

XDS 901540C
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DIAGNOSTIC PROGRAM MANUAL
SIGMA 5 AND 7
EXTENDED PERFORMANCE
RAPID ACCESS DATA (RAD) FILE
PROGRAM NO. 704978C

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RELATED PUBLICATIONS

<u>Publication Title</u>	<u>Publication No.</u>
XDS Sigma 7 Computer, Reference Manual	900950
XDS Sigma 5 Computer, Reference Manual	900959
Sigma 7 Computer, Technical Manual	901060
Sigma 5 Computer, Technical Manual	901172
Diagnostic Control Program for Sigma 5 and Sigma 7 Peripheral Devices, Reference Manual	900712
Sigma 5 and 7 Relocatable Diagnostic Program Loader, Diagnostic Program Manual	900972
Rapid Access Data (RAD) File Model 7231/7232, Technical Manual	901565
XDS Sigma Symbol and Meta-Symbol, Reference Manual	900952

SECTION I INTRODUCTION

1-1 SCOPE OF MANUAL

This manual describes a flexible and comprehensive test program for the Sigma 5/7 Extended Performance Rapid Access Data (RAD) File, model numbers 7231/7232.

This manual is made up of five sections. Section I is a general introduction to the test program. Section II contains a complete operating procedure and a description of each test subroutine. Section III describes in detail the individual tests. Section IV contains a complete program listing. Section V contains the concordance listing.

1-2 PROGRAM OBJECTIVES

The Sigma 5/7 Extended Performance RAD Test Program, Catalog No. 704978, consists of a collection of closed subroutines designed to operate under the executive control of the Sigma 5/7 Diagnostic Control Program (DCP), Reference Manual 900712. Most of these subroutines can be activated by the DCP in any combination or sequence specified by the user through the input of a syntax test language.

The reader is referred to the DCP Reference Manual for a detailed explanation of the test language and its use.

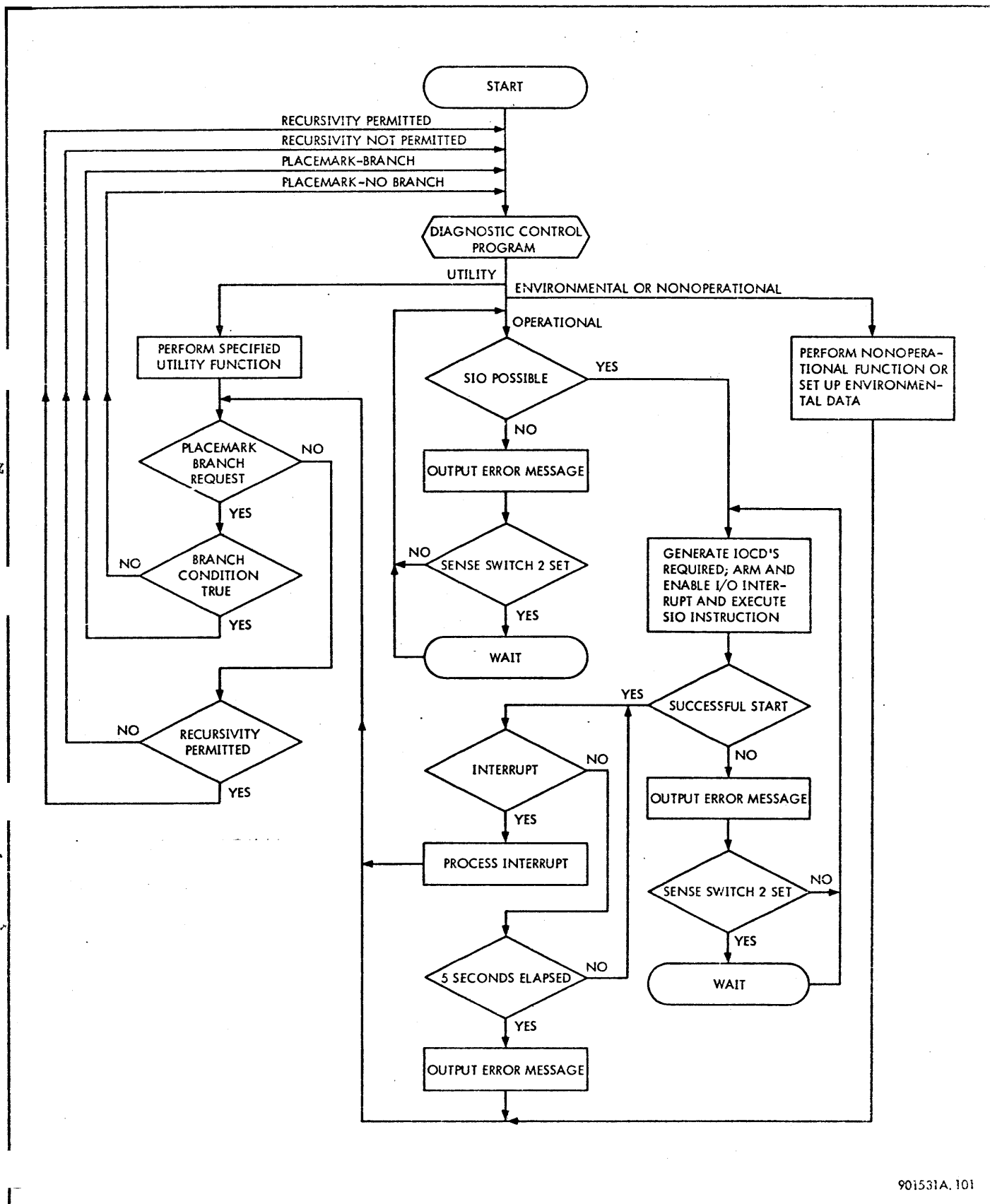
The test routines are of three different categories: environmental, operational, and utility. The environmental routines are used to establish the operating environment by supplying the program with the addresses of the available units, the desired track and sector address, the type pattern, the record length, etc. The operational routines are those that actually execute the different orders such as READ, WRT, SEEK, and those that affect the operations of order, such as the delay routine, the error report routine, the counter control routine and the stop routine. The utility routines do not relate directly to the actual program. They perform such functions as dumping sections of core and altering locations of core. (See the DCP manual.) Figure 1-1 is a general flow chart of the test program; figure 1-2 is a detailed flow chart.

1-3 GENERAL SPECIFICATIONS

General specifications for this program are listed in table 1-1.

Table 1-1. General Specifications

Computer configuration:	Sigma 5 or Sigma 7 computer with minimum of 8K memory
Required equipment:	Keyboard printer RAD Device Controller Model No. 7231 RAD Storage Unit Model No. 7232
Optional equipment:	Card reader and line printer
Storage:	4057 ₁₀ words from 40 ₁₆ to 1018 ₁₆
Source language:	XDS Metasymbol
Prerequisites:	The RAD controller and storage unit must conform to Equipment Design Specification, Drawing No. 139578A
Program media:	Self-loading paper tape or cards



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Figure 1-1. Extended Performance RAD File Test, General Flow Chart

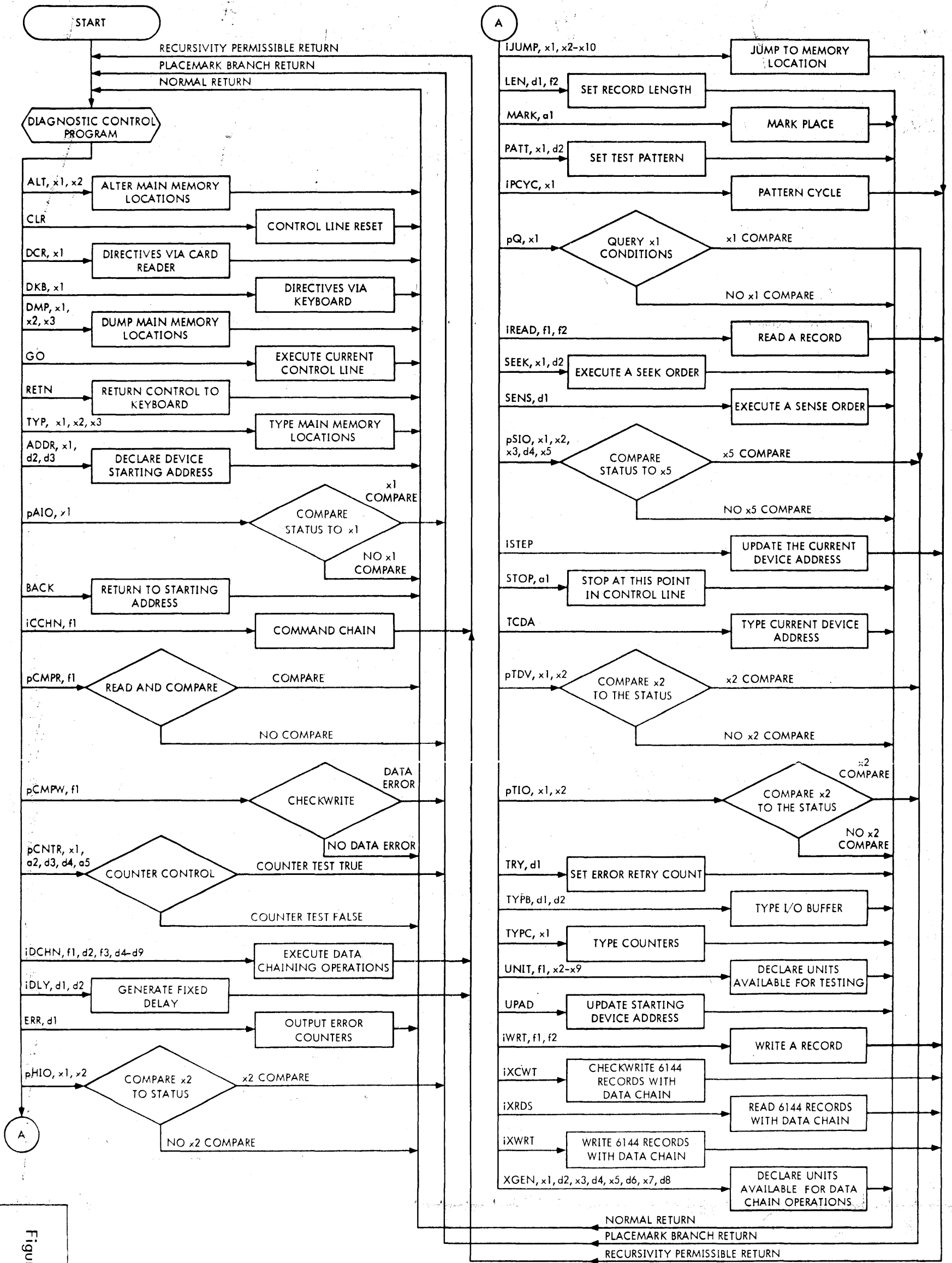


Figure 1-2. Extended Performance RAD File Test, Detailed Flow Chart

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SECTION II OPERATING INSTRUCTIONS

2-1 PROGRAM LOADING PROCEDURE

The test program uses the Sigma 5/7 Relocatable Diagnostic Program Loader, Catalog No. 704356, which is supplied with the object program media. (See XDS Manual 900972 for a detailed loading procedure.)

2-2 LOADER SUCCESS/ERROR INDICATIONS

A successful load operation is indicated by the following printout on the keyboard printer:

```
SIGMA 5/7 EXTENDED PERFORMANCE RAD TEST 704978B00 MANUAL 901540B
5
```

An unsuccessful load operation may result in a program wait or loop. (See XDS Manual 900972).

2-3 PROGRAM OPERATING PROCEDURE

2-4 CONSOLE SENSE SWITCH OPTIONS

Table 2-1 contains a listing of console sense switch options.

2-5 REGAINING OPERATOR CONTROL

Three methods are available for regaining program control:

a. Setting SENSE switch 1 during the running of the program.

b. Pressing the console INTERRUPT pushbutton will return control to the keyboard printer.

c. Setting the console COMPUTE switch to IDLE, pressing the CPU RESET pushbutton, and then setting the COMPUTE switch to RUN.

2-6 TEST LANGUAGE OPTIONS

The test program operates under the executive control of the DCP. Communication between the user and the DCP is provided through the use of a syntax test language. The procedure for using the test language is described in detail in the DCP reference manual. The following paragraphs include information unique to the extended performance RAD test language and are intended to supplement the DCP manual.

2-7 Definitions of Terms and Symbols

Table 2-2 contains definitions of the terms and symbols used in describing the test language.

2-8 Directives

Table 2-3 contains a glossary of the test language directives unique to the extended performance RAD test program.

Table 2-1. SENSE Switch Options

Switch	States	Function
1	OFF	Cycle repetitively through an input test language control line
1	ON	Terminate execution of the current test language control line and return to the input media for new control options
2	OFF	Do not halt on any errors
2	ON	Halt after "SIO NOT POSS", "UNSUCC START", or "COUPLER ERROR" message output
3	OFF	During execution of the read compare function, output all failing words and allow bit summary message
3	ON	During the read compare function, output only the first failing word of a record and inhibit the bit summary message
4	OFF	Output all messages which are at the same level or higher than the present message level key to the selected output device (see SMD and SML directives, DCP Reference Manual)
4	ON	Suppress low priority messages (see DCP Reference Manual)

Table 2-2. Definitions of Test Language Terms and Symbols

Symbol	Column Location in Test Language Glossary, Table 2-3	Explanation
i	Format	Iteration count for recursive operation may range from 1 to 9999. Always optional. If not specified, a value of 1 is assumed
p	Format	Place marker identification number for test-type operations. Refer to DCP manual for explanations of place marker use
a	Format, Parameter Identification Code	An alphabetic character, A through Z
d	Format, Parameter Identification Code	A decimal value using numeric characters 0 through 9
f	Format, Parameter Identification Code	A decimal value using numeric characters 0 through 9. This trailing parameter denotes the setting of a flag
h	Format, Parameter Identification Code	A Hollerith byte string using any alphanumeric or special characters
x	Format, Parameter Identification Code	A hexadecimal value using numerical characters 0 through 9, and alphabetical characters A through F
O	Execution Mode	Optional. The execution mode for all extended performance RAD directives. All directives may be executed in either the immediate or control line mode
O	Parameter Requirement	Optional. Indicates that the input of the respective parameter is not mandatory. If omitted, the value specified under the Standard column of table 2-3 is assumed by the program

MNEMONIC	FUNCTION NAME	FORMAT	EXECUTION MODE	PARAMETERS						
				Identification Code	Definition	Minimum Value	Maximum Value	Standard Value	Requirement	Notes
ADDR	Declare device starting address	ADDR, x1, d2, d3	O	x1	Unit list selection	1	FF		O	1
				d2	Starting track address	0	1023	0	O	
				d3	Starting sector address	0	11	0	O	
AIO	Execute AIO instruction	pAIO, x1	O	x1	Status compare word	0	FFFFC	0	O	2
BACK	Return to starting address	BACK	O		None					
CCHN	Command Chain	iCCHN, f1	O	f1	0 = Read 1 = Write	0	1	0	O	3
CMPR	Read Compare	pCMPR, f1	O	f1	0 = Read all tracks 1 = Skip write protected tracks	0	1	0	O	
CMPW	Write Compare	pCMPW, f1, d2	O	f1	0 = Checkwrite all tracks 1 = Skip write protected tracks	0	1	0	O	4
				d2	0 = I/O buffer address is starting address 1-8 = Contents of counter 1-8 is starting byte address	0	8	0	O	
CNTR	Counter Control	pCNTR, x1, a2, d3, d4, f5	O	x1	Counter selection	0	FFFFF	0	O	5
				a2	Add, subtract, or set counter	0	A or S	0	O	
				d3	Operation value	0	9999	0	O	
				d4	Counter test value	0	9999	0	O	
				f5	Counter output control	0	1	0	O	
DCHN	Data Chain	iDCHN, f1, d2, f3, d4-d9	O	f1	0 = Read, 1 = Write	0	1	0	O	
				d2	Number of times Data Chain is to be done	1	30	6	O	
				f3	IZC flag control	0	1	0	O	
				d4-d9	Byte counts	1	65535	1024	O	

Table 2-3. Extended Performance RAD Test Language Glossary

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(Continued)

MNEMONIC	FUNCTION NAME	FORMAT	EXECUTION MODE	PARAMETERS						
				Identification Code	Definition	Minimum Value	Maximum Value	Standard Value	Requirement	Notes
DLY	Delay Generated	iDLY, d1, d2	O	d1	Standard counter	0	4	4	O	
				d2	Number pulse count	0	9999	17	O	
ERR	Error Report	ERR, d1	O	d1	Report frequency	0	9999	0	O	
HIO	Execute HIO instruction	pHIO, x1, x2	O	x1	Device address	0	7FF	0	O	6
				x2	Status compare word	0	FFFFC	0	O	
JUMP	Jump to location	iJUMP, x1, x2-x10	O	x1	Memory address	0	1FFFF	0	O	
				x2-x10	Input parameters	0	FFFFFFFF	0	O	
LEN	Set record length	LEN, d1, f2	O	d1	Byte count	0	65535	1024	O	7
				f2	SIL flag control	0	1	0	O	
MARK	Mark Identify	MARK, h1	O	h1	Any 4 characters	0000	ZZZZ	4Blanks	O	
PATT	Set Test Pattern	PATT, x1, d2	O	x1	Pattern data	0	FFFFFFFF	0	O	8
				d2	Number of characters	0	8	0	O	
PCYC	Cycle Test Pattern	iPCYC, x1	O	x1	= 0 = Cycle ≠ 0 = Add x1	0	FFFFFFFF	0	O	9
Q	Query Test	pQ, x1	O	x1	Condition compare data	0	FFFF	0	O	10
READ	Read a Record	iREAD, f1, f2 <i>0, 1,</i>	O	f1	0 = Read all tracks 1 = Skip write protected tracks	0	1	0	O	
				f2	0 = Report errors at end of record 1 = Report errors at end of sector	0	1	0	O	
RIO	Reset I/O	RIO	O							
SEEK	Execute Seek Order	SEEK, x1, d2	O	x1	Track and sector address	0	FFFF	0	O	11
				d2	Byte Count	0	99	2	O	

Table 2-3. Extended Performance RAD Test Language Glossary (Cont.)

(Continued)

MNEMONIC	FUNCTION NAME	FORMAT	EXECUTION MODE	PARAMETERS						
				Identification Code	Definition	Minimum Value	Maximum Value	Standard Value	Requirement	Notes
SENS	Execute Sense Order	SENS, d1	○	d1	Byte Count	0	99	3	○	
SIO	Execute SIO instruction	pSIO, x1, x2, x3, d4, x5	○	x1	Device address	0	7FF	0	○	12
				x2	Order	0	FF	0	○	
				x3	Flag bits	0	FF	0	○	
				d4	Byte count	0	1024	0	○	
				x5	Status compare word	0	FFFFC	0	○	
STEP	Move device address	iSTEP	○							
STOP	Stop and Identify	STOP, h1	○	h1	Stop identify character	0	ZZZZ	4Blanks	○	
TCDA	Type Current Device Address	TCDA	○							
TDV	Execute TDV instruction	pTDV, x1, x2	○	x1	Device address	0	7FF	0	○	17
				x2	Status compare word	0	FFFF8	0	○	
TIO	Execute TIO instruction	pTIO, x1, x2	○	x1	Device address	0	7FF	0	○	6
				x2	Status compare word	0	FFFFC	0	○	
TRY	Declare Error Retry Count	TRY, d1	○	d1	Retry count	0	9999	0	○	
TYPB	Type I/O Buffer	TYPB, d1, d2	○	d1	Relative starting location	1	First buffer word	0	○	
				d2	Relative final location	1	Last buffer word	0	○	
TYPC	Type counters	TYPC, x1	○	x1	Counter selection	0	FFFFF	0	○	13
UNIT	Declare Unit Environment	UNIT, f1, x2-x9	○	f1	0 = New list 1 = Add to list	0	1	0	○	16
				x2-x9	Individual unit addresses	0800	7FF1	0	○	

Table 2-3. Extended Performance RAD Test Language Glossary (Cont.)

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(Continued)

MNEMONIC	FUNCTION NAME	FORMAT	EXECUTION MODE	PARAMETERS						
				Identification Code	Definition	Minimum Value	Maximum Value	Standard Value	Requirement	Notes
UPAD	Update Device Address	UPAD	○							
WRT	Write a Record	iWRT, f1, d2	○	f1	0 = Write all tracks 1 = Skip write protected tracks	0	1	0	○	4
				d2	0 = I/O buffer address is starting address 1-8 = Contents of counters 1-8 is starting byte address	0	8	0	○	
XCWT	Checkwrite-Data Chaining	iXCWT	○							14
XGEN	Declare unit environment for Data Chaining	XGEN, x1, d2, x3, d4, x5, d6, x7, d8	○	x1, x3, x5, x7	Unit addresses	800	FF1	0	○	15
				d2, d4, d6, d8	Starting track addresses	0	1536	0	○	
XRDS	Read-Data Chaining	iXRDS	○							14
XWRT	Write-Data Chaining	iXWRT	○							14

Table 2-3. Extended Performance RAD Test Language Glossary (Cont.)

2-9 Glossary Notes

1. x1 defines which storage units are to be run (any numbers from 1 to 8, as entered in the unit list; see UNIT directive). The program assumes a maximum of eight units, but more can be tested by changing the unit list after the present group is tested. If two or more units are selected, they will be treated as one logical unit. If there is not enough storage left on the currently addressed unit to contain a record during a write operation, the next unit will be selected at track 0, sector 0, and the record will be written there.

2. The final character, C, corresponds to the condition code bits 1 and 2. These bits are included in the comparison.

3. This will start at the CDA and read or write 1024 bytes. The pattern will be the address of the particular data group (track and sector address). Since the group address requires two bytes, it will be written 512 times. At the completion of the operation, the track and sector address (CDA) are both incremented by one and this is the address of the next data group. This is done 16 times. The result is that the data is written on the disc in a spiral fashion.

4. If d2 is 1 through 8, the content of the counters specified by d2 (1 through 8) is used as the starting byte address for the operation. This allows a variable byte boundary and variable data to be used as the test pattern. Should d2 be used with the CMPW directive, a WRT directive should immediately precede CMPW, and parameter d2 of WRT should refer to the same byte address.

5. Twenty counters are maintained within the program. Counters 1 through 8 are provided for the user's convenience. Counters 9 through 20 keep count of different types of errors. (See table 2-4.)

x1 specifies which counters are active

a2 specifies what operation is to be performed on the selected counters. A = Add; S = Subtract. If a2 = 0, set the counter to the value of d3.

d3 is the value to be added, subtracted, or loaded in the selected counters.

d4 is the value that the selected counters are to be compared to. If the contents of any of the selected counters are greater than d4 or less than 0, the value in that counter is typed out, along with the counter number, and if a place mark is present, the place mark branch is taken. f5 controls whether or not the counters are typed out on a test operation. If f5 = 0, no type-out occurs. If f5 = 1, a type-out will occur during the test function.

Table 2-4. Counter Functions

Function	Number	Use
Utility counter	1	General purpose
Utility counter	2	General purpose
Utility counter	3	General purpose
Utility counter	4	General purpose
Utility counter	5	General purpose
Utility counter	6	General purpose
Utility counter	7	General purpose
Utility counter	8	General purpose
Record counter	9	Maintains a count of the number of records passed since the last address declaration. It is unconditionally reset when the ADDR or UPAD directives are executed
Read error counter	10	Maintains a count of the errors occurring during read operations
Write error counter	11	Maintains a count of the errors occurring during write operations
Write protect violation counter	12	Maintains a count of the number of times a write is tried on a write protected sector
Address error count-sector unavailable	13	Maintains a count of the number of times an attempt is made to reference an unavailable sector
Transmission error count-data	14	Maintains a count of data transmission errors
Transmission error count-memory	15	Maintains a count of memory transmission errors
Memory address error count	16	Maintains a count of memory addressing errors
IOP memory error count	17	Maintains a count of IOP memory errors

Table 2-4 lists counter functions.

(Continued)

Table 2-4. Counter Functions (Cont.)

Function	Number	Use
IOP control error count	18	Maintains a count of IOP control errors
Rate error count	19	Maintains a count of rate errors
Unusual end count	20	Maintains a count of unusual end conditions

Parameter x1 of the CNTR directive selects these counters for modification or testing. The hexadecimal configuration select each counter is as follows:

00001	ctr 1	00400	ctr 11
00002	ctr 2	00800	ctr 12
00004	ctr 3	01000	ctr 13
00008	ctr 4	02000	ctr 14
00010	ctr 5	04000	ctr 15
00020	ctr 6	08000	ctr 16
00040	ctr 7	10000	ctr 17
00080	ctr 8	20000	ctr 18
00100	ctr 9	40000	ctr 19
00200	ctr 10	80000	ctr 20

Combinations of counters may be selected by merging these values.

- x2 specifies which bits are to be tested in the status response. A one in any selected position will cause place mark branch (p) to be executed. The final character, C, corresponds to condition code bits 1 and 2 and the bits are included in the comparison.
- If d1 = 0, a byte count of 1024 will be used. If f2 = 0, set Suppress Incorrect Length flag if length is not on integral multiple of 1024 bytes. If f2 = 1, set Suppress Incorrect Length flag to zero.
- The number of digits entered will be spread in the I/O buffer area until the record length specified in the LEN directive has been reached. The pattern will be cyclical every N bytes, where N = d2.

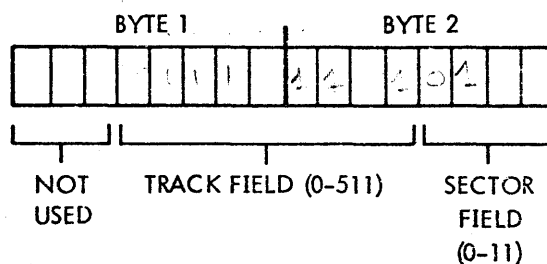
If x1 = 0, the data entered by the PATT directive will be cycled right one bit position. To shift more than one bit position, set the iteration count to the desired number of

If x1 ≠ 0, x1 is added to x1 of the PATT directive, and the pattern is spread.

- If any of the tested conditions are true, the place mark branch is taken. If all tested conditions are false, the next directive in the control line is executed.

The desired test conditions are specified by x1, and are defined as in table 2-5.

- x1 is the track and sector address to be loaded. Parameter x1 is defined as follows:



- x3 controls the time when the next directive is executed. If the ICE (interrupt at channel end), HTE (halt on error), or IUE (interrupt on unusual end) flags are set, the next directive will not be executed until the completion of the current operation. If these three flags are all cleared, the next directive will be executed without waiting for the current operation to finish.

x5 selects the bits to be tested in the status response. (See Glossary Note 6.)

- This will output the number and the contents of the counters selected by x1. (See Table 2-4.)

14. The entire RAD can be tested in 2048 revolutions. The first 256 words of the I/O buffer are used for the operation on each sector. Each operation uses data chaining on 6144 sectors. (See Glossary Note 15.)

Table 2-5. Test Conditions

x1	Test Condition	Printout	Remarks
0001	Device not ready	See Table 2-6	Current status as indicated by a TIO
0002	Device not operational	See Table 2-6	Current status as indicated by a TIO
0004	Device busy	See Table 2-6	Current status as indicated by a TIO
0008	Controller not ready	See Table 2-6	Current status as indicated by a TIO
0010	Controller busy	See Table 2-6	Current status as indicated by a TIO
0020	SIO not possible	See Table 2-6	Current status as indicated by a TIO
0040	No address recognition	See Table 2-6	Current status as indicated by a TIO
0080	Interrupt pending	See Table 2-6	Current status as indicated by a TIO
0100	Unusual end	See Table 2-6	AIO and HIO status from previous operation
0200	Write protect violation	See Table 2-6	AIO and HIO status from previous operation
0400	Sector unavailable	See Table 2-6	AIO and HIO status from previous operation
0800	Rate error	See Table 2-6	AIO and HIO status from previous operation
1000	Transmission error	See Table 2-6	AIO and HIO status from previous operation
2000	Incorrect length	See Table 2-6	AIO and HIO status from previous operation
4000	Coupler error	See Table 2-6	AIO and HIO status from previous operation

15. This directive is to XCWT, XRDS, and XWRT what the UNIT and ADDR directives are to READ, WRT, CMPW, etc., in that it will set up environmental prerequisites for data chaining operations.

x1, x3, x5, x7 specify the units to be tested. The x parameters are defined as follows:

First character = IOP number ($0_{16} - 7_{16}$)

Second character = DC number ($8_{16} - F_{16}$)

Third character = Device number ($0_{16} - F_{16}$)

Parameters d2, d4, d6, d8 specify the respective starting track on each unit.

16. x2 through x9 specify the units available for testing. The parameter is defined by four characters, as follows:

First character = IOP number (0 through 7)

Second character = Device controller number (8 through F)

Third character = Device number (0 through F)

Fourth character = Has to be 1

17. x2 specifies which bits are to be tested in the status response. A one in any selected position will cause place mark branch (p) to be executed. The final character, 8, corresponds to condition code bit 1 and is included in the comparison.

2-10 Program Printouts

The Extended Performance RAD test program identifies error conditions by the output of error messages. Their output may be inhibited by SENSE switch settings or message level selections.

Table 2-6 lists error messages and their meanings.

Table 2-6. Error Messages

Message No.	Message Level	Message Printout	Description and Recovery Procedure
1	ML-1	O/L/U/T/S/X	<p>O is the operation in process at the time the error occurred. O can be WRT, READ, SEEK, SENS, CMPW, or ILEG if the order is not one of the above.</p> <p>L is the current byte count as last set up in the LEN directive.</p> <p>U is the current device address, consisting of the IOP number, the device controller number, and the unit number.</p> <p>T is the current track address.</p> <p>S is the current sector address.</p> <p>X is the number of bytes remaining.</p>
2	ML-2	CURRENT COMMAND XXXXXXXX XXXXXXXX	X is the current command in hexadecimal notation. This message is output following the message described in message No. 1.
3	ML-3	XXX 0123 4567 8901 2345 CC1,2 ADDRESS III SSSS SSSS SSSS SSSS CC AAA	<p>I is the I/O instruction for which this status was received (SIO, HIO, TIO, TDV, AIO)</p> <p>S is the status response to the instruction.</p> <p>C is condition code bits 1 and 2</p> <p>A is the device address (IOP + controller address + unit address). This message is output following the messages described in messages Nos. 1 and 2.</p>
4	ML-1	SIO NOT POSS	An SIO has been attempted and could not be performed. This message is followed by the TIO status as described in message No. 3.
5	ML-1	UNSUCC START	The TIO status has indicated that an SIO was possible, but the SIO proved unsuccessful. This message is followed by the SIO status, as described in message No. 3.
6	ML-1	CHAN END NOT RECEIVED	An SIO has had a successful start, but has not been completed within 5 seconds
7	ML-1	NO UNITS SEL	Parameter x1 of the ADDR directive is equal to zero or has referenced entries in the unit list which are equal to zero
8	ML-1	CCHN COMPARE ERROR @ XXXXX	Read Command Chaining operation has been performed and the data received is incorrect. X is the address in the I/O buffer area of the first word of the failing block of data

(Continued)

Table 2-6. Error Messages (Cont.)

