAL,R15 ZPMEN
515                                     B *ZPDLNK
516                                     *
517                                     * DELTA TRANSLATOR PROCESSOR
518                                     * ABSOLUTE TRANSFER REFERENCE TO NON-ZERO PLACE MARKER
519                                     * LINK RETURN TRANSFER REFERENCE TO ZERO PLACE MARKER
520                                     * ABSOLUTE TRANSFER EQUALS TWO WORD ENTRY TO EXECUTE TABLE
521                                     * LINK TRANSFER EQUALS ONE WORD ENTRY TO EXECUTE TABLE
522                                     *
523 1 0023R 35F00028 A ZASTRN STW,R15 ZASLNK
524 1 0023C 6AF0030C BAL,R15 ZTST7
525 1 0023D 22F0056C LI,R15 ZLKAS
526 1 0023E B5F00583 STW,R15 *ZEXPT0
527 1 0023F 33C00009 A MTW,0 R9
528 1 00240 68300045 BCR,3 $+5
529 1 00241 32F0055E LW,R15 ZASPR0-1
530 1 00242 B5F00583 STW,R15 *ZEXPT0
531 1 00243 6AF003BF BAL,R15 ZTST2
532 1 00244 6AF00247 BAL,R15 ZPMRQ
533 1 00245 6AF0038C BAL,R15 ZADPTR
534                                     B *ZASLNK

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534                                     PAGE
535                                     *
536                                     * PLACE MARKER PROCESSOR FOR PLACE MARKER TABLE
537                                     * PROCESSES PLACE MARKER ENTRIES AND REQUESTS
538                                     * ASSUMES R9 CONTAINS BINARY VALUE FOR PLACE MARKER
539                                     *
540 1 00247 20900000 A ZPMR0 AI,R9 X'800'
541 1 00248 30F00029 A ZPMEN STW,R15 ZPMLNK
542 1 00249 3070007E LW,X7 ZPMADR
543 1 0024A 3070007F SW,X7 ZPMPTR
544 1 0024B 63300070 BCR,3 ZPMEN40
545 1 0024C 803F0070 ZPMEN10 LW,R11 *ZPMPTR,X7
546 1 0024D 2580046F A SAS,R11 -17
547 1 0024E 21900000 A CI,R9 X'800'
548 1 0024F 69400250 BCS,4 ZPMEN20
549 1 00250 21000000 A CI,R11 X'800'
550 1 00251 69400260 BCS,4 ZPMEN30
551 1 00252 31900000 A CW,R9 R11
552 1 00253 6930006F HCS,3 ZPMEN40-1
553 1 00254 22C00031 A LI,R12 X'31'
554 1 00255 64000077 B ZSNER
555 1 00256 21000000 A ZPMEN20 CI,R11 X'800'
556 1 00257 6940026F BCS,4 ZPMEN40-1
557 1 00258 20800000 A AI,R11 X'800'
558 1 00259 31500000 A CW,R9 R11
559 1 0025A 6930006F BCS,3 ZPMEN40-1
560 1 0025B 22R1FFFF A LI,R11 X'1FFFF'
561 1 0025C 003E007F AND,R11 *ZPMPTR,X7
562 1 0025D 65800064 STW,R11 *ZEXPT1
563 1 0025E 6AF00092 BAL,R15 ZTST4
564 1 0025F E0C00029 A B *ZPMLNK
565 1 00260 22F0003F A ZPMEN30 LI,R15 X'3FF'
566 1 00261 4000000F A AND,R11 R15
567 1 00262 31900000 A CW,R9 R11
568 1 00263 6930006F BCS,3 ZPMEN40-1
569 1 00264 33F0002D A MTW,X'F' ZUDFPM
570 1 00265 82FE007F LW,R15 *ZPMPTR,X7
    
```

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571 1 00266 32E00583 LW,R11 ZEXPT0
572 1 00267 8580000F A STW,R11 *R15
573 1 00268 32F0007F LW,R15 ZPMPTR
574 1 00269 3310000F A MTW,1 R15
575 1 0026A 82BE000F A LW,R11 *R15,X7
576 1 0026B 85BE057F STW,R11 *ZPMPTR,X7
577 1 0026C 65700026A BIR,X7 *-2
578 1 0026D 33F0057F MTW,X'F' ZPMPTR
579 1 0026E 68000249 B ZPMEN+1
580 1 0026F 6570024C BIR,X7 ZPMEN10
581 1 00270 21900000 A ZPMEN40 CI,R9 X'800'
582 1 00271 69400275 BCS,4 *+4
583 1 00272 25900411 A SAS,R9 17
584 1 00273 49900583 BR,R9 ZEXPT0
585 1 00274 68000279 B *+5
586 1 00275 3310002D A MTW,1 ZUDFPM
587 1 00276 25900411 A SAS,R9 17
588 1 00277 49900584 BR,R9 ZEXPT1
589 1 00278 6AF00092 PAL,R15 ZTST4
590 1 00279 8590057F STW,R9 *ZPMPTR
591 1 0027A 22C00030 A LI,R12 X'30'
592 1 0027B 32E0057F LW,R11 ZPMPTR
593 1 0027C 33100003 A MTW,1 R11
594 1 0027D 31R00580 CW,R11 ZMFRIBAD
595 1 0027E 683000377 BCR,3 ZSNER
596 1 0027F 33E0057F STW,R11 ZPMPTR
597 1 00280 E40C0029 A B *ZPMLNK
    
```

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598                                     PAGE
599
600                                     *
601                                     * FIELD SEPARATORS,SPACE,PLUS,NEW LINE,ETC.
602                                     * PROCESSES LEADING DECIMAL RE-ITERATION COUNT OR PLACE MARKER
603                                     * IDENTIFIER FIELD FOR CALLED SUB-ROUTINE
604                                     * PROCESSES TRAILING PARAMETERS FOR SUB-ROUTINES
605
606 1 00281 33000004 A ZPLTRN MTW,0 R8
607 1 00282 68300303 A BCR,3 ZTST3
608 1 00283 38F00020 A STW,R15 ZPLLNK
609 1 00284 227FFFE3 A LI,X7 -ZSRLEN
610 1 00285 318F0000 A CW,R8 ZSRTRL,X7
611 1 00286 6830000A BCR,3 ZPLTRN20
612 1 00287 65700005 A BIR,X7 $=2
613 1 00288 22000130 A LI,R12 X'150'
614 1 00289 68000377 B ZSNBR
615 1 0028A 320F0008 A ZPLTRN20 LW,R11 ZSRADR,X7
616 1 0028B 55000003 A STW,R11 *ZEXPT0
617 1 0028C F2000003 A LB,R12 *ZEXPT0
618 1 0028D 48000003 A AND,R12 R3
619 1 0028E 68300101 A BCR,3 ZTRN50
620 1 0028F 35000030 A MTW,0 ZDSFLG
621 1 00290 69300005 A BCS,3 ZPLTRN30
622 1 00291 22000051 A LI,R12 X'151'
623 1 00292 71100000 A CB,R1 R11
624 1 00293 68400377 A BCR,4 ZSNBR
625 1 00294 25000004 A SCS,R11 4
626 1 00295 25000402 A SAS,R11 2
627 1 00296 F3000003 A STB,R11 *ZEXPT0
628 1 00297 6AF00000 A BAL,R15 ZTST1
629 1 00298 6AF00001 A BAL,R15 ZC0TRN
630 1 00299 22F00100 A LI,R15 ZTRN60
631 1 0029A 71A00100 A CB,R10 ZMS
632 1 0029B E8300100 A BCR,3 *ZMS
633 1 0029C 6AF00000 A BAL,R15 ZADPTR
634 1 0029D 22800000 A LI,R8 0
635 1 0029E 22900000 A LI,R9 0
    
```

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635 1 0029F 32F00020 A LW,R15 ZPLLNK
636 1 002A0 71A00100 A CB,R10 ZFS
637 1 002A1 E8300100 A BCR,3 *ZFS
638 1 002A2 71A00100 A CB,R10 ZRP
639 1 002A3 E8300100 A BCR,3 *ZRP
640 1 002A4 E8000020 A B *ZPLLNK
641 1 002A5 22000052 A ZPLTRN30 LI,R12 X'152'
642 1 002A6 71200000 A CB,R2 R11
643 1 002A7 68400377 A BCR,4 ZSNBR
644 1 002A8 25000004 A SCS,R11 4
645 1 002A9 25000404 A SAS,R11 4
646 1 002AA F3000003 A STB,R11 *ZEXPT0
647 1 002AB 6AF00000 A BAL,R15 ZTST3
648 1 002AC 6AF00001 A BAL,R15 ZC0TRN
649 1 002AD 22F00100 A LI,R15 ZTRN60
650 1 002AE 71A00100 A CB,R10 ZMS
651 1 002AF E8300100 A BCR,3 *ZMS
652 1 002B0 68000100 A B ZTRN60
    
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653
654
655
656
657
658
659 1 002E1 33F0002A A ZC0TRN STW,R15 ZC0LNK
660 1 002E2 32B000A4 LW,R11 ZEXPT1
661 1 002E3 35B00030 A STW,R11 ZPCHK
662 1 002E4 37B00031 A STW,R11 ZPCHK1
663 1 002E5 F2B00053 LB,R11 *ZEXPT0
664 1 002E6 25B00047C A SAS,R11 =4
665 1 002E7 37B0001F A STW,R11 ZPCNT
666 1 002E8 75B00034F STB,R11 ZPC7M,X3
667 1 002E9 D7B000533 LH,R11 *ZEXPT0,X1
668 1 002EA 35B00002F A SW,R11 ZPCNT
669 1 002EB 33B00002E A STW,R11 ZPTY
670 1 002EC 22B000000 A ZC0TRN10 LI,R8 0
671 1 002ED 27B000000 A LI,R9 0
672 1 002EE B5B000584 STW,R8 *ZEXPT1
673 1 002EF F0700002E A LB,R7 *ZPTY
674 1 002F0 33F00002F A MTW,X'F' ZPCNT
675 1 002F1 691000003 BCS,1 ZC0TRN50
676 1 002F2 71A00010F CB,R10 ZC0
677 1 002F3 6530002CA BCR,3 ZC0TRN30
678 1 002F4 71A60034D CB,R10 ZPC7M,X3
679 1 002F5 6830002CA BCR,3 ZC0TRN30
680 1 002F6 217000008 A CI,R7 8
681 1 002F7 6340002CD BCR,4 ZC0TRN40
682 1 002F8 22C000005 A LI,R12 X'55'
683 1 002F9 68000377 B ZSNR
684 1 002FA 23700047C A ZC0TRN30 SAS,R7 =4
685 1 002FB 670E002E6 EXU ZPRTYP,X7
686 1 002FC B59000534 STW,R9 *ZEXPT1
687 1 002FD 35100002E A ZC0TRN40 MTW,1 ZPTY
688 1 002FE 6AF000392 BAL,R15 ZTST4
689 1 002FF 310000009 A MTW,0 R9
    
```

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*
* COMMA TRANSLATOR PROCESSOR
* CALLED ONLY BY FIELD SEPARATOR TRANSLATOR PROCESSOR
* PROCESSES ALL SUB-ROUTINE TRAILING PARAMETERS
*
    
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690 1 002D0 683002BC BCR,3 ZC0TRN10
691 1 002D1 35B00031 A STW,R11 ZPCHK1
692 1 002D2 680002BC B ZC0TRN10
693 1 002D3 71A60034D ZC0TRN50 CB,R10 ZPC7M,X3
694 1 002D4 6930002D6 BCS,3 =+2
695 1 002D5 22A00040 A LI,R10 X'40'
696 1 002D6 227FFFF9 A LI,X7 =Z0PLN?
697 1 002D7 32BE010C LW,R11 Z0PTB2,X7
698 1 002D8 71A00000B A CB,R10 R11
699 1 002D9 6830020D BCR,3 ZC0TRN60
700 1 002DA 6570002D7 BIR,X7 =-3
701 1 002DB 22C000054 A LI,R12 X'54'
702 1 002DC 68000377 B ZSNR
703 1 002DD 32B00031 A ZC0TRN60 LW,R11 ZPCHK1
704 1 002DE 38B00030 A SW,R11 ZPCHK
705 1 002DF 25B000404 A SAS,R11 4
706 1 002E0 22F0000CF A LI,R15 X'F'
707 1 002E1 F07000583 LB,R7 *ZEXPT0
708 1 002E2 +R70000F A AND,R7 R15
709 1 002E3 +9B00007 A BR,R11 R7
710 1 002E4 F03000583 STB,R11 *ZEXPT0
711 1 002E5 F000002A A B ZC0LNK
    