Message No.	Message Level	Message Printout	Description and Recovery Procedure																											
9	ML-1	COMPARE ERROR @ U/TT/SS AAAAA EEEEEEE RRRRRRR	<p>During a Read and Compare (CMPR) operation, a word in the I/O buffer area failed to compare.</p> <p>U, T, and S have the same meaning as in message No. 1 of this table.</p> <p>A is the relative word address in the I/O area.</p> <p>E is the expected word.</p> <p>R is the word received.</p>																											
10	ML-3	SUMMARY U/TT/SS <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>BIT POS</th> <th>DROPPED</th> <th>PICKED</th> </tr> </thead> <tbody> <tr><td>0</td><td>X</td><td>X</td></tr> <tr><td>1</td><td>X</td><td>X</td></tr> <tr><td>2</td><td>X</td><td>X</td></tr> <tr><td>3</td><td>X</td><td>X</td></tr> <tr><td>4</td><td>X</td><td>X</td></tr> <tr><td>5</td><td>X</td><td>X</td></tr> <tr><td>6</td><td>X</td><td>X</td></tr> <tr><td>7</td><td>X</td><td>X</td></tr> </tbody> </table>	BIT POS	DROPPED	PICKED	0	X	X	1	X	X	2	X	X	3	X	X	4	X	X	5	X	X	6	X	X	7	X	X	<p>After all comparisons are made on a Read and Compare (CMPR) operation, this message is output if any compare errors occurred, unless inhibited by SENSE switch 3 or 4.</p> <p>U, T, and S have the same meaning as in message No. 1.</p> <p>X corresponds to the number of times the particular bit was picked or dropped</p>
BIT POS	DROPPED	PICKED																												
0	X	X																												
1	X	X																												
2	X	X																												
3	X	X																												
4	X	X																												
5	X	X																												
6	X	X																												
7	X	X																												
11	ML-1	WRT COMPARE ERROR @ U/TT/SS AAA	<p>During a Checkwrite (CMPW) operation a byte has failed to compare.</p> <p>U, T, and S have the same meaning as in message No. 1.</p> <p>A is the remaining byte count at the time of the error.</p>																											
12	ML-0	ADDRESS OUT OF RANGE	<p>This message is output in a Checkwrite (CMPW) or Write (WRT) operation where parameter d2 specifies a counter, if the starting byte address, as contained in the counter, plus the byte count, as entered in the LEN directive, exceeds the core capacity of the machine.</p>																											
13	ML-1	CNTR NN VVVV	<p>Message format of utility or error counters as a result of the CNTR, ERR, or TYPC directives.</p> <p>N is the counter number.</p> <p>V is the counter contents.</p>																											
14	ML-1	CPLR ERR SEEK AAAA SENS RRRR	<p>Before a Read, Write or Checkwrite operation is attempted, a Seek is executed, followed by a Sense. This message is output if the Sense data does not compare with the Seek data.</p> <p>A is the data sent to the RAD address register.</p> <p>R is the data received by the Sense.</p>																											

(Continued)

Table 2-6. Error Messages (Cont.)

Message No.	Message Level	Message Printout	Description and Recovery Procedure
15	ML-1	MAX REC LENGTH NNNN BYTES	Parameter d1 of the LEN directive specified a byte count greater than the I/O buffer area could contain. N is the maximum number of bytes available for an I/O buffer
16	ML-0	MARK AAAA	MARK directive was executed. A is the data entered as parameter h1
17	ML-1	DEV NOT RDY	Q directive tested the device and found it not ready
18	ML-1	DEV NOT OPTL	Q directive tested the device and found it not operational
19	ML-1	DEV BUSY	Q directive tested the device and found it busy
20	ML-1	CTLR NOT OPTL	Q directive tested the device controller and found it not operational
21	ML-1	CTLR BUSY	Q directive tested the device controller and found it busy
22	ML-1	SIO NOT POSS	Q directive tested the device and controller and found condition code bit 2 set
23	ML-1	NO ADDR REC	Q directive tested the device and controller and found condition code bit 1 set
24	ML-1	INT PDG	Q directive tested the device and found an interrupt pending
25	ML-1	UNUS END	Q directive found the unusual end indicator set from a previous operation
26	ML-1	WRT PROT VIOL	Q directive found the write protect violation indicator set from a previous operation
27	ML-1	SECT UNAV	Q directive found the sector unavailable indicator set from previous operation
28	ML-1	RATE ERR	Q directive found the rate error indicator set from a previous operation
29	ML-1	TRANS ERR	Q directive found the data transmission error indicator set from a previous operation
30	ML-1	INC LENGTH	Q directive found the incorrect length indicator set from a previous operation

(Continued)

Table 2-6. Error Messages (Cont.)

Message No.	Message Level	Message Printout	Description and Recovery Procedure
31	ML-1	CPLR ERR	Q directive found the coupler error indicator set from a previous operation
32	ML-1	SENS TTSSCC	SENS directive has been executed, and the four bytes received are output T and S are the contents of the RAD address register. C is the current angular position of the current sector.
33	ML-1	STOP AAAA	STOP directive has been executed. A is the data entered as parameter h1
34	ML-1	CDA U/T/S	TCDA directive has been executed. U, T, and S have the same meaning as in message No. 1
35	ML-1	CDA U/T/S REL LOC	TYPB directive has been executed. U, T, and S have the same meaning as in message No. 1 REL LOC indicates that the addresses following it are relative locations and not actual core addresses
36	ML-1	UNIT LIST FULL	UNIT directive has been executed with parameter fl \neq 0 and the unit list contained eight entries, so that no more could be added to the list
37	ML-2	O/L/U/T/S/WRT PROTECTED	A write (WRT), READ, read, and compare (CMPR), or checkwrite (CMPW) operation has been specified, and fl was \neq 0, causing the program to skip write protected bands. This message is output for each band that is being skipped. O, L, U, T, and S have the same meaning as in message No. 1
38	ML-0	CONTROL ERROR - XGEN DIRECTIVE MUST BE USED BEFORE DIRECTIVES XCWT, XRDS OR XWRT	A data chaining operation of check-write (XCWT), Write (XWRT) or Read (XRDS) was attempted prior to use of environmental directive XGEN, which declares the unit environment for data-chaining.

SECTION III PROGRAM DESCRIPTION

3-1 GENERAL

This section describes eight tests applicable to the Extended Performance RAD Test Program. All these tests assume operator control via keyboard printer, at address 001, and only one unit, at address 090, is being tested.

The flow charts in this section are general rather than specific representations of the tests that accompany them.

3-2 TEST 1

3-3 OBJECTIVE

The object is to verify the addressing capabilities of the system. This will also test the WRITE, CHECKWRITE, and READ orders. The test consists of two parts.

3-4 PROCEDURE

Enter the following at the keyboard:

```
$SMD,1/
$SML,3/
$CLR/
UNIT,,901+ADDR,1+LEN,1024+
10+512(WRT+CPW+20)+MARK,AAAA+BACK+
10+512(CMPR+20)+MARK,BBBB+RETN+
1.+PATT,0,1+0+2.+12STEP+PCYC,1+0+1/
```

3-5 SUCCESS INDICATION

After successful completion of the first part of the test the following will be output:

MARK AAAA

After successful completion of the last part of the test the following will be output:

MARK BBBB
\$

3-6 ERROR INDICATION

Any other message will indicate error conditions. (See table 2-6.)

3-7 EXECUTION

a. In the first part of the test, the environmental prerequisites are set up, UNIT, ADDR and LEN. A unique pattern is then written and checked on Sector 0 of each Track. A pattern of 0 is written on Track 0, Sector 0. After checking, the address is stepped by 12 sectors, a one is

added to the previously defined pattern, and this is now written and checked. The track address is thus written on Sector 0 of each of the 512 tracks of the file. MARK AAAA indicates the end of this part of the test.

b. The second part of the test uses the same addressing and pattern setup as described in a, above, but with a Read order, and comparison of the data against the pattern. The end of the test is indicated by MARK BBBB.

3-8 TEST 2

3-9 OBJECTIVE

The object is to check out the SEEK and SENSE orders and the proper reporting of an illegal address.

3-10 PROCEDURE

Enter the following at the keyboard:

```
$SMD,1/
$SML,3/
$CLR/
UNIT,,901+ADDR,1+SEEK,0000+10+SEEK,127A+10+SEEK,1FFB+10+
SEEK,123F+MARK,AAAA+SEEK,9567+MARK,BBBB+RETN+
1.+SENS+0+1/
```

3-11 SUCCESS INDICATION

After each successful completion of a SEEK and SENS in the above control line, the following messages will be output:

```
SENS          4
SENS        127A09
SENS        1FFB05
```

3-12 ERROR INDICATION

a. To Seek an unavailable sector (such as 123F) will cause the following message to be output:

```
SEEK          2 90/  0/ 0/      0
CURRENT COMMAND      3003193  1C000002
UNUS END
SECT UNAV
A10 0123 4567 8901 2345  CC1,2  ADDRESS
      0010 0000 0001 1000      01  90
TDV 0123 4567 8901 2345  CC1,2  ADDRESS
      0010 0000 0000 0000      01  90
H10 0123 4567 8901 2345  CC1,2  ADDRESS
      0001 1000 0000 0000      00  90
```

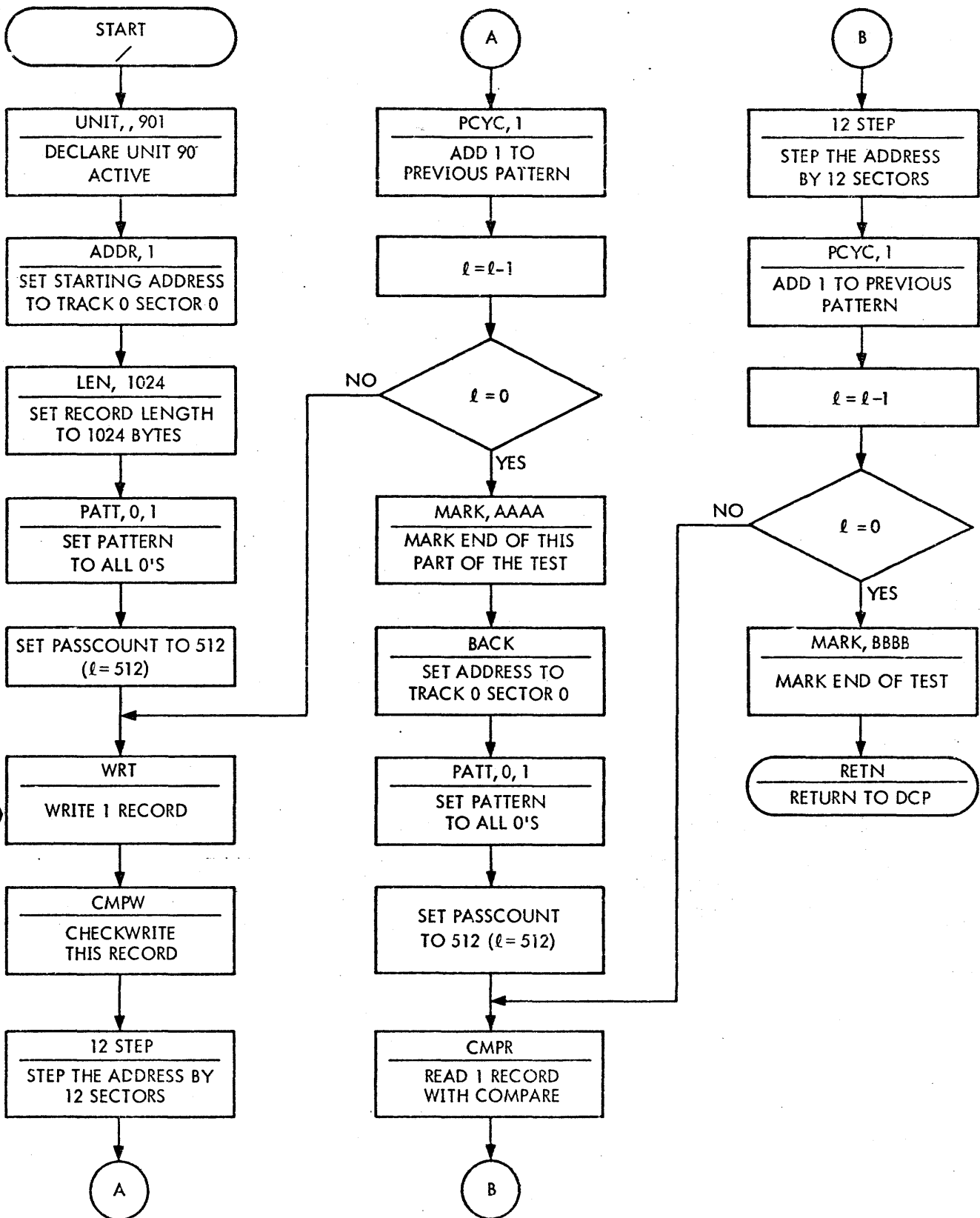


Figure 3-1. Test 1 Flow Chart

Then,
MARK AAAA

serves the purpose of separating the previous message from the following.

b. To Seek an unavailable track (such as 9567) amounts to seeking an unavailable sector, and the same type of message will be output:

```
SEEK          2 90/  0/ 0/      1
CURRENT COMMAND 3003193 1C000002
UNUS END
SECT UNAV
INC LENGTH
AIO 0123 4567 8901 2345  CC1,2  ADDRESS
    0010 0000 1001 1000          01    90
TDV 0123 4567 8901 2345  CC1,2  ADDRESS
    0010 0000 1000 0010          01    90
HIO 0123 4567 8901 2345  CC1,2  ADDRESS
    0001 1000 1000 0010          00    90
```

Finally,

MARK BBBB
\$

indicates the end of the test.

c. Any other message or bits in the status responses will indicate other error conditions. (See table 2-6.)

3-13 EXECUTION

The first SEEK defines the address to be sent to the RAD address register as being Track 0, Sector 0. This is followed by a SENS which reads the RAD address register and types it out. This address should be the same as the one defined by the previous SEEK. This is done two more times for valid addresses. The last two SEEK directives, however, define invalid addresses, Track 291, Sector 15, and Track 2390, Sector 7, respectively. Whereupon, the error messages described in 3-12 a and b are output. Control is then returned to the keyboard.

3-14 TEST 3

3-15 OBJECTIVE

The object is to test the proper functioning of the RAD Write Protect switches.

3-16 PROCEDURE

Enter the following at the keyboard:

```
$SMD,1/
$SNL,3/
$UNIT,,901/
$ADDR,1/
$LEN,12288/
$PATT,F,1/
$CLR/
BACK+512(WRT+STEP)+/
```

a. Set the first Write Protect switch to the UP position. A message will be output, as described in paragraph 3-12a.

b. Reset the Write Protect switch which was set. Set the next Write Protect switch to the UP position to test its proper functioning. Continue the test for all 16 switches.

c. Regain keyboard control. (See paragraph 2-8.)

3-17 SUCCESS INDICATION

No timeout shall occur for those tracks which are not write protected (i.e., those tracks whose Write Protect switches are in the DOWN position).

3-18 ERROR INDICATION

a. The following type of message will be output, indicating write protect violation for those tracks which are write protected (i.e., those tracks whose Write Protect switches are in the UP position).

```
WRT          12288 90/  0/ 0/      12276
CURRENT COMMAND 1004D98 1C003000
UNUS END
WRT PROT VIOL
AIO 0123 4567 8901 2345  CC1,2  ADDRESS
    0001 0000 0001 1000          01    90
TDV 0123 4567 8901 2345  CC1,2  ADDRESS
    0001 0000 0000 0000          01    90
HIO 0123 4567 8901 2345  CC1,2  ADDRESS
    0001 1000 0000 0000          00    90
WRT          12288 90/  1/ 0/      12276
CURRENT COMMAND 1004D98 1C003000
UNUS END
WRT PROT VIOL
AIO 0123 4567 8901 2345  CC1,2  ADDRESS
    0001 0000 0001 1000          01    90
TDV 0123 4567 8901 2345  CC1,2  ADDRESS
    0001 0000 0000 0000          01    90
HIO 0123 4567 8901 2345  CC1,2  ADDRESS
    0001 1000 0000 0000          00    90
```

b. Any other type of message or bits in the status or operational status byte responses will indicate error conditions other than write protect violations. (See table 2-6.)

3-19 EXECUTION

The record length, LEN, is set to one track and the starting address to Track 0, Sector 0. One track will then be written (or an attempt will be made to write) on the RAD file. Should the corresponding Write Protect switch be in the UP position, a message will be output. (See paragraph 3-18a.) The address will then be stepped by 12 sectors, or one track. Should the corresponding Write Protect switch be in the DOWN position, however, no message will be output, and the address will be stepped by 12 sectors. This is done 512 times, so that an attempt is made to write on all tracks of the file, after which the whole process starts over at Track 0, Sector 0.

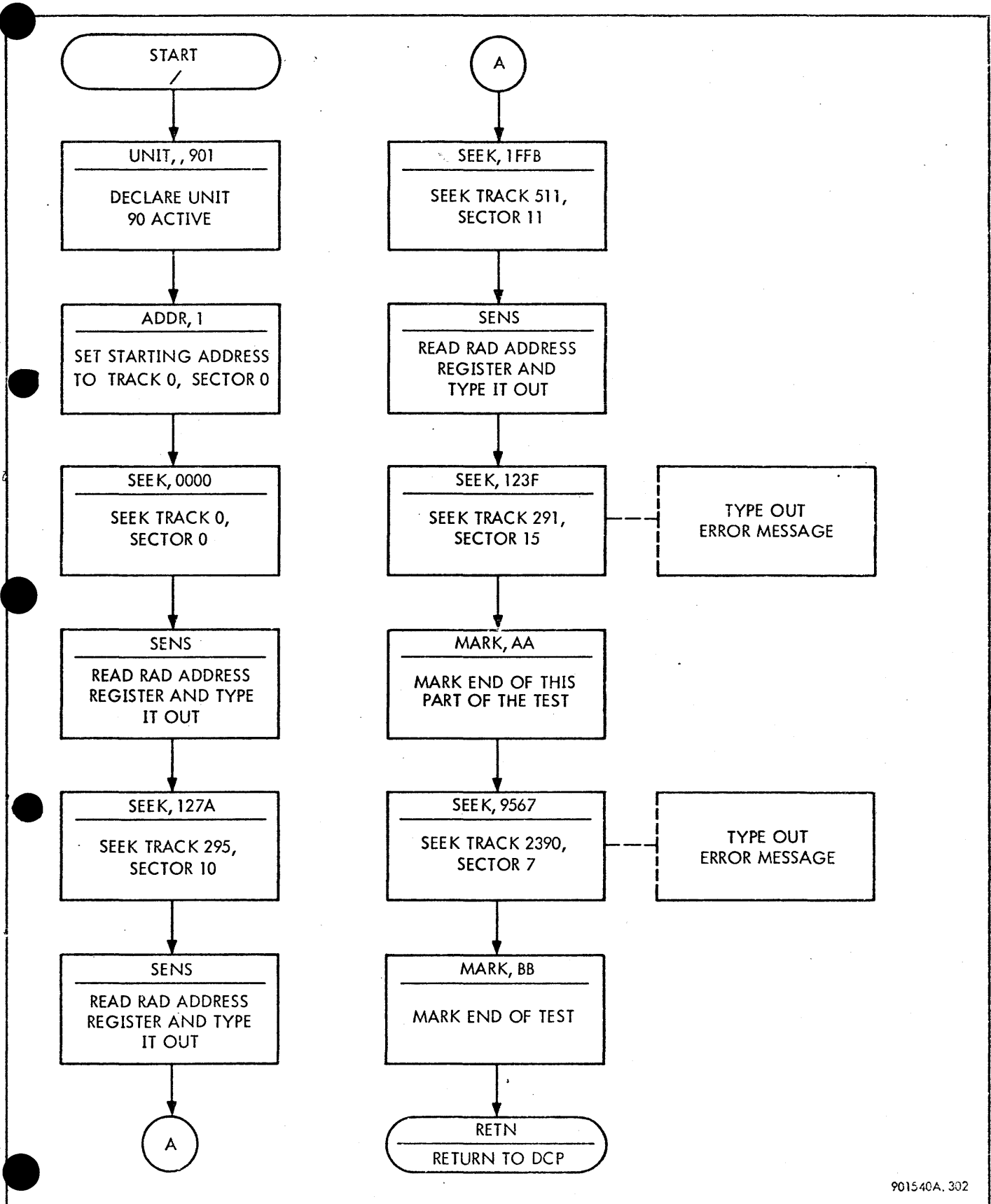


Figure 3-2. Test 2 Flow Chart

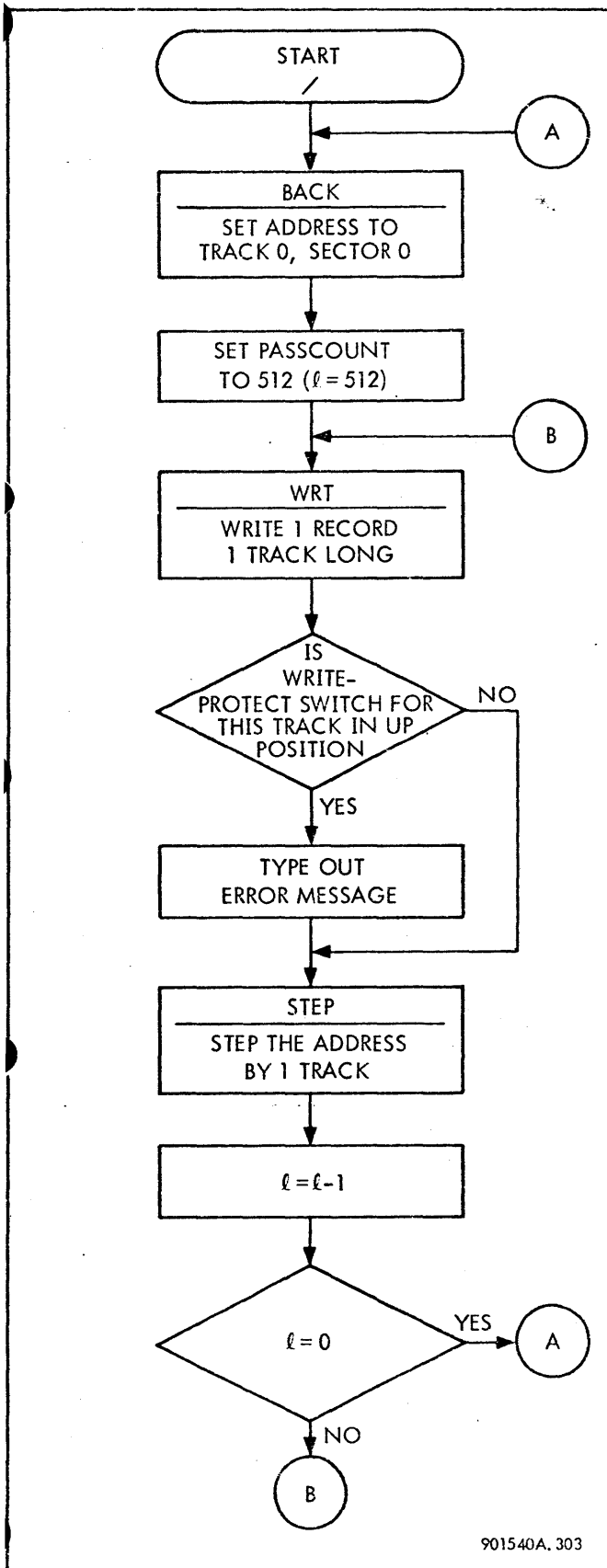


Figure 3-3. Test 3 Flow Chart

3-20 TEST 4

3-21 OBJECTIVE

The object is to verify proper reporting of an Incorrect Length condition. The test consists of two parts.

3-22 PROCEDURE

Enter the following at the keyboard:

```

$SMD,1/
$SML,3/
$CLR/
UNIT,,901+ADDR,1+LEN,1023+PATT,F,1+1@+MARK,AAAA+
LEN,1025+1@+MARK,BBBB+RETN+
1.+WRT+TIO,90+@+/
  
```

3-23 SUCCESS INDICATION

No timeout shall occur as a result of the WRT directive.

3-24 ERROR INDICATION

a. After completion of the first part of the test the following message will be output:

```

TIO 0123 4567 8901 2345 CC1,2 ADDRESS
    0001 0000 1000 0000      00      90
  
```

Then,

```
MARK AAAA
```

indicates the end of the first part of the test.

b. After completion of the last part of the test, the following message will be output:

```

TIO 0123 4567 8901 2345 CC1,2 ADDRESS
    0001 0000 1000 0000      00      90
  
```

And

```
MARK BB
$
```

indicates the end of the test.

c. Any other message or bits in the TIO status response will indicate error conditions. (See table 2-6.)

3-25 EXECUTION

a. In the first part of the test, the record length, LEN, is set to 1023 bytes, i. e., smaller than one sector. A record is then written, and a message is output as in paragraph 3-24.

b. The second part of the test sets up the record length to 1025 bytes, i. e., greater than one sector. And the process described in a, above, is repeated.

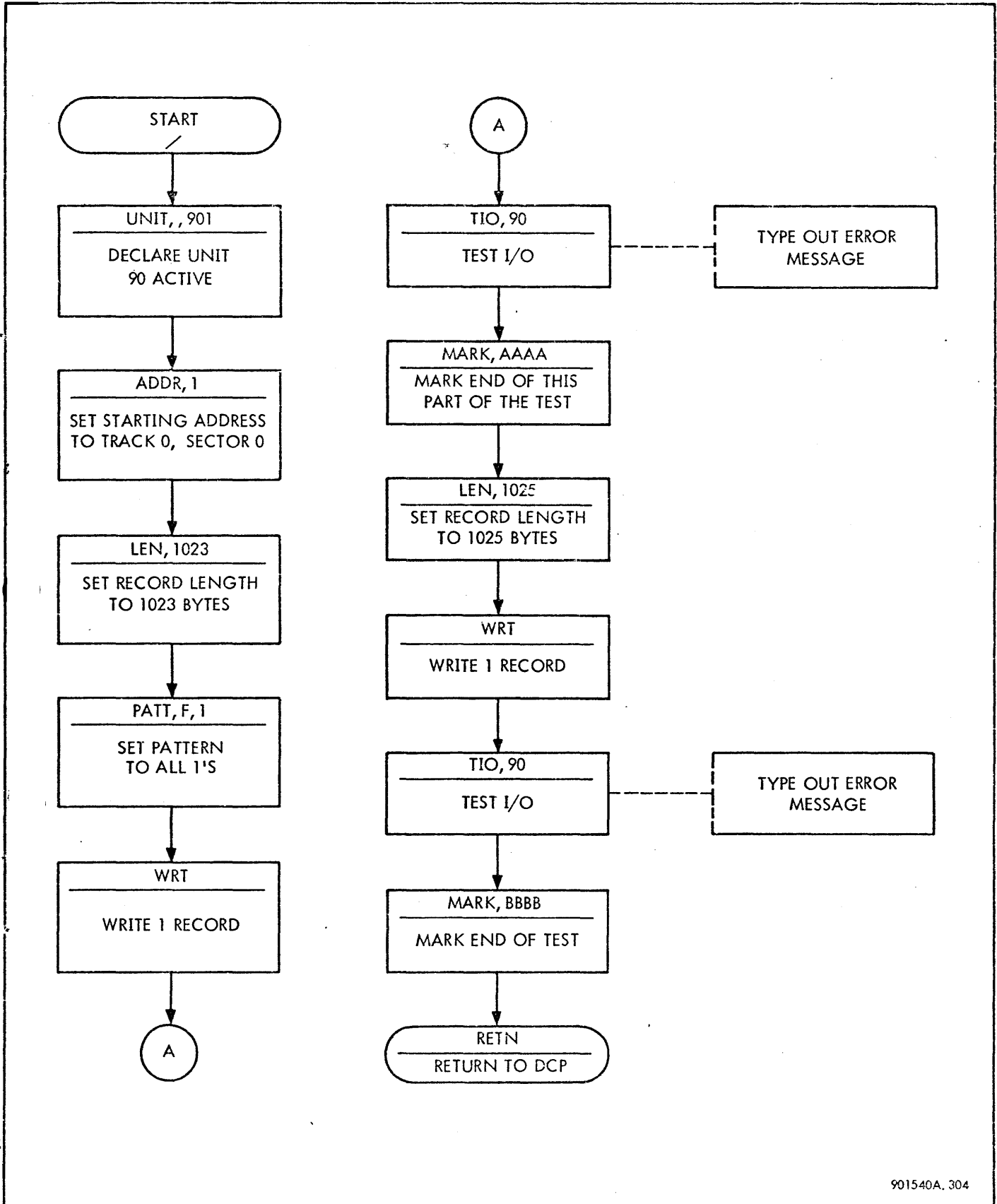


Figure 3-4. Test 4 Flow Chart

3-26 TEST 5

3-27 OBJECTIVE

The object is to verify proper reporting of a Sector Unavailable condition.

3-28 PROCEDURE

Enter the following at the keyboard:

```

$SMD,1/
$SML,3/
$CLR/
UNIT,,901+ADDR,1,511,11+LEN,2048+PATT,F,1+WRT+RETN+/
    
```

3-29 SUCCESS INDICATION

No timeout shall occur for the sector which is available.

3-30 ERROR INDICATION

a. The following message will be output, indicating that a sector was unavailable.

```

WRT      . 2048 90/ 511/11/    1012
CURRENT COMMAND    1004098    1C000800
UNUS END
SECT UNAV
AI0 0123 4567 8901 2345    CC1,2    ADDRESS
    0010 0000 0001 1000        01      90
TDV 0123 4567 8901 2345    CC1,2    ADDRESS
    0010 0000 0000 0000        01      90
HI0 0123 4567 8901 2345    CC1,2    ADDRESS
    0001 1000 0000 0000        00      90
$
    
```

b. Any other message or bits in the reported statuses will indicate error conditions other than Sector Unavailable. (See table 2-6.)

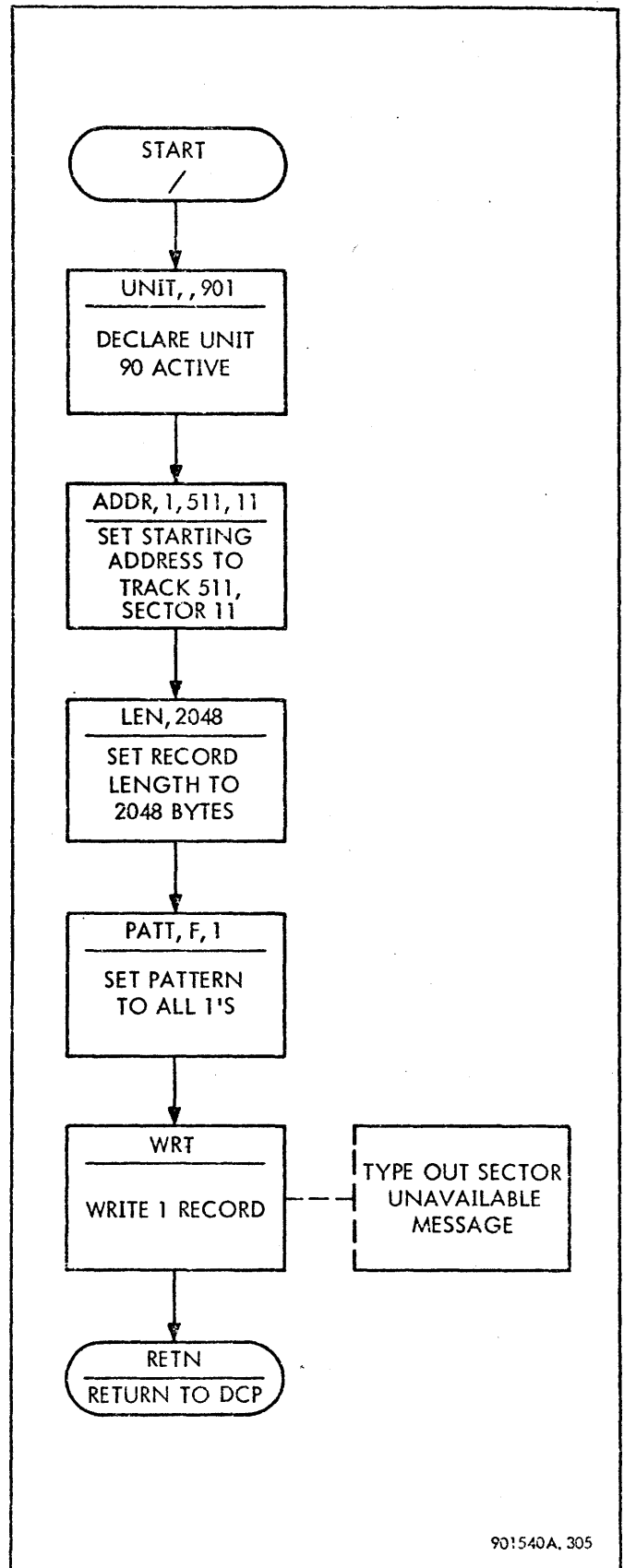
3-31 EXECUTION

The starting address is specified as Track 511, Sector 11, i. e., the last sector of the file. The record length, LEN, is set to 2048 bytes, or two sectors long. The pattern is being written on the last sector and an attempt is being made to write on the next sector, which is unavailable. Whereupon, the message described in paragraph 3-30 is output. The first line of this message shows the remaining byte count, 1012, at the time of error reporting.

3-32 TEST 6

3-33 OBJECTIVE

The object is to verify proper error reporting on the Check-write (CMPW) and Read with Compare (CMPR) directives. The test consists of two parts.



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Figure 3-5. Test 5 Flow Chart

34 PROCEDURE

Enter the following at the keyboard:

```

$SMD,1/
$SML,3/
$CLR/
UNIT,,901+ADDR,1+LEN,1024+CNTR,82000+PATT,5,1+WRT+PATT,A,1+CMF+W
MARK,AAAA+TYPC,82000+MARK,BBBB+PATT,5,1+LEN,1019+CMF+RETN+/
    
```

3-35 SUCCESS INDICATION

No timeout shall occur as a result of the Write (WRT) directive.

3-36 ERROR INDICATION

a. The following message will be output on the CMFV directive:

```

WRT COMPARE ERROR @ 90/ 0/ 0/ 1012
CWRT 1024 90/ 0/ 0/ 1012
CURRENT COMMAND 5004098 1C000400
UNUS END
TRANS ERR
AIO 0123 4567 8901 2345 CC1,2 ADDRESS
    0000 0000 0101 1000 01 90
TDV 0123 4567 8901 2345 CC1,2 ADDRESS
    0000 0000 0100 0010 00 90
HIO 0123 4567 8901 2345 CC1,2 ADDRESS
    0001 1000 0100 0010 00 90
    
```

b. Following the above message, counters 14 (Transmission Errors) and 20 (Unusual End) will be output:

```

MARK AAAA
CNTR 14
CNTR 20
MARK BBBB
    
```

c. Then, the following message will be output on the PR directive:

```

COMPARE ERROR @ 90/ 0/ 0/
255 55555555 55555500
SUMMARY 90/ 0/ 0/
BIT DROPPED PICKED
 0 0 0
 1 1 0
 2 0 0
 3 1 0
 4 0 0
 5 1 0
 6 0 0
 7 1 0
$
    
```

d. Any other messages or bits in the reported status response will indicate error conditions. (See table 2-6.)

37 EXECUTION

In the first part of the test, counters 14 and 20 are cleared the pattern is set to 0101 and written on a complete

sector (1024 bytes). The pattern is then changed to 1010, and a Checkwrite order is issued. The message described in 3-36a is output immediately.

The number of Transmission Errors and Unusual Ends is then output from counters 14 and 20. MARK AAAA and MARK BBBB delimit this message from the preceding and following error messages. In the second part of the test, the pattern is set again to 0101 as was originally written on the disc, but the record length, LEN, is set to 1019 bytes, and a Read order is issued, with comparison of the data read-in against the pattern. Since at the end of the sector the comparison is not satisfactory, the message described in 3-36c is output.

3-38 TEST 7

3-39 OBJECTIVE

The object is to verify the proper operation of Command Chaining. The test consists of two parts.

3-40 PROCEDURE

Enter the following at the keyboard:

```

$SMD,1/
$SML,3/
$CLR/
UNIT,,901+ADDR,1+10+MARK,AAAA+ADDR,1,15,0+10+MARK,BBBB+RETN+
T,+CCHN,1+BACK+CCHN,0+TYPB,1+0+/
    
```

3-41 SUCCESS INDICATION

a. After completion of the first part of the test, the following message will be output:

```

CDA /90/ 0
REL LOC
00001 00000000
MARK AAAA
    
```

b. After completion of the second part of the test, the following will be output:

```

CDA /90/ 16
REL LOC
00001 01000100
MARK BBBB
$
    
```

3-42 ERROR INDICATION

Any other message will indicate error conditions. (See table 2-6.)

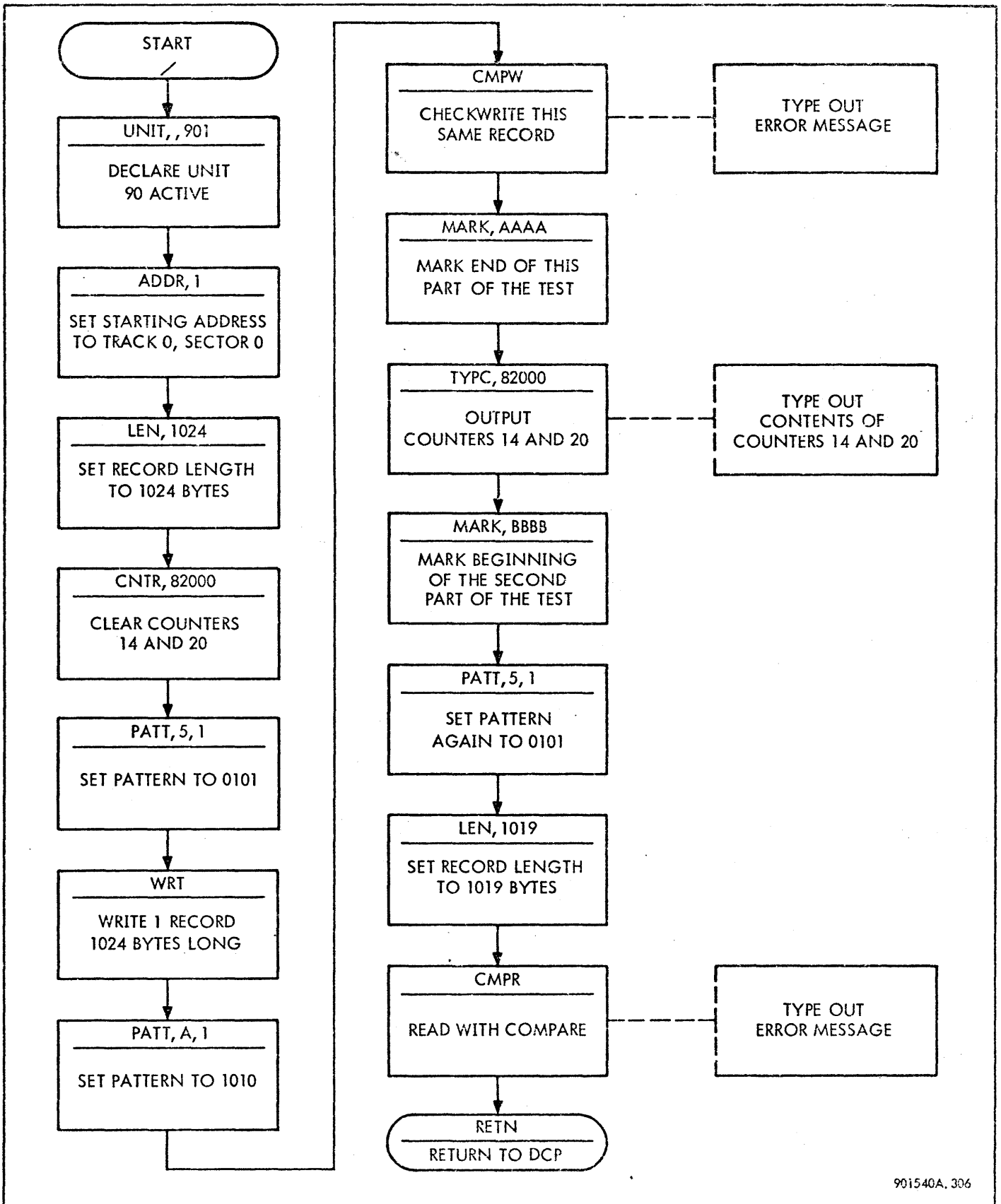


Figure 3-6. Test 6 Flow Chart

3 EXECUTION

In the first part of the test, the starting address is set to Track 0, Sector 0. Then a Write order with Command Chaining is issued. This operation is performed as described in paragraph 2-9-3. The starting address is then set back to Track 0, Sector 0, and Command Chaining with a Read order is performed in the same fashion. The first word of data read in the I/O buffer is then typed out, and this information should reflect the current Track and Sector address. MARK AAAA defines the end of this part of the test.

The second part of the test addresses Track 16, Sector 0, and the same operations are performed. MARK BBBB indicates the end of the test.

It should be remembered that in a Command Chaining operation, the Track and Sector address appears twice in a word. Thus, in the second part of the test, the first word in the I/O buffer contains twice 0100 which is the hexadecimal representation for Track 16, Sector 0.

3-44 TEST 8

5 OBJECTIVE

The object is to Write, Checkwrite, and Read 6144 sectors using data chaining and different patterns.

3-46 PROCEDURE

Enter the following at the keyboard:

```

1/
$300,3/
$CLR/
LEN,1024+PATT,F082B55,7+CNTR,1+XGEN,90,0+
1.+3CNTR,1,A,1,2+XWRT+46+MARK,WSUC+XCWT+40+MARK,CWSU+
XRDS+40+MARK,RSUC+10+
3.+MARK,OKOK+60+4.+5Q,FFFFF+0+5.+MARK,EROR+6.+RETN+/
    
```

3-47 SUCCESS INDICATIONS

Upon successful completion of the operations, the following messages will be output:

```

MARK WSUC
MARK CWSU
MARK RSUC
MARK WSUC
MARK CWSU
MARK RSUC
MARK OKOK
$
    
```

3-48 ERROR INDICATION

Should an error occur in any operation, an appropriate message will be output (see table 2-6), followed by MARK EROR. The test will then be terminated and control will be returned to the keyboard.

3-49 EXECUTION

Counter 1 will be used to allow only two iterations of the control line. After setting up the pattern, counter 1 is cleared and Unit 90 is declared active for the following data chaining operations. Counter 1 is then incremented by one. Its content is interrogated for being greater than two. Since it is smaller than two — at least at the beginning of the test — 6144 sectors are being written on the disc. If no error occurred, MARK WSUC will indicate a successful Write operation. However, if an error had been detected, MARK EROR would be output after an appropriate message, and the test would come to an end.

The same process occurs for the XCWT and XRDS directives, with MARK CWSU and MARK XRDS their respective success indications.

Counter 1 is then again incremented by one and its content interrogated. The control line is executed once more. When Counter 1 gets incremented again, its contents are then greater than two, and no more data chain operations take place. Instead, MARK OKOK is output indicating the end of the test.

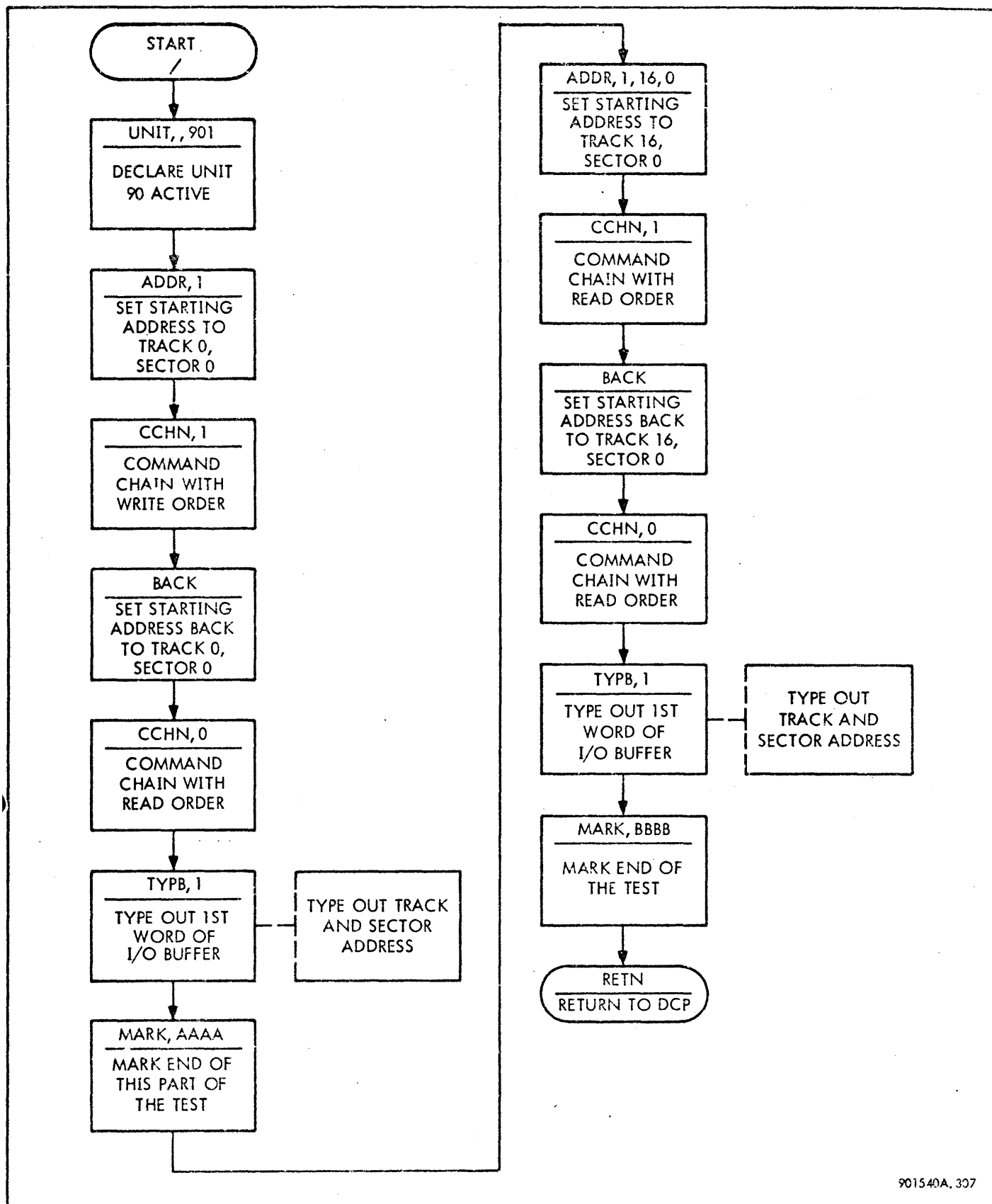


Figure 3-7. Test 7 Flow Chart

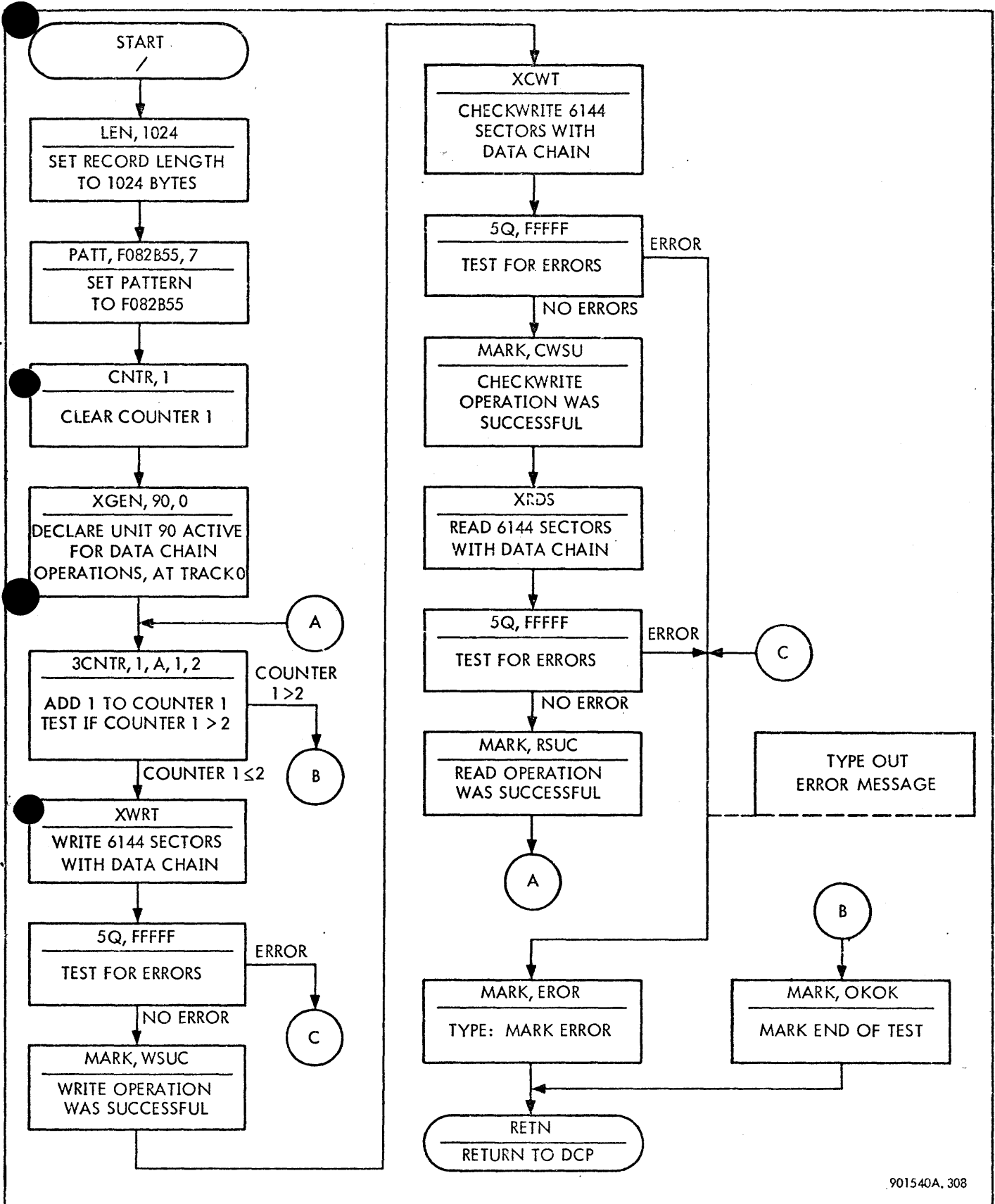


Figure 3-8. Test 8 Flow Chart

XDS 901540

SECTION IV
PROGRAM LISTING

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
SIGMA 5/7 EXTENDED PERFORMANCE RAD TEST 704978-51000								
TITLE 'SIGMA 5/7 EXTENDED PERFORMANCE RAD TEST 704978-51000 JULY 16, 69'								
1								
2								
3	01	00040						
	01	00040			SYSTEM	SIG7FDP		
					ORG	64		
4					*			
5					* RIVISION COO (7/16/69) DOCUMENTATION REFORMATTING CHANGE ONLY			*C
6					* REVISION BOO 10-21-68 CHANGES TO PROGRAM ARE INDICATED BY			*B
7					* IN CELLS 71-72. IMPROVEMENTS ARE:			
8					*			
9					* TO PERMIT PROGRAM TO START A DATA CHAIN OPERATION IN WRITE,			*E
10					* CHECKWRITE, OR READ MODE FROM OTHER THAN TRACK ADDRESS ZERO			*B
11					* TO PROVIDE OPERATOR NOTIFICATION IF XGEN ENVIRONMENTAL DI-			*B
12					* RECTIVE IS NOT USED PRIOR TO XRDS, XCWT OR XWRT DIRECTIVES			*B
13					*			*E
14					*			*E
15					*			
16					* LISTED BELOW, IN ALPHABETICAL ORDER, IS A TABLE OF			
17					* TEST LANGUAGE DIRECTIVES WITH THEIR RESPECTIVE			
18					* ADDRESSES. THESE DIRECTIVES ARE UNIQUE TO THE			
19					* SIGMA 5/7 HIGH CAPACITY RAD MEMORY TEST PROGRAM.			
20					*			
21								
22		0000000			PAGE	OPEN	PAGE	THIS INHIBITS
23						CNAME		PAGE
24						PREC		DIRECTIVE
25						PEND		TO PERMIT MAX. LINAGE/PAGE
26					*			*C
27					* TABLE OF DIRECTIVES			*C
28					*			*C
29	01	00040	0000064D		ADDRINDX	DATA	ADDR	TO ESTABLISH THE INITIAL OPERATING
30					*			POINTS IN THE PROGRAM
31	01	00041	00000699		AIBINDX	DATA	AIB	TO ISSUE AN AIB INSTRUCTION AND
32					*			HAVE THE STATUS RESPONSE PRINTED
33	01	00042	000006A8		BACKINDX	DATA	BACK	RETURN TO STARTING ADDRESS
34	01	00043	000006CC		CCHNINDX	DATA	CCHN	TO TEST COMMAND CHAINING CAPABILI-
35					*			TIES OF THE DEVICE AND ITS CON-
36					*			TROLLER
37	01	00044	000007B3		CMPRINDX	DATA	CMPR	READ DATA FROM DISC AND COMPARE IT
38					*			WITH THE PATTERN DEFINED BY THE
39					*			PATT DIRECTIVE
40	01	00045	000007C3		CMPWINDX	DATA	CMPW	VERIFY CORRECT EXECUTION OF A
41					*			WRITE OPERATION
42	01	00046	00000818		CNTRINDX	DATA	CNTR	FOR COUNTER CONTROL
43	01	00047	0000095A		DCHNINDX	DATA	DCHN	TEST DATA CHAINING CAPABILITIES
44	01	00048	000009D3		DLYINDX	DATA	DLY	TO ALLOW THE GENERATION OF A FIXED
45					*			DELAY
46	01	00049	000009F1		ERRINDX	DATA	ERR	TO OUTPUT THE CONTENTS OF THE ERROR
47					*			COUNTERS 9 THROUGH 20
48	01	0004A	00000B0A		HIBINDX	DATA	HIB	TO ISSUE AN HIB INSTRUCTION AND
49					*			HAVE THE STATUS RESPONSE PRINTED
50	01	0004B	00000B30		JUMPINDX	DATA	JUMP	TO ALLOW USER SUBROUTINES TO INTER-
51					*			FACE WITH THE DCP
52	01	0004C	00000B36		LENINDX	DATA	LEN	ESTABLISH THE RECORD LENGTH FOR
53					*			ALL READ, WRITE, CHECKWRITE OR
54					*			COMPARE OPERATIONS
55	01	0004D	00000B7B		MARKINDX	DATA	MARK	TO MARK A POSITION IN A CONTROL
56					*			LINE
57	01	0004E	00000B9B		PATTINDX	DATA	PATT	SET TEST PATTERN FOR WRITE, READ
58					*			OR COMPARE OPERATIONS
59	01	0004F	00000BDC		PCYCINDX	DATA	PCYC	TO MODIFY THE PATTERN PREVIOUSLY
60					*			ESTABLISHED BY THE PATT DIRECTIVE
61	01	00050	00000COA		QINDX	DATA	Q	ALLOWS THE USER TO TEST CERTAIN
62					*			CONDITIONS
63	01	00051	00000C9C		READINDX	DATA	READ	READ ONE RECORD FROM THE DISC UNIT
64	01	00052	00000CCD		RIBINDX	DATA	RIB	RESET OF THE I/O SYSTEM
65	01	00053	00000CD2		SEEKINDX	DATA	SEEK	LOAD BAND AND SECTOR ADDRESS INTO
66					*			THE DISC ADDRESS REGISTER
67	01	00054	00000CED		SENSINDX	DATA	SENS	TO READ THE DISC ADDRESS REGISTER
68					*			AND PRINT IT OUT

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
70	01	00055	00000D22	*	S10INDX	DATA	S10	TO ISSUE AN S10 INSTRUCTION AND HAVE THE STATUS RESPONSE PRINTED INCREMENT THE CURRENT DEVICE ADDR BY THE NUMBER OF SECTORS REQUIRED TO CONTAIN THE RECORD LENGTH HALT THE COMPUTER AFTER PRINTING STOP XXXX
71				*	STEPINDX	DATA	STEP	
72	01	00056	00000DCC	*				
73				*				
74				*				
75	01	00057	00000DDE	*	ST0PINDX	DATA	ST0P	
76				*				
77	01	00058	00000DED	*	TCDAINDX	DATA	TCDA	
78	01	00059	00000DFE	*	TDVINDX	DATA	TDV	
79				*				
80	01	0005A	00000E11	*	T10INDX	DATA	T10	
81				*				
82	01	0005B	00000E23	*	TRYINDX	DATA	TRY	SET UP A RETRY COUNTER
83	01	0005C	00000E4C	*	TYPBINDX	DATA	TYPB	PRINT CONTENTS OF I/O BUFFER
84	01	0005D	00000E66	*	TYPCINDX	DATA	TYPC	PRINT CONTENTS OF SELECTED COUNTERS
85	01	0005E	00000E7C	*	UNITINDX	DATA	UNIT	ESTABLISH EQUIPMENT ENVIRONMENT
86	01	0005F	00000EB9	*	UPADINDX	DATA	UPAD	THE CURRENT DEVICE ADDRESS BECOMES THE STARTING DEVICE ADDRESS
87				*				
88	01	00060	00000EE5	*	WRTINDX	DATA	WRT	WRITE ONE RECORD ON THE DISC UNIT
89	01	00061	00000F3F	*	XCWTINDX	DATA	XCWT	CHECKWRITE ENTIRE RAD
90	01	00062	00000F22	*	XGENINDX	DATA	XGEN	GENERATE A UNIT LIST WITH STARTING ADDRESSES FOR USE BY XCWT XRDS OR XWRT DIRECTIVES
91				*				
92				*				
93	01	00063	00000F49	*	XRDSINDX	DATA	XRDS	READ ENTIRE RAD
94	01	00064	00000F44	*	XWRTINDX	DATA	XWRT	WRITE ENTIRE RAD
95				*				
96				*				
97				*				LISTED BELOW, IS A TABLE OF WAITS AND LOOPS WITH THEIR RESPECTIVE ADDRESSES
98				*				
99				*				
100				*				
101				*				
102				*				
103	01	00065	00000663	*	WAIT01	DATA	WAIT1	WAITING BECAUSE AN INEXISTENT DEVICE ADDRESS HAS BEEN ENTERED
104				*				
105	01	00066	00000905	*	WAIT02	DATA	WAIT2	A COUPLER ERROR HAS OCCURRED AND SENSE SWITCH 2 IS SET
106				*				
107	01	00067	000009EC	*	WAIT03	DATA	WAIT3	EXECUTING DELAY DIRECTIVE (DLY)
108				*				
109	01	00068	00000D6C	*	WAIT04	DATA	WAIT4	S10 IS NOT POSSIBLE AND SENSE SWITCH 2 IS SET
110				*				
111	01	00069	00000DE6	*	WAIT05	DATA	WAIT5	EXECUTING THE STOP DIRECTIVE
112				*				
113	01	0006A	00000EB2	*	WAIT06	DATA	WAIT6	UNSUCCESSFUL START AND SENSE SWITCH 2 IS SET
114				*				
115	01	0006B	00000FB0	*	WAIT07	DATA	XWAIT	WAITING FOR ZERO BYTE COUNT INTERRUPT DURING A DATA CHAIN OPERATION ON THE ENTIRE RAD
116				*				
117				*				
118	01	0006C	000007A0	*	LOOP01	DATA	LOOP1	WAITING FOR CHANNEL END INTERRUPT
119				*				
120	01	0006D	00000AB2	*	LOOP02	DATA	LOOP2	LOOPING BECAUSE S10 IS NOT POSSIBLE
121				*				
122	01	0006E	00000ABA	*	LOOP03	DATA	LOOP3	LOOPING BECAUSE OF AN UNSUCCESSFUL START OF THE CURRENT OPERATION
123				*				
124				*		SPACE	8	
125				*				
126				*				
127				*				AN AREA OF 32 WORDS IS RESERVED FOR THE USER'S CONVENIENCE. IT IS LOCATED AT THE FOLLOWING ADDRESS
128	01	0006F	0000062A	*	PTCHINDX	DATA	PTCHAREA	
129				*		PAGE		
130				*				
131				*				
132				*				*STATUS BITS FOR S10, T10 AND H10 INSTRUCTIONS

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
133								
134								*POSITION AND STATE IN REGISTER RU1
135								* 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
136								
137								* 1
138								DEVICE INTERRUPT PENDING
139								0 0
140								0 1
141								1 0
142								1 1
143								0
144								1
145								1
146								0 0
147								0 1
148								1 0
149								1 1
150								0
151								
152								1
153								- 1
154								1
155								1
156								
157								1
158								1
159								1
160								1
161								1
162								
163								PAGE
164								*STATUS BITS FOR AIO INSTRUCTION
165								
166								*POSITION AND STATE IN REGISTER R
167								
168								* 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
169								
170								* 1
171								1
172								1
173								1
174								1
175								1
176								1
177								1
178								1
179								1
180								0
181								0
182								0
183								
184								PAGE
185								*STATUS BITS FOR TDV INSTRUCTIONS
186								
187								
188								*POSITION AND STATE IN REGISTER RU1
189								* 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
190								
191								* 1
192								1
193								1
194								
195								1
196								1
197								1
198								1
199								
200								1
201								1
202								1
203								1
204								
205								PAGE