```

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712                                     PAGE
713
714                                     *
715                                     * VARIABLE ENTRY TABLE TO PARAMETER PROCESSORS
716                                     *
716 1 002E6 6AF00328 ZPRTYP BAL,R15 ZFNUP
717 1 002E7 6AF0032B BAL,R15 ZFN
718 1 002E8 6AF0032E BAL,R15 ZFNCTS
719 1 002E9 6AF00334 BAL,R15 ZF0CT
720 1 002EA 6AF00337 BAL,R15 ZFH
721 1 002EB 6AF0033A BAL,R15 ZPC5
722 1 002EC 6AF0034C BAL,R15 ZPC6
723 1 002ED 6AF00346 BAL,R15 ZPC7
724
725                                     *
726                                     * PARAMETER INFORMATION
727                                     * PARAMETER DECODE WORD FORMAT
727                                     * BIT 0-3 CODE TYPE
728                                     * 4 0N-PARAMETER REQUIRED
729                                     * 0FF-PARAMETER NOT REQUIRED
730
731                                     *
732                                     * CODE TYPE
732                                     * 0 NUMERIC 0-9 ONLY; STORE WITH ZONE BITS
733                                     * 1 NUMERIC 0-9 ONLY; STORE WITHOUT ZONE BITS
734                                     * 2 NUMERIC 0-9 ONLY; CONVERT TO BINARY
735                                     * 3 NUMERIC 0-7 ONLY; OCTAL
736                                     * 4 HEXADFCIMAL 0-9 A-F; STORE AS BINARY VALUE
737                                     * 5 ALPHABETIC ONLY A-Z
738                                     * 6 ALPHA-NUMERIC ONLY A-Z 0-9
739                                     * 7 ANY CHARACTER; FIRST CHARACTER REPRESENTS
740                                     * TERMINATOR, BOTH NOT PUTAWAY
741

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742                                     PAGE
743
744                                     *
745                                     * FORWARD SLASH TRANSLATOR PROCESSOR, TERMINATE CONTROL
746                                     * EXECUTE TABLE ENTRY EQUALS TWO WORDS
747                                     * VERIFIES ALL LOOPS AND PLACE MARKER REQUESTS PROCESSED
748                                     * VERIFIES LAST DIRECTIVE PROCESSED
749                                     * SAVES THIS ENTRY LOCATION FOR POSSIBLE EXTEND OR PATCH
750
750 1 002FE 35F0002B A ZFSTRN STW,R15 ZFSLNK
751 1 002FF 6AF00261 BAL,R15 ZPLTRN
752 1 002F0 3300003D A MTW,C ZDSFLG
753 1 002F1 E930002B A BCS,3 *ZFSLNK
754 1 002F2 32B0055A LW,R11 ZFSPR0-1
755 1 002F3 B5B00583 STW,R11 *ZEXPT0
756 1 002F4 22C00101 A LI,R12 X'101'
757 1 002F5 32B0083A LW,R11 ZEXADR
758 1 002F6 31B00583 CW,R11 ZEXPT0
759 1 002F7 68300377 BCR,3 ZSNR
760 1 002F8 B5B00584 STW,R11 *ZEXPT1
761 1 002F9 22C00041 A LI,R12 X'141'
762 1 002FA 32B0057E LW,R11 ZLBPTR
763 1 002FB 31B0057A CW,R11 ZLRADR
764 1 002FC 69200377 BCS,2 ZSNR
765 1 002FD 33000009 A MTW,C R9
766 1 002FE 68300301 BCR,3 *+3
767 1 002FF 6AF0038F BAL,R15 ZTST2
768 1 00300 6AF00247 BAL,R15 ZFMPG
769 1 00301 22C00032 A LI,R12 X'132'
770 1 00302 3300002E A MTW,C ZUDFFM
771 1 00303 69200377 BCS,2 ZSNR
772 1 00304 32B00583 LW,R11 ZEXPT0
773 1 00305 6AF0039C BAL,R15 ZSTPTR
774 1 00306 B2B0000E A LW,R11 *R11
775 1 00307 55F20558 STH,R11 ZG0PTR,X1
776 1 00308 22F00558 LI,R15 ZG0PTR
777 1 00309 55F20558 STH,R15 ZG0PR0,X1
778 1 0030A 52C00354 LH,R12 ZMFRX7,X1

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779	1	0030B	55C2035F	STW,R12	ZMFRNBA,X1
780	1	0030C	32C001C4	LW,R12	ZTRN100
781	1	0030D	6AF004BC	BAL,R15	ZTMNCR
782	1	0030E	65C008CA	B	ZEX00

783					
784					
785					
786					
787					
788					
789	1	0030F	35E00035 A	ZCFR	STW,R14 ZCFRCA
790	1	00310	35F00034 A		STW,R15 ZCFRLNK
791	1	00311	6AF00351		BAL,R15 ZFRC
792	1	00312	F1A20035 A		CB,R10 *ZCFRCA,X1
793	1	00313	E9100034 A		BCS,1 *ZCFRLNK
794	1	00314	F1440035 A		CB,R10 *ZCFRCA,X2
795	1	00315	E9200034 A		BCS,2 *ZCFRLNK
796	1	00316	22F00359		LI,R15 ZFH+2
797	1	00317	31F00035 A		CW,R15 ZCFRCA
798	1	00318	6930031E		BCS,3 *+6
799	1	00319	21A000E9 A		CI,R10 X'E9'
800	1	0031A	6920031E		BCS,2 *+4
801	1	0031B	21A000C6 A		CI,R10 X'06'
802	1	0031C	E9200034 A		BCS,2 *ZCFRLNK
803	1	0031D	20A00009 A		AI,R10 X'9'
804	1	0031E	32F0000A A		LW,R15 R10
805	1	0031F	BA700035 A		LCW,X7 *ZCFRCA
806	1	00320	F2E00035 A		LB,R14 *ZCFRCA
807	1	00321	B2E0000F A		LW,R14 *R14
808	1	00322	25FE0200 A		SCS,R15 0,X7
809	1	00323	B2700035 A		LW,X7 *ZCFRCA
810	1	00324	25EE0000 A		SAD,R14 0,X7
811	1	00325	F2F00035 A		LB,R15 *ZCFRCA
812	1	00326	B5E0000F A		STW,R14 *R15
813	1	00327	65C00311		B ZCFR+2

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814                                     PAGE
815                                     *
816                                     * FETCH NUMERIC 0-9 UNPACKED ZONE BITS PRESENT
817                                     *
818 1 00328 22900J00 A ZFNUP LI,R9 0
819 1 00329 6AE0030F BAL,R14 ZCFR
820 1 0032A 09F0F908 A DATA X'09F0F908'
821                                     *
822                                     * FETCH NUMERIC 0-9 PACKED ZONE BITS NOT PRESENT
823                                     *
824 1 0032B 22900J00 A ZFN LI,R9 0
825 1 0032C 6AE0030F BAL,R14 ZCFR
826 1 0032D 09F0F904 A DATA X'09F0F904'
827                                     *
828                                     * FETCH NUMERIC 0-9 CONVERTED TO BINARY
829                                     *
830 1 0032E 35F00421 ZFNDB STW,R15 ZCSRL
831 1 0032F 6AF0032B BAL,R15 ZFN
832 1 00330 45C0000B A XW,R12 R9
833 1 00331 6AF0030C BAL,R15 ZDTB
834 1 00332 45C0000B A XW,R12 R9
835 1 00333 E4000421 B *ZCSRL
836                                     *
837                                     * FETCH OCTAL 0-7 BINARY VALUE
838                                     *
839 1 00334 22900C00 A ZFOCT LI,R9 0
840 1 00335 6AE0030F BAL,R14 ZCFR
841 1 00336 09F0F703 A DATA X'09F0F703'
842                                     *
843                                     * FETCH HEXADEXIMAL 0-F BINARY VALUE
844                                     *
845 1 00337 22900700 A ZFH LI,R9 0
846 1 00338 6AE0030F BAL,R14 ZCFR
847 1 00339 09C1F904 A DATA X'09C1F904'
    
```

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848                                     PAGE
849                                     *
850                                     * FETCH ALPHABETIC A-Z UNPACKED ZONE BITS PRESENT
851                                     *
852 1 0033A 22900000 A ZPC5 LI,R9 0
853 1 0033B 6AE0030F BAL,R14 ZCFR
854 1 0033C 09C1E908 A DATA X'09C1E908'
855 1 0033D 22800000 A ZFA LI,R8 0
856 1 0033E 6AE0030F BAL,R14 ZCFR
857 1 0033F 08C1E908 A DATA X'08C1E908'
858                                     *
859                                     * FETCH ALPHA-NUMERIC 0-9 A-Z UNPACKED ZONE BITS PRESENT
860                                     *
861 1 00340 22900000 A ZPC6 LI,R9 0
862 1 00341 6AE0030F BAL,R14 ZCFR
863 1 00342 09C1F908 A DATA X'09C1F908'
864 1 00343 22800000 A ZFAN LI,R8 0
865 1 00344 6AE0030F BAL,R14 ZCFR
866 1 00345 08C1F908 A DATA X'08C1F908'
867                                     *
868                                     * FETCH ANY CHARACTER *SPECIAL APPLICATIONS*
869                                     * FIRST CHARACTER REPRESENTS TERMINATOR WITH FIRST AND
870                                     * LAST CHARACTER NOT INCLUDED IN BYTE COUNT
871                                     *
872 1 00346 35F00036 A ZPC7 STW,R15 ZPC7LNK
873 1 00347 6AF00351 BAL,R15 ZFOC
874 1 00348 75A6034F STB,R10 ZPC7M,x3
875 1 00349 52F20354 LH,R15 ZMFRX7,x1
876 1 0034A 55F00384 STW,R15 *ZEXPT1
877 1 0034B 6AF00351 BAL,R15 ZFOC
878 1 0034C 22900384 LW,R9 *ZEXPT1
879 1 0034D 21A00000 A ZPC7M CI,R10 0
880 1 0034E E9300336 A RCR,3 *ZPC7LNK
881 1 0034F F3100584 MTB,1 *ZEXPT1
882 1 00350 6500034B B 5-5
    
```

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PAGE
*
* MAINLINE FETCH ROUTINE VIA TYPEWRITER PR CARD READER
* INPUT CONTROL LINE SYNTAX TO INPUT/OUTPUT AREA
*
888      1 00351 35F00037 A
889      1 00352 35A00039 A
890      1 00353 35A0003A A
891      1 00354 28700000 A
892      1 00355 21700000 A
893      1 00356 6010036F
894      1 00357 50720074
895      1 00358 35A00041
896      1 00359 25A00402 A
897      1 0035A 55A20355
898      1 0035B 60300376
899      1 0035C 21A00050 A
900      1 0035D 6910035F
901      1 0035E 28A00350 A
902      1 0035F 50F20424
903      1 00360 51F20369
904      1 00361 60300369
905      1 00362 25A00001 A
906      1 00363 55A20370
907      1 00364 50A20354
908      1 00365 55A20355
909      1 00366 C0C00369
910      1 00367 69C00366
911      1 00368 2800018A
912      1 00369 40C00001 A
913      1 0036A 60C00369
914      1 0036B C0C00369
915      1 0036C 7200000D A
916      1 0036D 21D00060 A
917      1 0036E 6740036B
918      1 0036F 724E0000 A
919      1 00370 35A00039 A

ZF0C      STW,R15 ZMFRLNK
          LW,R10  ZCHAR
          STW,R10 ZLSTCH
ZMFRX7    LI,R7   0
ZMFRNBA   CI,R7   0
          BCS,1   ZMFRTCBA
          STW,R7  ZMFRCW0,X1
          LW,R10  ZIBADR
          SAS,R10  2
          SH,R10  ZMFRNBA,X1
          BCR,3   ZMFRIOF
          CI,R10  80
          BCS,1   *-2
          LI,R10  80
          LH,R15  ZDKB+1,X1
          CH,R15  ZMFRDA,X1
          BCS,3   *-2
          LI,R10  1
          STW,R10 ZMFRCW1,X1
          AH,R10  ZMFRX7,X1
          STW,R10 ZMFRNBA,X1
          TI0,R12 *ZMFRDA
          BCS,12  *-1
          LI,R0   DA(ZMFRCW0)
ZMFRDA    SI0,R12 1
          BCS,12  *-1
          TI0,R12 *ZMFRDA
          LB,R13  R13
          CI,R13  X160'
          BCS,4   *-3
ZMFRTCBA  LB,R10  0,X7
          STW,R10 ZCHAR
    
```

```

920      1 00371 33100354          MTW,1  ZMFRX7
921      1 00372 E0000037 A          B      *ZMFRLNK
922      1 00374          BOUND 8
923      1 00374 00000000 ZMFRCW0 ZFCP  X1E1,BA($)
924      1 00375 00000001 A ZMFRCW1 ZFCP  0,1
    
```

925				PAGE	
926			*		
927			* SYNTAX ERROR REPORTER		
928			*		
929	1 00376	22C00120 A	ZMFR10F	LI,R12	X'120'
930	1 00377	6AF003F6	ZSNER	BAL,R15	ZBTH
931	1 00378	25D00208 A		SCS,R13	8
932	1 00379	35D00388		STW,R13	ZSNMSG+2
933	1 0037A	22F00018 A		LI,R15	X'115'
934	1 0037B	74F6038E		STB,R15	ZSNMSG+2,X3
935	1 0037C	32C2035+		LH,R12	ZMFRX7,X1
936	1 0037D	56C0035F		STH,R12	ZMFRNBA,X1
937	1 0037E	32C0038X		LW,R12	ZSNERMW
938	1 0037F	6AF0048F		BAL,R15	ZSML40
939	1 00380	72F00389		LB,R15	ZSNMSG+2
940	1 00381	21F000F0 A		CI,R15	X'1F0'
941	1 00382	69D00183		BCS,2	ZPC010
942	1 00383	59F20427		LH,R15	ZDCR+1,X1
943	1 00384	51F00369		CH,R15	ZMFRDA,X1
944	1 00385	65300183		DCR,3	ZPC010
945	1 00386	22F001C2		LI,R15	ZTRN60
946	1 00387	F40001C8		B	*ZMS
947	1 00388	10C00E24 A	ZSNERMW	ZFMX	1,0,12,BA(ZSNMSG)
948	1 00389	E2F8D540 A	ZSNMSG	TEXT	'SYN ERR
	1 0038A	C5C9D940 A			
	1 0038B	4C+04040 A			

949				PAGE	
950			*		
951			* UPDATE EXECUTE TABLE POINTERS TO NEXT ENTRY		
952			* BASED UPON PARAMETER COUNT AND/OR RE-ITERATION COUNT OR		
953			* IDENTIFIER FIELD		
954			*		
955	1 0038C	F2B00583	ZADPTR	LB,R11	*ZEXPT0
956	1 0038D	20B0001C A		AI,R11	X'11C'
957	1 0038E	25B0047C A		SAS,R11	-4
958	1 0038F	30B00583		AW,R11	ZEXPT0
959			*		
960			* SET EXECUTE TABLE POINTERS FOR BASE WORD AND POSSIBLE		
961			* RE-ITERATION COUNT OR PLACE MARKER ADDRESS FIELD		
962			*		
963	1 00390	35B00583	ZSTPTR	STW,R11	ZEXPT0
964	1 00391	35B00584		STW,R11	ZEXPT1
965			*		
966			* VERIFY EXECUTE TABLE NON-OVERFLOW		
967			*		
968	1 00392	33100584	ZTST4	MTW,1	ZEXPT1
969	1 00393	32B00584		LW,R11	ZEXPT1
970	1 00394	31B0057C		CW,R11	ZLKADR
971	1 00395	E91000CF A		BCS,1	*R15
972	1 00396	22C001CC A		LI,R12	X'100'
973	1 00397	65C00377		B	ZSNER


```

974                                     PAGE
975                                     *
976                                     * ADVANCE POINTERS AND CLEAR RE-ITERATION COUNT FIELD
977                                     * IF EXISTENT IN EXECUTE TABLE ENTRY
978                                     *
979 1 00398 35F000CE A ZADCRC STW,R15 R14
980 1 00399 6AF0038C BAL,R15 ZADPTR
981 1 0039A 6400039D B $+3
982
983                                     *
984                                     * SET POINTERS AND CLEAR RE-ITERATION COUNT FIELD
985                                     * (R11) CONTAINS BASE WORD VALUE
986                                     *
986 1 0039B 35F000CE A ZSTCRC STW,R15 R14
987 1 0039C 6AF0039D BAL,R15 ZSTPTR
988 1 0039D 32F000CE A LW,R15 R14
989
990                                     *
991                                     * CLEAR OR RESET RE-ITERATION COUNT FIELD IN EXECUTE TABLE
992                                     * ONLY IF RC FIELD IS EXISTENT
993                                     *
993 1 0039E F2B00583 ZCRC LB,R11 *ZEXPT0
994 1 0039F 21B00008 A CI,R11 8
995 1 003A0 E84000CF A BCR,4 *R15
996 1 003A1 D2B00584 LH,R11 *ZEXPT1
997 1 003A2 25B00410 A SAS,R11 16
998 1 003A3 B5B00584 STW,R11 *ZEXPT1
999 1 003A4 E800000F A B *R15
    
```