SIO, TIO, HIO

HIO

TDV

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
205					*			
206					*CONDITION CODE BITS FOR I/O INSTRUCTIONS			
207					*			
208					*			
209					*	POSITION AND STATE OF CC		
210					*	1 2 3 4		
211					*			
212					* SIB	0		I/O ADDRESS RECOGNITION
213					*	1		NO I/O ADDRESS RECOGNITION
214					*		0	SUCCESSFUL START
215					*		1	UNSUCCESSFUL START
216					*			
217					* TIB	0		I/O ADDRESS RECOGNITION
218					*	1		NO I/O ADDRESS RECOGNITION
219					*		0	SIB POSSIBLE
220					*		1	SIB NOT POSSIBLE
221					*			
222					* HIB	0		I/O ADDRESS RECOGNITION
223					*	1		NO I/O ADDRESS RECOGNITION
224					*		0	DEVICE NOT OPERATING AT TIME OF HALT
225					*		1	DEVICE OPERATING AT TIME OF HALT
226					*			
227					* AIB	0		I/O INTERRUPT RECOGNITION
228					*	1		NO I/O INTERRUPT RECOGNITION
229					*		0	NORMAL INTERRUPT
230					*		1	UNUSUAL CONDITION INTERRUPT
231					*			
232					* IDV	0		I/O ADDRESS RECOGNITION
233					*	1		NO I/O ADDRESS RECOGNITION
234					*		PAGE	
235					* CATALOG NO. 704070 SIGMA 5/7 DIAGNOSTIC CONTRL PRGGRAM (DCP)			
236					*			
237					*			
238	01 00040					BRG	64	
239	01 00040							
240					* ASSIGN MNEMONIC NAMES TO INDEX REGISTERS			
241		00000001			X1	EQU	1	
242		00000002			X2	EQU	2	
243		00000003			X3	EQU	3	
244		00000004			X4	EQU	4	
245		00000005			X5	EQU	5	
246		00000006			X6	EQU	6	
247		00000007			X7	EQU	7	
248					*			
249					* ASSIGN MNEMONIC NAMES TO GENERAL REGISTERS			
250					*			
251		00000000			R0	EQU	0	
252		00000001			R1	EQU	1	
253		00000002			R2	EQU	2	
254		00000003			R3	EQU	3	
255		00000004			R4	EQU	4	
256		00000005			R5	EQU	5	
257		00000006			R6	EQU	6	
258		00000007			R7	EQU	7	
259		00000008			R8	EQU	8	
260		00000009			R9	EQU	9	
261		0000000A			R10	EQU	X'10'	
262		0000000B			R11	EQU	X'11'	
263		0000000C			R12	EQU	X'12'	
264		0000000D			R13	EQU	X'13'	
265		0000000E			R14	EQU	X'14'	
266		0000000F			R15	EQU	X'15'	
267					*		PAGE	
268					*			
269					* EQUATE STATEMENTS TO UTILIZE UNASSIGNED MEMORY LOCATIONS			
270					*			
271		00000010			ZML10	EQU	X'10'	LOCATIONS 10-IF UTILIZED
272		00000014			ZML14	EQU	X'14'	BY COMMON TYPE/PRINT ROUTINE
273		0000001E			ZML1E	EQU	X'1E'	
274		0000001F			ZML1F	EQU	X'1F'	
275		00000022			ZCLLNK	EQU	X'22'	TEMPORARY

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
276		00000023			ZEGLNK	EQU	X'23'	LINK STORAGE FOR TRANSLATOR SUBROUTINES
277		00000024			ZMSLNK	EQU	X'24'	
278		00000025			ZLPLNK	EQU	X'25'	
279		00000025			ZRPLNK	EQU	X'25'	
280					* CPU RESET RECOVERY LOCATION			
281		00000027			ZPDLNK	EQU	X'27'	
282		00000028			ZASLNK	EQU	X'28'	
283		00000029			ZPMLNK	EQU	X'29'	
284		0000002A			ZC9LNK	EQU	X'2A'	
285		0000002B			ZFSLNK	EQU	X'2B'	
286		0000002C			ZPLLNK	EQU	X'2C'	
287		0000002D			ZUDFPM	EQU	X'2D'	
288		0000002E			ZPTY	EQU	X'2E'	
289		0000002F			ZPCNT	EQU	X'2F'	
290		00000030			ZPCHK	EQU	X'30'	
291		00000031			ZPCHK1	EQU	X'31'	
292		00000032			ZDSLNK	EQU	X'32'	
293		00000033			ZDSPTR	EQU	X'33'	
294		00000034			ZCFRLNK	EQU	X'34'	
295		00000035			ZCFRCA	EQU	X'35'	
296		00000036			ZPC7LNK	EQU	X'36'	
297		00000037			ZMFRLNK	EQU	X'37'	
298		00000038			ZTSTLNK	EQU	X'38'	
299		00000039			ZCHAR	EQU	X'39'	
300		0000003A			ZLSTCH	EQU	X'3A'	
301		0000003C			ZFTF	EQU	X'3C'	
302		0000003D			ZDSFLG	EQU	X'3D'	
303					PAGE			
304					*			
305					* FORM DIRECTIVES FOR FORMATTED WORDS			
306					*			
307					ZFCP	FORM	8,24	ORDER, BYTE ADDRESS/COUNT
308					ZFOT	FORM	8,7,17	OPERATOR, UNASSIGNED, ADDRESS
309					*			
310					* PROCEDURE FOR GENERATION OF FORMATTED MESSAGE WORDS			
311					*			
312		00000000			ZFMW	CNAME		
313						PROC		
314					LF	GEN,4,4,8,16	ABSVAL(AF(1)),ABSVAL(AF(2)),ABSVAL(AF(3)),	
315						ABSVAL(AF(4))		
316						PEND		
317					*			
318					* PROCEDURE FOR GENERATION OF FORMATTED SUBROUTINE CONTROL TABLE			
319					*			
320		00000000			ZFST2	CNAME		
321						PROC		
322					LF	GEN,4,2,9,17	ABSVAL(AF(1)),ABSVAL(AF(2)),ABSVAL(AF(3)),	
323						ABSVAL(AF(4))		
324						PEND		
325					*			
326					* PROCEDURE FOR GENERATION OF FORMATTED PARAMETER WORDS			
327					*			
328		00000000			ZFSAT	CNAME		
329						PROC		
330					LF	GEN,4,2,2,7,17	ABSVAL(AF(1)),ABSVAL(AF(2)),	
331						ABSVAL(AF(3)),ABSVAL(AF(4)),ABSVAL(AF(5))		
332						PEND		
333					*			
334					* PROCEDURE FOR GENERATION OF FORMATTED HALF WORDS			
335					*			
336		00000000			ZAP1	CNAME		
337						PROC		
338					LF	GEN,16,16	ABSVAL(AF(1)),ABSVAL(AF(2))	
339						PEND		
340					PAGE			
341					*			
342					* SYNTAX ERROR CODE MESSAGES			
343						NO.	MEANING	
344						---	-----	
345						001	UNDEFINED SPECIAL CHARACTER	
						010	COMMENTS LINE INITIATOR (ASTERISK) NOT PRECEDED	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
347				*				BY NEW LINE CHARACTER
348				*	020	DECIMAL RE-ITERATION COUNT AND/OR PLACE MARKER		
349				*		IDENTIFIER SUB-FIELD GREATER OR LESS THAN AND/OR		
350				*		NOT PERMITTED BY DIRECTIVE		
351				*	021	ALPHABETIC CHARACTERS ENCOUNTERED IN DECIMAL SUB-		
352				*		FIELD OR ABSENCE OF FIELD SEPARATOR		
353				*	030	PLACE MARKER IDENTIFIER TABLE OVERFLOW		
354				*	031	DOUBLY DEFINED PLACE MARKER IDENTIFIERS		
355				*	032	UNDEFINED PLACE MARKER IDENTIFIERS AT EXECUTE TIME		
356				*	040	CLOSE LOOP OPERATION WITHOUT PRIOR OPEN LOOP OPER.		
357				*	041	OPEN LOOP OPERATIONS EXIST AT EXECUTE TIME		
358				*	050	UNDEFINED MNEMONIC DIRECTIVE		
359				*	051	DIRECTIVE NON-EXECUTABLE IN CONTROL LINE MODE		
360				*	052	DIRECTIVE NON-EXECUTABLE IN IMMEDIATE MODE		
361				*	053	UNDEFINED AND/OR DOUBLY DEFINED MNEMONIC DIRECTIVE		
362				*		NAME FOR MNEMONIC NAME RE-DEFINITION		
363				*	054	ILLEGAL FIELD SEPARATOR FOLLOWING DIRECTIVE		
364				*	055	FIELD SEPARATOR ENTERED PRIOR TO REQUIRED PARAMETER		
365				*	100	EXECUTE TABLE OVERFLOW-UNCONDITIONAL ABORT		
366				*	101	EXECUTE TABLE UNDERFLOW-UNCONDITIONAL ABORT		
367				*	105	GO ERROR UNCONDITIONAL ABORT		
368				*	110	LINK TABLE OVERFLOW-UNCONDITIONAL ABORT		
369				*	111	LINK TABLE UNDERFLOW-UNCONDITIONAL ABORT		
370				*	120	SYMBOLIC INPUT OVERFLOW-UNCONDITIONAL ABORT		
371				*		PAGE		
372				*				
373				*				
374				*		PRE-INITIALIZATION OF CPU TRAP LOCATIONS		
375	01	00040	0F0005BC			XPSD,0	ZCMST40	40 NON-ALLOWED OPERATION
376	01	00041	0F000144			XPSD,0	ZT41	41 UNIMPLEMENTED INSTRUCTION
377	01	00042	0F000158			XPSD,0	ZCTL	42 PUSHDOWN STACK LIMIT
378	01	00043	0F000148			XPSD,0	ZT43	43 FIXED POINT OVERFLOW
379	01	00044	0F000158			XPSD,0	ZCTL	44 FLOATING POINT FAULT
380	01	00045	0F000158			XPSD,0	ZCTL	45 DECIMAL ARITHMETIC FAULT
381	01	00046	0F00014C			XPSD,0	ZT46	46 WATCHDOG TIMER RUNOUT
382	01	00047	0F000158			XPSD,0	ZCTL	47 UNASSIGNED
383	01	00048	0F000158			XPSD,0	ZCTL	48 CALL 1
384	01	00049	0F000158			XPSD,0	ZCTL	49 CALL 2
385	01	0004A	0F000158			XPSD,0	ZCTL	4A CALL 3
386	01	0004B	0F000158			XPSD,0	ZCTL	4B CALL 4
387	01	0004C	0F000158			XPSD,0	ZCTL	4C CURRENT
388	01	0004D	0F000158			XPSD,0	ZCTL	4D UNASSIGNED
389	01	0004E	0F000158			XPSD,0	ZCTL	4E TRAP
390	01	0004F	0F000158			XPSD,0	ZCTL	4F LOCATIONS
391				*		PAGE		
392				*				
393				*		PRE-INITIALIZATION OF INTERRUPT LOCATIONS		
394				*				
395	01	00050	0F000158			XPSD,0	ZCTL	50 OPTIONAL POWER ON
396	01	00051	0F000158			XPSD,0	ZCTL	51 POWER OFF INTERRUPTS
397	01	00052	0F000158			XPSD,0	ZCTL	52 OPTIONAL COUNTER
398	01	00053	0F000158			XPSD,0	ZCTL	53 1-3 COUNT
399	01	00054	0F000158			XPSD,0	ZCTL	54 PULSES
400	01	00055	0F000158			XPSD,0	ZCTL	55 STANDARD COUNTER & PULSE
401	01	00056	0F000150			XPSD,0	Z156	56 MEMORY PARITY
402	01	00057	0F000158			XPSD,0	ZCTL	57 UNASSIGNED
403	01	00058	0F000158			XPSD,0	ZCTL	58 OPTIONAL COUNTER
404	01	00059	0F000158			XPSD,0	ZCTL	59 1-3 INTERRUPT
405	01	0005A	0F000158			XPSD,0	ZCTL	5A LOCATIONS
406	01	0005B	0F000158			XPSD,0	ZCTL	5B STANDARD COUNTER & INT.
407	01	0005C	0F000158			XPSD,0	ZCTL	5C INPUT/OUTPUT INTERRUPT
408	01	0005D	0F000154			XPSD,0	Z15D	5D CONSOLE INTERRUPT
409	01	0005E	0F000158			XPSD,0	ZCTL	5E CURRENTLY
410	01	0005F	0F000158		Z1L5F	XPSD,0	ZCTL	5F UNASSIGNED
411				*				60 OPTIONAL EXTERNAL GROUPS
412				*				61 2-15 LOCATIONS 60-13F
413				*				PAGE
414				*				
415				*		PRE-INITIALIZED CPU TRAP RECOVERY		
416				*				
417	01	00140				BRG	X'140'	
	01	00140						