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1000                                     PAGE
1001                                     *
1002                                     * PROCESS LEADING DECIMAL SUB-FIELD ASSUMED BINARY IN R9
1003                                     * RE-ITERATION COUNT LESS THAN 10K AND GREATER THAN 1
1004                                     * PLACE MARKER IDENTIFIER LESS THAN 512
1005                                     *
1006 1 003A5 35F00038 A ZTST1 STW,R15 ZTSTLNK
1007 1 003A6 F2B00583 LB,R11 *ZEXPT0
1008 1 003A7 21B00008 A CI,R11 X'CF'
1009 1 003A8 684003C5 BCR,4 ZTST3
1010 1 003A9 21B00008 A CI,R11 8
1011 1 003AA 69400381 BCS,4 ZTST1A
1012 1 003AB 22C00000 A LI,R12 0
1013 1 003AC 33000009 A MTW,0 R9
1014 1 003AD 6830039C BCR,3 ZTST1C
1015 1 003AE 6AF0038F BAL,R15 ZTST2
1016 1 003AF 6AF00247 BAL,R15 ZPMRQ
1017 1 003B0 E3000038 A B *ZTSTLNK
1018 1 003B1 33F00009 A ZTST1A MTW,X'F' R9
1019 1 003B2 69200388 BCS,2 ZTST1B
1020 1 003B3 22C000F3 A LI,R12 X'F3'
1021 1 003B4 F2B00583 LB,R11 *ZEXPT0
1022 1 003B5 43B0000C A AND,R11 R12
1023 1 003B6 F5B00583 STB,R11 *ZEXPT0
1024 1 003B7 E8000038 A B *ZTSTLNK
1025 1 003B8 219C270F A ZTST1B CI,R9 9999
1026 1 003B9 692003C3 BCS,2 ZTST2A
1027 1 003BA 32C00009 A LW,R12 R9
1028 1 003BB 25C00410 A SAS,R12 16
1029 1 003BC B5C00584 STW,R12 *ZEXPT1
1030 1 003BD 6AF00392 BAL,R15 ZTST4
1031 1 003BE E3000038 A B *ZTSTLNK
    
```

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1032                                     PAGE
1033                                     *
1034                                     * VERIFIES PLACE MARKER VALUE GREATER THAN ONE
1035                                     * AND LESS THAN 512 DECIMAL
1036                                     *
1037 1 003BF 33000009 A ZTST2  MTW,0  R9
1038 1 003C0 683003C3          BCR,3  ZTST2A
1039 1 003C1 21900200 A          CI,R9  X'200'
1040 1 003C2 E310000F A          BCS,1  *R15
1041 1 003C3 22C00020 A ZTST2A LI,R12 X'20'
1042 1 003C4 68C00377          B      ZSNER
1043
1044                                     *
1045                                     * VERIFY NUMERIC ACCUMULATOR IS EMPTY (ZER0)
1046                                     *
1046 1 003C5 33000009 A ZTST3  MTW,0  R9
1047 1 003C6 E830000F A          BCR,3  *R15
1048 1 003C7 683003C3          B      ZTST2A
1049
1050                                     *
1051                                     * VERIFY ALPHA ACCUMULATOR EMPTY (ZER0)
1052                                     *
1052 1 003C8 33000008 A ZTST6  MTW,0  R8
1053 1 003C9 E830000F A          BCR,3  *R15
1054 1 003CA 22C00021 A          LI,R12 X'21'
1055 1 003CB 68C00377          B      ZSNER
1056
1057                                     *
1058                                     * VERIFY TRANSLATOR NOT IN IMMEDIATE MODE
1059                                     *
1059 1 003CC 33000009 A ZTST7  MTW,0  ZDSFLG
1060 1 003CD E830000F A          BCR,3  *R15
1061 1 003CE 22C00021 A          LI,R12 X'52'
1062 1 003CF 68C00377          B      ZSNER
    
```

```

1063                                     PAGE
1064                                     *
1065                                     * DECIMAL TO BINARY CONVERTER FOUR BITS PER DIGIT
1066                                     * (R12) VALUE TO CONVERT TO R12 AND ZTEMP
1067                                     * (R15) LINK RETURN VALUE
1068                                     *
1069 1 003D0 46C0000F A ZDTB   XW,R12  R15
1070 1 003D1 35F00585          STW,R15 ZTEMP
1071 1 003D2 48F0083B          AND,R15 L(X'FOFOFOFO')
1072 1 003D3 25F0027C A          SCS,R15 -4
1073 1 003D4 23FFFFFFA A          MI,R15  -6
1074 1 003D5 30F00585          AW,R15  ZTEMP
1075 1 003D6 35F00585          STW,R15 ZTEMP
1076 1 003D7 48F0083C          AND,R15 L(X'FF00FF00')
1077 1 003D8 25F00278 A          SCS,R15 -8
1078 1 003D9 23FFFF64 A          MI,R15 -156
1079 1 003DA 30F00585          AW,R15  ZTEMP
1080 1 003DB 35F00585          STW,R15 ZTEMP
1081 1 003DC 52F0000F A          LH,R15  R15
1082 1 003DD 23FF2710 A          MI,R15 -55536
1083 1 003DE 30F00585          AW,R15  ZTEMP
1084 1 003DF 35F00585          STW,R15 ZTEMP
1085 1 003E0 46C0000F A          XW,R12  R15
1086 1 003E1 E8C0000F A          B      *R15
    
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1087                                     PAGE
1088                                     *
1089                                     * BINARY TO DECIMAL CONVERTER FOUR BITS PER DIGIT
1090                                     * (R12) VALUE TO CONVERT TO R12 AND ZTEMP
1091                                     * (R15) LINK RETURN VALUE
1092                                     *
1093 1 003E2 35000421 ZBTD STW,R13 ZCSRL
1094 1 003E3 22D00400 A LI,R13 X'400'
1095 1 003E4 46C00000 A XW,R12 R13
1096 1 003E5 35C00097 STW,R12 PX
1097 1 003E6 22C00000 A LI,R12 0
1098 1 003E7 35C00085 STW,R12 ZTEMP
1099 1 003E8 22C00000 A ZBTD10 LI,R12 0
1100 1 003E9 21D0000A A CI,R13 10
1101 1 003EA 691003F0 BCS,1 ZBTD20
1102 1 003EB 36C00080 DW,R12 L(X'A')
1103 1 003EC A3C00097 S,R12 *PX
1104 1 003ED 33400097 MTW,4 PX
1105 1 003EE 66C00085 AWM,R12 ZTEMP
1106 1 003EF 64C000E8 B ZBTD10
1107 1 003F0 32C00421 ZBTD20 LW,R12 ZCSRL
1108 1 003F1 46C00000 A XW,R12 R13
1109 1 003F2 A3C00097 S,R12 *PX
1110 1 003F3 43C00085 BR,R12 ZTEMP
1111 1 003F4 35C00085 STW,R12 ZTEMP
1112 1 003F5 E8C0000F A B *R15
    
```

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1113                                     PAGE
1114                                     *
1115                                     * BINARY TO HEXADECIMAL CONVERTER
1116                                     * (R12) VALUE TO CONVERT TO R12-R13 AND ZTEMP=ZTEMP1
1117                                     * (R15) LINK RETURN VALUE
1118                                     *
1119 1 003F6 35100421 ZBTH STW,R1 ZCSRL
1120 1 003F7 221FFFF8 A LI,X1 -8
1121 1 003F8 22D0000F A LI,R13 X'F'
1122 1 003F9 25C00004 A SCD,R12 4
1123 1 003FA 21D000FA A CI,R13 X'FA'
1124 1 003FB 691003FD BCS,1 $+2
1125 1 003FC 20D00007 A AI,R13 X'C7'
1126 1 003FD 76D20087 STB,R13 ZTEMP1+1,X1
1127 1 003FE 651003F8 BIR,X1 ZBTH+2
1128 1 003FF 32C00085 LW,R12 ZTEMP
1129 1 00400 32D00086 LW,R13 ZTEMP1
1130 1 00401 32100421 LW,R1 ZCSRL
1131 1 00402 E8C0000F A B *R15
1132                                     *
1133                                     * LEADING ZERO SUPPRESSION ON UNPACKED VALUE
1134                                     * (R12) CONTAINS VALUE TO SUPPRESS
1135                                     * (R15) CONTAINS LINK RETURN ADDRESS
1136                                     *
1137 1 00403 35F00421 ZGUP STW,R15 ZCSRL
1138 1 00404 35100085 STW,X1 ZTEMP
1139 1 00405 221FFFFC A LI,X1 -X'4'
1140 1 00406 22F000F0 A LI,R15 X'F0'
1141 1 00407 71F2000D A CB,R15 R12+1,X1
1142 1 00408 6930040C BCS,3 $+4
1143 1 00409 22F00040 A LI,R15 X'40'
1144 1 0040A 75F2000D A STB,R15 R12+1,X1
1145 1 0040B 65100406 BIR,X1 ZSUP+3
1146 1 0040C 32100085 LW,R1 ZTEMP
1147 1 0040D 35C00085 STW,R12 ZTEMP
1148 1 0040E 69C00421 B *ZCSRL
    
```

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1149
1150
1151
1152
1153
1154
1155 1 0040F 35100585 ZDECADER STW,R1 ZTEMP
1156 1 00410 221FFFF8 A LI,X1 -8
1157 1 00411 33100000 A MTW,1 R12
1158 1 00412 21000008 A CI,R12 X'18'
1159 1 00413 68400417 BCR,4 $+4
1160 1 00414 21000002 A CI,R12 X'12'
1161 1 00415 68400417 BCR,4 $+2
1162 1 00416 33600000 A MTW,6 R12
1163 1 00417 2500027C A SCS,R12 -4
1164 1 00418 55100412 BIR,X1 $-6
1165 1 00419 3210060C A LW,R1 R12
1166 1 0041A 46100585 XW,R1 ZTEMP
1167 1 0041B E800000F A B *R15
1168
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1179
1180
1181 1 0041C 22000000 A ZSCIR LI,R0 0
1182 1 0041D 22100001 A LI,X1 1
1183 1 0041E 22200002 A LI,X2 2
1184 1 0041F 22300003 A LI,X3 3
1185 1 00420 E800000F A B *R15
1186 1 00421 00000000 A ZCSRL PZE
    
```

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1177
1178
1179
1180
1181 1 00422 40000000 A
1182 1 00423 6AE00428 ZDKB DATA X'40000000'
1183 1 00424 00000001 A BAL,R14 ZKBCR19A
1184 DATA 1
1185
1186
1187 1 00425 40000000 A
1188 1 00426 6AE00428 ZDCR DATA X'40000000'
1189 1 00427 00000003 A BAL,R14 ZKBCR19A
1190 DATA 3
1191
1192
1193 1 00428 220007FF A
1194 1 00429 4E000588 ZKBCR18A LI,R0 X'17FF'
1195 1 0042A B500000E A AND,R0 P1
1196 1 0042B 55020369 STW,R0 *R14
1197 1 0042C 52020354 STH,R0 ZMFRCA,X1
1198 1 0042D 55020355 LH,R0 ZMFRX7,X1
1199 1 0042E E500000F A STH,R0 ZMFRN3A,X1
    B *R15
    
```

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1200
1201
1202
1203
1204 1 0042F 10000000 A
1205 1 00430 32000588 A
1206 1 00431 48000003 A
1207 1 00432 550204CA A
1208 1 00433 E80000CF A
1209
1210
1211
1212 1 00434 40000000 A
1213 1 00435 2200077F A
1214 1 00436 48000588 A
1215 1 00437 550204E0 A
1216 1 00438 E80000CF A

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PAGE

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*
* SML DIRECTIVE ASSIGNING MESSAGE LEVELS TO BE REPORTED
*
ZSML DATA X'10000000'
      LW,R0 P1
      AND,R0 R3
      STW,R0 ZMSGKEY,X1
      B *R15
*
* SMD DIRECTIVE ASSIGNING MESSAGES TO TYPEWRITER OR LINE PRINTER
*
ZSMD DATA X'40000000'
      LI,R0 X'77F'
      AND,R0 P1
      STW,R0 ZTWLP9,X1
      B *R15

```

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1217
1218
1219
1220
1221 1 00439 10000000 A
1222 1 0043A 35F00596 A
1223 1 0043B 32000588 A
1224 1 0043C 6AF003F6 A
1225 1 0043D 35C00448 A
1226 1 0043E 32000446 A
1227 1 0043F 02300670 A
1228 1 00440 6AF004C0 A
1229 1 00441 22F00001 A
1230 1 00442 48F00588 A
1231 1 00443 E8220596 A
1232 1 00444 2E000000 A
1233 1 00445 E8020596 A
1234 1 00446 10081110 A
1235 1 00447 C803E340 A
1236 1 00448 E7E7E7E7 A

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PAGE

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*
* HLT DIRECTIVE TO IDENTIFY LOCATION IN CONTROL LINE
*
ZHLT DATA X'10000000' P1 DECIMAL IDENTIFIER
      STW,R15 P15
      LW,R12 P1
      BAL,R15 ZBTH
      STW,R13 ZHLTMSG+1
      LW,R12 ZHLTMSG-1
      LCF1 7
      BAL,R15 ZTALP
      LI,R15 1
      AND,R15 P1
      BCR,2 *P15,X1
      WAIT
      B *P15,X1
      ZFMK 1,0,8,3A(ZHLTMSG)
ZHLTMSG TEXT 'HLT XXXX'

```

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1236                                     PAGE
1237                                     *
1238                                     * ALT DIRECTIVE TO ALTER CONTIGUOUS MAIN MEMORY LOCATIONS
1239                                     *
1240      1 00449  35F00421  ZALT  STW,R15  ZCSR
1241      1 0044A  6AF00458                BAL,R15  ZALT10
1242      1 0044B  6AF00337                BAL,R15  ZFH
1243      1 0044C  6AF00458                BAL,R15  ZALT10
1244      1 0044D  22F1FFFF A             LI,R15   X'1FFFFF'
1245      1 0044E  4B90000F A             AND,R9   R15
1246      1 0044F  31900578                CW,R9   ZEMS
1247      1 00450  E9200421                BCS,2   *ZCSR
1248      1 00451  35900585                STW,R9  ZTEMP
1249      1 00452  6AF00337                BAL,R15  ZFH
1250      1 00453  6AF00458                BAL,R15  ZALT10
1251      1 00454  B5900585                STW,R9  *ZTEMP
1252      1 00455  33100585                MTW,1   ZTEMP
1253      1 00456  32900585                LW,R9   ZTEMP
1254      1 00457  6800044F                B        ZALT05
1255      1 00458  21A0006B A             CI,R10  X'16B'
1256      1 00459  E830000F A             BCR,3   *R15
1257      1 0045A  E8000421                B        *ZCSPL
    
```

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1258                                     PAGE
1259                                     *
1260                                     * DMP DIRECTIVE TO DUMP CONTIGUOUS MAIN MEMORY LOCATIONS
1261                                     *
1262      1 0045B  40000000 A             DATA   X'40000000'
1263      1 0045C  40000000 A             DATA   X'40000000'
1264      1 0045D  40000000 A             DATA   X'40000000'
1265      1 0045E  02300070 A             ZTYP    LCFI    7
1266      1 0045F  64000464                B        ZDMP+1
1267      1 00460  40000000 A             DATA   X'40000000'      P1 FIRST
1268      1 00461  40000000 A             DATA   X'40000000'      P2 LAST
1269      1 00462  40000000 A             DATA   X'40000000'      P3 RELATIVE
1270      1 00463  023000F0 A             ZDMP    LCFI    X'F'
1271      1 00464  74000499                STCF    ZDMP24+2,X3
1272      1 00465  35F00596                STW,R15 P15
1273      1 00466  227FFFFD A             LI,X7   -3      TRUNCATE
1274      1 00467  32C0058B                LW,R12  P3+1,X7
1275      1 00468  48C00578                AND,P12 ZEMS
1276      1 00469  35CE058B                STW,R12 P3+1,X7      ADDRESSES
1277      1 0046A  65700467                BIR,X7  *-3
1278      1 0046B  6AF0041C                BAL,R15 ZSCR
1279      1 0046C  39000589                LW,R13  P2
1280      1 0046D  33100000 A             MTW,1   R13
1281      1 0046E  31000573                CW,R13  ZEMS
1282      1 0046F  68200471                BCR,2   *-2
1283      1 00470  33F00589                MTW,-1  P2
1284      1 00471  32C0058A                LW,R12  P3
1285      1 00472  68300475                BCR,3   *-3
1286      1 00473  32000588                LW,R0   P1
1287      1 00474  3800058A                SW,R0   P3
1288      1 00475  3500058A                STW,R0  P3
1289      1 00476  32000588                LW,R12  P1      ZDMP10
1290      1 00477  38C0058A                SW,R12  P3
1291      1 00478  6AF003F6                BAL,R15 ZBTH
1292      1 00479  22F04040 A             LI,R15  X'4040'
1293      1 0047A  53F0000C A             STH,R15 R12
1294      1 0047B  25C00310 A             SCD,R12 16
    
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1295	1	00470	35C00498		STW,R12	ZDMPA	
1296	1	00470	35C00499		STW,R13	ZDMPA+1	
1297	1	0047E	75F00498		STB,R15	ZDMPA	
1298	1	0047H	22700007 A		LI,X7	7	RESET INDEX
1299	1	00480	22F00000 A		LI,R15	0	DUPLICATE
1300	1	00481	35F00595		STW,R15	P14	COUNTER
1301	1	00482	B2C00588	ZDMP20	LW,R12	*P1	DUPLICATE
1302	1	00483	B1C00588		CW,R12	*P1,X1	WORDS
1303	1	00484	6A30049E		BCR,3	ZDMP30	
1304	1	00485	33C00595		MTW,0	P14	DUPLICATE
1305	1	00486	683004A9		BCR,3	ZDMP40	BLOCK
1306	1	00487	22C00060 A		LI,R12	X'60'	
1307	1	00488	75C00498		STB,R12	ZDMPA,X7	
1308	1	00489	32C00588	ZDMP22	LW,R12	P1	
1309	1	0048A	38C0058A		SW,R12	P3	
1310	1	0048B	6AF003F6		BAL,R15	ZBTH	
1311	1	0048C	22F00440 A		LI,R15	X'4040'	
1312	1	0048D	55F00000 A		STH,R15	R12	
1313	1	0048E	25C00310 A		SCD,R12	16	
1314	1	0048F	35C0059A		STW,R12	ZDMPA+2	
1315	1	00490	35C00598		STW,R13	ZDMPA+3	
1316	1	00491	75F0059A		STB,R15	ZDMPA+2	
1317	1	00492	B2C00588		LW,R12	*P1	SET DUPLICATE
1318	1	00493	6AF003F6		BAL,R15	ZBTH	KEY FOR OUTPUT
1319	1	00494	35C0059C		STW,R12	ZDMPA+4	
1320	1	00495	35C0059D		STW,R13	ZDMPA+5	
1321	1	00496	22700018 A		LI,R7	24	
1322	1	00497	757004BB	ZDMP24	STB,R7	ZDMP70,X1	
1323	1	00498	32C00488		LW,R12	ZDMP70	
1324	1	00499	023000F0 A		LCFI	X'F'	
1325	1	0049A	6AF004C0		BAL,R15	ZTWLP	
1326	1	0049B	6AF004E7		BAL,R15	ZDMP50	
1327	1	0049C	69100476		BCS,1	ZDMP10	DUMP
1328	1	0049D	E800049B		B	*P15	COMPLETE
1329	1	0049E	21700007 A	ZDMP30	CI,X7	7	
1330	1	0049F	682004A2		BCR,2	\$+3	
1331	1	004A0	33F00588		MTW,-1	P1	

1332	1	004A1	68C00497		B	ZDMP24	
1333	1	004A2	33100495		MTW,1	P14	
1334	1	004A3	6AF00487		BAL,R15	ZDMP50	
1335	1	004A4	69100482		BCS,1	ZDMP20	
1336	1	004A5	33F00588		MTW,-1	P1	
1337	1	004A6	33F00595		MTW,X'F'	P14	
1338	1	004A7	69200489		BCS,2	ZDMP22	
1339	1	004A8	B2C00588		LW,R12	*P1	
1340	1	004A9	6AF003F6	ZDMP40	BAL,R15	ZBTH	SET NON-DUPLICATE
1341	1	004AA	33100007 A		MTW,1	X7	WORD FOR OUTPUT
1342	1	004AB	226FFFF8 A		LI,X6	=8	
1343	1	004AC	25C00308 A		SCD,R12	8	
1344	1	004AD	75DF0498		STB,R13	ZDMPA,X7	
1345	1	004AE	33100007 A		MTW,1	X7	
1346	1	004AF	656004AC		BIR,X6	\$-3	
1347	1	004B0	22F00040 A		LI,R15	X'40'	
1348	1	004B1	75FE0598		STB,R15	ZDMPA,X7	
1349	1	004B2	2170004E A		CI,X7	78	
1350	1	004B3	69200497		BCS,2	ZDMP24	
1351	1	004B4	6AF004E7		BAL,R15	ZDMP50	
1352	1	004B5	69100482		BCS,1	ZDMP20	
1353	1	004B6	68C00497		B	ZDMP24	
1354	1	004B7	32C00588	ZDMP50	LW,R12	P1	
1355	1	004B8	33100588		MTW,1	P1	
1356	1	004B9	31C00389		CW,R12	P2	
1357	1	004BA	E800000F A		B	*R15	
1358	1	004BB	10001660 A	ZDMP70	ZFMW	1,0,C,BA(ZDMPA)	
1359					*		
1360					*		TRANSMIT MESSAGE ONLY IF KEYBOARD INPUT DEVICE
1361					*		
1362	1	004BC	52C20427	ZTMNCR	LH,R13	ZDCR+1,X1	
1363	1	004BD	51C20369		CH,R13	ZMFRDA,X1	
1364	1	004BE	E830000F A		BCR,3	*R15	
1365					*		
1366					*		LOAD CONDITIONS FOR TYPEWRITER ONLY MESSAGE LEVEL 0
1367					*		
1368	1	004EF	02300040 A	ZSML4C	LCFI	4	

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1369                                     PAGE
1370
1371                                     *
1372                                     * COMMON TYPEWRITER/LINE PRINTER OUTPUT ROUTINE
1373                                     *
1373 1 004C0 E8C0000F A ZTWLP BCR,12 *R15
1374 1 004C1 7400001E A STCF ZML1E
1375 1 004C2 35F00421 STW,R15 ZCSRL
1376 1 004C3 6AF0041C BAL,R15 ZSCR1
1377 1 004C4 72F0001E A LB,R15 ZML1E
1378 1 004C5 25F0047C A SAS,R15 -4
1379 1 004C6 46F00003 A AND,R15 R3
1380 1 004C7 683004CC BCR,3 ZTWLP01
1381 1 004C8 6C000010 A RD,0 X'10'
1382 1 004C9 E9100421 BCS,1 *ZCSRL
1383 1 004CA 21F00004 A ZMSGKEY CI,R15 4
1384 1 004CB E9200421 BCS,2 *ZCSRL SUPPRESSED
1385 1 004CC 35C0001F A ZTWLP01 STW,R12 ZML1F
1386 1 004CD 55C00006 STH,R12 ZTWLP10+2,X1
1387 1 004CE 52C0000C A LH,R12 R12
1388 1 004CF 75C00009 STB,R12 ZTWLP10+3,X3
1389 1 004D0 26C00478 A SAS,R12 -8
1390 1 004D1 75C00007 STB,R12 ZTWLP10+1,X3
1391 1 004D2 201FFFF8 A LI,X1 -8
1392 1 004D3 22C04040 A LI,R12 X'4040'
1393 1 004D4 55C0000C A STH,R12 R12
1394 1 004D5 35C00018 A STW,R12 ZML14+4,X1
1395 1 004D6 63100405 RIR,X1 *-1
1396 1 004D7 32100001 A LI,R1 1
1397 1 004D8 32F00424 LW,R15 ZDKB+1
1398 1 004D9 72C0001E A LB,R12 ZML1E
1399 1 004DA 25C0047A A SAS,R12 -6
1400 1 004DB 33F0000C A MTW,X'F' R12
1401 1 004DC 663004EC BCR,3 ZTW
1402 1 004DD 22F0000C A LI,R15 2
1403 1 004DE 33F0000C A MTW,X'F' R12
1404 1 004DF 673004E3 BCR,3 ZLPD
1405 1 004E0 02F00002 A ZTWLPB LI,R15 2
    
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1406 1 004E1 31F00424 CW,R15 ZDKB+1
1407 1 004E2 683004EC BCR,3 ZTW
1408 1 004E3 55F20500 ZLPD STH,R15 ZTWLPA,X1
1409 1 004E4 72C60507 LB,R12 ZTWLP10+1,X3
1410 1 004E5 25C0047C A SAS,R12 -4
1411 1 004E6 20C0000C A AI,R12 X'CO'
1412 1 004E7 75C00010 A STB,R12 ZML10
1413 1 004E8 22C0000F A LI,R12 X'F'
1414 1 004E9 46C00007 AND,R12 ZTWLP10+1
1415 1 004EA 3310000C A MTW,1 R12
1416 1 004EB 580004FD B ZTWLP08
1417 1 004EC 55F20500 ZTW STH,R15 ZTWLPA,X1
1418 1 004ED 22C0000F A LI,R12 X'FO'
1419 1 004EE 46C00007 AND,R12 ZTWLP10+1
1420 1 004EF 683004F6 BCR,3 *-7
1421 1 004F0 25C0047C A SAS,R12 -4
1422 1 004F1 22F00015 A LI,R15 X'15'
1423 1 004F2 22100000 A LI,R1 0
1424 1 004F3 75F20010 A STB,R15 ZML10,X1
1425 1 004F4 33100001 A MTW,1 R1
1426 1 004F5 64C004F3 BDR,R12 *-2
1427 1 004F6 22000284 LI,R0 DA(ZTWLP11)
1428 1 004F7 72C60507 LB,R12 ZTWLP10+1,X3
1429 1 004F8 25C0057C A SAD,R12 -4
1430 1 004F9 72C00000 A LB,R13 R13
1431 1 004FA 25D0047C A SAS,R13 -4
1432 1 004FB 30C0000C A AW,R12 R13
1433 1 004FC 683004FF BCR,3 *-3
1434 1 004FD 75C60507 ZTWLP08 STB,R12 ZTWLP10+1,X3
1435 1 004FE 22000283 LI,R0 DA(ZTWLP10)
1436 1 004FF 22100001 A LI,R1 1
1437 1 00500 4CC00001 A ZTWLPA STH,R12 1
1438 1 00501 69C00000 BCS,12 *-1
1439 1 00502 C0C0000C T18,R12 *ZTWLPA
1440 1 00503 69C00002 ECS,12 *-1
1441 1 00504 E8C00421 B *ZCSRL
1442 1 00506 BOUND 8
    
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1443 1 00506 05000040 A ZTWLP10 ZFCP 5,X1401
1444 1 00507 82000000 A ZFCP X'821'0
1445 1 00508 05000000 A ZTWLP11 ZFCP 5,0
1446 1 00509 02000000 A ZFCP 2,0
    
```

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1447                                     PAGE
1448
1449                                     *
1450                                     * THIS SECTION OF CODE COMPRISES THE EXECUTIVE PROGRAM
1451                                     * EXECUTION OF SPECIFIED SUB-ROUTINES WHICH EXIST IN EXTBL
1452                                     *
1452 1 0050A B2B00584 ZEX00 LW,R11 *ZEXPT1
1453 1 0050B 6AF0039B BAL,R15 ZSTCRC
1454 1 0050C 6AF0041C ZEX01 BAL,R15 ZSCIR
1455 1 0050D 6AF00518 BAL,R15 ZMPTWA
1456 1 0050E 22F00820 A LI,R15 X'201
1457 1 0050F 6DF01100 A WD,R15 X'11001
1458 1 00510 6DF01500 A WD,R15 X'15001
1459 1 00511 22F00810 A LI,R15 X'101
1460 1 00512 6DF01200 A WD,R15 X'12001
1461 1 00513 6DC00022 A WD,C X'221
1462 1 00514 B2F00583 LW,R15 *ZEXPT0
1463 1 00515 EAF0000F A BAL,R15 *R15
1464
1465                                     *
1466                                     * SUBROUTINES RETURN CONTROL HERE
1467                                     *
1467 1 00516 6800052C B ZRETN1 NORMAL
1468 1 00517 68000537 B ZRETN2 ABORT/CONDITIONAL
    
```

```

1469                                     PAGE
1470                                     *
1471                                     * MOVE PARAMETERS TO LABELED WORK AREA P1-P15
1472                                     *
1473 1 00518 F2B00583 ZMPTWA LB,R11 *ZEXPT0
1474 1 00519 22C00000 A LI,R12 0
1475 1 0051A 21B00008 A CI,R11 8
1476 1 0051B 6840051D BCR,4 $+2
1477 1 0051C D2C20584 LH,R12 *ZEXPT1,X1
1478 1 0051D 35C0003C A STW,R12 ZFTF
1479 1 0051E 32E00584 LW,R14 ZEXPT1
1480 1 0051F 21B0000C A CI,R11 X'0'
1481 1 00520 68400522 BCR,4 $+2
1482 1 00521 3310000E A MTW,1 R14
1483 1 00522 25B0047C A SAS,R11 -4
1484 1 00523 227FFFF1 A LI,X7 -15
1485 1 00524 22C00000 A LI,R12 0
1486 1 00525 33F0000B A MTW,X'F' R11
1487 1 00526 69100529 BCS,1 $+3
1488 1 00527 B2C0000E A LW,R12 *R14
1489 1 00528 3310000E A MTW,1 R14
1490 1 00529 35CE0597 STW,R12 P15+1,X7
1491 1 0052A 65700524 BIR,X7 $-6
1492 1 0052B E800000F A B *R15
    
```