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
489	01	00183	6AF0041B		ZPC010	BAL,R15	ZSCIR	
490	01	00184	32F00199			LW,R15	ZRECBV	
491	01	00185	35F00026	A		STW,R15	X'26'	
492	01	00186	22F00800	A		LI,R15	X'800'	
493	01	00187	6DF01200	A		WD,R15	X'1200'	
494	01	00188	32F00586			LW,R15	ZMFRIBAD	
495	01	00189	25F00402	A		SAS,R15	Z	
496	01	0018A	55F20355			STH,R15	ZMFRX7,X1	
497	01	0018B	55F20356			STH,R15	ZMFRNBA,X1	
498	01	0018C	52F20423			LH,R15	ZDKR+1,X1	
499	01	0018D	55F2036A			STH,R15	ZMFRDA,X1	
500	01	0018E	32C00198		ZPC020	LW,R12	ZPC050	
501	01	0018F	6AF0048B			BAL,R15	ZTMNCR	
502	01	00190	22900000	A		LI,R9	0	
503	01	00191	6AF001DA			BAL,R15	ZDSTRN	
504	01	00192	68000193			B	*+1	
505	01	00193	22F00196			LI,R15	ZPC030	
506	01	00194	55F201C1			STH,R15	ZTRN60,X1	
507	01	00195	680001AA			B	ZPC210	
508	01	00196	6AF001E7		ZPC030	BAL,R15	ZDSSET	
509	01	00197	6800018E			B	ZPC020	
510	01	00198	1001072C	A	ZPC050	ZFMW	1,0,1,BA(ZDS)	
511	01	00199	68000183			B	ZPC010	
512							PAGE	
513							*	
514							* CLEAR EXISTENT EXECUTE TABLE AND CONSTRUCT NEW TABLE	
515							*	
516	01	0019A	6AF0041B		ZPC200	BAL,R15	ZSCIR	
517	01	0019B	3500002D	A		STW,R0	ZUDFPM	
518	01	0019C	3500003D	A		STW,R0	ZDSFLG	
519	01	0019D	5502055D			STH,P0	ZG8PTR,X1	
520	01	0019E	228001AC			LI,R11	ZTRN10	
521	01	0019F	55B201C1			STH,R11	ZTRN60,X1	
522	01	001A0	32B00584			LW,R11	ZPMADR	
523	01	001A1	35B00585			STW,R11	ZPMPTR	
524	01	001A2	32B00582			LW,R11	ZLKADR	
525	01	001A3	35B00583			STW,R11	ZLKPTR	
526	01	001A4	32B0058F			LW,R11	ZEXADR	
527	01	001A5	6AF00390			BAL,R15	ZSTPTR	
528	01	001A6	32B00580			LW,R11	ZLBADR	
529	01	001A7	35B00581			STW,R11	ZLBPTR	
530	01	001A8	32C001C3			LW,R12	ZTRN100	
531	01	001A9	6AF0048B			BAL,R15	ZTMNCR	
532	01	001AA	72A001C7		ZPC210	LB,R10	ZAL	
533	01	001AB	35A00039	A		STW,R10	ZCHAR	
534							PAGE	
535							*	
536							* MAIN-LINE TRANSLATOR	
537							*	
538	01	001AC	22800000	A	ZTRN10	LI,R8	0	
539	01	001AD	6AF0032F			BAL,R15	ZFNCTB	
540	01	001AE	227FFFEA	A		LI,X7	-Z8PLEN	
541	01	001AF	32BEC1DA			LW,R11	Z8PTBL,X7	
542	01	001B0	71A0000B	A		CB,R10	R11	
543	01	001B1	683001CC			BCR,3	ZTRN50	
544	01	001B2	657001AF			BIR,X7	*-3	
545	01	001B3	21AC00C1	A		CI,R10	X'01'	
546	01	001B4	691001BE			BCS,1	ZTRN40	
547	01	001B5	21A000E9	A		CI,R10	X'E9'	
548	01	001B6	692001BE			BCS,2	ZTRN40	
549	01	001B7	328000CA	A		LW,R8	R10	
550	01	001B8	6AF0033F			BAL,R15	ZFA+1	
551	01	001B9	227FFFEA	A		LI,X7	-Z8PLEN	
552	01	001BA	32BEC1DA			LW,R11	Z8PTBL,X7	
553	01	001BB	71A0000B	A		CB,R10	R11	
554	01	001BC	683001CC			BCR,3	ZTRN50	
555	01	001BD	657001BA			BIR,X7	*-3	
556	01	001BE	22C000C1	A	ZTRN40	LI,R12	X'01'	
557	01	001BF	68000377			B	ZSNER	
558	01	001C0	6AF000CB	A	ZTRN50	BAL,R15	*R11	
559	01	001C1	6AF001AC		ZTRN60	BAL,R15	ZTRN10	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
560	01	001C2	680001AC			R	ZTRN10	
561	01	001C3	0001071C	A	ZTRN100	ZFMW	0,0,1,BA(ZNL)	
562							PAGE	
563								*
564								* SYNTAX TEST LANGUAGE TABLE CONTAINING ALL SPECIAL CHARACTERS
565								* ONE WORD PER SYNTAX OR SPECIAL CHARACTER
566								* BITS 0-7 SYNTAX OR SPECIAL CHARACTER
567								* BITS 8-14 RESERVED
568								* BITS 15-31 SYNTAX PROCESSOR SUBROUTINE ADDRESS
569								*
570		01 001C4			Z0PBEG	EQU	\$	
571	01	001C4	5C0002PC		ZRP	ZF0T	X'5D',0,ZRPTRN) CLOSE LOOP
572	01	001C5	610002F1		ZFS	ZF0T	X'61',0,ZFSTRN	/ RELEASE TO EXECUTE
573	01	001C6	40000284		ZSP	ZF0T	X'40',0,ZPLTRN	FIELD SEPARATORS
574	01	001C7	15000284		ZNL	ZF0T	X'15',0,ZPLTRN	NL
575	01	001C8	4E000284		ZPL	ZF0T	X'4E',0,ZPLTRN	+
576	01	001C9	50000284		ZPL	ZF0T	X'50',0,ZPLTRN	+
577	01	001CA	60000201		ZMS	ZF0T	X'60',0,ZMSTRN	* FIELD DELETOR
578		01 001CB			Z0PTB2	EQU	\$	
579		00000007			Z0PLN2	EQU	\$=Z0PBEG	
580	01	001CR	5E0001DA		ZDS	ZF0T	X'5B',0,ZDSTRN	* IMMEDIATE EXECUTION
581	01	001CC	4C00021D		ZLP	ZF0T	X'4D',0,ZLPTRN	(OPEN LOOP
582	01	001CD	7C000240		ZAS	ZF0T	X'7C',0,ZASTRN	! TRANSFER OR LINK
583	01	001CE	65000284		ZCB	ZF0T	X'6B',0,ZPLTRN	, PARAMETER SEPARATOR
584	01	001CF	4B00023B		ZPD	ZF0T	X'4B',0,ZPDTRN	. PLACE MARKER
585	01	001D0	5C0001F8		ZCL	ZF0T	X'5C',0,ZCLTRN	* COMMENTS LINE
586	01	001D1	7E000209		ZEQ	ZF0T	X'7E',0,ZEQTRN	* MNEMONIC REDEFINITION
587	01	001D2	7A0001BE			ZF0T	X'7A',0,ZTRN40	O CURRENTLY
588	01	001D3	7B0001BE			ZF0T	X'7B',0,ZTRN40	= UNDEFINED
589	01	001D4	4C0001BE			ZF0T	X'4C',0,ZTRN40	< SPECIAL
590	01	001D5	6C0001BE			ZF0T	X'6C',0,ZTRN40	(CHARACTERS
591	01	001D6	5E0001BE			ZF0T	X'5E',0,ZTRN40]
592	01	001D7	6E0001BE			ZF0T	X'6E',0,ZTRN40	>
593	01	001D8	4F0001BE			ZF0T	X'4F',0,ZTRN40	!
594	01	001D9	7D0001BE			ZF0T	X'7D',0,ZTRN40	'
595		01 001DA			Z0PTBL	EQU	\$	
596		00000016			Z0PLEN	EQU	\$=Z0PBEG	
597							PAGE	
598								*
599								* DOLLAR SIGN TRANSLATOR PROCESSOR TO INITIALIZE TRANSLATOR
600								*
601	01	001DA	35F00032	A	ZDSTRN	STW,R15	ZDSLNK	
602	01	001DB	6AF003C1			BAL,R15	ZTST3	
603	01	001DC	3590058D			STW,R9	PO	
604	01	001DD	3300003D	A		MTW,0	ZDSFLG	
605	01	001DE	693001E1			BCS,3	*+3	
606	01	001DF	32F00589			LW,R15	ZEXPTO	
607	01	001E0	35F00033	A		STW,R15	ZDSPTR	
608	01	001E1	22B0058D			LI,R11	PO	
609	01	001E2	6AF00390			BAL,R15	ZSTPTR	
610	01	001E3	35B0003D	A		STW,R11	ZDSFLG	
611	01	001E4	22B001E7			LI,R11	ZDSSET	
612	01	001E5	55B201C1			STW,R11	ZTRN60,X1	
613	01	001E6	E8020032	A		R	*ZDSLNK,X1	
614								*
615								* IMMEDIATE EXECUTION OF DIRECTIVE
616								*
617	01	001E7	35F00032	A	ZDSSET	STW,R15	ZDSLNK	
618	01	001E8	6AF0041B			BAL,R15	ZSCIR	
619	01	001E9	3300058D			MTW,0	PO	
620	01	001EA	683001F2			BCR,3	ZDSSET10	
621	01	001EB	22B0058D			LI,R11	PO	
622	01	001EC	6AF00390			BAL,R15	ZSTPTR	
623	01	001ED	6AF00524			BAL,R15	ZMPTWA	
624	01	001EE	B2B00589			LW,R11	*ZEXPTO	
625	01	001EF	EAF0000B	A		BAL,R15	*R11	
626	01	001F0	680001F1			B	*+1	
627	01	001F1	6AF0041B			BAL,R15	ZSCIR	
628	01	001F2	3500003D	A	ZDSSET10	STW,R0	ZDSFLG	
629	01	001F3	22B001AC			LI,R11	ZTRN10	
630	01	001F4	55B201C1			STW,R11	ZTRN60,X1	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
631	01	001F5	32B00033	A		LW,R11	ZDSPTR	
632	01	001F6	6AF00350			BAL,R15	ZSTPTR	
633	01	001F7	E8000032	A		B	*ZDSLK	
634							PAGE	
635								*
636								* ASTERISK TRANSLATOR PROCESSOR, VERIFIES LEGAL COMMENTS LINE
637								* OR AN ERRONEOUS ENTRY, IF LEGAL WAIT FOR NL TO TERMINATE
638								* COMMENTS LINE AND RETURN TO MAIN-LINE TRANSLATOR, IF ILLEGAL
639								* DELETE CURRENT FIELD AND OUTPUT ERROR MESSAGE AND RETURN TO
640								* MAIN-LINE TRANSLATOR FOR RE-ENTRY OF SAME FIELD
641								* NO EXECUTE TABLE ENTRY
642								*
643	01	001F8	35F00022	A	ZCLTRN	STW,R15	ZCLLNK	
644	01	001F9	22C00010	A		LI,R12	X'10'	
645	01	001FA	32F0003A	A		LW,R15	ZLSTCH	
646	01	001FB	71F001C7			CB,R15	ZNL	
647	01	001FC	69300377			BCS,3	ZSNR	
648	01	001FD	6AF00352			BAL,R15	ZF8C	
649	01	001FE	71A001C7			CB,R10	ZNL	
650	01	001FF	693001FD			BCS,3	*-2	
651	01	00200	E8000022	A		B	*ZCLLNK	
652								*
653								* MINUS SIGN TRANSLATOR PROCESSOR
654								* DELETES CURRENT FIELD FOR RE-ENTRY
655								* NO EXECUTE TABLE ENTRY
656								*
657	01	00201	35F00024	A	ZMSTRN	STW,R15	ZMSLNK	
658	01	00202	32B00589			LW,R11	ZEXPT0	
659	01	00203	6AF00390			BAL,R15	ZSTPTR	
660	01	00204	22C00000	A		LI,R12	0	
661	01	00205	B5C00589			STW,R12	*ZEXPT0	
662	01	00206	32C001C3			LW,R12	ZYRN100	
663	01	00207	6AF0048B			BAL,R15	ZTMNCR	
664	01	00208	E8000024	A		B	*ZMSLNK	
665							PAGE	
666								*
667								* EQUAL TRANSLATOR PROCESSOR, NO EXECUTE TABLE ENTRY
668								* RE-ASSIGN MNEMONIC SUB-ROUTINE, ALPHA CHARACTERS ONLY
669								* VERIFIES MNEMONIC EXISTS AND RE-ASSIGN MNEMONIC NON-EXISTENT
670								* REPLACES (DELETES) CURRENT MNEMONIC NAME
671								* INSERTS NEW MNEMONIC INTO SUBROUTINE DICTIONARY
672								*
673	01	00209	35F00023	A	ZEQTRN	STW,R15	ZEQLNK	
674	01	0020A	6AF003C1			BAL,R15	ZTST3	
675	01	0020B	32900008	A		LW,R9	R8	
676	01	0020C	6AF0033E			BAL,R15	ZFA	
677	01	0020D	33000008	A		MTW,0	R8	
678	01	0020E	68300216			BCR,3	ZEQTRN10	
679	01	0020F	227FFFD0	A		LI,X7	-ZSRLEN	
680	01	00210	35700006	A		STW,X7	X6	
681	01	00211	318E05FA			CW,R8	ZSRTBL,X7	
682	01	00212	68300216			BCR,3	ZEQTRN10	
683	01	00213	319E05FA			CW,R9	ZSRTBL,X7	
684	01	00214	6830021A			BCR,3	ZEQTRN20	
685	01	00215	65700210			BIR,X7	*-5	
686	01	00216	22C00053	A	ZEQTRN10	LI,R12	X'153'	
687	01	00217	68000377			B	ZSNR	
688	01	00218	319E05FA			CW,R9	ZSRTBL,X7	
689	01	00219	68300216			BCR,3	ZEQTRN10	
690	01	0021A	65700218		ZEQTRN20	BIR,X7	*-2	
691	01	0021B	358C05FA			STW,R8	ZSRTBL,X6	
692	01	0021C	E8000023	A		B	*ZEQLNK	
693							PAGE	
694								*
695								* LEFT PARAM TRANSLATOR PROCESSOR FOR OPEN LOOP
696								* EXECUTE TABLE ENTRY EQUALS TWO WORDS FOR ITERATION COUNT
697								* GREATER THAN ONE, NON-EXISTENT FOR 0 AND 1
698								*
699	01	0021D	35F00025	A	ZLPTRN	STW,R15	ZLPLNK	
700	01	0021E	6AF003C8			BAL,R15	ZTST7	
701	01	0021F	32F00551			LW,R15	ZLPPR0	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL ORIG	LABEL	OPERATION	OPERAND	COMMENTS
702	01	00220	85F00589			STW,R15	*ZEXPT0	
703	01	00221	6AF003A5			BAL,R15	ZTST1	
704	01	00222	22F00000	A		LI,R15	0	
705	01	00223	33000009	A		MTW,0	R9	
706	01	00224	68200226			BCR,2	#+2	
707	01	00225	32F00589			LW,R15	ZEXPT0	
708	01	00226	85F00581			STW,R15	*ZLBPTR	
709	01	00227	33100581			MTW,1	ZLBPTR	
710	01	00228	33000009	A		MTW,0	R9	
711	01	00229	E8200025	A		BCR,2	*ZLPLNK	
712	01	0022A	6AF0038C			BAL,R15	ZADPTR	
713	01	0022B	E8000025	A		B	*ZLPLNK	
714								*
715								* RIGHT PARAN TRANSLATOR PROCESSOR FOR CLSSE L00P
716								* EXECUTE TABLE ENTRY EQUALS TWO WORDS
717								* SECOND WORD CONTAINS ADDRESS OF BASE WORD FOR START OF L00P
718								*
719	01	0022C	35F00025	A	ZRPTRN	STW,R15	ZRPLNK	
720	01	0022D	6AF00284			BAL,R15	ZPLTRN	
721	01	0022E	6AF003C8			BAL,R15	ZTST7	
722	01	0022F	22C00040	A		LI,R12	X'40'	
723	01	00230	32F00581			LW,R15	ZLBPTR	
724	01	00231	31F00580			CW,R15	ZLBADR	
725	01	00232	68300377			BCR,3	ZSNR	
726	01	00233	32F00552			LW,R15	ZRPPR0-1	
727	01	00234	85F00589			STW,R15	*ZEXPT0	
728	01	00235	33F00581			MTW,-1	ZLBPTR	
729	01	00236	82F00581			LW,R15	*ZLBPTR	
730	01	00237	E8200025	A		BCR,2	*ZRPLNK	
731	01	00238	85F0058A			STW,R15	*ZEXPT1	
732	01	00239	6AF0038C			BAL,R15	ZADPTR	
733	01	0023A	E8000025	A		B	*ZRPLNK	
734							PAGE	
735								*
736								* PERIOD , PLACE MARKER, TRANSLATOR PROCESSOR
737								* LEGAL IF NON-ZERO PLACE MARKER, MARK PLACE IN CONTROL LINE
738								* ILLEGAL IF ZERO PLACE MARKER AND/OR PREVIOUSLY DEFINED
739								* NO EXECUTE TABLE ENTRY, ENTRY TO PLACE MARKER TABLE
740								*
741	01	0023B	35F00027	A	ZPDTRN	STW,R15	ZPDLNK	
742	01	0023C	6AF003C8			BAL,R15	ZTST7	
743	01	0023D	6AF0038B			BAL,R15	ZTST2	
744	01	0023E	6AF0024D			BAL,R15	ZPMEN	
745	01	0023F	E8000027	A		B	*ZPDLNK	
746								*
747								* DELTA TRANSLATOR PROCESSOR
748								* ABSOLUTE TRANSFER REFERENCE TO NON-ZERO PLACE MARKER
749								* LINK RETURN TRANSFER REFERENCE TO ZERO PLACE MARKER
750								* ABSOLUTE TRANSFER EQUALS TWO WORD ENTRY TO EXECUTE TABLE
751								* LINK TRANSFER EQUALS ONE WORD ENTRY TO EXECUTE TABLE
752								*
753	01	00240	35F00028	A	ZASTRN	STW,R15	ZASLNK	
754	01	00241	6AF003C8			BAL,R15	ZTST7	
755	01	00242	22F00566			LI,R15	ZLKAS	
756	01	00243	85F00589			STW,R15	*ZEXPT0	
757	01	00244	33000009	A		MTW,0	R9	
758	01	00245	6830024A			BCR,3	ZASTRN10	
759	01	00246	32F00564			LW,R15	ZASPR0-1	
760	01	00247	85F00589			STW,R15	*ZEXPT0	
761	01	00248	6AF0038B			BAL,R15	ZTST2	
762	01	00249	6AF0024C			BAL,R15	ZPMRQ	
763	01	0024A	6AF0038C		ZASTRN10	BAL,R15	ZADPTR	
764	01	0024B	E8000028	A		R	*ZASLNK	
765							PAGE	
766								*
767								* PLACE MARKER PROCESSOR FOR PLACE MARKER TABLE
768								* PROCESSES PLACE MARKER ENTRIES AND REQUESTS
769								* ASSUMES R9 CONTAINS BINARY VALUE FOR PLACE MARKER
770								*
771	01	0024C	20900800	A	ZPMRQ	AI,R9	X'800'	
772	01	0024D	35F00029	A	ZPMEN	STW,R15	ZPMLNK	
773	01	0024E	32700584			LW,X7	ZPMADR	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
774	01	0024F	38700585			SW,X7	ZPMPTR	
775	01	00250	68300273			BCR,3	ZPMEN40	
776	01	00251	B2BE0585		ZPMEN10	LW,R11	*ZPMPTR,X7	
777	01	00252	25B0046F	A		SAS,R11	-17	
778	01	00253	21900800	A		CI,R9	X'800'	
779	01	00254	6940025B			BCS,4	ZPMEN20	
780	01	00255	21B00800	A		CI,R11	X'800'	
781	01	00256	69400265			BCS,4	ZPMEN30	
782	01	00257	319000CB	A		CW,R9	R11	
783	01	00258	69300272			BCS,3	ZPMEN40-1	
784	01	00259	22C00031	A		LI,R12	X'31'	
785	01	0025A	68000377			R	ZSNER	
786	01	0025B	21B0080C	A	ZPMEN20	CI,R11	X'800'	
787	01	0025C	69400272			BCS,4	ZPMEN40-1	
788	01	0025D	20B0080C	A		AI,R11	X'800'	
789	01	0025E	319000CB	A		CW,R9	R11	
790	01	0025F	69300272			BCS,3	ZPMEN40-1	
791	01	00260	22B1FFFF	A		LI,R11	X'1FFFF'	
792	01	00261	C8BE0585			AND,R11	*ZPMPTR,X7	
793	01	00262	B5B0058A			STW,R11	*ZEXPT1	
794	01	00263	6AF00392			BAL,R15	ZTST4	
795	01	00264	E8000029	A		B	*ZPMLNK	
796	01	00265	22F003FF	A	ZPMEN30	LI,R15	X'3FF'	
797	01	00266	48B0000F	A		AND,R11	R15	
798	01	00267	3190000B	A		CW,R9	R11	
799	01	00268	69300272			BCS,3	ZPMEN40-1	
800	01	00269	33F0002D	A		MTW,-1	ZUDFPM	
801	01	0026A	B2FE0585			LW,R15	*ZPMPTR,X7	
802	01	0026B	32B00589			LW,R11	ZEXPT0	
803	01	0026C	B5B0000F	A		STW,R11	*R15	
804	01	0026D	33F00585			MTW,-1	ZPMPTR	
805	01	0026E	B2B00585			LW,R11	*ZPMPTR	
806	01	0026F	33100007	A		MTW,1	X7	
807	01	00270	B5BE0585			STW,R11	*ZPMPTR,X7	
808	01	00271	6800024E			B	ZPMEN+1	
809	01	00272	65700251			BIR,X7	ZPMEN10	
810	01	00273	21900800	A	ZPMEN40	CI,R9	X'800'	
811	01	00274	69400278			BCS,4	S+4	
812	01	00275	25900411	A		SAS,R9	17	
813	01	00276	49900589			BR,R9	ZEXPT0	
814	01	00277	6800027C			B	S+5	
815	01	00278	3310002D	A		MTW,1	ZUDFPM	
816	01	00279	25900411	A		SAS,R9	17	
817	01	0027A	4990058A			BR,R9	ZEXPT1	
818	01	0027B	6AF00392			BAL,R15	ZTST4	
819	01	0027C	B5B00585			STW,R9	*ZPMPTR	
820	01	0027D	22C00030	A		LI,R12	X'30'	
821	01	0027E	32B00585			LW,R11	ZPMPTR	
822	01	0027F	3310000B	A		MTW,1	R11	
823	01	00280	31B00586			CW,R11	ZMFRIBAD	
824	01	00281	69200377			BCS,2	ZSNER	
825	01	00282	35B00585			STW,R11	ZPMPTR	
826	01	00283	E8000029	A		B	*ZPMLNK	
827						PAGE		
828						*		
829						* FIELD SEPARATORS,SPACE,PLUS,NEW LINE,ETC.		
830						* PROCESSES LEADING DECIMAL RE-ITERATION COUNT OR PLACE MARKER		
831						* IDENTIFIER FIELD FOR CALLED SUB-ROUTINE		
832						* PROCESSES TRAILING PARAMETERS FOR SUB-ROUTINES		
833						*		
834	01	00284	33000008	A	ZPLTRN	MTW,0	R8	
835	01	00285	683003C1			BCR,3	ZTST3	
836	01	00286	35F0002C	A		STW,R15	ZPLLNK	
837	01	00287	227FFFDC	A		LI,X7	*ZSRLEN	
838	01	00288	31AE05FA			CW,R8	ZSRTRL,X7	
839	01	00289	6830028C			BCR,3	ZPLTRN20	
840	01	0028A	65700288			BIR,X7	S+2	
841	01	0028B	22C00030	A		LI,R12	X'50'	
842	01	0028C	68000377			B	ZSNER	
843	01	0028D	32BE062A		ZPLTRN20	LW,R11	ZSRADR,X7	
844	01	0028E	B5B00589			STW,R11	*ZEXPTC	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
845	01	0028F	F2C00589			LB,R12	*ZEXPT0	
846	01	00290	4EC00003 A			AND,R12	R3	
847	01	00291	683001C0			BCR,3	ZTRN50	
848	01	00292	3300003D A			MTW,0	ZDSFLG	
849	01	00293	693002A8			BCS,3	ZPLTRN30	
850	01	00294	22C00051 A			LI,R12	X'51'	
851	01	00295	7110000B A			CB,R1	R11	
852	01	00296	68400377			BCR,4	ZSNER	
853	01	00297	25B00206 A			SCS,R11	6	
854	01	00298	25B00402 A			SAS,R11	2	
855	01	00299	F5B00589			STB,R11	*ZEXPT0	
856	01	0029A	6AF003A5			BAL,R15	ZTST1	
857	01	0029B	6AF002B4			BAL,R15	ZC0TRN	
858	01	0029C	22F001C1			LI,R15	ZTRN60	
859	01	0029D	71A001CA			CB,R10	ZMS	
860	01	0029E	E83001CA			BCR,3	*ZMS	
861	01	0029F	6AF0038C			BAL,R15	ZADPTR	
862	01	002A0	22800000 A			LI,R8	0	
863	01	002A1	22900000 A			LI,R9	0	
864	01	002A2	22F001C1			LI,R15	ZTRN60	
865	01	002A3	71A001C5			CB,R10	ZFS	
866	01	002A4	E83001C5			BCR,3	*ZFS	
867	01	002A5	71A001C4			CB,R10	ZRP	
868	01	002A6	E83001C4			BCR,3	*ZRP	
869	01	002A7	E800002C A			B	*ZPLLNK	
870	01	002A8	22C00052 A		ZPLTRN30	LI,R12	X'52'	
871	01	002A9	7120000B A			CB,R2	R11	
872	01	002AA	68400377			BCR,4	ZSNER	
873	01	002AB	25B00204 A			SCS,R11	4	
874	01	002AC	25B00404 A			SAS,R11	4	
875	01	002AD	F5B00589			STB,R11	*ZEXPT0	
876	01	002AE	6AF003C1			BAL,R15	ZTST3	
877	01	002AF	6AF002B4			BAL,R15	ZC0TRN	
878	01	002B0	22F001C1			LI,R15	ZTRN60	
879	01	002B1	71A001CA			CB,R10	ZMS	
880	01	002B2	E83001CA			BCR,3	*ZMS	
881	01	002B3	680001C1			B	ZTRN60	
882						PAGE		
883						*		
884						* COMMA TRANSLATOR PROCESSOR		
885						* CALLED ONLY BY FIELD SEPARATOR TRANSLATOR PROCESSOR		
886						* PROCESSES ALL SUB-ROUTINE TRAILING PARAMETERS		
887						*		
888	01	002B4	35F0002A A		ZC0TRN	STW,R15	ZC0LNK	
889	01	002B5	32B0058A			LW,R11	ZEXPT1	
890	01	002B6	35B00030 A			STW,R11	ZPCHK	
891	01	002B7	35B00031 A			STW,R11	ZPCHK1	
892	01	002B8	F2B00589			LB,R11	*ZEXPT0	
893	01	002B9	25B0047C A			SAS,R11	-4	
894	01	002BA	35B0002F A			STW,R11	ZPCNT	
895	01	002BB	75B6034E			STB,R11	ZPC7M,X3	
896	01	002BC	D2B20589			LH,R11	*ZEXPT0,X1	
897	01	002BD	38B0002F A			SW,R11	ZPCNT	
898	01	002BE	35B0002E A			STW,R11	ZPTY	
899	01	002BF	22800000 A		ZC0TRN10	LI,R8	0	
900	01	002C0	22900000 A			LI,R9	0	
901	01	002C1	B580058A			STW,R8	*ZEXPT1	
902	01	002C2	F270002E A			LB,R7	*ZPTY	
903	01	002C3	33F0002F A			MTW,-1	ZPCNT	
904	01	002C4	691002D6			BCS,1	ZC0TRN50	
905	01	002C5	71A001CE			CB,R10	ZC0	
906	01	002C6	683002CD			BCR,3	ZC0TRN30	
907	01	002C7	71A6034E			CB,R10	ZPC7M,X3	
908	01	002C8	683002CD			BCR,3	ZC0TRN30	
909	01	002C9	21700008 A			CI,R7	8	
910	01	002CA	684002DC			BCR,4	ZC0TRN40	
911	01	002CB	22C00055 A			LI,R12	X'55'	
912	01	002CC	68000377			B	ZSNER	
913	01	002CD	2570047C A		ZC0TRN30	SAS,R7	-4	
914	01	002CE	670002F9			EXU	ZPRYP,X7	
915	01	002CF	B590058A			STW,R9	*ZEXPT1	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
916	01	002D0	3310002E	A	ZC0TRN40	MTW,1	ZPTY	
917	01	002D1	6AF00392			BAL,R15	ZTST4	
918	01	002D2	33000009	A		MTW,0	R9	
919	01	002D3	683002BF			RCR,3	ZC0TRN10	
920	01	002D4	35B00031	A		STW,R11	ZPCWK1	
921	01	002D5	680002BF			B	ZC0TRN10	
922	01	002D6	71A6034E		ZC0TRN50	CB,R10	ZPC7M,X3	
923	01	002D7	693002D9			HCS,3	*+2	
924	01	002D8	22A00040	A		LI,R10	X'40'	
925	01	002D9	227FFFF9	A		LI,X7	-Z0PLN2	
926	01	002DA	32BE01CB			LW,R11	Z0PTB2,X7	
927	01	002DB	71A0000B	A		CB,R10	R11	
928	01	002DC	683002FC			RCR,3	ZC0TRN60	
929	01	002DD	657002DA			BIR,X7	*-3	
930	01	002DE	22C00054	A		LI,R12	X'54'	
931	01	002DF	68000377			B	ZSNR	
932	01	002E0	32B00031	A	ZC0TRN60	LW,R11	ZPCWK1	
933	01	002E1	38B00030	A		SW,R11	ZPCWK	
934	01	002E2	25B00404	A		SAS,R11	4	
935	01	002E3	22F0000F	A		LI,R15	X'F'	
936	01	002E4	F2700589			LB,R7	*ZEXPTO	
937	01	002E5	4B70000F	A		AND,R7	R15	
938	01	002E6	49B00007	A		OR,R11	R7	
939	01	002E7	F5B00589			STB,R11	*ZEXPTO	
940	01	002E8	E800002A	A		B	*ZC0LNK	
941						PAGE		
942					*			
943					* VARIABLE ENTRY TABLE TO PARAMETER PROCESSORS			
944					*			
945	01	002E9	6AF00329		ZPRTYP	BAL,R15	ZFNUP	
946	01	002EA	6AF0032C			BAL,R15	ZFN	
947	01	002EB	6AF0032F			BAL,R15	ZFN0TB	
948	01	002EC	6AF00335			BAL,R15	ZF0CT	
949	01	002ED	6AF00338			BAL,R15	ZFH	
950	01	002EE	6AF0033B			BAL,R15	ZPC5	
951	01	002EF	6AF00341			BAL,R15	ZPC6	
952	01	002F0	6AF00347			BAL,R15	ZPC7	
953					*			
954					* PARAMETER INFORMATION			
955					* PARAMETER DECODE WORD FORMAT			
956					* BIT 0-3	CODE TYPE		
957					* 4	0N=PARAMETER REQUIRED		
958					*	0FF=PARAMETER NOT REQUIRED		
959					*			
960					* CODE TYPE			
961					* 0	NUMERIC 0-9 ONLY; STORE WITH ZONE BITS		
962					* 1	NUMERIC 0-9 ONLY; STORE WITHOUT ZONE BITS		
963					* 2	NUMERIC 0-9 ONLY; CONVERT TO BINARY		
964					* 3	NUMERIC 0-7 ONLY; OCTAL		
965					* 4	HEXADECIMAL 0-9 A-F; STORE AS BINARY VALUE		
966					* 5	ALPHABETIC ONLY A-Z		
967					* 6	ALPHA-NUMERIC ONLY A-Z 0-9		
968					* 7	ANY CHARACTER; FIRST CHARACTER REPRESENTS TERMINATOR, BOTH NOT PUTAWAY		
969					*			
970					*			
971					PAGE			
972					*			
973					* FORWARD SLASH TRANSLATOR PROCESSOR, TERMINATE CONTROL			
974					* EXECUTE TABLE ENTRY EQUALS TWO WORDS			
975					* VERIFIES ALL L00PS AND PLACE MARKER REQUESTS PROCESSED			
976					* VERIFIES LAST DIRECTIVE PROCESSED			
977					* SAVES THIS ENTRY LOCATION FOR POSSIBLE EXTEND OR PATCH			
978					*			
979	01	002F1	35F0002B	A	ZFSTRN	STW,R15	ZFSLNK	
980	01	002F2	6AF002A4			BAL,R15	ZPLTRN	
981	01	002F3	33000030	A		MTW,0	ZDSFLG	
982	01	002F4	E930002B	A		BCS,3	*ZFSLNK	
983	01	002F5	32B00056C			LW,R11	ZFSPR0-1	
984	01	002F6	R5B000589			STW,R11	*ZEXPTO	
985	01	002F7	22C00101	A		LI,R12	X'101'	
986	01	002F8	32B000FEF			LW,R11	ZEXADR	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
987	01	002F9	31B00589			CW,R11	ZEXPT0	
988	01	002FA	68300377			BCR,3	ZSNER	
989	01	002FB	B5B0058A			STW,R11	*ZEXPT1	
990	01	002FC	22C00041	A		LI,R12	X'41'	
991	01	002FD	32B00581			LW,R11	ZLBPTR	
992	01	002FE	31B00580			CW,R11	ZLBADR	
993	01	002FF	69200377			BCS,2	ZSNER	
994	01	00300	33000009	A		MTW,0	R9	
995	01	00301	68300304			BCR,3	*+3	
996	01	00302	6AF003BB			BAL,R15	ZTST2	
997	01	00303	6AF0024C			BAL,R15	ZPMRQ	
998	01	00304	22C00032	A		LI,R12	X'32'	
999	01	00305	3300002D	A		MTW,0	ZUDFPM	
1000	01	00306	69200377			BCS,2	ZSNER	
1001	01	00307	32B00589			LW,R11	ZEXPT0	
1002	01	00308	6AF00390			BAL,R15	ZSTPTR	
1003	01	00309	B2B0000B	A		LW,R11	*R11	
1004	01	0030A	55B2055D			STW,R11	ZG8PTR,X1	
1005	01	0030B	52C20355			LH,R12	ZMFRX7,X1	
1006	01	0030C	55C20356			STW,R12	ZMFRNBA,X1	
1007	01	0030D	32C001C3			LW,R12	ZTRN100	
1008	01	0030E	6AF0048B			BAL,R15	ZTMNCR	
1009	01	0030F	68000516			B	ZEX00	
1010						PAGE		
1011								
1012								
1013								
1014								
1015								
1016	01	00310	35E00035	A	ZCFR	STW,R14	ZCFRCA	
1017	01	00311	35F00034	A		STW,R15	ZCFRLNK	
1018	01	00312	6AF00352			BAL,R15	ZF8C	
1019	01	00313	F1A20035	A		CB,R10	*ZCFRCA,X1	
1020	01	00314	E9100034	A		BCS,1	*ZCFRLNK	
1021	01	00315	F1A40035	A		CB,R10	*ZCFRCA,X2	
1022	01	00316	E9200034	A		BCS,2	*ZCFRLNK	
1023	01	00317	22F0033A			LI,R15	ZFH+2	
1024	01	00318	31F00035	A		CW,R15	ZCFRCA	
1025	01	00319	6930031F			BCS,3	*+6	
1026	01	0031A	21A000E9	A		CI,R10	X'E9'	
1027	01	0031B	6920031F			BCS,2	*+4	
1028	01	0031C	21A000C6	A		CI,R10	X'C6'	
1029	01	0031D	E9200034	A		BCS,2	*ZCFRLNK	
1030	01	0031E	20A00009	A		AI,R10	X'9'	
1031	01	0031F	32F0000A	A		LW,R15	R10	
1032	01	00320	BA700035	A		LCW,X7	*ZCFRCA	
1033	01	00321	F2E00035	A		LB,R14	*ZCFRCA	
1034	01	00322	B2E0000E	A		LW,R14	*R14	
1035	01	00323	25FE0200	A		SCS,R15	0,X7	
1036	01	00324	B2700035	A		LW,X7	*ZCFRCA	
1037	01	00325	25EE0500	A		SAD,R14	0,X7	
1038	01	00326	F2F00035	A		LB,R15	*ZCFRCA	
1039	01	00327	B5E0000F	A		STW,R14	*R15	
1040	01	00328	68000312			B	ZCFR+2	
1041						PAGE		
1042								
1043								
1044								
1045	01	00329	22900000	A	ZFNUP	LI,R9	0	
1046	01	0032A	6AE00310			BAL,R14	ZCFR	
1047	01	0032B	09F0F908	A		DATA	X'09F0F908'	
1048								
1049								
1050								
1051	01	0032C	22900000	A	ZFN	LI,R9	0	
1052	01	0032D	6AE00310			BAL,R14	ZCFR	
1053	01	0032E	09F0F904	A		DATA	X'09F0F904'	
1054								
1055								
1056								
1057	01	0032F	35F00420		ZFNDB	STW,R15	ZCSRL	
1058	01	00330	6AF0032C			BAL,R15	ZFN	

* COMMON FETCH ROUTINE PARAMETERIZED BY ONE WORD FOLLOWING CALL
 * LINK IN R14 AND LINK RETURN IN R15 TO FETCH WITHIN LIMITS
 * REGISTER=MINIMUM-MAXIMUM-SHIFT

* FETCH NUMERIC 0-9 UNPACKED ZONE BITS PRESENT

* FETCH NUMERIC 0-9 PACKED ZONE BITS NOT PRESENT

* FETCH NUMERIC 0-9 CONVERTED TO BINARY

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1059	01	00331	46C00009	A		XW,R12	R9	
1060	01	00332	6AF003CC			BAL,R15	ZDTB	
1061	01	00333	46C00009	A		XW,R12	R9	
1062	01	00334	E800042C			R	*ZCSRL	
1063					*			
1064					* FETCH OCTAL 0-7 BINARY VALUE			
1065					*			
1066	01	00335	22900000	A	ZF9CT	LI,R9	0	
1067	01	00336	6AE00310			BAL,R14	ZCFR	
1068	01	00337	09F0F703	A		DATA	X'09F0F703'	
1069					*			
1070					* FETCH HEXADECIMAL 0-F BINARY VALUE			
1071					*			
1072	01	00338	22900000	A	ZFH	LI,R9	0	
1073	01	00339	6AE00310			BAL,R14	ZCFR	
1074	01	0033A	09C1F904	A		DATA	X'09C1F904'	
1075						PAGE		
1076					*			
1077					* FETCH ALPHABETIC A-Z UNPACKED ZONE BITS PRESENT			
1078					*			
1079	01	0033B	22900000	A	ZPC5	LI,R9	0	
1080	01	0033C	6AE00310			BAL,R14	ZCFR	
1081	01	0033D	09C1E908	A		DATA	X'09C1E908'	
1082	01	0033E	22800000	A	ZFA	LI,R8	0	
1083	01	0033F	6AE00310			BAL,R14	ZCFR	
1084	01	00340	08C1E908	A		DATA	X'08C1E908'	
1085					*			
1086					* FETCH ALPHA -NUMERIC 0-9 A-Z UNPACKED ZONE BITS PRESENT			
1087					*			
1088	01	00341	22900000	A	ZPC6	LI,R9	0	
1089	01	00342	6AE00310			BAL,R14	ZCFR	
1090	01	00343	09C1F908	A		DATA	X'09C1F908'	
1091	01	00344	22800000	A	ZFAN	LI,R8	0	
1092	01	00345	6AE00310			BAL,R14	ZCFR	
1093	01	00346	08C1F908	A		DATA	X'08C1F908'	
1094					*			
1095					* FETCH ANY CHARACTER *SPECIAL APPLICATIONS*			
1096					* FIRST CHARACTER REPRESENTS TERMINATOR WITH FIRST AND			
1097					* LAST CHARACTER NOT INCLUDED IN BYTE COUNT			
1098					*			
1099	01	00347	35F00036	A	ZPC7	STW,R15	ZPC7LNK	
1100	01	00348	6AF00352			BAL,R15	ZF9C	
1101	01	00349	75A6034E			STB,R10	ZPC7M,X3	
1102	01	0034A	52F20355			LH,R15	ZMFRX7,X1	
1103	01	0034B	85F0058A			STW,R15	*ZEXPT1	
1104	01	0034C	6AF00352			BAL,R15	ZF8C	
1105	01	0034D	8290058A			LW,R9	*ZEXPT1	
1106	01	0034E	21A00000	A	ZPC7M	CI,R10	0	
1107	01	0034F	E8300336	A		BCR,3	*ZPC7LNK	
1108	01	00350	F310058A			MTB,1	*ZEXPT1	
1109	01	00351	6800034C			B	*-5	
1110						PAGE		
1111					*			
1112					* MAINLINE FETCH ROUTINE VIA TYPEWRITER OR CARD READER			
1113					* INPUT CONTROL LINE SYNTAX TO INPUT/OUTPUT AREA			
1114					*			
1115	01	00352	35F00037	A	ZF9C	STW,R15	ZMFRLNK	
1116	01	00353	32A00039	A		LW,R10	ZCHAR	
1117	01	00354	35A0003A	A		STW,R10	ZLSTCH	
1118	01	00355	22700000	A	ZMFRX7	LI,R7	0	
1119	01	00356	21700000	A	ZMFRNBA	CI,R7	0	
1120	01	00357	69100370			BCS,1	ZMFRTCBA	
1121	01	00358	55720374			STH,R7	ZMFRWC0,X1	
1122	01	00359	32A00587			LW,R10	ZIADR	
1123	01	0035A	25A00402	A		SAS,R10	2	
1124	01	0035B	58A20356			SH,R10	ZMFRNBA,X1	
1125	01	0035C	68300376			BCR,3	ZMFR10F	
1126	01	0035D	21A00050	A		CI,R10	80	
1127	01	0035E	69100360			BCS,1	*+2	
1128	01	0035F	22A00050	A		LI,R10	80	
1129	01	00360	52F20423			LH,R15	ZDKB+1,X1	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL ORIG	LABEL	OPERATION	OPERAND	COMMENTS
1130	01	00361	51F2036A			CH,R15	ZMFRDA,X1	
1131	01	00362	69300364			RCS,3	\$+2	
1132	01	00363	22A00001	A		LI,R10	1	
1133	01	00364	55A20375			STH,R10	ZMFRCW1,X1	
1134	01	00365	50A20355			AH,R10	ZMFRX7,X1	
1135	01	00366	55A20356			STH,R10	ZMFRNBA,X1	
1136	01	00367	0000036A			T10,R12	*ZMFRDA	
1137	01	00368	69000367			BCS,12	\$=1	
1138	01	00369	2200018A			LI,RC	DA(ZMFRCW0)	
1139	01	0036A	40000001	A	ZMFRDA	S10,R12	1	
1140	01	0036B	6900036A			BCS,12	\$=1	
1141	01	0036C	0000036A			T10,R12	*ZMFRDA	
1142	01	0036D	7200000D	A		LB,R13	R13	
1143	01	0036E	21000060	A		CI,R13	X'60'	
1144	01	0036F	6940036C			BCS,4	\$=3	
1145	01	00370	72AEC000	A	ZMFRTCBA	LB,R10	0,X7	
1146	01	00371	35A00039	A		STW,R10	ZCHAR	
1147	01	00372	33100355			MTW,1	ZMFRX7	
1148	01	00373	E8000037	A		B	*ZMFRLNK	
1149						BBOUND 8		
1150	01	00374	0E0000D0		ZMFRCW0	ZFCP	X'E',BA(\$)	
1151	01	00375	02000001	A	ZMFRCW1	ZFCP	2,1	
1152						PAGE		
1153						*		
1154						* SYNTAX ERROR REPORTER		
1155						*		
1156	01	00376	22000120	A	ZMFR10F	LI,R12	X'120'	
1157	01	00377	6AF003F5		ZSNER	BAL,R15	ZBTH	
1158	01	00378	25000208	A		SCS,R13	8	
1159	01	00379	3500038B			STW,R13	ZSNMSG+2	
1160	01	0037A	22F00015	A		LI,R15	X'15'	
1161	01	0037B	75F6038B			STB,R15	ZSNMSG+2,X3	
1162	01	0037C	52C20355			LH,R12	ZMFRX7,X1	
1163	01	0037D	55C20356			STH,R12	ZMFRNBA,X1	
1164	01	0037E	32C00388			LW,R12	ZSNERMW	
1165	01	0037F	6AF004BE			BAL,R15	ZSML40	
1166	01	00380	72F0038B			LB,R15	ZSNMSG+2	
1167	01	00381	21F000F0	A		CI,R15	X'F0'	
1168	01	00382	69200183			BCS,2	ZPC010	
1169	01	00383	52F20426			LH,R15	ZDCR+1,X1	
1170	01	00384	51F2036A			CH,R15	ZMFRDA,X1	
1171	01	00385	68300183			BCR,3	ZPC010	
1172	01	00386	22F001C1			LI,R15	ZTRN60	
1173	01	00387	E80001CA			B	*ZMS	
1174	01	00388	10000E24	A	ZSNERMW	ZFMW	1,0,12,BA(ZSNMSG)	
1175	01	00389	E2E80540	A	ZSNMSG	TEXT	'SYN ERR	
1176	01	0038A	C5D9C940	A				
1177	01	0038B	40404040	A				
1178						PAGE		
1179						*		
1180						* UPDATE EXECUTE TABLE POINTERS TO NEXT ENTRY		
1181						* BASED UPON PARAMETER COUNT AND/OR RE-ITERATION COUNT OR		
1182						* IDENTIFIER FIELD		
1183						*		
1184	01	0038C	F2B00589		ZADPTR	LB,R11	*ZEXPT0	
1185	01	0038D	20B0001C	A		AI,R11	X'1C'	
1186	01	0038E	25B0047C	A		SAS,R11	=4	
1187	01	0038F	30B00589			AW,R11	ZEXPT0	
1188						*		
1189						* SET EXECUTE TABLE POINTERS FOR BASE WORD AND POSSIBLE		
1190						* RE-ITERATION COUNT OR PLACE MARKER ADDRESS FIELD		
1191						*		
1192						*		
1193						* VERIFY EXECUTE TABLE NON-OVERFLOW		
1194						*		
1195	01	00390	35B00589		ZSTPTR	STW,R11	ZEXPT0	
1196	01	00391	35B0058A			STW,R11	ZEXPT1	
1197						*		
1198						* ZYST4		
1199	01	00392	3310058A			MTW,1	ZEXPT1	
1200	01	00393	32B0058A			LW,R11	ZEXPT1	
1201	01	00394	31B00582			CW,R11	ZLKADR	
1202	01	00395	E91000CF	A		BCS,1	*R15	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1199	01	00396	22C00100	A		LI,R12	X'100'	
1200	01	00397	68000377			B	ZSNR	
1201							PAGE	
1202								*
1203								* ADVANCE PRINTERS AND CLEAR RE-ITERATION COUNT FIELD
1204								* IF EXISTENT IN EXECUTE TABLE ENTRY
1205								*
1206	01	00398	35F0000E	A	ZADCRC	STW,R15	R14	
1207	01	00399	6AF0038C			BAL,R15	ZADPTR	
1208	01	0039A	6800039D			B	*+3	
1209								*
1210								* SET PRINTERS AND CLEAR RE-ITERATION COUNT FIELD
1211								* (R11) CONTAINS BASE WORD VALUE
1212								*
1213	01	00398	35F0000E	A	ZSTCRC	STW,R15	R14	
1214	01	0039C	6AF00390			BAL,R15	ZSTPTR	
1215	01	0039D	32F0000E	A		LW,R15	R14	
1216								*
1217								* CLEAR OR RESET RE-ITERATION COUNT FIELD IN EXECUTE TABLE
1218								* ONLY IF RC FIELD IS EXISTENT
1219								*
1220	01	0039E	F2800589		ZCRC	LB,R11	*ZEXPT0	
1221	01	0039F	21800008	A		CI,R11	8	
1222	01	003A0	E840000F	A		BCR,4	*R15	
1223	01	003A1	0280058A			LW,R11	*ZEXPT1	
1224	01	003A2	25800410	A		SAS,R11	16	
1225	01	003A3	8580058A			STW,R11	*ZEXPT1	
1226	01	003A4	E800000F	A		B	*R15	
1227							PAGE	
1228								*
1229								* PROCESS LEADING DECIMAL SUB-FIELD ASSUMED BINARY IN R9
1230								* RE-ITERATION COUNT LESS THAN 10K AND GREATER THAN 1
1231								* PLACE MARKER IDENTIFIER LESS THAN 512
1232								*
1233	01	003A5	F2800589		ZTST1	LB,R11	*ZEXPT0	
1234	01	003A6	2180000C	A		CI,R11	X'1C'	
1235	01	003A7	684003C1			BCR,4	ZTST3	
1236	01	003A8	21800C08	A		CI,R11	8	
1237	01	003A9	694003AF			BCS,4	ZTST1A	
1238	01	003AA	33000009	A		MTW,0	R9	
1239	01	003AB	68300381			BCR,3	ZTST1AA	
1240	01	003AC	219001FF	A		CI,R9	511	
1241	01	003AD	692003BF			BCS,2	ZTST2A	
1242	01	003AE	6800024C			B	ZPMRQ	
1243	01	003AF	33F00009	A	ZTST1A	MTW,-1	R9	
1244	01	003B0	692003B5			BCS,2	ZTST1B	
1245	01	003B1	22C000F3	A	ZTST1AA	LI,R12	X'F3'	
1246	01	003B2	4880000C	A		AND,R11	R12	
1247	01	003B3	F5800589			STB,R11	*ZEXPTC	
1248	01	003B4	E800000F	A		B	*R15	
1249	01	003B5	2190270F	A	ZTST1B	CI,R9	9999	
1250	01	003B6	692003BF			BCS,2	ZTST2A	
1251	01	003B7	32C00009	A		LW,R12	R9	
1252	01	003B8	25C00410	A		SAS,R12	16	
1253	01	003B9	85C0058A		ZTST1C	STW,R12	*ZEXPT1	
1254	01	003BA	68000392			B	ZTST4	
1255							PAGE	
1256								*
1257								* VERIFIES PLACE MARKER VALUE GREATER THAN ONE
1258								* AND LESS THAN 512 DECIMAL
1259								*
1260	01	003BB	33000009	A	ZTST2	MTW,0	R9	
1261	01	003BC	633003BF			BCR,3	ZTST2A	
1262	01	003BD	2190020C	A		CI,R9	X'200'	
1263	01	003BE	E910000F	A		BCS,1	*R15	
1264	01	003BF	22C00020	A	ZTST2A	LI,R12	X'20'	
1265	01	003C0	68000377			B	ZSNR	
1266								*
1267								* VERIFY NUMERIC ACCUMULATOR IS EMPTY (ZERO)
1268								*
1269	01	003C1	33000009	A	ZTST3	MTW,0	R9	
1270	01	003C2	E830000F	A		BCR,3	*R15	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL ORIG	LABEL	OPERATION	OPERAND	COMMENTS
1271	01	003C3	680003BF			B	ZTST2A	
1272					*			
1273					* VERIFY ALPHA ACCUMULATOR EMPTY (ZERO)			
1274					*			
1275	01	003C4	33000008 A		ZTST6	MTW,0	R8	
1276	01	003C5	E83000CF A			RCR,3	*R15	
1277	01	003C6	22C00021 A			LI,R12	X'21'	
1278	01	003C7	68000377			B	ZSNR	
1279					*			
1280					* VERIFY TRANSLATOR NOT IN IMMEDIATE MODE			
1281					*			
1282	01	003C8	3300003D A		ZTST7	MTW,0	ZDSFLG	
1283	01	003C9	E83000CF A			RCR,3	*R15	
1284	01	003CA	22C00052 A			LI,R12	X'52'	
1285	01	003CF	68000377			B	ZSNR	
1286							PAGE	
1287					*			
1288					* DECIMAL TO BINARY CONVERTER FOUR BITS PER DIGIT			
1289					* (R12) VALUE TO CONVERT TO R12 AND ZTEMP			
1290					* (R15) LINK RETURN VALUE			
1291					*			
1292	01	003CC	46C0000F A		ZDTB	XW,R12	R15	
1293	01	003CD	35F0058B			STW,R15	ZTEMP	
1294	01	003CE	48F003DE			AND,R15	ZDTB10	
1295	01	003CF	25F0027C A			SCS,R15	-4	
1296	01	003D0	23FFFFFFA A			MI,R15	-6	
1297	01	003D1	30F0058B			AW,R15	ZTEMP	
1298	01	003D2	35F0058B			STW,R15	ZTEMP	
1299	01	003D3	48F003DF			AND,R15	ZDTB20	
1300	01	003D4	25F00278 A			SCS,R15	-8	
1301	01	003D5	23FFFFFF4 A			MI,R15	-156	
1302	01	003D6	30F0058B			AW,R15	ZTEMP	
1303	01	003D7	35F0058B			STW,R15	ZTEMP	
1304	01	003D8	52F0000F A			LH,R15	R15	
1305	01	003D9	23FF2710 A			MI,R15	-55536	
1306	01	003DA	30F0058B			AW,R15	ZTEMP	
1307	01	003DB	35F0058B			STW,R15	ZTEMP	
1308	01	003DC	46C0000F A			XW,R12	R15	
1309	01	003DD	E80000CF A			B	*R15	
1310	01	003DE	F0F0F0F0 A		ZDTB10	DATA	X'F0F0F0F0'	
1311	01	003DF	FF00FF0C A		ZDTB20	DATA	X'FF00FF00'	
1312							PAGE	
1313					*			
1314					* BINARY TO DECIMAL CONVERTER FOUR BITS PER DIGIT			
1315					* (R12) VALUE TO CONVERT TO R12 AND ZTEMP			
1316					* (R15) LINK RETURN VALUE			
1317					*			
1318	01	003E0	35D0042C		ZBTD	STW,R13	ZCSRL	
1319	01	003E1	22D0C400 A			LI,R13	X'400'	
1320	01	003E2	46C0C00D A			XW,R12	R13	
1321	01	003E3	35C0059D			STW,R12	PX	
1322	01	003E4	22C00000 A			LI,R12	0	
1323	01	003E5	35C0058B			STW,R12	ZTEMP	
1324	01	003E6	22C00000 A		ZBTD10	LI,R12	0	
1325	01	003E7	21D000CA A			CI,R13	10	
1326	01	003E8	691003EE			BCS,1	ZBTD20	
1327	01	003E9	36C003F4			DW,R12	ZBTD30	
1328	01	003EA	A5C0059D			S,R12	*PX	
1329	01	003EB	3340059D			MTW,4	PX	
1330	01	003EC	66C0058B			AWP,R12	ZTEMP	
1331	01	003ED	680003E6			B	ZBTD10	
1332	01	003EE	32C00420		ZBTD20	LW,R12	ZCSRL	
1333	01	003EF	46C0000D A			XW,R12	R13	
1334	01	003F0	A5C0059D			S,R12	*PX	
1335	01	003F1	49C0058B			BR,R12	ZTEMP	
1336	01	003F2	35C0058B			STW,R12	ZTEMP	
1337	01	003F3	E80000CF A			B	*R15	
1338	01	003F4	000000CA A		ZBTD30	DATA	10	
1339							PAGE	
1340					*			
1341					* BINARY TO HEXADECIMAL CONVERTER			