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1493                                     PAGE
1494                                     *
1495                                     * NORMAL RETURN ONE
1496                                     *
1497 1 0052C 6AF0041C ZRETN1 BAL,R15 ZSCIR
1498 1 0052D 6AF00540 BAL,R15 ZBPT1
1499 1 0052E F2B00583 LB,R11 *ZEXPT0
1500 1 0052F 21B00008 A CI,R11 8
1501 1 00530 68400535 BCR,4 $+5
1502 1 00531 B3100584 MTW,1 *ZEXPT1
1503 1 00532 D2B20584 LH,R11 *ZEXPT1,X1
1504 1 00533 D1B00584 CH,R11 *ZEXPT1
1505 1 00534 6820050C BCR,2 ZEX01
1506 1 00535 6AF00398 ZRETN1A BAL,R15 ZADCRC
1507 1 00536 6800050C B ZEX01
1508
1509                                     *
1510                                     * ABORT AND/OR CONDITIONAL RETURN
1511                                     *
1511 1 00537 6AF0041C ZRETN2 BAL,R15 ZSCIR
1512 1 00538 6AF00540 BAL,R15 ZBPT1
1513 1 00539 F2B00583 LB,R11 *ZEXPT0
1514 1 0053A 21B00004 A CI,R11 4
1515 1 0053B 68400535 BCR,4 ZRETN1A
1516 1 0053C B2B00584 LW,R11 *ZEXPT1
1517 1 0053D 68300535 BCR,3 ZRETN1A
1518 1 0053E 6AF00568 BAL,R15 ZLKSET
1519 1 0053F 6800050A B ZEX01
    
```

1520 PAGE 55
 1521 *
 1522 * CHECK BREAKPOINT NO. 1
 1523 * RESET CONTINUE EXECUTION OF DIRECTIVES IN CONTROL LINE
 1524 * SET STOP EXECUTION OF DIRECTIVES RETURN FOR DIRECTIVE INPUT
 1525 *
 1526 1 00540 60000110 A ZBPT1 RD,0 X'10'
 1527 1 00541 E2R0000F A BCR,8 *R15
 1528 *
 1529 * CONSOLE INTERRUPT INITIATED BY OPERATOR
 1530 * STOP EXECUTION OF DIRECTIVES RETURN FOR DIRECTIVE INPUT
 1531 *
 1532 1 00542 22F00030 A ZCENINT LI,R15 X'30'
 1533 1 00543 60F01300 A WD,R15 X'13C0'
 1534 1 00544 60F01100 A WD,R15 X'1100'
 1535 1 00545 CF000500 H10,R0 *ZTWLPA
 1536 1 00546 68000183 B ZPC010

1537 PAGE 56
 1538 *
 1539 * OPEN LOOP PROCESSOR
 1540 * CLEARS CURRENT LOOP RE-ITERATION COUNT
 1541 * ADVANCES TO NEXT OPERATION
 1542 *
 1543 1 00547 08000535 A ZLPPR0 ZFST2 0,2,0,ZRETN1A
 1544 *
 1545 * CLOSE LOOP PROCESSOR
 1546 * CHECKS IF OPEN LOOP RE-ITERATION COUNT COMPLETE
 1547 * IF COMPLETE ADVANCE TO NEXT OPERATION
 1548 * IF NOT UPDATE COUNT AND RESTART LOOP
 1549 *
 1550 1 00548 04000549 A ZRPPR0 ZFST2 0,1,0,ZRPPR0
 1551 1 00549 B2C00584 LW,R12 *ZEXPT1
 1552 1 0054A F2BC000C A LB,R11 *R12
 1553 1 0054B 21BC0008 A CI,R11 8
 1554 1 0054C 68400535 BCR,4 ZRETN1A
 1555 1 0054D 3310000C A MTW,1 R12
 1556 1 0054E B310000C A MTW,1 *R12
 1557 1 0054F D2B2000C A LH,R11 *R12,X1
 1558 1 00550 D1BC000C A CH,R11 *R12
 1559 1 00551 69200535 BCS,2 ZRETN1A
 1560 1 00552 B2800584 LW,R11 *ZEXPT1
 1561 1 00553 358C0583 STW,R11 ZEXPT0
 1562 1 00554 68000535 B ZRETN1A

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1563                                     PAGE
1564
1565                                     *
1566                                     * GO DIRECTIVE PROCESSOR TO CONTINUE EXECUTION OF DIRECTIVES
1567                                     *
1567 1 00565 64000566 ZG0PR0 B ZG0ERR
1568 1 00566 22000103 A ZG0ERR LI,R12 X'105'
1569 1 00567 64000377 B ZSNER
1570 1 00568 22000000 A ZG0PTR LI,R11 0
1571 1 00569 64000504 B ZEX00+1
1572
1573                                     *
1574                                     * END OF LINE PROCESSOR FOR FORWARD SLASH
1575                                     *
1575 1 0056A 04000158 A ZFST2 0,1,0,ZFSPR0
1576 1 0056F 64F00540 ZFSPR0 BAL,R15 ZBPT1
1577 1 0056C 64F0056F BAL,R15 ZLKSET
1578 1 0056D 64000507 B ZEX00
1579
1580                                     *
1581                                     * ABSOLUTE TRANSFER PROCESSOR
1582                                     * SAVES CURRENT EXECUTE TABLE POINTER VALUE AS LINK
1583                                     * RESETS POINTERS TO TRANSFER LOCATION
1584                                     *
1584 1 0056F 0400058F A ZFST2 0,1,0,ZASPR0
1585 1 0056F 64000350 ZASPR0 B ZFSPR0+1
1586
1587                                     *
1588                                     * LINK RETURN TRANSFER PROCESSOR
1589                                     * CHECK IF LINK TABLE EMPTY; IF SO ABORT WITH ERROR MESSAGE
1590                                     * IF NOT REMOVE LAST LINK ENTRY, REDUCE LINK POINTER BY ONE
1591                                     * TRANSFER TO NEW OPERATION
1592                                     *
1592 1 00560 22000111 A ZLKAS LI,R12 X'111'
1593 1 00561 32300570 LW,R11 ZLKPTR
1594 1 00562 31800570 CW,R11 ZLKADR
1595 1 00563 64200577 BCR,2 ZSNER
1596 1 00564 33F00570 MTW,X'F' ZLKPTR
1597 1 00565 02E00570 LW,R11 *ZLKPTR
1598 1 00566 35B00583 STW,R11 ZEXPT0
1599 1 00567 64000535 B ZRETN1A
    
```

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1600                                     PAGE
1601
1602                                     *
1603                                     * PURGE AND/OR INSERT EXECUTE TABLE POINTER AS LINK ADDRESS TO
1604                                     * LINK TABLE, CHECK IF TABLE FULL; IF SO ABORT WITH ERROR MSG
1605                                     *
1605 1 00568 32000570 ZLKSET LW,R12 ZLKPTR
1606 1 00569 32000583 LW,R11 ZEXPT0
1607 1 0056A 33F00J0C A MTW,X'F' R12
1608 1 0056B 31000570 CW,R12 ZLKADR
1609 1 0056C 69100570 BCS,1 *+4
1610 1 0056D B1800000 A CW,R11 *R12
1611 1 0056E 6730056A BCS,3 *+4
1612 1 0056F 35000570 STW,R12 ZLKPTR
1613 1 00570 B5800570 STW,R11 *ZLKPTR
1614 1 00571 27000110 A LI,R12 X'110'
1615 1 00572 32000570 LW,R11 ZLKPTR
1616 1 00573 37100J0C A MTW,1 R11
1617 1 00574 3180057E CW,R11 ZPMADR
1618 1 00575 64300377 BCR,3 ZSNER
1619 1 00576 33E00570 STW,R11 ZLKPTR
1620 1 00577 E300000F A B *R15
    
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1621                                     PAGE
1622                                     *
1623                                     * COMPUTE MEMORY SIZE AND ASSIGN TABLE LENGTHS AND I/O ADDRESS
1624                                     * EXECUTE TABLE LENGTH = MS/4.96
1625                                     * LINK TABLE LENGTH = MS/4.16
1626                                     * PLACE MARKER TABLE LENGTH = MS/4.16
1627                                     * THIS CODE IS THEN OVERLAYED BY TRANSLATOR
1628                                     * REMAINDER OF AREA AVAILABLE AS INPUT/OUTPUT AREA
1629                                     *
1630 1 00575 00020FFF A ZEMS DATA X'20FFF' LAST MEMORY LOCATION
1631 1 0057A B0UND 8
1632 1 0057A 0E0000AC ZCMS LPSD,0 ZCMST40+2
1633 1 00573 32A0007F LW,R10 ZEMS
1634 1 0057C 38A000A8 SW,R10 ZCMS6
1635 1 0057D 35A0007F STW,R10 ZEMS
1636 1 0057E B5A0000A A STW,R10 *R10
1637 1 0057F 3310000A A MTW,1 R10
1638 1 00580 25A00478 A SAS,R10 +8
1639 1 00581 35A00008 A STW,R10 R11
1640 1 00582 25A00408 A SAS,R10 3
1641 1 00583 35A00081 STW,R10 ZI0ADR
1642 1 00584 30A0003A AW,R10 ZEXADR
1643 1 00585 35A00080 STW,R10 ZMFRIBAD
1644 1 00586 66A00081 AWM,R10 ZI0ADR
1645 1 00587 38A0000F A SW,R10 R11
1646 1 00588 35A0007E STW,R10 ZPMADR
1647 1 00589 35A0007F STW,R10 ZPMPTR
1648 1 0058A 38A0000F A SW,R10 R11
1649 1 0058B 35A0007C STW,R10 ZLKADR
1650 1 0058C 35A0007D STW,R10 ZLKPTR
1651 1 0058D 32A00075 LW,R10 ZEMS
1652 1 0058E 38A00081 SW,R10 ZI0ADR
1653 1 0058F 35A00082 STW,R10 ZI0WDS
1654 1 00590 22E00040 A LI,R11 X'40'
1655 1 00591 32A00078 LW,R10 ZEMS
1656 1 00592 38A00008 A SW,R10 R11
1657 1 00593 35A0007A STW,R10 ZLBADR
    
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1658 1 00594 35A00073 STW,R10 ZLBPTR
1659 1 00595 32A000A7 LW,R10 ZCMS5
1660 1 00596 35A0004C A STW,R10 64
1661 1 00597 227FFF2C A LI,X7 -224
1662 1 00598 32A0005F LW,R10 ZIL5F
1663 1 00599 3310000A A MTW,1 R10
1664 1 0059A 35AEC140 STW,R10 ZIL5F+225,X7
1665 1 0059B 65700599 BIR,X7 $+2
1666 1 0059C 6AF0041C BAL,R15 ZSCIR
1667 1 0059D 32B0043A LW,R11 ZEXADR
1668 1 0059E 6AF0039D BAL,R15 ZSTPTR
1669 1 0059F 68C000E8 B BEGINKSR
1670 1 005A0 32C000A3 LW,R12 ZCMS2
1671 1 005A1 6AF004BF BAL,R15 ZSML40
1672 1 005A2 68000183 B ZPC010
1673 1 005A3 200C1690 A ZCMS2 ZFMW 2,0,12,BA(ZCMS3)
1674 1 005A4 7DC4C3D7 A ZCMS3 DATA X'7DC4C3D7'
1675 1 005A5 40E5D540 A DATA X'40E5D540'
1676 1 005A6 F0F1C17D A DATA X'F0F1C17D'
1677 1 005A7 0F000140 A ZCMS5 XPSD,0 ZT40
1678 1 005A8 00001300 A ZCMS6 DATA X'1000'
1679 1 005AA B0UND 8
1680 1 005AA 0J000000 A ZCMST40 DATA 0
1681 1 005AB 07000000 A DATA 0
1682 1 005AC 00000078 A DATA ZCMS+1
1683 1 005AD 00000000 A DATA 0
    
```

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1684                                     PAGE
1685
1686 *
1687 * EQUATE STATEMENTS TO OVERLAY CODE FOR COMPUTING MEMORY SIZE
1688 * AND ASSIGNING LENGTH AND BASE ADDRESSES FOR TABLES ETC
1689 *
1689 1 0057A ZLBADR EQU ZCMS OPEN LOOP ADDRESS
1690 1 0057B ZLBPTR EQU ZLBADR+1 AND POINTER
1691 1 0057C ZLKADR EQU ZLRPTR+1 LINK TABLE ADDRESS
1692 1 0057D ZLKPTR EQU ZLKADR+1 AND POINTER
1693 1 0057E ZPMADR EQU ZLKPTR+1 PLACE MARKER ADDRESS
1694 1 0057F ZPMPTR EQU ZPMADR+1 AND POINTER
1695 1 00580 ZMFRIBAD EQU ZPMPTR+1 MAIN FETCH INPUT/OUTPUT ADDRESS
1696 1 00581 ZIBADR EQU ZMFRIBAD+1 INPUT/OUTPUT BASE ADDRESS
1697 1 00582 ZIBWDS EQU ZIBADR+1 AND NUMBER OF WORDS
1698 1 00583 ZEXPT0 EQU ZIBWDS+1 EXECUTE TABLE BASE
1699 1 00584 ZEXPT1 EQU ZEXPT0+1 AND VARIABLE POINTERS
1700 1 00585 ZTEMP EQU ZEXPT1+1 TEMPORARY
1701 1 00586 ZTEMP1 EQU ZTEMP+1 LOCATIONS
1702 1 00587 P0 EQU ZTEMP1+1
1703 1 00588 P1 EQU P0+1 LABELED
1704 1 00589 P2 EQU P1+1 PARAMETER
1705 1 0058A P3 EQU P2+1 AREA FOR
1706 1 0058B P4 EQU P3+1 SUBROUTINES
1707 1 0058C P5 EQU P4+1
1708 1 0058D P6 EQU P5+1
1709 1 0058E P7 EQU P6+1
1710 1 0058F P8 EQU P7+1
1711 1 00590 P9 EQU P8+1
1712 1 00591 P10 EQU P9+1
1713 1 00592 P11 EQU P10+1
1714 1 00593 P12 EQU P11+1
1715 1 00594 P13 EQU P12+1
1716 1 00595 P14 EQU P13+1
1717 1 00596 P15 EQU P14+1
1718 1 00597 PX EQU P15+1
1719 1 00598 ZDMPA EQU PX+1 DUMP
1720 1 005AE RES 10 AREA
    
```