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1342								* (R12) VALUE TO CONVERT TO R12-R13 AND ZTEMP-ZTEMP1
1343								* (R15) LINK RETURN VALUE
1344								*
1345	01	C03F5	35100420		ZRTH	STW,R1	ZCSRL	
1346	01	C03F6	221FFFF8	A		LI,X1	=8	
1347	01	C03F7	220000F	A		LI,R13	X'F'	
1348	01	C03F8	25000304	A		SCD,R12	4	
1349	01	C03F9	210000FA	A		CI,R13	X'FA'	
1350	01	C03FA	691003FC			BCS,1	#+2	
1351	01	C03FB	200000C7	A		AI,R13	X'C7'	
1352	01	C03FC	7502058D			STB,R13	ZTEMP1+1,X1	
1353	01	C03FD	651003F7			BIR,X1	ZRTH+2	
1354	01	C03FE	3200058B			LW,R12	ZTEMP	
1355	01	C03FF	3200058C			LW,R13	ZTEMP1	
1356	01	C0400	32100420			LW,R1	ZCSRL	
1357	01	C0401	E80000CF	A		R	*R15	
1358								*
1359								* LEADING ZERO SUPPRESSION ON UNPACKED VALUE
1360								* (R12) CONTAINS VALUE TO SUPPRESS
1361								* (R15) CONTAINS LINK RETURN ADDRESS
1362								*
1363	01	C0402	35F00420		ZSUP	STW,P15	ZCSRL	
1364	01	C0403	3510058B			STW,X1	ZTEMP	
1365	01	C0404	221FFFFC	A		LI,X1	-X'4'	
1366	01	C0405	22F000FC	A		LI,R15	X'F0'	
1367	01	C0406	71F2000D	A		CB,R15	R12+1,X1	
1368	01	C0407	6930040B			BCS,3	#+4	
1369	01	C0408	22F00040	A		LI,R15	X'40'	
1370	01	C0409	75F2000D	A		STB,R15	R12+1,X1	
1371	01	C040A	65100405			BIR,X1	ZSUP+3	
1372	01	C040B	3210058B			LW,R1	ZTEMP	
1373	01	C040C	3500058B			STW,R12	ZTEMP	
1374	01	C040D	E8000420			R	*ZCSRL	
1375								PAGE
1376								*
1377								* DECIMAL ADDER FOUR BITS PER DIGIT
1378								* (R12) CURRENT DECIMAL ADDER VALUE
1379								* (R15) LINK RETURN VALUE
1380								*
1381	01	C040E	3510058B		ZDECADER	STW,R1	ZTEMP	
1382	01	C040F	221FFFF8	A		LI,X1	=8	
1383	01	C0410	33100000	A		MTW,1	R12	
1384	01	C0411	2100000B	A		CI,R12	X'8'	
1385	01	C0412	68400416			BCR,4	#+4	
1386	01	C0413	21000002	A		CI,R12	X'2'	
1387	01	C0414	68400416			BCR,4	#+2	
1388	01	C0415	33600000	A		MTW,6	R12	
1389	01	C0416	25000270	A		SCS,R12	=4	
1390	01	C0417	65100411			BIR,X1	#+6	
1391	01	C0418	32100000	A		LW,R1	R12	
1392	01	C0419	4610058B			XW,R1	ZTEMP	
1393	01	C041A	E80000CF	A		B	*R15	
1394								*
1395								* INITIALIZE COMMON INDEX REGISTERS
1396								*
1397	01	C041B	22000000	A	ZSCIR	LI,R0	0	
1398	01	C041C	22100001	A		LI,X1	1	
1399	01	C041D	22200002	A		LI,X2	2	
1400	01	C041E	22300003	A		LI,X3	3	
1401	01	C041F	E80000CF	A		B	*R15	
1402	01	C0420	00000000	A	ZCSRL	PZE		
1403								PAGE
1404								*
1405								* DCR DIRECTIVE ASSIGNING DIRECTIVE INPUT VIA TYPEWRITER
1406								*
1407	01	C0421	40000000	A	ZOKB	DATA	X'40000000'	
1408	01	C0422	6AECC427			BAL,R14	ZKBCR18A	
1409	01	C0423	00000001	A		DATA	1	
1410								*
1411								* DCR DIRECTIVE ASSIGNING DIRECTIVE INPUT VIA CARD READER
1412								*

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1413	01	00424	40000000	A		DATA	X'40000000'	
1414	01	00425	6AE00427		ZDCR	BAL,R14	ZKBCRIBA	
1415	01	00426	00000003	A		DATA	3	
1416								*
1417								* PRESERVE TYPEWRITER/CARD READER INPUT/OUTPUT ADDRESS
1418								*
1419	01	00427	2200077F	A	ZKBCRIBA	LI,RO	X'77F'	
1420	01	00428	4B00058E			AND,RO	P1	
1421	01	00429	8500000E	A		STW,RO	*R14	
1422	01	0042A	5502036A			STH,RO	ZMFRDA,X1	
1423	01	0042E	52020355			LH,RO	ZMFRX7,X1	
1424	01	0042C	55020356			STH,RO	ZMFRNBA,X1	
1425	01	0042D	E800000F	A		B	*R15	
1426						PAGE		
1427								*
1428								* SML DIRECTIVE ASSIGNING MESSAGE LEVELS TO BE REPORTED
1429								*
1430	01	0042E	10000000	A		DATA	X'10000000'	
1431	01	0042F	3200058E		ZSML	LW,RO	P1	
1432	01	00430	4B000003	A		AND,RO	R3	
1433	01	00431	55020409			STH,RO	ZMSGKEY,X1	
1434	01	00432	E800000F	A		B	*R15	
1435								*
1436								* SMD DIRECTIVE ASSIGNING MESSAGES TO TYPEWRITER OR LINE PRINTER
1437								*
1438	01	00433	40000000	A		DATA	X'40000000'	
1439	01	00434	2200077F	A	ZSMD	LI,RO	X'77F'	
1440	01	00435	4B00058E			AND,RO	P1	
1441	01	00436	550204E1			STH,RO	ZTWLP8,X1	
1442	01	00437	E800000F	A		B	*R15	
1443						PAGE		
1444								*
1445								* HLT DIRECTIVE TO IDENTIFY LOCATION IN CONTROL LINE
1446								*
1447	01	00438	10000000	A		DATA	X'10000000'	P1 DECIMAL IDENTIFIER
1448	01	00439	35F0059C		ZHLT	STW,R15	P15	
1449	01	0043A	3200058E			LW,R12	P1	
1450	01	0043B	6AF003F5			BAL,R15	ZETH	
1451	01	0043C	35000447			STW,R13	ZHLTMSG+1	
1452	01	0043D	32000445			LW,R12	ZHLTMSG-1	
1453	01	0043E	0230007C	A		LCFI	7	
1454	01	0043F	6AF004BF			BAL,R15	ZTWLP	
1455	01	00440	22F00001	A		LI,R15	1	
1456	01	00441	4BF0058E			AND,R15	P1	
1457	01	00442	E822059C			BCR,2	*P15,X1	
1458	01	00443	2E000000	A		WAIT		
1459	01	00444	E802059C			B	*P15,X1	
1460	01	00445	10081118	A		ZFMW	1,0,8,BA(ZHLTMSG)	
1461	01	00446	C8D3E34C	A	ZHLTMSG	TEXT	'HLT XXXX'	
1462						PAGE		
1463								*
1464								* ALT DIRECTIVE TO ALTER CONTIGUOUS MAIN MEMORY LOCATIONS
1465								*
1466	01	00448	35F0042C		ZALT	STW,R15	ZCSRL	
1467	01	00449	6AF00457			BAL,R15	ZALT10	
1468	01	0044A	6AF00338			BAL,R15	ZFH	
1469	01	0044B	6AF00457			BAL,R15	ZALT10	
1470	01	0044C	22F1FFFF	A		LI,R15	X'1FFFF'	
1471	01	0044D	4B90000F	A		AND,R9	R15	
1472	01	0044E	3190057E		ZALT05	CW,R9	ZEMS	
1473	01	0044F	E920042C			BCS,2	*ZCSRL	
1474	01	00450	3590058B			STW,R9	ZTEMP	
1475	01	00451	6AF00338			BAL,R15	ZFH	
1476	01	00452	6AF00457			BAL,R15	ZALT10	
1477	01	00453	8590058B			STW,R9	*ZTEMP	
1478	01	00454	3310055B			MW,1	ZTEMP	
1479	01	00455	3290058B			LW,R9	ZTEMP	
1480	01	00456	6800044E			B	ZALT05	
1481	01	00457	21A0006B	A	ZALT10	CI,R10	X'6B'	
1482	01	00458	E830000F	A		BCR,3	*R15	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1483	01	00459	E8000420			B	*ZCSRL	
1484						PAGE		
1485						*		
1486						* DMP DIRECTIVE TO DUMP CONTIGUOUS MAIN MEMORY LOCATIONS		
1487						*		
1488	01	0045A	40000000	A		DATA	X'40000000'	
1489	01	0045B	40000000	A		DATA	X'40000000'	
1490	01	0045C	40000000	A		DATA	X'40000000'	
1491	01	0045D	02300070	A	ZTYP	LCFI	7	
1492	01	0045E	68000463			B	ZDMP+1	
1493	01	0045F	40000000	A		DATA	X'40000000'	P1 FIRST
1494	01	00460	40000000	A		DATA	X'40000000'	P2 LAST
1495	01	00461	40000000	A		DATA	X'40000000'	P3 RELATIVE
1496	01	00462	023000FC	A	ZDMP	LCFI	X'F'	
1497	01	00463	74060498			STCF	ZDMP24+2,X3	
1498	01	00464	35F0059C			STW,R15	P15	
1499	01	00465	227FFFFD	A		LI,X7	-3	TRUNCATE
1500	01	00466	32CE0591			LW,R12	P3+1,X7	
1501	01	00467	4BC0057E			AND,R12	ZEMS	
1502	01	00468	35CE0591			STW,R12	P3+1,X7	ADDRESSES
1503	01	00469	65700466			BIR,X7	*-3	
1504	01	0046A	6AF0041B			BAL,R15	ZSCIR	
1505	01	0046B	32D0058F			LW,R13	P2	
1506	01	0046C	3310000D	A		MTW,1	R13	
1507	01	0046D	31D0057E			CW,R13	ZEMS	
1508	01	0046E	6820047C			BCR,2	*+2	
1509	01	0046F	33F0058F			MTW,-1	P2	
1510	01	00470	32C00590			LW,R12	P3	
1511	01	00471	68300474			BCR,3	*+3	
1512	01	00472	3200058E			LW,R0	P1	
1513	01	00473	3800059C			SW,R0	P3	
1514	01	00474	35000590			STW,R0	P3	
1515	01	00475	32C0058E		ZDMP10	LW,R12	P1	
1516	01	00476	38C00590			SW,R12	P3	
1517	01	00477	6AF003F5			BAL,R15	ZBTH	
1518	01	00478	22F04040	A		LI,R15	X'4040'	
1519	01	00479	55F0000C	A		STH,R15	R12	
1520	01	0047A	25C00310	A		SCD,R12	16	
1521	01	0047B	35C0059E			STW,R12	ZDMPA	
1522	01	0047C	35D0059F			STW,R13	ZDMPA+1	
1523	01	0047D	75F0059E			STB,R15	ZDMPA	
1524	01	0047E	22700007	A		LI,X7	7	RESET INDEX
1525	01	0047F	22F00000	A		LI,R15	0	DUPLICATE
1526	01	00480	35F0059B			STW,R15	P14	COUNTER
1527	01	00481	B2C0058E		ZDMP20	LW,R12	*P1	DUPLICATE
1528	01	00482	B1C2058E			CW,R12	*P1,X1	WORDS
1529	01	00483	6830049D			BCR,3	ZDMP30	
1530	01	00484	3300059B			MTW,0	P14	DUPLICATE
1531	01	00485	683004A8			BCR,3	ZDMP40	BLOCK
1532	01	00486	22C00060	A		LI,R12	X'60'	
1533	01	00487	75CE059E			STB,R12	ZDMPA,X7	
1534	01	00488	32C0058E		ZDMP22	LW,R12	P1	
1535	01	00489	38C00590			SW,R12	P3	
1536	01	0048A	6AF003F5			BAL,R15	ZBTH	
1537	01	0048B	22F04040	A		LI,R15	X'4040'	
1538	01	0048C	55F0000C	A		STH,R15	R12	
1539	01	0048D	25C00310	A		SCD,R12	16	
1540	01	0048E	35C005AC			STW,R12	ZDMPA+2	
1541	01	0048F	35D005A1			STW,R13	ZDMPA+3	
1542	01	00490	75F005A0			STB,R15	ZDMPA+2	
1543	01	00491	B2C0058E			LW,R12	*P1	SET DUPLICATE
1544	01	00492	6AF003F5			BAL,R15	ZBTH	KEY FOR OUTPUT
1545	01	00493	35C005A2			STW,R12	ZDMPA+4	
1546	01	00494	35D005A3			STW,R13	ZDMPA+5	
1547	01	00495	22700018	A		LI,R7	24	
1548	01	00496	757204BA		ZDMP24	STB,R7	ZDMP70,X1	
1549	01	00497	32C004BA			LW,R12	ZDMP70	
1550	01	00498	023000F0	A		LCFI	X'F'	
1551	01	00499	6AF004BF			BAL,R15	ZTWLP	
1552	01	0049A	6AF004B6			BAL,R15	ZDMP50	
1553	01	0049B	69100475			BCS,1	ZDMP10	DUMP

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS CR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1554	01	0049C	E800059C			B	*P15	COMPLETE
1555	01	0049D	21700007	A	ZDMP30	CI,X7	7	
1556	01	0049E	682004A1			BCR,2	*+3	
1557	01	0049F	33F0058E			MTW,-1	P1	
1558	01	004A0	68000496			B	ZDMP24	
1559	01	004A1	3310059B			MTW,1	P14	
1560	01	004A2	6AF004B6			BAL,R15	ZDMP50	
1561	01	004A3	69100481			BCS,1	ZDMP20	
1562	01	004A4	33F0058E			MTW,-1	P1	
1563	01	004A5	33F0059B			MTW,-1	P14	
1564	01	004A6	69200488			BCS,2	ZDMP22	
1565	01	004A7	B2C0058E			LW,R12	*P1	
1566	01	004A8	6AF003F5		ZDMP40	BAL,R15	ZBTH	SET NON-DUPLICATE
1567	01	004A9	33100007	A		MTW,1	X7	WORD FOR OUTPUT
1568	01	004AA	226FFFF8	A		LI,X6	-8	
1569	01	004AB	25C00308	A		SCD,R12	8	
1570	01	004AC	75DE059E			STB,R13	ZDMPA,X7	
1571	01	004AD	33100007	A		MTW,1	X7	
1572	01	004AE	656004AB			BIR,X6	*-3	
1573	01	004AF	22F0004C	A		LI,R15	X'40'	
1574	01	004B0	75FE059E			STB,R15	ZDMPA,X7	
1575	01	004B1	2170004E	A		CI,X7	78	
1576	01	004B2	69200496			BCS,2	ZDMP24	
1577	01	004B3	6AF004B6			BAL,R15	ZDMP50	
1578	01	004B4	69100481			BCS,1	ZDMP20	
1579	01	004B5	68000496			R	ZDMP24	
1580	01	004B6	32C0058E		ZDMP50	LW,R12	P1	
1581	01	004B7	3310058E			MTW,1	P1	
1582	01	004B8	31C0058F			CW,R12	P2	
1583	01	004B9	E80000CF	A		B	*R15	
1584	01	004BA	10001678	A	ZDMP70	ZFMW	1,C,0,BA(ZDMPA)	
1585						*		
1586						* TRANSMIT MESSAGE ONLY IF KEYBOARD INPUT DEVICE		
1587						*		
1588	01	004BB	52D20426		ZTMNCR	LW,R13	ZDCR+1,X1	
1589	01	004BC	51D2036A			CH,R13	ZMFRDA,X1	
1590	01	004BD	E83000CF	A		BCR,3	*R15	
1591						*		
1592						* LOAD CONDITIONS FOR TYPEWRITER ONLY MESSAGE LEVEL 0		
1593						*		
1594	01	004BE	02300040	A	ZSML40	LCF1	4	
1595						PAGE		
1596						*		
1597						* COMMON TYPEWRITER/LINE PRINTER OUTPUT ROUTINE		
1598						*		
1599	01	004BF	E8C000CF	A	ZTWLP	BCR,12	*R15	
1600	01	004C0	740000CF	A		STCF	R15	
1601	01	004C1	35F00420			STW,R15	ZCSRL	
1602	01	004C2	6AF0041B			BAL,R15	ZSCIR	
1603	01	004C3	72F00420			LB,R15	ZCSRL	
1604	01	004C4	25F0047C	A		SAS,R15	-4	
1605	01	004C5	4BF00003	A		AND,R15	R3	
1606	01	004C6	683004CB			BCR,3	ZTWLP01	
1607	01	004C7	6C000010	A		RD,0	X'10'	
1608	01	004C8	E9100420			BCS,1	*ZCSRL	
1609	01	004C9	21F00004	A	ZMSGKEY	CI,R15	4	
1610	01	004CA	E9200420			BCS,2	*ZCSRL	
1611	01	004CB	55C20514		ZTWLP01	STW,R12	ZTWLP12,X1	SUPPRESSED
1612	01	004CC	52C0000C	A		LW,R12	R12	
1613	01	004CD	75C60515			STB,R12	ZTWLP12+1,X3	
1614	01	004CE	72C*000C	A		LB,R12	R12,X2	
1615	01	004CF	22D0000F	A		LI,R13	15	
1616	01	004D0	4BD0000C	A		AND,R13	R12	
1617	01	004D1	25C0047C	A		SAS,R12	-4	
1618	01	004D2	75C60511			STB,R12	ZTWLP10+1,X3	
1619	01	004D3	32C0000C	A		LW,R12	R12	
1620	01	004D4	683004D6			BCR,3	*+2	
1621	01	004D5	55C20513			STW,R0	ZTWLP11+1,X1	
1622	01	004D6	50C20513			AW,R13	ZTWLP11+1,X1	
1623	01	004D7	55C20513			STW,R13	ZTWLP11+1,X1	
1624	01	004D8	75100512			STB,R1	ZTWLP11	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL ORIGIN	LABEL	OPERATION	OPERAND	COMMENTS
1625	01	004D9	32FC0423			LW,R15	ZDKB+1	
1626	01	004DA	72C00420			LB,R12	ZCSR	
1627	01	004DB	25C0047A	A		SAS,R12	=6	
1628	01	004DC	33F0000C	A		MTW,-1	R12	
1629	01	004DD	683004F3			BCR,3	ZTW	
1630	01	004DE	22F00002	A		LI,R15	2	
1631	01	004DF	33F0000C	A		MTW,-1	R12	
1632	01	004E0	683004E4			BCR,3	ZLPD	
1633	01	004E1	22F00002	A	ZTWLPE	LI,R15	2	
1634	01	004E2	31F004F3			CW,R15	ZDKB+1	
1635	01	004E3	683004F3			BCR,3	ZTW	
1636	01	004E4	55F20507		ZLPD	STH,R15	ZTWLPA,X1	
1637	01	004E5	22000289			LI,RO	DA(ZTWLPA11)	
1638	01	004E6	72C60511			LB,R12	ZTWLPA10+1,X3	
1639	01	004E7	693004E9			BDS,3	*+2	
1640	01	004E8	22C000A0	A		LI,R12	X'AO'	
1641	01	004E9	33F0000C	A		MTW,-1	R12	
1642	01	004EA	683004EF			BCR,3	ZLPD10	
1643	01	004EB	20C000C1	A		AI,R12	X'C1'	
1644	01	004EC	75C00010	A		STB,R12	ZML10	
1645	01	004ED	75160511			STB,R1	ZTWLPA10+1,X3	
1646	01	004EE	22000288			LI,RO	DA(ZTWLPA10)	
1647	01	004EF	72C60513		ZLPD10	LB,R12	ZTWLPA11+1,X3	
1648	01	004F0	693004F2			BDS,3	*+2	
1649	01	004F1	73700512			MTB,7	ZTWLPA11	
1650	01	004F2	68000507			B	ZTWLPA	
1651	01	004F3	55F20507		ZTW	STH,R15	ZTWLPA,X1	
1652	01	004F4	2200028A			LI,RO	DA(ZTWLPA12)	
1653	01	004F5	72C60511			LB,R12	ZTWLPA10+1,X3	
1654	01	004F6	68300507			BCR,3	ZTWLPA	
1655	01	004F7	73700512			MTB,7	ZTWLPA11	
1656	01	004F8	22F00015	A		LI,R15	X'15'	
1657	01	004F9	2210000C	A		LI,R1	0	
1658	01	004FA	75F20010	A		STB,R15	ZML10,X1	
1659	01	004FB	331000C1	A		MTW,1	R1	
1660	01	004FC	64C004FA			BDR,R12	*+2	
1661	01	004FD	22F00040	A		LI,R15	X'40'	
1662	01	004FE	72C60513			LB,R12	ZTWLPA11+1,X3	
1663	01	004FF	68300505			BCR,3	ZTW10	
1664	01	0C500	48C0048F			AND,R12	ZTWLPA	
1665	01	00501	73160511			MTB,1	ZTWLPA10+1,X3	
1666	01	00502	75F20010	A		STB,R15	ZML10,X1	
1667	01	00503	331000C1	A		MTW,1	R1	
1668	01	00504	64C00501			BDR,R12	*+3	
1669	01	00505	221000C1	A	ZTW10	LI,R1	1	
1670	01	00506	22000288			LI,RO	DA(ZTWLPA10)	
1671	01	00507	4CC000C1	A	ZTWLPA	SIO,R12	1	
1672	01	00508	69C00507			BDS,12	*-1	
1673	01	00509	CDC00507			TIO,R12	*ZTWLPA	
1674	01	0050A	69C00509			BDS,12	*-1	
1675	01	0050B	52020515			LH,RO	ZTWLPA12+1,X1	
1676	01	0050C	50020513			AH,RO	ZTWLPA11+1,X1	
1677	01	0050D	55020513			STH,RO	ZTWLPA11+1,X1	
1678	01	0050E	E8000420			B	*ZCSR	
1679						ROUND 8		
1680	01	00510	0500004C	A	ZTWLPA10	ZFCP	5,X'40'	
1681	01	00511	8CC0000C	A		ZFCP	X'80',0	
1682	01	00512	0C00028A		ZTWLPA11	DATA	DA(ZTWLPA12)	
1683	01	00513	8100000C	A		ZFCP	X'81',0	
1684	01	00514	0100000C	A	ZTWLPA12	ZFCP	1,C	
1685	01	00515	0000000C	A		DATA	0	
1686						PAGE		
1687						*		
1688						* THIS SECTION OF CODE COMPRISES THE EXECUTIVE PROGRAM		
1689						* EXECUTION OF SPECIFIED SUB-ROUTINES WHICH EXIST IN EXTL		
1690						*		
1691	01	00516	B2R0058A		ZEX00	LW,R11	*ZEXPT1	
1692	01	00517	6AF0039B			BAL,R15	ZSTCRC	
1693	01	00518	6AF0041B		ZEX01	BAL,R15	ZSCIR	
1694	01	00519	6AF00524			BAL,R15	ZMPTWA	
1695	01	0051A	22F0002C	A		LI,R15	X'20'	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1696	01	0051B	6DF01100	A		WD,R15	X'1100'	
1697	01	0051C	6DF01500	A		WD,R15	X'1500'	
1698	01	0051D	22F00010	A		LI,R15	X'10'	
1699	01	0051E	6DF01200	A		WD,R15	X'1200'	
1700	01	0051F	6D000322	A		WD,C	X'22'	
1701	01	00520	B2F00589	A		LW,R15	*ZEXPT0	
1702	01	00521	EAF0000F	A		BAL,R15	*R15	
1703					*			
1704					* SUBROUTINES RETURN CONTROL HERE			
1705					*			
1706	01	00522	68000538			B	ZRETN1	NORMAL
1707	01	00523	68000543			B	ZRETN2	ABORT/CONDITIONAL
1708						PAGE		
1709					*			
1710					* MOVE PARAMETERS TO LABELED WORK AREA P1-P15			
1711					*			
1712	01	00524	F2B00589		ZMPTWA	LB,R11	*ZLXPT0	
1713	01	00525	22C00000	A		LI,R12	0	
1714	01	00526	21B00008	A		CI,R11	8	
1715	01	00527	68400529			BCR,4	*+2	
1716	01	00528	D2C2058A			LH,R12	*ZEXPT1,X1	
1717	01	00529	35C0003C	A		STW,R12	ZFTF	
1718	01	0052A	32E0058A			LW,R14	ZEXPT1	
1719	01	0052B	21B0000C	A		CI,R11	X'C'	
1720	01	0052C	6840052E			BCR,4	*+2	
1721	01	0052D	3310000E	A		MTW,1	R14	
1722	01	0052E	25B0047C	A		SAS,R11	-4	
1723	01	0052F	227FFFF1	A		LI,X7	-15	
1724	01	00530	22C00000	A		LI,R12	0	
1725	01	00531	33F0000B	A		MTW,-1	R11	
1726	01	00532	69100535			BCS,1	*+3	
1727	01	00533	B2C0000E	A		LW,R12	*R14	
1728	01	00534	3310000E	A		MTW,1	R14	
1729	01	00535	35CE059D			STW,R12	P15+1,X7	
1730	01	00536	65700530			BIR,X7	*=6	
1731	01	00537	E800000F	A		B	*R15	
1732						PAGE		
1733					*			
1734					* NORMAL RETURN ONE			
1735					*			
1736	01	00538	6AF0041B		ZRETN1	BAL,R15	ZSCIR	
1737	01	00539	6AF0054A			BAL,R15	ZBPT1	
1738	01	0053A	F2B00589			LB,R11	*ZEXPT0	
1739	01	0053B	21B00008	A		CI,R11	8	
1740	01	0053C	68400541			BCR,4	ZRETN1A	
1741	01	0053D	B310058A			MTW,1	*ZEXPT1	
1742	01	0053E	D2B2058A			LH,R11	*ZEXPT1,X1	
1743	01	0053F	D1B0058A			CH,R11	*ZEXPT1	
1744	01	00540	68200512			BCR,2	ZEX01	
1745	01	00541	6AF00398		ZRETN1A	BAL,R15	ZADCRC	
1746	01	00542	68000518			B	ZEX01	
1747					*			
1748					* ABORT AND/OR CONDITIONAL RETURN			
1749					*			
1750	01	00543	6AF0041B		ZRETN2	BAL,R15	ZSCIR	
1751	01	00544	6AF0054A			BAL,R15	ZBPT1	
1752	01	00545	F2B00589			LB,R11	*ZEXPT0	
1753	01	00546	21B00004	A		CI,R11	4	
1754	01	00547	68400541			BCR,4	ZRETN1A	
1755	01	00548	22F00516			LI,R15	ZEX00	
1756	01	00549	6800056E			B	ZLKSET	
1757						PAGE		
1758					*			
1759					* CHECK BREAKPOINT NO. 1			
1760					* RESET CONTINUE EXECUTION OF DIRECTIVES IN CONTROL LINE			
1761					* SET STOP EXECUTION OF DIRECTIVES RETURN FOR DIRECTIVE INPUT			
1762					*			
1763	01	0054A	6C000010	A	ZBPT1	RD,0	X'10'	
1764	01	0054B	E880000F	A		BCR,8	*R15	
1765					*			
1766					* CONSOLE INTERRUPT INITIATED BY OPERATOR			
1767					* STOP EXECUTION OF DIRECTIVES RETURN FOR DIRECTIVE INPUT			

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1768								*
1769	01	0054C	22F00030	A	ZCONJNT	LI,R15	X'30'	
1770	01	0054D	6DF01300	A		WD,R15	X'1300'	
1771	01	0054E	6DF01100	A		WD,R15	X'1100'	
1772	01	0054F	CF000507			HI,R0	*ZTALPA	
1773	01	00550	680001R3			B	ZPC010	
1774						PAGE		
1775								*
1776								* OPEN LOOP PROCESSOR
1777								* CLEARS CURRENT LOOP RE-ITERATION COUNT
1778								* ADVANCES TO NEXT OPERATION
1779								*
1780	01	00551	08000541	A	ZLPPR0	ZFST2	0,2,0,ZRETN1A	
1781								*
1782								* CLOSE LOOP PROCESSOR
1783								* CHECKS IF OPEN LOOP RE-ITERATION COUNT COMPLETE
1784								* IF COMPLETE ADVANCE TO NEXT OPERATION
1785								* IF NOT UPDATE COUNT AND RESTART LOOP
1786								*
1787	01	00552	04000553	A		ZFST2	0,1,0,ZRPPR0	
1788	01	00553	B2C0058A		ZRPPR0	LW,R12	*ZEXPT1	
1789	01	00554	33100000	A		MTW,1	R12	
1790	01	00555	B3100000	A		MTW,1	*R12	
1791	01	00556	D2B20000	A		LH,R11	*R12,X1	
1792	01	00557	D1800000	A		CH,R11	*R12	
1793	01	00558	69200541			BCS,2	ZRETN1A	
1794	01	00559	B2B0058A			LW,R11	*ZEXPT1	
1795	01	0055A	35B00589			STW,R11	ZEXPT0	
1796	01	0055B	68000541			B	ZRETN1A	
1797						PAGE		
1798								*
1799								* GO DIRECTIVE PROCESSOR TO CONTINUE EXECUTION OF DIRECTIVES
1800								*
1801	01	0055C	22C00105	A	ZG0PR0	LI,R12	X'105'	
1802	01	0055D	22B00000	A	ZG0PTR	LI,R11	0	
1803	01	0055E	68300377			BCR,3	ZSNR	
1804	01	0055F	68000517			B	ZEX00+1	
1805								*
1806								* END OF LINK PROCESSOR FOR FORWARD SLASH
1807								*
1808	01	00560	04000561	A		ZFST2	0,1,0,ZFSPR0	
1809	01	00561	6AF0054A		ZFSPR0	BAL,R15	ZBPT1	
1810	01	00562	6AF0056E			BAL,R15	ZLKSET	
1811	01	00563	68000516			B	ZEX00	
1812								*
1813								* ABSOLUTE TRANSFER PROCESSOR
1814								* SAVES CURRENT EXECUTE TABLE POINTER VALUE AS LINK
1815								* RESETS POINTERS TO TRANSFER LOCATION
1816								*
1817	01	00564	04000565	A		ZFST2	0,1,0,ZASPR0	
1818	01	00565	68000562		ZASPR0	B	ZFSPR0+1	
1819								*
1820								* LINK RETURN TRANSFER PROCESSOR
1821								* CHECK IF LINK TABLE EMPTY, IF SO ABORT WITH ERROR MESSAGE
1822								* IF NOT REMOVE LAST LINK ENTRY, REDUCE LINK POINTER BY ONE
1823								* TRANSFER TO NEW OPERATION
1824								*
1825	01	00566	22C00111	A	ZLKAS	LI,R12	X'111'	
1826	01	00567	32B00583			LW,R11	ZLKPTR	
1827	01	00568	31B00582			CW,R11	ZLKADR	
1828	01	00569	68200377			BCR,2	ZSNR	
1829	01	0056A	33F00583			MTW,-1	ZLKPTR	
1830	01	0056B	B2B00583			LW,R11	*ZLKPTR	
1831	01	0056C	35B00589			STW,R11	ZEXPT0	
1832	01	0056D	68000541			B	ZRETN1A	
1833						PAGE		
1834								*
1835								* PURGE AND/OR INSERT EXECUTE TABLE POINTER AS LINK ADDRESS TO
1836								* LINK TABLE, CHECK IF TABLE FULL, IF SO ABORT WITH ERROR MSG
1837								*
1838	01	0056E	32C005R3		ZLKSET	LW,R12	ZLKPTR	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1839	01	0056F	32B0C589			LW,R11	ZEXPTO	
1840	01	00570	33F0C00C	A		MTW,-1	R12	
1841	01	00571	31C00582			CW,R12	ZLKADR	
1842	01	00572	69100576			BCS,1	*-4	
1843	01	00573	B180000C	A		CW,R11	*R12	
1844	01	00574	69300570			BCS,3	*-4	
1845	01	00575	35C00583			STW,R12	ZLKPTR	
1846	01	00576	22C00110	A		LI,R12	X'110'	
1847	01	00577	32D00583			LW,R13	ZLKPTR	
1848	01	00578	3310000D	A		MTW,1	R13	
1849	01	00579	31D00584			CW,R13	ZPMADR	
1850	01	0057A	69200377			BCS,2	ZSNR	
1851	01	0057B	B5B00583			STW,R11	*ZLKPTR	
1852	01	0057C	33100583			MTW,1	ZLKPTR	
1853	01	0057D	E800000F	A		B	*R15	
1854						PAGE		
1855								
1856								
1857								
1858								
1859								
1860								
1861								
1862								
1863	01	0057E	00020FFF	A	ZEMS	DATA	X'20FFF'	LAST MEMORY LOCATION
1864						BUND 8		
1865	01	00580	0E00058E		ZCMS	LPSD,C	ZCMST40+2	
1866	01	00581	32A0057E			LW,R10	ZEMS	
1867	01	00582	38A0058B			SW,R10	ZCMS6	
1868	01	00583	35A0057E			STW,R10	ZEMS	
1869	01	00584	B5A0000A	A		STW,R10	*R10	
1870	01	00585	3310000A	A		MTW,1	R10	
1871	01	00586	25A00478	A		SAS,R10	-8	
1872	01	00587	35A0000B	A		STW,R10	R11	
1873	01	00588	25A00403	A		SAS,R10	3	
1874	01	00589	35A00587			STW,R10	ZI8ADR	
1875	01	0058A	30A00FEF			AW,R10	ZEXADR	
1876	01	0058B	35A00586			STW,R10	ZMFR18AD	
1877	01	0058C	66A00587			AWM,R10	ZI8ADR	
1878	01	0058D	38A0000B	A		SW,R10	R11	
1879	01	0058E	35A00584			STW,R10	ZPMADR	
1880	01	0058F	35A00585			STW,R10	ZPMPTR	
1881	01	00590	38A0000B	A		SW,R10	R11	
1882	01	00591	35A00582			STW,R10	ZLKADR	
1883	01	00592	35A00583			STW,R10	ZLKPTR	
1884	01	00593	32A0057E			LW,R10	ZEMS	
1885	01	00594	38A00587			SW,R10	ZI8ADR	
1886	01	00595	35A00588			STW,R10	ZI8WDS	
1887	01	00596	22B0004C	A		LI,R11	X'4C'	
1888	01	00597	32A0057E			LW,R10	ZEMS	
1889	01	00598	38A0000B	A		SW,R10	R11	
1890	01	00599	35A0058C			STW,R10	ZI8ADR	
1891	01	0059A	35A00581			STW,R10	ZI8PTR	
1892	01	0059B	32A0058A			LW,R10	ZCMS5	
1893	01	0059C	35A00040	A		STW,R10	64	
1894	01	0059D	227FFF20	A		LI,X7	-224	
1895	01	0059E	32A0005F			LW,R10	ZI15F	
1896	01	0059F	35AE0140			STW,R10	ZI15F+225,X7	
1897	01	005A0	6570059F			BIR,X7	*-1	
1898	01	005A1	6AF0041B			BAL,R15	ZSCIR	
1899	01	005A2	3500003D	A		STW,C	ZDSFLG	
1900	01	005A3	32B00FEF			LW,R11	ZFXADR	
1901	01	005A4	6AF00390			BAL,R15	ZSTPTR	
1902	01	005A5	32C005A8			LW,R12	ZCMS2	
1903	01	005A6	6AF0048E			BAL,R15	ZSML40	
1904	01	005A7	6800C183			B	ZPCC10	
1905	01	005A8	204016A4	A	ZCMS2	ZFMW	2,0,64,BA(ZCMS3)	
1906	01	005A9	E2C9C7D4	A	ZCMS3	TEXT	'SIGMA 5/7 EXTENDED PERFORMANCE RAD TESTN704978C00'	
	01	005AA	C14CF561	A				
	01	005AB	F740C5E7	A				
	01	005AC	E3C5B5C4	A				
	01	005AD	E5C440D7	A				

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
	01	005AE	C5D9C6D6	A				
	01	005AF	D9D4C1D5	A				
	01	005B0	C3C540D9	A				
	01	005B1	C1C440E3	A				
	01	005B2	C5E2E315	A				
	01	005B3	F7F0F4F9	A				
	01	005B4	F7F8C3F0	A				
	01	005B5	F0404040	A				
1907	01	005B6	40D4C1D5	A		TEXT	' MANUAL 901540C'	
	01	005B7	E4C1D340	A				
	01	005B8	F9F0F1F5	A				
	01	005B9	F4F0C340	A				
1908	01	005BA	0F000140	A	ZCMS5	XPSD,0	ZY40	
1909	01	005BB	00001000	A	ZCMS6	DATA	X'1000'	
1910						BOUND	8	
1911	01	005BC	00000000	A	ZCMST40	DATA	0	
1912	01	005BD	00000000	A		DATA	0	
1913	01	005BE	00000581	A		DATA	ZCMS+1	
1914	01	005BF	00000000	A		DATA	0	
1915						PAGE		
1916					*			
1917					*			* EQUATE STATEMENTS TO OVERLAY CODE FOR COMPUTING MEMORY SIZE
1918					*			* AND ASSIGNING LENGTH AND BASE ADDRESSES FOR TABLES ETC
1919					*			
1920	01	00580			ZLBADR	EGU	ZCMS	OPEN LOOP ADDRESS
1921	01	00581			ZLBPTR	EGU	ZLBADR+1	AND POINTER
1922	01	00582			ZLKADR	EGU	ZLBPTR+1	LINK TABLE ADDRESS
1923	01	00583			ZLKPTR	EGU	ZLKADR+1	AND POINTER
1924	01	00584			ZPMADR	EGU	ZLKPTR+1	PLACE MARKER ADDRESS
1925	01	00585			ZMPTR	EGU	ZPMADR+1	AND POINTER
1926	01	00586			ZMFRIBAD	EGU	ZMPTR+1	MAIN FETCH INPUT/OUTPUT ADDRESS
1927	01	00587			ZI0ADR	EGU	ZMFRIBAD+1	INPUT/OUTPUT BASE ADDRESS
1928	01	00588			ZI0WDS	EGU	ZI0ADR+1	AND NUMBER OF WORDS
1929	01	00589			ZEXPT0	EGU	ZI0WDS+1	EXECUTE TABLE BASE
1930	01	0058A			ZEXPT1	EGU	ZEXPT0+1	AND VARIABLE POINTERS
1931	01	0058B			ZTEMP	EGU	ZEXPT1+1	TEMPORARY
1932	01	0058C			ZTEMP1	EGU	ZTEMP+1	LOCATIONS
1933	01	0058D			P0	EGU	ZTEMP1+1	
1934	01	0058E			P1	EGU	P0+1	LABELED
1935	01	0058F			P2	EGU	P1+1	PARAMETER
1936	01	00590			P3	EGU	P2+1	AREA FOR
1937	01	00591			P4	EGU	P3+1	SUBROUTINES
1938	01	00592			P5	EGU	P4+1	
1939	01	00593			P6	EGU	P5+1	
1940	01	00594			P7	EGU	P6+1	
1941	01	00595			P8	EGU	P7+1	
1942	01	00596			P9	EGU	P8+1	
1943	01	00597			P10	EGU	P9+1	
1944	01	00598			P11	EGU	P10+1	
1945	01	00599			P12	EGU	P11+1	
1946	01	0059A			P13	EGU	P12+1	
1947	01	0059B			P14	EGU	P13+1	
1948	01	0059C			P15	EGU	P14+1	
1949	01	0059D			PX	EGU	P15+1	
1950	01	0059E			ZDMPA	EGU	PX+1	DUMP
1951	01	005C0			RES		10	AREA
1952					PAGE			
1953					*			
1954					*			* SUB-ROUTINE TABLE WITH FORM DIRECTIVE
1955					*			* TWO WORDS PER SUB-ROUTINE DIVIDED AS FOLLOWS
1956					*			* FIRST WORD = MNEMONIC NAME, FOUR ALPHA CHARACTERS MAXIMUM
1957					*			* SECOND WORD = SUB-ROUTINE INFO AND ENTRY ADDRESS
1958					*			
1959	01	005CA			ZSRBEG	EGU	\$	
1960	01	005CA	00C3D3D9	A		DATA	X'C3D3D9'	CLR
1961	01	005CB	09C5E3D5	A		DATA	X'D9C5E3D5'	RETN
1962	01	005CC	0000C7D6	A		DATA	X'C7D6'	GO
1963	01	005CD	00C4D2C2	A		DATA	X'C4D2C2'	DKB
1964	01	005CE	00C4C3D9	A		DATA	X'C4C3D9'	DCR
1965	01	005CF	00E2D4D3	A		DATA	X'E2D4D3'	SML
1966	01	005D0	00E2D4C4	A		DATA	X'E2D4C4'	SNC
1967	01	005D1	00C1D3E3	A		DATA	X'C1D3E3'	ALT

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
1968	01	00502	00C4D4D7	A		DATA	X'C4D4D7'	DMP
1969	01	00503	00E3E8D7	A		DATA	X'E3E8D7'	TYP
1970	01	00504	00C8D3E3	A		DATA	X'C8D3E3'	HLT
1971	01	00505	C1C4C4D9	A		DATA	X'C1C4C4D9'	ADDR
1972	01	00506	00C1C9D6	A		DATA	X'C1C9D6'	AIB
1973	01	00507	C2C1C3D2	A		DATA	X'C2C1C3D2'	BACK
1974	01	00508	C3C3C8D5	A		DATA	X'C3C3C8D5'	CCHN
1975	01	00509	C3D4D7D9	A		DATA	X'C3D4D7D9'	CMPR
1976	01	0050A	C3D4D7E6	A		DATA	X'C3D4D7E6'	CPW
1977	01	0050B	C3D5E3D9	A		DATA	X'C3D5E3D9'	CNTR
1978	01	0050C	C4C3C8D5	A		DATA	X'C4C3C8D5'	DCHN
1979	01	0050D	0CC4D3E8	A		DATA	X'C4D3E8'	DLY
1980	01	0050E	00C5D9D9	A		DATA	X'C5D9D9'	ERR
1981	01	0050F	00C8C9D6	A		DATA	X'C8C9D6'	HIB
1982	01	00500	D1E4D4D7	A		DATA	X'D1E4D4D7'	JUMP
1983	01	00501	00D3C5D5	A		DATA	X'D3C5D5'	LEN
1984	01	00502	D4C1D9D2	A		DATA	X'D4C1D9D2'	MARK
1985	01	00503	D7C1E3E3	A		DATA	X'D7C1E3E3'	PATT
1986	01	00504	D7C3E8C3	A		DATA	X'D7C3E8C3'	PCYC
1987	01	00505	000000D8	A		DATA	X'D8'	Q
1988	01	00506	D9C5C1C4	A		DATA	X'D9C5C1C4'	READ
1989	01	00507	00D9C9D6	A		DATA	X'D9C9D6'	RIB
1990	01	00508	E2C5C5D2	A		DATA	X'E2C5C5D2'	SEEK
1991	01	00509	E2C5D5E2	A		DATA	X'E2C5D5E2'	SENS
1992	01	0050A	00E2C9D6	A		DATA	X'E2C9D6'	SIB
1993	01	0050B	E2E3C5D7	A		DATA	X'E2E3C5D7'	STEP
1994	01	0050C	E2E3D6D7	A		DATA	X'E2E3D6D7'	STBP
1995	01	0050D	E3C3C4C1	A		DATA	X'E3C3C4C1'	TCDA
1996	01	0050E	00E3C4E5	A		DATA	X'E3C4E5'	TDV
1997	01	0050F	00E3C9D6	A		DATA	X'E3C9D6'	TIB
1998	01	00500	00E3D9E8	A		DATA	X'E3D9E8'	TRY
1999	01	00501	E3E8D7C2	A		DATA	X'E3E8D7C2'	TYPB
2000	01	00502	E3E8D7C3	A		DATA	X'E3E8D7C3'	TYPC
2001	01	00503	E4D5C9E3	A		DATA	X'E4D5C9E3'	UNIT
2002	01	00504	E4D7C1C4	A		DATA	X'E4D7C1C4'	UPAD
2003	01	00505	00E6D9E3	A		DATA	X'E6D9E3'	WRT
2004	01	00506	E7C3E6E3	A		DATA	X'E7C3E6E3'	XCWT
2005	01	00507	E7C7C5D5	A		DATA	X'E7C7C5D5'	XGEN
2006	01	00508	E7D9C4E2	A		DATA	X'E7D9C4E2'	XRDS
2007	01	00509	E7E6D9E3	A		DATA	X'E7E6D9E3'	XWRT
2008		01 005FA			ZSRBL	EQU	\$	
2009		00000030			ZSRLEN	EQU	\$=ZSRBEG	
2010						PAGE		
2011					*			
2012					*	SUBROUTINE ADDRESS TABLE WITH CONTROL INFORMATION		
2013					*			
2014					*	BITS 0-3	PARAMETER COUNT	
2015					*	BITS 4-5	RE-ITERATION/IDENTIFIER CODE	
2016					*		00 NO LEADING DECIMAL SUBFIELD PERMITTED	
2017					*		01 PLACE MARKER IDENTIFIER REQUEST	
2018					*		10 REITERATION COUNT	
2019					*		11 ILLEGAL	
2020					*	BITS 6-7	EXECUTION MODE KEYS	
2021					*		00 UNCONDITIONAL	
2022					*		01 CONTROL LINE MODE ONLY	
2023					*		10 IMMEDIATE MODE ONLY	
2024					*		11 OPTIONAL CONTROL OR IMMEDIATE MODE	
2025					*	BITS 8-14	RESERVED	
2026					*	BITS 15-31	SUBROUTINE ADDRESS	
2027					*			
2028	01	005FA	0000019A	A		ZFSAT	0,0,0,0,ZPC200	CLR
2029	01	005FB	0300C54C	A		ZFSAT	0,0,3,0,ZC9NINT	RETN
2030	01	005FC	0200C55C	A		ZFSAT	0,0,2,0,ZGBPR0	GB
2031	01	005FD	12000422	A		ZFSAT	1,0,2,0,ZDKB	DKB
2032	01	005FE	12000425	A		ZFSAT	1,0,2,0,ZDCR	DCR
2033	01	005FF	1300042F	A		ZFSAT	1,0,3,0,ZSML	SML
2034	01	00600	13000434	A		ZFSAT	1,0,3,0,ZSMD	SMD
2035	01	00601	00000448	A		ZFSAT	0,0,0,0,ZALT	ALT
2036	01	00602	33000462	A		ZFSAT	3,0,3,0,ZDMP	DMP
2037	01	00603	3300045D	A		ZFSAT	3,0,3,0,ZTYP	TYP
2038	01	00604	17000439	A		ZFSAT	1,1,3,0,ZHLT	HLT