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1721                                     PAGE
1722
1723 *
1724 * SUB-ROUTINE TABLE WITH FORM DIRECTIVE
1725 * TWO WORDS PER SUB-ROUTINE DIVIDED AS FOLLOWSO
1726 * FIRST WORD = MNEMONIC NAME, FOUR ALPHA CHARACTERS MAXIMUM
1727 * SECOND WORD = SUB-ROUTINE INFO AND ENTRY ADDRESS
1728 *
1728 1 005B8 ZSRBEG EQU $
1729 1 005B8 00C3D3D9 A DATA X'C3D3D9' CLR
1730 1 005B9 09C5E3D5 A DATA X'D9C5E3D5' RETN
1731 1 005BA 0000C7D6 A DATA X'C7D6' 3B
1732 1 005BB 00C4D2C2 A DATA X'C4D2C2' DKB
1733 1 005BC 00C4C3D9 A DATA X'C4C3D9' DCR
1734 1 005BD 00E2D4D3 A DATA X'E2D4D3' SML
1735 1 005BE 00E2D4C4 A DATA X'E2D4C4' SMD
1736 1 005BF 00C1D3E3 A DATA X'C1D3E3' ALT
1737 1 005C0 00C4D4D7 A DATA X'C4D4D7' DMP
1738 1 005C1 00E3E8D7 A DATA C'ITYP'
1739 1 005C2 00C3D3E3 A DATA X'C3D3E3' HLT
1740 1 005C3 00C8C9D6 A DATA C'HIB'
1741 1 005C4 00D0D9D2 A DATA C'IRK'
1742 1 005C5 00D9D7C3 A DATA C'IRKC'
1743 1 005C6 E3E8D7C5 A DATA C'ITYPE'
1744 1 005C7 00E2C9D6 A DATA C'ISIB'
1745 1 005C8 00E3C9D6 A DATA C'ITIR'
1746 1 005C9 00E3C4E5 A DATA C'ITDV'
1747 1 005CA 000000D8 A DATA C'IG'
1748 1 005CB E4D5C9E3 A DATA C'UNIT'
1749 1 005CC C5C3C8D6 A DATA C'IEC-H'
1750 1 005CD D4D6C4C3 A DATA C'IMODE'
1751 1 005CE C3D6D4C3 A DATA C'IC9'C'
1752 1 005CF 00C1E2D9 A DATA C'ASR'
1753 1 005D0 ZSRTBL EQU $
1754 0000C18 ZSRLEN EQU $-ZSRBEG
    
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1755                                     PAGF
1756                                     *
1757                                     * SUBROUTINE ADDRESS TABLE WITH CONTROL INFORMATION
1758                                     *
1759                                     * BITS 0-3      PARAMETER COUNT
1760                                     * BITS 4-5      RE-ITERATION/IDENTIFIER CODE
1761                                     *                00 NO LEADING DECIMAL SUBFIELD PERMITTED
1762                                     *                01 PLACE MARKER IDENTIFIER REQUEST
1763                                     *                10 REITERATION COUNT
1764                                     *                11 ILLEGAL
1765                                     * BITS 6-7      EXECUTION MODE KEYS
1766                                     *                00 UNCONDITIONAL
1767                                     *                01 CONTROL LINE MODE ONLY
1768                                     *                10 IMMEDIATE MODE ONLY
1769                                     *                11 OPTIONAL CONTROL OR IMMEDIATE MODE
1770                                     * BITS 8-14     RESERVED
1771                                     * BITS 15-31    SUBROUTINE ADDRESS
1772                                     *
1773 1 005D0 0000019A A          ZFSAT 0,0,0,0,ZPC200 CLR
1774 1 005D1 01000542 A          ZFSAT 0,0,1,0,ZCRNINT RETN
1775 1 005D2 02000955 A          ZFSAT 0,0,2,0,ZGAPR0  GR
1776 1 005D3 12000423 A          ZFSAT 1,0,2,0,ZDKB   DKB
1777 1 005D4 1P000426 A          ZFSAT 1,0,2,0,ZDCR   DCR
1778 1 005D5 13000430 A          ZFSAT 1,0,3,0,ZSML   SML
1779 1 005D6 13000435 A          ZFSAT 1,0,3,0,ZSYD   SMD
1780 1 005D7 00000449 A          ZFSAT 0,0,0,0,ZALT   ALT
1781 1 005D8 33000463 A          ZFSAT 3,0,3,0,ZDMP   DMP
1782 1 005D9 3300045E A          ZFSAT 3,0,3,0,ZTYP   TYP
1783 1 005DA 1700043A A          ZFSAT 1,1,3,0,ZHLT   HLT
1784 1 005DB 080006E1 A          ZFSAT 0,2,3,0,HALT10 HI0
1785 1 005DC 0800067E A          ZFSAT 0,2,3,0,READKEY
1786 1 005DD 08000685 A          ZFSAT 0,2,3,0,READKEYC
1787 1 005DE 08000687 A          ZFSAT 0,2,3,0,TYPE
1788 1 005DF 1800068E A          ZFSAT 1,2,3,0,SIG
1789 1 005E0 18000699 A          ZFSAT 1,2,3,0,TIR
1790 1 005E1 180006A4 A          ZFSAT 1,2,3,0,TDV
1791 1 005E2 17000649 A          ZFSAT 1,1,3,0,QQ00
    
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1792 1 005E3 22000676 A          ZFSAT 2,0,2,0,UNIT00
1793 1 005E4 0300071A A          ZFSAT 0,0,3,0,ECH0
1794 1 005E5 020005E8 A          ZFSAT 0,0,2,0,BEGINKSR
1795 1 005E6 08000730 A          ZFSAT 0,2,3,0,CBMCHAIN
1796 1 005E7 5800073B A          ZFSAT 5,2,3,0,ASR35  ASR ROUTINE
1797          1 005ER          ZSRADR EQU $
    
```

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1798                                     PAGE
1799                                     *
1800                                     * SIGMA 7/5 K S R BASIC DECODING DIAGNOSTIC
1801                                     *
1802                                     * DAN STÖTTLEMYRE
1803                                     *
1804                                     *
1805 1 005E8 0E000704 BEGINKSR LPSD,0 PSDW01
1806 1 005E9 22100010 A LI,1 X'10'
1807 1 005EA 60101200 A WD,1 (1,1**9)
1808 1 005EB 321007B2 LW,1 XPSD06
1809 1 005EC 35100046 A STW,1 70 WATCH DBG TIMER TRAP
1810 1 005ED 321007F3 LW,1 XPSD08 I/O INTERRUPT
1811 1 005EE 35100050 A STW,1 92
1812 1 005EF 321007E4 LW,1 XPSD09 CONSOLE INTERRUPT
1813 1 005F0 3510005D A STW,1 93
1814 1 005F1 321007F7 LW,1 MTNI
1815 1 005F2 3510005E A STW,1 85
1816 1 005F3 321007B8 LW,1 XPSD13
1817 1 005F4 3510005B A STW,1 91
1818 1 005F5 60000000 A RESTART RD,0 0 RETURN
1819 1 005F6 68100724 BCR,1 KSRAUT9 SENSE SWITCH 4 SET
1820 1 005F7 02200000 A LCI 0 YES
1821 1 005F8 2A0007E2 LM,C ZERES
    
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1822                                     PAGE
1823 1 005F9 320007F3 RETURN LW,C I0PDC
1824 1 005FA 721007F9 LB,1 BYTEIN
1825 1 005FB 002007F3 TIB,2 *I0PDC
1826 1 005FC 702007F4 LC CCSET
1827 1 005FD 2E000000 A WAIT WAIT FOR I0P AND D/C ID
1828 1 005FE 350007F3 STW,C I0PDC
1829 1 005FF 751007F2 STB,1 BYTEOUT
1830 1 00600 751007F9 STB,1 BYTEIN
1831 1 00601 02200000 A LCI 0
1832 1 00602 2A0007E2 LM,C ZERES
1833 1 00603 350007F4 STW,C CCSET
1834 1 00604 22900030 A LI,0 X'30'
1835 1 00605 60901200 A WD,0 (1,1**9)
1836 1 00606 60000037 A WD,0 (0,X'37')
1837 1 00607 60000022 A WD,0 (0,X'22')
1838 1 00608 22000000 A RETURN1 LI,0 0
1839 1 00609 350007F8 STW,C INRUPFLG
1840 1 0060A 350007F4 STW,C CCSET
1841 1 0060B 000007F3 TIB,13 *I0PDC
1842 1 0060C 3100003E CW,13 L(6**28)
1843 1 0060D 6940060B ECS,4 *-2
1844 1 0060E 60000000 A RD,C 0
1845 1 0060F 69800612 BCS,8 *-3
1846 1 00610 6AF00626 FAL,15 BUTPUT
1847 1 00611 68000613 E *-2
1848 1 00612 6AF0062F BAL,15 INPUT
1849 1 00613 328007F5 LW,8 DELAY
1850 1 00614 358007F6 STW,8 COUNTER
1851 1 00615 22801040 A LI,8 X'1040'
1852 1 00616 60801200 A WD,8 (1,X'200')
1853 1 00617 60800024 A WD,8 (0,X'024')
1854 1 00618 328007F6 LW,8 COUNTER
1855 1 00619 69300618 BCS,3 *-1
1856 1 0061A 22801040 A LI,8 X'1040'
1857 1 0061B 60801100 A WD,8 (1,X'100')
1858 1 0061C 328007F8 LW,8 INRUPFLG
    
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1859	1	0061D	68300A21	BCR,3	TIMERR	
1860	1	0061E	6CC00000 A	RD,C	0	SENSE SWITCH 2
1861	1	0061F	69400608	BCS,4	RETURN1	
1862	1	00620	680005F9	B	RETURN	STEP OPERATION

1863					PAGE	
1864	1	00621	3290083F	TIMERR	LW,9	L(1**28)
1865	1	00622	479007F4		STS,9	CCSET
1866	1	00623	32900840		LW,9	L(X'20')
1867	1	00624	60901100 A		WD,9	(1,1**8)
1868	1	00625	680005F9		B	RETURN
1869				*		
1870	1	00626	220003E1	OUTPUT	LI,0	DA(C9MPR05)
1871	1	00627	CC2007F3		SI0,2	*I0PDC
1872	1	00628	69C0062A		BCS,12	*+2
1873	1	00629	E800000F A		B	*15
1874				*		
1875	1	0062A	32900841	STATER	LW,9	L(1**29)
1876	1	0062B	479007F4		STS,9	CCSET
1877	1	0062C	32900840		LW,9	L(X'20')
1878	1	0062D	60901100 A		WD,9	(1,1**8)
1879	1	0062E	680005F9		B	RETURN
1880				*		
1881	1	0062F	220003E2	INPUT	LI,0	DA(C9MPR06)
1882	1	00630	CC2007F3		SI0,2	*I0PDC
1883	1	00631	69C0062A		BCS,12	STATER
1884	1	00632	2E000000 A		WAIT	
1885	1	00633	E800000F A		B	*15
1886				*		

BRANCH FOR ERROR

			PAGE		
1887					
1888	1 0063+	329003+2	WATCHDOG	LW,9	L(8**28)
1889	1 00633	479007F4		STS,9	CCSET
1890	1 00636	32600796		LW,6	PSDW07
1891	1 00637	22900020 A	DISABLE	LI,9	X'20'
1892	1 00638	60901100 A		WD,9	(1,1**8)
1893	1 00639	640005F9		B	RETURN
1894			*		
1895	1 0063A	22900001 A	IBINT	LI,9	1
1896	1 0063B	300007F8		STW,9	INRUPFLG
1897	1 0063C	6F400000 A		AT0,4	0
1898	1 0063D	32900843		LW,9	L(1**19)
1899	1 0063E	3190000+ A		CW,9	4
1900	1 0063F	69+00641		BCS,4	*+2
1901	1 00640	0E30079A		LPSD,3	PSDW09
1902	1 00641	32900844		LW,9	L(4**28)
1903	1 00642	479007F4		STS,9	CCSET
1904	1 00643	0E20079A		LPSD,2	PSDW09
1905			*		
1906	1 00644	0E3007A4	CONSOLE	LPSD,3	PSDW11+2
1907			*		
1908	1 00645	22900000 A	CTRINT	LI,9	0
1909	1 00646	359007F6		STW,9	COUNTER
1910	1 00647	0E2007A4		LPSD,2	PSDW15

			PAGE		
1911					
1912			*		
1913	1 00648		BRND		4
1914			*		
1915			*		
1916	1 00648	40000000 A	DATA		4**28
1917			*		
1918			*		
1919	1 00649	22000000 A	GG00	LI,0	0
1920	1 0064A	C00007F3		TI0,13	*10PDC
1921	1 0064B	74000002 A		STCF	2
1922	1 0064C	CE0007F3		TDV,11	*10PDC
1923	1 0064D	25800061 A		SLS,11	-31
1924	1 0064E	2730000F A		LI,3	X'F'
1925	1 0064F	25200204 A		SCS,2	4
1926	1 00650	25200002 A		SLS,2	2
1927	1 00651	47B00002 A		STS,11	2
1928	1 00652	47200000 A		STS,2	13
1929	1 00653	32A00588		LW,10	P1
1930	1 00654	2270000F A		LI,7	15
1931	1 00655	21A00001 A	GG01	CI,10	1
1932	1 00656	6040065E		BCS,4	0003
1933	1 00657	25A0007F A	GG02	SLS,10	-1
1934	1 00658	33E00007 A		MTW,14	7
1935	1 00659	63100655		BCR,1	0001
1936	1 0065A	33000000 A		MTW,0	0
1937	1 0065B	E830000F A		BCR,3	*15
1938	1 0065C	20F00001 A		AI,15	1
1939	1 0065D	E800000F A		B	*15
1940	1 0065E	323E0664	GG03	LW,3	BITABLE,7
1941	1 0065F	322E0663		LW,2	BITABLE-1,7
1942	1 00660	4820000E A		CS,2	13
1943	1 00661	66300657		BCR,3	0002
1944	1 00662	200FFFFF A		LI,0	-1
1945	1 00663	64000657		B	0002

TAKE PLACEMARKER BRANCH
CHECK BITS
MASK BITS

1946				PAGE	
1947	1 00664	00000000 A	RITABLE	DATA	0
1948	1 00665	00000001 A		DATA	1
1949	1 00666	00000000 A		DATA	0
1950	1 00667	60000000 A		DATA	4**28
1951	1 00668	00000000 A		DATA	0
1952	1 00669	06000000 A		DATA	6**24
1953	1 0066A	00000000 A		DATA	0
1954	1 0066B	08000000 A		DATA	1**27
1955	1 0066C	00000000 A		DATA	0
1956	1 0066D	00000004 A		DATA	1**2
1957	1 0066E	00000000 A		DATA	0
1958	1 0066F	00000008 A		DATA	1**3
1959	1 00670	00000000 A		DATA	0
1960	1 00671	00400000 A		DATA	1**22
1961	1 00672	00000000 A		DATA	0
1962	1 00673	80000000 A		DATA	8**28
1963			*		

1964				PAGE	
1965	1 00674			BEUND	4
1966			*		
1967	1 00674	30000000 A		DATA	3**28
1968	1 00675	40000000 A		DATA	4**28
1969			*		
1970			*		
1971			*		
1972			*		
1973	1 00676	22300007 A	UNIT00	LI,3	7
1974	1 00677	4A300588		LS,3	P1
1975	1 00678	25300008 A		SLS,3	8
1976	1 00679	225000FF A		LI,5	X'FF'
1977	1 0067A	4A400589		LS,4	P2
1978	1 0067B	47400003 A		STS,4	3
1979	1 0067C	353007F3		STW,3	18PDC
1980	1 0067D	E800000F A		B	*15
1981			*		
1982			*		
1983	1 0067E	2200030D	READKEY	LI,0	DA(C0MPR01)
1984	1 0067F	6AE0072B		BAL,14	I0IARM
1985	1 00680	0C0007F3		SI0,0	*18PDC
1986	1 00681	69C006E1		BCS,12	HALTI0
1987	1 00682	2F000000 A		WAIT	
1988	1 00683	6AE006DB		BAL,14	SETLGTH
1989	1 00684	E800000F A		B	*15
1990			*		
1991	1 00685	2200030E	READKEYC	LI,0	DA(C0MPR02)
1992	1 00686	5800067F		B	READKEY+1
1993			*		
1994	1 00687	2200030F	TYPE	LI,0	DA(C0MPR03)
1995	1 00688	6AE0072B		BAL,14	I0IARM
1996	1 00689	0C0007F3		SI0,0	*18PDC
1997	1 0068A	69C006E1		BCS,12	HALTI0
1998	1 0068B	2E000000 A		WAIT	
1999	1 0068C	E800000F A		B	*15
2000			*		

P1-OCTAL-I0P NO.
P2-HEX-D/C NO.

2001	1	0068D	40000000 A		DATA	4**28
2002				*		
2003	1	0068E	220003E0	SIB	LI,0	DA(C0MPRO4)
2004	1	0068F	32300845		LW,3	L(X'FF'***24)
2005	1	00690	32000588		LH,2	P1
2006	1	00691	25200018 A		SLS,2	24
2007	1	00692	472007C0		STS,2	C0MPRO4
2008	1	00693	6AE0072B		BAL,14	I0IARM
2009	1	00694	CC0007F3		SI9,0	*I0PDC
2010	1	00695	67C000E1		BCS,12	HALTI0
2011	1	00696	2E000000 A		WAIT	
2012	1	00697	E800000F A		B	*15
2013				*		
2014	1	00698	40000000 A		DATA	4**28
2015				*		
2016	1	00699	C07007F3	TI0	TI0,7	*I0PDC
2017	1	0069A	74000717		STCF	CCSAV
2018	1	0069B	33000588		MTW,0	P1
2019	1	0069C	E430000F A		BCR,3	*15
2020	1	0069D	35700008 A		STW,7	8
2021	1	0069E	27700004 A		LI,7	4
2022	1	0069F	6AE000CD		BAL,14	HEXALF
2023	1	006A0	6AE006FC		BAL,14	STATUSTY
2024	1	006A1	E3C9D640 A		TEXT	'TI0 '
2025	1	006A2	E800000F A		B	*15
2026				*		
2027	1	006A3	40000J0C A		DATA	4**28
2028				*		
2029	1	006A4	CE7007F3	TDV	TDV,7	*I0PDC
2030	1	006A5	74000717		STCF	CCSAV
2031	1	006A6	33000588		MTW,0	P1
2032	1	006A7	E430000F A		BCR,3	*15
2033	1	006A8	35700008 A		STW,7	8
2034	1	006A9	27700004 A		LI,7	4
2035	1	006AA	6AE000CD		BAL,14	HEXALF
2036	1	006AB	6AE006FC		BAL,14	STATUSTY
2037	1	006AC	E3C4E040 A		TEXT	CITDV '

2038	1	006AC	E800000F A		B	*15
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			PAGE		
2039					
2040					
2041	:	006AE	02200000 A	* I0INTRPT	LCI 0
2042	:	006AF	2B0007CE		STM,0 TEMPSAV
2043	:	006BC	6E800000 A		AI0,8 0
2044	:	006B1	74000717		STCF CCSAV
2045	:	006B2	32500843		LW,5 L(1**19)
2046	:	006B3	31500008 A		CW,5 8
2047	:	006B4	69400688		BCS,4 **4
2048	:	006B5	02200000 A		LCI 0
2049	:	006B6	2ACC07CE		LM,0 TEMPSAV
2050	:	006B7	0E3007A6		LPSC,3 PSDW12
2051	:	006B8	2E500000 A		LI,5 X'20'
2052	:	006B9	60801100 A		WD,5 (1,1**8)
2053	:	006EA	0E3007AC		LPSC,3 PSDW14
2054	:	006EB	E405E4E2 A	TEXT01	TEXT 'UNUSUAL CONDITION INTERRUPT '
	:	006EC	E4C1D840 A		
	:	006ED	C5D6D0C4 A		
	:	006EE	C9E3C9D6 A		
	:	006EF	754009D5 A		
	:	006F0	E3C5D9D9 A		
	:	006F1	E4D7E840 A		
2055	:	006F2	101C1AEC A	TYPEWD02	ZFM, 1,0,28,BA(TEXT01)
2056	:	006F3	3E0004C2	I0ICLEAR	LW,12 TYPEWD02
2057	:	006F4	02200000 A		LCI 5
2058	:	006F5	6AF004C0		BAL,15 TYPE0
2059	:	006F6	227000C4 A		LI,7 4
2060	:	006F7	6AE008CD		BAL,14 HEXALF
2061	:	006F8	6AE006FC		BAL,14 STATUSTY
2062	:	006F9	C1C9D640 A		TEXT 'AI0 '
2063	:	006FA	02200000 A		LCI 0
2064	:	006FB	2ACC07CE		LM,0 TEMPSAV
2065	:	006FC	0E0007A6		LPSC,0 PSDW12

				PAGE	
2066					
2067					
2068	:	006CD	32900846	* HEXALF	LW,9 L(X'F')
2069	:	006CE	32300847		LW,11 L(X'40404040')
2070	:	006CF	32A00847		LW,10 L(X'40404040')
2071	:	006D0	47800008 A	NXTH2A	STS,8 11
2072	:	006D1	25A00378 A		SCD,10 -8
2073	:	006D2	45800848		CS,8 L(X'9')
2074	:	006D3	692006D8		BCS,2 GRTH9
2075	:	006D4	49A00849		BR,10 L(X'F'**28)
2076	:	006D5	2580007C A	STNXTH	SLS,8 -4
2077	:	006D6	647C0E20		BDR,7 NXTH2A
2078	:	006D7	E800000E A		B *14
2079	:	006D8	38A0094A	GRTH9	SW,10 L(X'9'**24)
2080	:	006D9	49A0094B		BR,10 L(0)
2081	:	006DA	680006D5		B STNXTH
2082					
2083					
2084	:	006DB	0D3007F3	* SETLGTH	TI0,3 *19PDC
2085	:	006DC	4830084C		E0R,3 L(X'FF')
2086	:	006DD	35300002 A		STW,3 2
2087	:	006DE	223000FF A		LI,3 X'FF'
2088	:	006DF	472007BF		STS,2 C0MPRO3+1
2089	:	006E0	5800000E A		B *14
2090					

2091				PAGE	
2092	1 006E1	3310000F A	HALT10	MTW,1	15
2093	1 006E2	02200000 A		LCI	0
2094	1 006E3	280007CE		STM,0	TEMPSAV
2095	1 006E4	CF7007F3		H10,7	*10PDC
2096	1 006E5	74000717		STCF	CCSAV
2097	1 006E6	E640000F A		BCR,4	*15
2098	1 006E7	22900020 A		LI,9	X'20'
2099	1 006E8	6D901100 A		WD,9	(1,1**8)
2100	1 006E9	32C006F4		LW,12	TYPEWDC3
2101	1 006EA	02200050 A		LCI	5
2102	1 006EB	6AF004C0		BAL,15	TYPE0
2103	1 006EC	35700008 A		STW,7	8
2104	1 006ED	22700004 A		LI,7	4
2105	1 006EE	6AE006CD		BAL,14	HEXALF
2106	1 006EF	6AE006FC		BAL,14	STATUSTY
2107	1 006F0	C3C90640 A		TEXT	'H10 '
2108	1 006F1	02200000 A		LCI	0
2109	1 006F2	2AC007CE		LM,0	TEMPSAV
2110	1 006F3	E8C0000F A		B	*15
2111	1 006F4	101C1B04 A	TYPEW03	ZFMW	1,0,28,8A(TEXT02)
2112	1 006F5	E2C90640 A	TEXT02	TEXT	'S10 UNSUCCESSFUL-H10 ISSUED '
	1 006F6	E4D5E2E4 A			
	1 006F7	C3C3C5E2 A			
	1 006F8	E2C6E4D3 A			
	1 006F9	60C8C9D6 A			
	1 006FA	40C9E2E2 A			
	1 006FB	E4C5C440 A			

2113				PAGE	
2114			RETURNX	EQU	RETSAV+1
2115	1 006FC	35F0070E	STATUSTY	STW,15	RETSAV
2116	1 006FD	35E0070F		STW,14	RETSAV+1
2117	1 006FE	3310070F		MTW,1	RETSAV+1
2118	1 006FF	B2D0000E A		LW,13	*14
2119	1 00700	35D0053A		STW,13	P3
2120	1 00701	02200020 A		LCI	2
2121	1 00702	2AC007E0		LM,12	STATMSG
2122	1 00703	28C0058B		STM,12	P4
2123	1 00704	35A0058D		STW,10	P6
2124	1 00705	35B0058E		STW,11	P7
2125	1 00706	72800717		LB,8	CCSAV
2126	1 00707	2580007C A		SLS,8	*4
2127	1 00708	22700001 A		LI,7	1
2128	1 00709	6AE006CD		BAL,14	HEXALF
2129	1 0070A	25AC0068 A		SLS,10	*24
2130	1 0070B	49A00716		BR,10	TEXT03
2131	1 0070C	35A0058F		STW,10	P8
2132	1 0070D	32C00715		LW,12	TYPEWDC1
2133	1 0070E	02200050 A		LCI	5
2134	1 0070F	6AF004C0		BAL,15	TYPE0
2135	1 00710	32C00718		LW,12	TYPEWDC4
2136	1 00711	02200050 A		LCI	5
2137	1 00712	6AF004C0		BAL,15	TYPE0
2138	1 00713	32F0070E		LW,15	RETSAV
2139	1 00714	E8C0000F A		B	*RETURNX
2140	1 004C0		TYPE0	EQU	ZTWLP
2141	1 00715	10181628 A	TYPEW01	ZFMW	1,0,24,8A(P3)
2142	1 00716	C3C37E00 A	TEXT03	DATA	C'CC=']
2143	1 00717	00000000 A	CCSAV	DATA	0
2144	1 00718	00041064 A	TYPEW04	ZFMW	0,0,4,8A(SPCR)
2145	1 00719	40404015 A	SPCR	DATA	C']'

2146				PAGE	
2147	1 0071A	64E0072B	ECHO	BAL,14	I0IARM
2148	1 0071B	220003E3		LI,0	DA(C0MPRO7)
2149	1 0071C	CC0007F3		SI0,0	*I0PDC
2150	1 0071D	69CC06E1		BCS,12	HALTI0
2151	1 0071E	2F000000 A		WAIT	
2152	1 0071F	220003E4		LI,0	DA(C0MPRO8)
2153	1 00720	CC0007F3		SI0,0	*I0PDC
2154	1 00721	69CC06E1		BCS,12	HALTI0
2155	1 00722	2F000000 A		WAIT	
2156	1 00723	E80000CF A		B	*15
2157			*		
2158	1 00724	32A007E5	KSRALTB	LW,10	XPSD10
2159	1 00725	35A0005D A		STW,10	X'15D'
2160	1 00726	32A007E6		LW,10	XPSD11
2161	1 00727	35A00046 A		STW,10	X'146'
2162	1 00728	32A007E7		LW,10	XPSD12
2163	1 00729	35A0005C A		STW,10	X'15C'
2164	1 0072A	68000183		B	ZPC010
2165			*		
2166	1 0072B	22D00020 A	I0IARM	LI,13	X'120'
2167	1 0072C	60D01200 A		WD,13	(1,1**3)
2168	1 0072D	60D00037 A		WD,0	(0,X'137')
2169	1 0072E	60D00022 A		WD,0	(0,X'122')
2170	1 0072F	E800000E A		B	*14
2171			*		
2172	1 00730	6AE0072B	C0MCHAIN	BAL,14	I0IARM
2173	1 00731	220003E5		LI,0	DA(C0MPRO9)
2174	1 00732	CC0007F3		SI0,0	*I0PDC
2175	1 00733	69CC06E1		BCS,12	HALTI0
2176	1 00734	2E000000 A		WAIT	
2177	1 00735	E80000CF A		B	*15
2178			*		

2179				PAGE	
2180			*	SIGMA ASR COMPATIBILITY TEST ROUTINE	
2181	1 00736	20000000 A		DATA	X'20000000',X'40000000',X'40000000'
	1 00737	40000000 A			
	1 00738	40000000 A			
2182	1 00739	40000000 A		DATA	X'40000000',X'40000000'
	1 0073A	40000000 A			
2183	1 0073B	5EF20779	ASR35	STH,15	ASRLINK,1
2184	1 0073C	22B000FF A		LI,11	X'FF'
2185	1 0073D	48B00588		AND,11	P1
2186	1 0073E	69200740		BCS,2	*+2
2187	1 0073F	22B00001 A		LI,11	1
2188	1 00740	35B0078B		STW,11	LIST+1
2189	1 00741	35B0078D		STW,11	LIST+3
2190	1 00742	35B0078F		STW,11	LIST+5
2191	1 00743	35B00791		STW,11	LIST+7
2192	1 00744	22D00003 A		LI,13	X'08'
2193	1 00745	75D00791		STB,13	LIST+7
2194	1 00746	22900028 A		LI,9	X'28'
2195	1 00747	32800589		LW,8	P2
2196	1 00748	7580078A		STB,8	LIST
2197	1 00749	3280058A		LW,8	P3
2198	1 0074A	68300756		BCR,3	ASRG01
2199	1 0074B	75900783		STB,9	LIST+1
2200	1 0074C	7580078C		STB,8	LIST+2
2201	1 0074D	3280058B		LW,8	P4
2202	1 0074E	68300758		BCR,3	ASRG02
2203	1 0074F	7590078D		STB,9	LIST+3
2204	1 00750	7580078E		STB,8	LIST+4
2205	1 00751	3280058C		LW,8	P5
2206	1 00752	6830075A		BCR,3	ASRG03
2207	1 00753	7590078F		STB,9	LIST+5
2208	1 00754	75800790		STB,8	LIST+6
2209	1 00755	68000758		B	ASRTEST
2210	1 00756	75D00783	ASRG01	STB,13	LIST+1
2211	1 00757	68000758		B	ASRTEST
2212	1 00758	75D00783	ASRG02	STB,13	LIST+3

2213	1 00759	6800073B		B	ASRTEST	
2214	1 0075A	7500073F	ASRG03	STB,13	LIST*5	SET HTE IN 3RD CP
2215	1 0075B	220003C5	ASRTEST	LI,0	DA(LIST)	
2216	1 0075C	008007F3		TIO,8	*UNIT	
2217	1 0075D	6900075C		BCS,12	*-1	
2218	1 0075E	CC8007F3		SIO,8	*UNIT	
2219	1 0075F	6900075E		BCS,12	*-1	
2220	1 00760	008007F3		TIO,8	*UNIT	
2221	1 00761	69000760		BCS,12	*-1	
2222	1 00762	CEA007F3		TDV,10	*UNIT	
2223	1 00763	31900792		CW,9	MASK1	
2224	1 00764	52400768		BCS,4	ASRERR0R	ERROR
2225	1 00765	31900793		CW,11	MASK2	
2226	1 00766	69400768		BCS,4	ASRERR0R	ERROR
2227	1 00767	E8000779	ASRSUCC	B	*ASRLINK	SUCCESS RETURN TO DCP
2228	1 00768	32C00009 A	ASRERR0R	LW,12	9	
2229	1 00769	6AF003F6		BAL,15	ZBTH	CONVERT TIO RESPONSE FOR PRINT
2230	1 0076A	35000781		STW,12	ASRMSG+6	
2231	1 0076B	35000782		STW,13	ASRMSG+7	
2232	1 0076C	32C0000B A		LW,12	11	
2233	1 0076D	6AF003F6		BAL,15	ZBTH	CONVERT TDV RESPONSE FOR PRINT
2234	1 0076E	35000785		STW,12	ASRMSG+10	
2235	1 0076F	35000786		STW,13	ASRMSG+11	
2236	1 00770	25300001 A		SLS,8	1	SET DEVICE ORDER
2237	1 00771	B2C00008 A		LW,12	*8	
2238	1 00772	25C00008 A		SCS,12	8	
2239	1 00773	6AF003F6		BAL,15	ZBTH	CONVERT ORDER FOR PRINT
2240	1 00774	55000789		STH,13	ASRMSG+14	
2241	1 00775	32C0077A		LW,12	ASRMGCT	
2242	1 00776	02200000 A		LCI	13	
2243	1 00777	6AF004C0		BAL,15	ZTWLP	PRINTOUT ERROR MESSAGE
2244	1 00778	E4000779		B	*ASRLINK	RETURN TO DCP
2245	1 00779	00000000 A	ASRLINK	DATA	0	
2246	1 0077A	103C10EC A	ASRMGCT	ZFMW	1,0,60,BA(ASRMSG)	
2247	1 0077B	C1E2D940 A	ASRMSG	TEXT	*ASR C9MPAT ERR0R	TIO=XXXXXXXX TDV=XXXXXXXX'
	1 0077C	C306D4D7 A				
	1 0077D	C1E340C5 A				

	1 0077E	0909D609 A				
	1 0077F	40404040 A				
	1 00780	E3C9D57E A				
	1 00781	E7E7E7E7 A				
	1 00782	E7E7E7E7 A				
	1 00783	40404040 A				
	1 00784	E3C4E57E A				
	1 00785	F7E7E7E7 A				
	1 00786	E7E7E7E7 A				
2248	1 00787	4040D609 A		TEXT	' ORDER=XX '	
	1 00788	C4C5D97E A				
	1 00789	E7E74040 A				
2249	1 0078A			B0UND	8	
2250	1 0078A	00001FE4	LIST	DATA	BA(BUFFER)	1ST CP
2251	1 0078B	00000000 A		DATA	0	
2252	1 0078C	00001FE4		DATA	BA(BUFFER)	2ND CP
2253	1 0078D	00000000 A		DATA	0	
2254	1 0078E	00001FE4		DATA	BA(BUFFER)	3RD CP
2255	1 0078F	00000000 A		DATA	0	
2256	1 00790	00001FE4		DATA	BA(BUFFER)	4TH CP
2257	1 00791	00000000 A		DATA	0	
2258	1 00792	6EFE0000 A	MASK1	DATA	X'6EFE0000'	FOR TESTING SIO STATUS
2259	1 00793	18000000 A	MASK2	DATA	X'18000000'	FOR TESTING TDV STATUS
2260			BUFFFR	EGU	I8BUFF	
2261			UNIT	EGU	I9PDC	

2262				PAGE			
2263	1	00794		BBOUND	8		
2264	1	00794	000005E9	PSDW01	DATA	BEGINKSR+1	
2265	1	00795	05000000 A		DATA	5**24	
2266	1	00796	00000000 A	PSDW07	DATA	0,0,WATCHDBG,5**24	
	1	00797	00000000 A				
	1	00798	00000634				
	1	00799	05000000 A				
2267	1	0079A	00000000 A	PSDW09	DATA	0,0,I0INT,5**24	
	1	0079B	00000000 A				
	1	0079C	0000063A				
	1	0079D	05000000 A				
2268	1	0079E	00000000 A	PSDW10	DATA	0,0,C0N50LE,5**24	
	1	0079F	00000000 A				
	1	007A0	00000644				
	1	007A1	05000000 A				
2269	1	007A2	00000000 A	PSDW11	DATA	0,0,RESTART,5**24	
	1	007A3	00000000 A				
	1	007A4	000005F5				
	1	007A5	05000000 A				
2270	1	007A6	00000000 A	PSDW12	DATA	0,0,I0INTRPT,5**24	
	1	007A7	00000000 A				
	1	007A8	000006AE				
	1	007A9	05000000 A				
2271	1	007AA	000005F9	PSDW13	DATA	RETURN,5**24	
	1	007AB	05000000 A				
2272	1	007AC	000006C3	PSDW14	DATA	I0ICLEAR,5**24	
	1	007AD	05000000 A				
2273	1	007AE	00000000 A	PSDW15	DATA	0,0,CTRINT,0	
	1	007AF	00000000 A				
	1	007E0	00000645				
	1	007E1	00000000 A				
2274	1	007E2	0F000756	XPSD06	XPSD,0	PSDW07	WATCHDBG TIMER
2275	1	007E3	0F00079A	XPSD08	XPSD,0	PSDW09	I/O INTERRUPT
2276	1	007E4	0F00079F	XPSD09	XPSD,0	PSDW10	CONSOLE INTERRUPT
2277	1	007E5	0F000154	XPSD10	XPSD,0	ZI5D	
2278	1	007E6	0F00014C	XPSD11	XPSD,0	ZT46	

2279	1	007E7	0F0007A6	XPSD12	XPSD,0	PSDW12	
2280	1	007E8	0F0007AE	XPSD13	XPSD,0	PSDW15	

2281				PAGE	
2282	1 007EA			BOUND	8
2283	1 007EA	06001FE4	COMPR01	GEN,8,24	X'06',BA(I0BUFF)
2284	1 007EB	140000FF A		GEN,8,24	X'14',255
2285	1 007EC	26001FE4	COMPR02	GEN,8,24	X'86',BA(I0BUFF)
2286	1 007ED	140000FF A		GEN,8,24	X'14',255
2287	1 007EE	05001FE4	COMPR03	GEN,8,24	X'05',BA(I0BUFF)
2288	1 007EF	140000FF A		GEN,8,24	X'14',255
2289	1 007F0	00001FE4	COMPR04	GEN,8,24	0,BA(I0BUFF)
2290	1 007F1	14000001 A		GEN,8,24	X'14',1
2291	1 007F2	03001FC5	COMPR05	GEN,8,24	X'05',BA(BYTE0UT)
2292	1 007F3	14000001 A		GEN,8,24	X'14',1
2293	1 007F4	06001FE4	COMPR06	GEN,8,24	X'06',BA(BYTEIN)
2294	1 007F5	14000001 A		GEN,8,24	X'14',1
2295	1 007F6	06001FE4	COMPR07	GEN,8,24	X'06',BA(BYTEIN)
2296	1 007F7	14000001 A		GEN,8,24	X'14',1
2297	1 007F8	05001FE4	COMPR08	GEN,8,24	X'05',BA(BYTEIN)
2298	1 007F9	14000001 A		GEN,8,24	X'14',1
2299	1 007FA	05001FE4	COMPR09	GEN,8,24	X'05',BA(BYTEIN)
2300	1 007FB	20000001 A		GEN,8,24	X'20',1
2301	1 007FC	05001FE4	COMPR10	GEN,8,24	X'05',BA(BYTEIN)
2302	1 007FD	14000001 A		GEN,8,24	X'14',1

2303				PAGE	
2304	1 007CF			BOUND	8
2305	1 007CE	00000000 A	TEMPSAV	DATA	0,0,0,0,0,0,0,0
	1 007CF	00000000 A			
	1 007D0	00000000 A			
	1 007D1	00000000 A			
	1 007D2	00000000 A			
	1 007D3	00000000 A			
	1 007D4	00000000 A			
	1 007D5	00000000 A			
2306	1 007D6	00000000 A		DATA	0,0,0,0,0,0,0,0
	1 007D7	00000000 A			
	1 007D8	00000000 A			
	1 007D9	00000000 A			
	1 007DA	00000000 A			
	1 007DB	00000000 A			
	1 007DC	00000000 A			
	1 007DD	00000000 A			
2307	1 007DE	00000000 A	RETSAV	DATA	0,0
	1 007DF	00000000 A			
2308	1 007E0	E2E3C1E3 A	STATMSG	TEXT	'STATUS #'
	1 007E1	E4E2437E A			
2309	1 007E2			BOUND	8
2310	1 007E2	00000000 A	ZER0S	DATA	0,0,0,0,0,0,0,0
	1 007E3	00000000 A			
	1 007E4	00000000 A			
	1 007E5	00000000 A			
	1 007E6	00000000 A			
	1 007E7	00000000 A			
	1 007E8	00000000 A			
	1 007E9	00000000 A			
2311	1 007EA	00000000 A		DATA	0,0,0,0,0,0,0,0
	1 007EB	00000000 A			
	1 007EC	00000000 A			
	1 007ED	00000000 A			
	1 007EE	00000000 A			
	1 007EF	00000000 A			

1	007F0	00000000	A			
1	007F1	00000000	A			
2312	1	007F2	00000000	A	BYTEOUT	DATA 0
2313					BYTEIN	EQU I8RUFF
2314	1	007F3	00000001	A	ISPCD	DATA 1
2315	1	007F4	00000000	A	CCSET	DATA 0
2316	1	007F5	00000032	A	DELAY	DATA 50
2317	1	007F6	00000000	A	CBUNTER	DATA 0
2318	1	007F7	33F007F6	A	MTWI	MTW,15 *-1
2319	1	007F8	00000000	A	INRUFFLG	DATA 0
2320	1	007F9			BBOUND	4
2321		1	007F9		I8RUFF	EQU *
2322		00000000			DB	8
2323	1	007FA	00000000	A	DATA	0,0,0,0,0,0,0,0
	1	007FB	00000000	A		
	1	007FC	00000000	A		
	1	007FD	00000000	A		
	1	007FE	00000000	A		
	1	007FF	00000000	A		
	1	00800	00000000	A		
2324					FIN	
2323	1	00801	00000000	A	DATA	0,0,0,0,0,0,0,0
	1	00802	00000000	A		
	1	00803	00000000	A		
	1	00804	00000000	A		
	1	00805	00000000	A		
	1	00806	00000000	A		
	1	00807	00000000	A		
	1	00808	00000000	A		
2324					FIN	
2323	1	00809	00000000	A	DATA	0,0,0,0,0,0,0,0
	1	0080A	00000000	A		
	1	0080B	00000000	A		
	1	0080C	00000000	A		
	1	0080D	00000000	A		
	1	0080E	00000000	A		

1	0080F	00000000	A			
1	00810	00000000	A			
2324					FIN	
2323	1	00811	00000000	A	DATA	0,0,0,0,0,0,0,0
	1	00812	00000000	A		
	1	00813	00000000	A		
	1	00814	00000000	A		
	1	00815	00000000	A		
	1	00816	00000000	A		
	1	00817	00000000	A		
	1	00818	00000000	A		
2324					FIN	
2323	1	00819	00000000	A	DATA	0,0,0,0,0,0,0,0
	1	0081A	00000000	A		
	1	0081B	00000000	A		
	1	0081C	00000000	A		
	1	0081D	00000000	A		
	1	0081E	00000000	A		
	1	0081F	00000000	A		
	1	00820	00000000	A		
2324					FIN	
2323	1	00821	00000000	A	DATA	0,0,0,0,0,0,0,0
	1	00822	00000000	A		
	1	00823	00000000	A		
	1	00824	00000000	A		
	1	00825	00000000	A		
	1	00826	00000000	A		
	1	00827	00000000	A		
	1	00828	00000000	A		
2324					FIN	
2323	1	00829	00000000	A	DATA	0,0,0,0,0,0,0,0
	1	0082A	00000000	A		
	1	0082B	00000000	A		
	1	0082C	00000000	A		
	1	0082D	00000000	A		
	1	0082E	00000000	A		
	1	0082F	00000000	A		

2324 1 00830 00000000 A
 2323 1 00831 00000000 A
 1 00832 00000000 A
 1 00833 00000000 A
 1 00834 00000000 A
 1 00835 00000000 A
 1 00836 00000000 A
 1 00837 00000000 A
 1 00838 00000000 A

FIN
 DATA 0,0,0,0,0,0,0,0

2324 1 0083A
 2325 1 0083A 0000089E
 2326 1 0083A
 2327 1 0083A
 1 0083B F0F0F0F0 A
 1 0083C FF00FF00 A
 1 0083D 0000000A A
 1 0083E 60000000 A
 1 0083F 10000000 A
 1 00840 00000020 A
 1 00841 20000000 A
 1 00842 80000000 A
 1 00843 00050000 A
 1 00844 40000000 A
 1 00845 FF000000 A
 1 00846 0000000F A
 1 00847 40404040 A
 1 00848 00000000 A
 1 00849 F0000000 A
 1 0084A 00000000 A
 1 0084B 00000000 A
 1 0084C 000000FF A

ZEXADR
 FIN
 BOUND 8
 DATA \$+100
 END ZCMS



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