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2174	01	00692	E8000693			B	*ADRGXIT	
2175	01	00693	00000000	A	ADRGXIT	DATA	0	
2176	01	00694			ADRGNSAV	RES	4	
2177						PAGE		
2178								
2179								
2180								
2181								
2182								
2183								
2184	01	00698	40000000	A		DATA	X'40000000'	P1=STATUS COMPARISON WORD
2185	01	00699	35F006A5	A	A10	STW,R15	A10EXIT	SAVE RETURN
2186	01	0069A	3280058E			LW,R8	P1	
2187	01	0069B	358006A7			STW,R8	STCMPSAV	
2188	01	0069C	6ED00000	A		A10,R13	0	
2189	01	0069D	7400000C	A		STCF	R12	
2190	01	0069E	32B00AE1			LW,R11	TEXTA10	
2191	01	0069F	6AF0006C			BAL,R15	STATTYPE	
2192	01	006A0	25D00474	A		SAS,R13	-12	
2193	01	006A1	31D006A7			CR,R13	STCMPSAV	
2194	01	006A2	684006A4			BCR,4	**2	ANY BITS COMPARE
2195	01	006A3	331006A5			MTW,1	A10EXIT	YES
2196	01	006A4	E80006A5			B	*A10EXIT	NO
2197	01	006A5	00000000	A	A10EXIT	DATA	0	
2198	01	006A6	C1C9D640	A	A10HDG	TEXT	'A10'	
2199	01	006A7	00000000	A	STCMPSAV	DATA	0	
2200						PAGE		
2201								
2202								
2203								
2204								
2205	01	006A8	12800E00		BACK	LD,R8	SDA	
2206	01	006A9	15800E8E			STD,R8	CDA	
2207	01	006AA	E800000F	A		B	*R15	
2208						PAGE		
2209								
2210								
2211								
2212								
2213								
2214								
2215	01	006AB	32900E8E		CAPCHECK	LW,R9	CDA	
2216	01	006AC	32A00009	A		LW,R10	R9	
2217	01	006AD	22E00000	A		LI,R14	0	
2218	01	006AE	35F006CA			STW,R15	CPCHKXIT	
2219	01	006AF	6AF00E28			BAL,R15	TSUPDATE	
2220	01	006B0	330000DC			MTW,0	STEPIND	
2221	01	006B1	68300683			BEZ	**2	
2222	01	006B2	20A10000	A		AI,R10	X'10000'	
2223	01	006B3	32B00FF7			LW,R11	X'FFFF0000'	
2224	01	006B4	21900800	A		CI,R9	X'800'	
2225	01	006B5	69400688			BCS,4	**3	IS THIS AN XX UNIT
2226	01	006B6	45A00FF8			CS,R10	X'18000000'	NO-TEST FOR 2048
2227	01	006B7	68000689			B	**2	
2228	01	006B8	45A00FF9			CS,R10	X'20000000'	YES-TEST FOR > 511
2229	01	006B9	682006C2			BCR,2	CAPCHK00	WAS CAPACITY EXCEEDED
2230	01	006BA	32100EBF			LW,R1	CDAPNTR	YES
2231	01	006BB	651006BD			BIR,R1	**2	
2232	01	006BC	221FFFF8	A		LI,R1	-8	
2233	01	006BD	32E20EA7			LW,R14	UNITLIST+8,X1	
2234	01	006BE	21E08000	A		CI,R14	X'8000'	IS THIS UNIT
2235	01	006BF	694006C1			BCS,4	**2	AN ACTIVE ONE
2236	01	006C0	6800068B			B	**5	NO-CHECK NEXT ENTRY
2237	01	006C1	3290000E	A		LW,R9	R14	
2238	01	006C2	35900AE7		CAPCHK00	STW,R9	WBRKADDR	
2239	01	006C3	21100001	A		CI,R1	1	
2240	01	006C4	683006C7			BE	**3	IS R1 = 1
2241	01	006C5	3510000D	A		STW,R1	R13	NO.
2242	01	006C6	680006C8			B	**2	
2243	01	006C7	32D00E8F			LW,R13	CDAPNTR	YES.
2244	01	006C8	22100001	A		LI,R1	1	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2245	01	006C9	E80006CA			B	*CPCHKXIT	
2246	01	006CA	00000000	A	CPCHKXIT	DATA	0	
2247	01	006CB	00000000	A	SKWRPIND	DATA	0	
2248						PAGE		
2249								
2250								*THIS TESTS THE COMMAND CHAINING CAPABILITIES OF THE UNIT AND CONTROL.
2251								*LER. IT WILL START AT THE CDA AND READ OR WRITE 1024 BYTES (PARAMETER
2252								*TER D1=0, READ; D1=1, WRITE). THE PATTERN IS THE PARTICULAR TRACK
2253								*AND SECTOR ADDRESS. AS THIS GROUP ADDRESS REQUIRES 2 BYTES, IT WILL
2254								*BE WRITTEN 512 TIMES. AT THE COMPLETION OF THIS OPERATION, THE TRACK
2255								*AND SECTOR ADDRESSES (CDA) ARE BOTH INCREMENTED BY 1. THIS IS THEN
2256								*THE ADDRESS OF THE NEXT DATA GROUP. THIS IS DONE 16 TIMES. THE RESULT
2257								*IS THAT THE DATA IS WRITTEN ON THE DISC IN A SPIRAL FASHION.
2258								
2259	01	006CC	20000000	A		DATA	X'20000000'	P1
2260	01	006CD	35F00701		CCHN	STW,R15	CCHNEXIT	
2261	01	006CE	227FFFF4	A		LI,R7	-12	
2262	01	006CF	22800000	A		LI,R8	3072	
2263	01	006D0	31800588			CW,R8	ZI8WDS	
2264	01	006D1	682006D4			BCR,2	*+3	
2265	01	006D2	208FFFF0	A		AI,R8	-256	
2266	01	006D3	657006D0			BIR,P7	*-3	
2267	01	006D4	35700754			STW,R7	NSECTCNT	
2268	01	006D5	228FFFFF	A		LI,R8	*1	
2269	01	006D6	3300058E			MTW,0	P1	
2270	01	006D7	683006D8			BCR,3	*+4	
2271	01	006D8	35800F19			STW,R8	WRTIND	
2272	01	006D9	12C00ACE			LD,P12	WRTORDER	
2273	01	006DA	680006DD			B	*+3	
2274	01	006DB	35800CCA			STW,R8	READIND	
2275	01	006DC	12C00ADC			LD,R12	RDSORDER	
2276	01	006DD	12A00AD2			LD,R10	SEEKORDER	
2277	01	006DE	22800744			LI,R8	SK00	
2278	01	006DF	32900587			LW,R9	ZI8ADR	
2279	01	006E0	25800502	A		SAD,P8	2	
2280	01	006E1	49A00008	A		BR,R10	R8	
2281	01	006E2	49C00009	A		BR,R12	R9	
2282	01	006E3	32900EBE			LW,R9	CDA	
2283	01	006E4	25800510	A		SAD,R8	16	
2284	01	006E5	32900EBE			LW,R9	CDA	
2285	01	006E6	25800510	A		SAD,R8	16	
2286	01	006E7	22900744			LI,R9	SK00	
2287	01	006E8	30B00FFA			AW,R11	*X'10000002'	
2288	01	006E9	30D00FFB			AW,R13	*X'1000040C'	
2289	01	006EA	22600000	A		LI,R6	0	
2290	01	006EB	15AC0704		CCHN00	STD,R10	CHANLIST,X6	
2291	01	006EC	15CC0706			STD,R12	CHANLIST+2,X6	
2292	01	006ED	B5800009	A		STW,R8	*R9	
2293	01	006EE	33200006	A		MTW,2	R6	
2294	01	006EF	20C00400	A		AI,R12	1024	
2295	01	006F0	20A00004	A		AI,R10	4	
2296	01	006F1	6AF00797			BAL,R15	CHDTAUPD	
2297	01	006F2	20900001	A		AI,R9	1	
2298	01	006F3	657006EB			BIR,P7	CCHN00	
2299	01	006F4	33E00006	A		MTW,-2	R6	
2300	01	006F5	30D00FFC			AW,R13	*X'F0000000'	
2301	01	006F6	20CFFC00	A		AI,R12	*1024	
2302	01	006F7	15CC0706			STD,R12	CHANLIST+2,X6	
2303	01	006F8	33000CCA			MTW,0	READIND	
2304	01	006F9	693006FB			RCS,3	*+2	
2305	01	006FA	6AF007A3			BAL,R15	CHNGEN00	
2306	01	006FB	6AF00755			BAL,R15	CHANEXEC	
2307	01	006FC	6AF00764			BAL,R15	CHDTACHK	
2308	01	006FD	22800000	A		LI,R8	0	
2309	01	006FE	35800CCA			STW,R8	READIND	
2310	01	006FF	35800F19			STW,R8	WRTIND	
2311	01	00700	E8000701			B	*CCHNEXIT	
2312	01	00701	00000000	A	CCHNEXIT	DATA	0	
2313								
2314						B8UND	8	
2315	01	00702	08000382		CHAINTIC	ZFCP	X'08',DA(CHANLIST)	
2316	01	00703	00000000	A		DATA	0	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2317	01	00704			CHANLIST	RES	64	
2318	01	00744			SKOO	RES	16	
2319	01	00754	00000000	A	NSECTCNT	DATA	0	
2320						PAGE		
2321								
2322								
2323								
2324								
2325								
2326								
2327	01	00755	35F00763		CHANEXEC	STW,R15	CHNEXXIT	
2328	01	00756	32800E8E			LW,R8	CDA	
2329	01	00757	35800AF7			STW,R8	WORKADDR	
2330	01	00758	2280075E			LI,R8	CHNEXE00	
2331	01	00759	2290075F			LI,R9	CHNEXE00+1	
2332	01	0075A	15800ACC			STD,R8	NORMRETN	
2333	01	0075B	12800702			LD,R8	CHAIN TIC	
2334	01	0075C	15800ABE			STD,R8	COMMPAIR	
2335	01	0075D	68000AAF			B	EXECUTE	
2336	01	0075E	E8000763		CHNEXE00	B	*CHNEXXIT	
2337	01	0075F	6AF00A08			BAL,R15	ERRRCNT	
2338	01	00760	6AF00A34			BAL,R15	ERRORTYP	
2339	01	00761	33100763			MTW,1	CHNEXXIT	
2340	01	00762	E8000763			B	*CHNEXXIT	
2341	01	00763	00000000	A	CHNEXXIT	DATA	0	
2342						PAGE		
2343								
2344								
2345								
2346	01	00764	35F0078C		CHDTACHK	STW,R15	CHDTAXIT	
2347	01	00765	32600754			LW,R6	NSECTCNT	
2348	01	00766	32800E8E			LW,R8	CDA	
2349	01	00767	25800570	A		SAD,R8	-16	
2350	01	00768	32900E8E			LW,R9	CDA	
2351	01	00769	25800510	A		SAD,R8	16	
2352	01	0076A	32900587			LW,R9	ZISADR	
2353	01	0076B	22A00000	A		LI,R10	0	
2354	01	0076C	6800076E			B	*+2	
2355	01	0076D	6AF00797		CHDTA00	BAL,R15	CHDTAUPD	
2356	01	0076E	227FFF00	A		LI,R7	-256	
2357	01	0076F	2C900100	A		AI,R9	256	
2358	01	00770	2CAFFF00	A		AI,R10	-256	
2359	01	00771	B18E0009	A		CW,R8	*R9,X7	
2360	01	00772	69300776			BCS,3	*+4	
2361	01	00773	65700771		CHDTA01	BIR,P7	*+2	
2362	01	00774	6560076D			BIR,R6	CHDTA00	
2363	01	00775	E800078C			B	*CHDTAXIT	
2364	01	00776	32C00009	A		LW,R12	R9	
2365	01	00777	38C00587			SW,R12	ZISADR	
2366	01	00778	30C0000A	A		AW,R12	R10	
2367	01	00779	6AF00925			BAL,R15	DECCNVRT	
2368	01	0077A	35C00794			STW,R12	CHAINMSG+6	
2369	01	0077B	35D00795			STW,R13	CHAINMSG+7	
2370	01	0077C	32C0078D			LW,R12	CHAINCTL	
2371	01	0077D	6AF00E35			BAL,R15	TYPE01	
2372	01	0077E	32C00008	A		LW,R12	R8	
2373	01	0077F	6AF00931			BAL,R15	HEXCNVRT	
2374	01	00780	35C005A0			STW,R12	ZDMPA+2	
2375	01	00781	35D005A1			STW,R13	ZDMPA+3	
2376	01	00782	B2CE0009	A		LW,R12	*R9,X7	
2377	01	00783	6AF00931			BAL,R15	HEXCNVRT	
2378	01	00784	35C005A3			STW,R12	ZDMPA+5	
2379	01	00785	35D005A4			STW,R13	ZDMPA+6	
2380	01	00786	32C0094D			LW,R12	EBCBLNK	
2381	01	00787	35C0059F			STW,R12	ZDMPA+1	
2382	01	00788	35C005A2			STW,R12	ZDMPA+4	
2383	01	00789	32C00796			LW,R12	CHANCTL0	
2384	01	0078A	6AF00E35			BAL,R15	TYPE01	
2385	01	0078B	68000773			B	CHDTA01	
2386	01	0078C	00000000	A	CHDTAXIT	DATA	0	
2387	01	0078D	10201E38	A	CHAINCTL	ZFMW	1,0,32,BA(CHAINMSG)	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2388	01	0078E	C3C3C8D5	A	CHAINMSG	TEXT	ICCHN COMPARE ERROR 2	
	01	0078F	40C3D6D4	A				
	01	00790	D7C1D9C5	A				
	01	00791	40C5D9D9	A				
	01	00792	D6D9407C	A				
	01	00793	40404040	A				
	01	00794	40404040	A				
	01	00795	40404040	A				
2389	01	00796	101C1678	A	CHANCTLO	ZFMW	1,C,28,BA(ZDMPA)	
2390						PAGE		
2391								*
2392								*THIS ROUTINE INCREMENTS BOTH TRACK AND SECTOR ADDRESSES BY 1, FOR
2393								*USE IN THE CCHN DIRECTIVE.
2394								*
2395	01	00797	55F2079E		CHDTAUPD	STW,R15	CHUPDXIT,X1	
2396	01	00798	22E000CB	A		LI,R14	11	
2397	01	00799	22F0000F	A		LI,R15	15	
2398	01	0079A	30800FFD			AW,R8	*X'00110011'	
2399	01	0079B	45E00008	A		CS,R14	R8	IS R8 LESS THAN
2400	01	0079C	6810079E			BCR,1	2+2	OR EQUAL TO 11
2401	01	0079D	30800FFE			AW,R8	*X'FFF3FFF4'	NO-CORRECT SUM
2402	01	0079E	68000000	A	CHUPDXIT	B	0	YES-EXIT
2403						PAGE		
2404								*
2405								*THIS ROUTINE WAITS FOR THE COMPLETION OF AN SIB APPROXIMATELY
2406								*5 SECONDS. IF CHANNEL END HAS NOT OCCURRED IN THAT TIME, THE RAD
2407								*IS DISCONNECTED AND AN ERROR MESSAGE IS OUTPUT.
2408								*
2409	01	0079F	327007A2		CHENDCHK	LW,R7	CHENDLAY	
2410	01	007A0	647007A0		L08P1	BDR,R7	*	WAITING FOR CHANNEL END INTERRUPT
2411	01	007A1	68000889			B	NOCHEND	
2412	01	007A2	00320CD5	A	CHENDLAY	DATA	3333333	
2413						PAGE		
2414								*
2415								*THIS ROUTINE GENERATES DATA, AS DESCRIBED IN FRONT OF THE CCHN
2416								*DIRECTIVE.
2417								*
2418	01	007A3	55F207B1		CHNGEN00	STW,R15	CHNGXIT,X1	
2419	01	007A4	32700754			LW,R7	NSECTCNT	
2420	01	007A5	32800EBE			LW,R8	CDA	
2421	01	007A6	25800570	A		SAD,R8	*16	
2422	01	007A7	32900EBE			LW,R9	CDA	
2423	01	007A8	25800510	A		SAD,R8	16	
2424	01	007A9	32900587			LW,R9	ZIBADR	
2425	01	007AA	209FFFFFF	A		AI,R9	*1	
2426	01	007AB	22600100	A		LI,R6	256	
2427	01	007AC	B58C0009	A	CHNGEN01	STW,R8	*R9,X6	
2428	01	007AD	646007AC			BDR,R6	*-1	
2429	01	007AE	6AF00797			BAL,R15	CHDTAUPD	
2430	01	007AF	20900100	A		AI,R9	256	
2431	01	007B0	657007AB			BIR,R7	CHNGEN01-1	
2432	01	007B1	68000000	A	CHNGXIT	B	0	
2433						PAGE		
2434								*THIS WILL READ A RECORD FROM THE RAD AS SPECIFIED BY THE CDA AND THE
2435								*LENGTH DIRECTIVE. IT WILL THEN BE COMPARED WITH THE PATTERN SPECIFIED
2436								*BY THE PATT DIRECTIVE. A PLACEMARK BRANCH IS TAKEN ON ERROR, IF
2437								*SPECIFIED IN THE CONTRBL LINE.
2438								*
2439	01	007B2	20000000	A		DATA	X'20000000'	P1
2440	01	007B3	35F007C0		CMPR	STW,P15	CMPREXIT	
2441	01	007B4	3280058E			LW,R8	P1	
2442	01	007B5	35800AE8			STW,R8	SKWRPR0T	
2443	01	007B6	228000C1	A		LI,R8	1	
2444	01	007B7	3580058F			STW,R8	P2	
2445	01	007B8	6AF00C90			BAL,R15	READ	
2446	01	007B9	33000CCB			MTW,C	RDSEKIND	
2447	01	007BA	693007BE			BCS,3	CMPR00	READ ERROR
2448	01	007BB	6AF00868			BAL,R15	COMPARE	NO
2449	01	007BC	330008DE			MTW,C	CMPERIND	
2450	01	007BD	683007BF			BCR,3	*+2	COMPARE ERROR
2451	01	007BE	331007C0		CMPR00	MTW,1	CMPREXIT	YES

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2452	01	007BF	E80007C0			B	*CMPREXIT	
2453	01	007C0	00000000	A	CMPREXIT	DATA	0	
2454						PAGE		
2455						*		
2456						*THIS WILL COMPARE DATA IN DISC STORAGE WITH DATA IN CORE WITHOUT		*
2457						*READING DATA INTO CORE. A PLACEMARK BRANCH IS TAKEN ON ERROR, IF		*
2458						*SPECIFIED IN THE CONTRL LINE.		*
2459						*IF PARAMETER F1=0, EXECUTE CHECKWRITE ON ALL TRACKS; IF F1=1, SKIP		*
2460						*WRITE PROTECTED TRACKS.		*
2461						*IF PARAMETER D2 IS 1 THROUGH 8, THE CONTENTS OF THE COUNTER SPECIFIED		*
2462						*BY D2 IS USED AS THE STARTING BYTE ADDRESS FOR THE OPERATION.		*
2463						*		*
2464	01	007C1	20000000	A		DATA	X'20000000'	P1
2465	01	007C2	20000000	A		DATA	X'20000000'	P2
2466	01	007C3	35FC08CA		CMPW	STW,R15	CMPWEXIT	
2467	01	007C4	328C0AE6			LW,R8	TEXTCWR	
2468	01	007C5	358C0EE2			STW,R8	WRPBRDR	
2469	01	007C6	228C0C0C	A		LI,R8	0	
2470	01	007C7	358C0812			STW,R8	CWERRIND	
2471	01	007C8	328C005E			LW,R8	P1	
2472	01	007C9	358C0AE8			STW,R8	SKWRPRBT	
2473	01	007CA	328C0E26			LW,R8	RETRYCNT	
2474	01	007CB	358C0E27			STW,R8	RETRYCTR	
2475	01	007CC	330C058F			MTW,0	P2	
2476	01	007CD	693C07D1			BCS,3	CMPW02	
2477	01	007CE	330C0BC6			MTW,0	PATTERNI	
2478	01	007CF	693C07D1			BCS,3	*+2	
2479	01	007D0	6AF00B9F			BAL,R15	PATTENT1	
2480	01	007D1	6AF006AB		CMPW02	BAL,R15	CAPCHECK	
2481	01	007D2	330C0AE8			MTW,0	SKWRPRBT	
2482	01	007D3	683C07D6			BCR,3	*+3	
2483	01	007D4	6AF00EC2			BAL,R15	WRPRTCHK	
2484	01	007D5	680C07D9			B	*+4	
2485	01	007D6	228C0000	A		LI,R8	0	
2486	01	007D7	358C0811			STW,R8	CWRTIND	
2487	01	007D8	6AF008F1			BAL,R15	CBUPLE	
2488	01	007D9	228FFFFFF	A		LI,R8	=1	
2489	01	007DA	358C0811			STW,R8	CWRTIND	
2490	01	007DB	32A00587			LW,R10	ZIBADR	
2491	01	007DC	25A00402	A		SAS,R10	2	
2492	01	007DD	3CA0CC02			AW,R10	SAVEBITS	
2493	01	007DE	49A00AD6			BR,R10	CWRTBRDR	
2494	01	007DF	35A00ABE			STW,R10	CMMMPAIR	
2495	01	007E0	32A00B6B			LW,R10	RECLNGTH	
2496	01	007E1	49A00AD7			BR,R10	CWRTBRDR+1	
2497	01	007E2	49A00B70			BR,R10	SILIND	
2498	01	007E3	35A00ABF			STW,R10	CMMMPAIR+1	
2499	01	007E4	228C07E8			LI,R8	CMPW00	
2500	01	007E5	229C07E9			LI,R9	CMPW00+1	
2501	01	007E6	158C0AC0			STD,R8	NGRMRETN	
2502	01	007E7	680C0AAF			B	EXECUTE	
2503	01	007E8	680C0806		CMPW00	B	CMPW03	
2504	01	007E9	328C0ACD			LW,R8	AI0STAT+1	
2505	01	007EA	318C0FFF			CW,R8	X'400000'	
2506	01	007EB	684C07FE			BCR,4	CMPW01	TRANS ERR
2507	01	007EC	227FFFFFF	A		LI,R7	=5	YES
2508	01	007ED	328E0810			LW,R8	CMPWMSG+5,X7	
2509	01	007EE	358E05A3			STW,R8	ZDMPA+5,X7	
2510	01	007EF	657C07ED			BIR,R7	*-2	
2511	01	007F0	32C00AE7			LW,R12	WRKADR	
2512	01	007F1	6AF0067C			BAL,R15	ADDRGEN	
2513	01	007F2	227FFFFFF	A		LI,R7	=3	
2514	01	007F3	328E0698			LW,R8	ADRGNSAV+4,X7	
2515	01	007F4	358E05A6			STW,R8	ZDMPA+8,X7	
2516	01	007F5	657C07F3			BIR,R7	*-2	
2517	01	007F6	32C00ACB			LW,R12	TDVSTAT+1	
2518	01	007F7	45C01C00			AND,R12	X'FFFF'	
2519	01	007F8	6AF00925			BAL,R15	DECCNVRT	
2520	01	007F9	35C005A6			STW,R12	ZDMPA+8	
2521	01	007FA	35D005A7			STW,R13	ZDMPA+9	
2522	01	007FB	32C0081C			LW,R12	CMPWECTL	
2523	01	007FC	6AF00E35			BAL,R15	TYPE01	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2524	01	007FD	33100812			MTW,1	CWERRIND	
2525	01	007FE	6AF00A34		CMPW01	BAL,R15	ERR0RTYP	
2526	01	007FF	6AF00A08			BAL,R15	ERR0RCNT	
2527	01	00800	33F00E27			MTW,-1	RETRYCTR	
2528	01	00801	69100803			BCS,1	*+2	
2529	01	00802	680007D2			B	CMPW02+1	
2530	01	00803	33000812			MTW,0	CWERRIND	
2531	01	00804	65300806			BCR,3	*+2	
2532	01	00805	3310080A			MTW,1	CMPWEXIT	
2533	01	00806	22800000	A	CMPW03	LI,R8	0	
2534	01	00807	35800811			STW,R8	CWRTIND	
2535	01	00808	35800C02			STW,R8	SAVEBITS	
2536	01	00809	E800080A			B	*CMPWEXIT	
2537	01	0080A	00000300	A	CMPWEXIT	DATA	0	
2538	01	0080B	E6D5E340	A	CMPWMSG	TEXT	'WRT COMPARE ERROR @ '	
		01	0080C	A			C3D6D4D7	
		01	0080D	A			C1D9C540	
		01	0080E	A			C5D9D906	
		01	0080F	A			D9407C40	
2539	01	00810	10281678	A	CMPWECTL	ZFMW	1,0,40,BA(ZDMPA)	
2540	01	00811	00000000	A	CWRTIND	DATA	0	
2541	01	00812	00000000	A	CWERRIND	DATA	0	
2542							PAGE	
2543								
2544								
2545								
2546								
2547								
2548								
2549								
2550								
2551	01	00813	40000000	A		DATA	X'40000000'	P1-SELECT COUNTERS
2552	01	00814	50000000	A		DATA	X'50000000'	P2-ADD,SUBT, OR SET (A,S,0)
2553	01	00815	20000000	A		DATA	X'20000000'	P3-AMOUNT TO A,S, OR SET
2554	01	00816	20000000	A		DATA	X'20000000'	P4-TEST VALUE
2555	01	00817	20000000	A		DATA	X'20000000'	P5-TYPE ON TEST COMPARE (1 OR 0)
2556	01	00818	35F00849		CNTR	STW,R15	CNTREXIT	
2557	01	00819	22800000	A		LI,R8	0	
2558	01	0081A	3580084A			STW,R8	PLBRIND	
2559	01	0081B	226FFFEC	A		LI,R6	=20	
2560	01	0081C	22700001	A		LI,R7	1	
2561	01	0081D	3280058E			LW,R8	P1	
2562	01	0081E	21800001	A	CNTR04	CI,R8	1	
2563	01	0081F	68400842			BCR,4	CNTR00	IS BIT SET
2564	01	00820	32CC0865			LW,R12	CBOUNTER+20,X6	YES
2565	01	00821	32C0058F			LW,R13	P2	
2566	01	00822	68300829			BCR,3	CNTR01	P2 = 0,
2567	01	00823	21D00001	A		CI,R13	1	NO
2568	01	00824	69400827			BCS,4	*+3	P2 = A
2569	01	00825	38C00590			SW,R12	P3	NO
2570	01	00826	6800082A			B	*+4	
2571	01	00827	30C00590			AW,R12	P3	
2572	01	00828	6800082A			B	*+2	
2573	01	00829	32C00590		CNTR01	LW,R12	P3	
2574	01	0082A	35CC0865			STW,R12	CBOUNTER+20,X6	
2575	01	0082B	6910082F			BCS,1	*+4	IS CTR NEGATIVE
2576	01	0082C	32D00591			LW,R13	P4	NO
2577	01	0082D	31C00000	A		CW,R12	R13	
2578	01	0082E	68200842			BCR,2	CNTR00	CNTR < 0R = P4
2579	01	0082F	22EFFFFFF	A		LI,R14	-1	
2580	01	00830	35E0084A			STW,R14	PLBRIND	
2581	01	00831	32CC0865			LW,R12	CBOUNTER+20,X6	
2582	01	00832	32D00592			LW,R13	P5	
2583	01	00833	68300842			BCR,3	CNTR00	
2584	01	00834	356C0865		CNTR02	STW,R6	CNTRSAVE	
2585	01	00835	35700866			STW,R7	CNTRSAVE+1	
2586	01	00836	35800867			STW,R8	CNTRSAVE+2	
2587	01	00837	6AF00925			BAL,R15	DECCNVRT	
2588	01	00838	35C0084E			STW,R12	CNTRMSG+3	
2589	01	00839	35D0084F			STW,R13	CNTRMSG+4	
2590	01	0083A	32C00866			LW,R12	CNTRSAVE+1	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2591	01	0083B	6AF00925			BAL,R15	DECCNVRT	
2592	01	0083C	35D0084C			STW,R13	CNTRMSG+1	
2593	01	0083D	32C00850			LW,R12	CNTRMCTL	
2594	01	0083E	6AF00E35			BAL,R15	TYPE01	
2595	01	0083F	32600865			LW,R6	CNTRSAVE	
2596	01	00840	32700866			LW,R7	CNTRSAVE+1	
2597	01	00841	32800867			LW,R8	CNTRSAVE+2	
2598	01	00842	2580047F	A	CNTR00	SAS,R8	=1	
2599	01	00843	65700844			BIR,R7	\$+1	
2600	01	00844	6560081E			BIR,R6	CNTR04	
2601	01	00845	3280084A			LW,R8	PLBRIND	
2602	01	00846	68300848			BCR,3	\$+2	
2603	01	00847	33100849			MTW,1	CNTRXIT	
2604	01	00848	E8000849			B	*CNTRXIT	
2605	01	00849	00000C00	A	CNTRXIT	DATA	0	
2606	01	0084A	00000C00	A	PLBRIND	DATA	0	
2607	01	0084B	C3D5E3D9	A	CNTRMSG	TEXT	'CNTR	
		01	0084C	A				
		01	0084D	A				
		01	0084E	A				
		01	0084F	A				
2608	01	00850	1014212C	A	CNTRMCTL	ZFMW	1,0,20,BA(CNTRMSG)	
2609	01	00851			COUNTER	RES	20	
2610	01	00865			CNTRSAVE	RES	3	
2611						PAGE		
2612								
2613								
2614								
2615	01	00868	35F008CD		COMPARE	STW,R15	CMPAREXT	
2616	01	00869	3A50086F			LCW,R5	RECADCNT	
2617	01	0086A	32800857			LW,R8	ZIBADR	
2618	01	0086B	3080086F			AW,R8	RECADCNT	
2619	01	0086C	30801001			AW,R8	=X'328A000C'	
2620	01	0086D	35800875			STW,R8	COMPARE03	
2621	01	0086E	22800C00	A		LI,R8	0	
2622	01	0086F	358008DF			STW,R8	CPAS1IND	
2623	01	00870	358008DE			STW,R8	CMPERIND	
2624	01	00871	227FFFFC	A		LI,R7	-16	
2625	01	00872	358E08DE			STW,R8	DR0PS+16,X7	
2626	01	00873	65700872			BIR,R7	\$-1	
2627	01	00874	3A4008C5			LCW,R4	P2STORE	
2628	01	00875	0C000C00	A	COMPARE03	DATA	0	
2629	01	00876	B18808BC			CW,R8	*PATTLBAD,X4	
2630	01	00877	683008B2			BCR,3	COMPARE00	
2631	01	00878	32900008	A		LW,R9	R8	
2632	01	00879	B2A808BC			LW,R10	*PATTLBAD,X4	
2633	01	0087A	4B80000A	A		AND,R8	R10	SAVE GOOD BITS
2634	01	0087B	4880000A	A		EOR,R8	R10	
2635	01	0087C	48A01002			EOR,R10	=-1	
2636	01	0087D	4B90000A	A		AND,R9	R10	GEN PICKED BITS
2637	01	0087E	226FFFFC	A		LI,R6	-4	
2638	01	0087F	227FFFF8	A		LI,R7	-8	
2639	01	00880	31800FF8		COMPARE01	CW,R8	=X'80000000'	
2640	01	00881	68400883			BCR,4	\$+2	
2641	01	00882	331E08D6			MTW,1	DR0PS+8,X7	
2642	01	00883	31900FF8			CW,R9	=X'80000000'	
2643	01	00884	68400886			BCR,4	\$+2	
2644	01	00885	331E08DE			MTW,1	PICKS+8,X7	
2645	01	00886	25800301	A		SCD,R8	1	
2646	01	00887	65700880			BIR,R7	COMPARE01	
2647	01	00888	6560087F			BIR,R6	COMPARE01-1	
2648	01	00889	227FFFFC	A		LI,R7	-4	
2649	01	0088A	328E0810			LW,R8	CMPWEMSG+5,X7	SET UP ERROR MESSAGE
2650	01	0088B	358E08A2			STW,R8	Z0MPA+4,X7	
2651	01	0088C	6570088A			BIR,R7	\$-2	
2652	01	0088D	330008DF			MTW,0	CPAS1IND	
2653	01	0088E	69200895			RCS,2	COMPARE02	1ST TIME HERE
2654	01	0088F	32C00AE7			LW,R12	WORKADDR	
2655	01	00890	6AF00C7C			BAL,R15	ADDRGEN	
2656	01	00891	227FFFFD	A		LI,R7	-3	
2657	01	00892	328E0698			LW,R8	ADRGN SAV+4,X7	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2658	01	00893	358E08EA			STW,R8	TXTSUMRY+5,X7	
2659	01	00894	65700892			BIR,R7	\$-2	
2660	01	00895	227FFFFC	A	COMPAR02	LI,R7	+4	
2661	01	00896	328E08EB			LW,R8	TXTSUMRY+6,X7	
2662	01	00897	358E05A6			STW,R8	ZDMPA+8,X7	
2663	01	00898	65700896			BIR,R7	\$-2	
2664	01	00899	32C008E1			LW,R12	CPERCTLO	
2665	01	0089A	6AF00E35			BAL,R15	TYPE01	
2666	01	0089B	32C00005	A		LW,R12	R5	
2667	01	0089C	30C0036F			AW,R12	RECWD CNT	
2668	01	0089D	20C00001	A		AI,R12	1	
2669	01	0089E	6AF00925			BAL,R15	DECCNVRT	
2670	01	0089F	35D0059E			STW,R13	ZDMPA	
2671	01	008A0	22700008	A		LI,R7	8	
2672	01	008A1	B2C8038C			LW,R12	*PATTLBAD,X4	
2673	01	008A2	6AF00931			BAL,R15	HEXC NVRT	
2674	01	008A3	35C005A0			STW,R12	ZDMPA+2	
2675	01	008A4	35D005A1			STW,R13	ZDMPA+3	
2676	01	008A5	B2CA0875			LW,R12	*COMPAR03,X5	
2677	01	008A6	6AF00931			BAL,R15	HEXC NVRT	
2678	01	008A7	35C005A3			STW,R12	ZDMPA+5	
2679	01	008A8	35D005A4			STW,R13	ZDMPA+6	
2680	01	008A9	32F0094D			LW,R15	EBCBLNK	
2681	01	008AA	35F0059F			STW,R15	ZDMPA+1	
2682	01	008AB	35F005A2			STW,R15	ZDMPA+4	
2683	01	008AC	32C008E2			LW,R12	CPERCTL1	
2684	01	008AD	6AF00E35			BAL,R15	TYPE01	
2685	01	008AE	228FFFFFF	A		LI,R8	-1	
2686	01	008AF	358008DE			STW,R8	CMPERIND	
2687	01	008B0	6C000010	A		RD,C	X'10'	TYPE ONLY FIRST ERR AND SUPPRESS SUMMARY TYPE
2688	01	008B1	E92008CD			BCS,2	*CMPAREXT	
2689	01	008B2	654008B4		COMPAR00	BIR,R4	\$+2	
2690	01	008B3	3A4008C5			LCW,R4	P2STORE	
2691	01	008B4	65500875			BIR,P5	COMPAR03	
2692	01	008B5	330008DE			MTW,C	CMPERIND	
2693	01	008B6	E83008CD			BCR,3	*CMPAREXT	
2694	01	008B7	32C008E3			LW,R12	CPERCTL2	
2695	01	008B8	6AF00E39			BAL,R15	TYPE11	
2696	01	008B9	32C008EB			LW,R12	SMHOGCTL	
2697	01	008BA	6AF00E39			BAL,R15	TYPE11	
2698	01	008BB	3280094D			LW,R8	EBCBLNK	
2699	01	008BC	3580059F			STW,R8	ZDMPA+1	
2700	01	008BD	358005A1			STW,R8	ZDMPA+3	
2701	01	008BE	227FFFFFF8	A		LI,R7	=8	
2702	01	008BF	22C00008	A	COMPAR04	LI,R12	8	
2703	01	008C0	30C00007	A		AW,R12	R7	
2704	01	008C1	6AF00925			BAL,R15	DECCNVRT	
2705	01	008C2	35D0059E			STW,R13	ZDMPA	
2706	01	008C3	32CE08D6			LW,R12	DR8PS+8,X7	
2707	01	008C4	6AF00925			BAL,R15	DECCNVRT	
2708	01	008C5	35D005A0			STW,R13	ZDMPA+2	
2709	01	008C6	32CE08DE			LW,R12	PICKS+8,X7	
2710	01	008C7	6AF00925			BAL,R15	DECCNVRT	
2711	01	008C8	35D005A2			STW,R13	ZDMPA+4	
2712	01	008C9	32C008E4			LW,R12	CPERCTL3	
2713	01	008CA	6AF00E39			BAL,R15	TYPE11	
2714	01	008CB	657008BF			BIR,R7	COMPAR04	
2715	01	008CC	E80008CD			B	*CMPAREXT	
2716	01	008CD	00000000	A	CMPAREXT	DATA	0	
2717	01	008CE			DR8PS	RES	8	
2718	01	008D6			PICKS	RES	8	
2719	01	008DE	00000000	A	CMPERIND	DATA	0	
2720	01	008DF	00000000	A	CPAS1IND	DATA	0	
2721	01	008E0	00000000	A	CMPTMP	DATA	0	
2722	01	008E1	10201678	A	CPERCTLO	ZFMW	1,0,32,BA(ZDMPA)	
2723	01	008E2	101C1678	A	CPERCTL1	ZFMW	1,0,28,BA(ZDMPA)	
2724	01	008E3	10142394	A	CPERCTL2	ZFMW	1,0,20,BA(TXTSUMRY)	
2725	01	008E4	10141678	A	CPERCTL3	ZFMW	1,0,20,BA(ZDMPA)	
2726	01	008E5	E2E4D4D4	A	TXTSUMRY	TEXT	'SUMMARY	
	01	008E6	C1D9E84C	A				
	01	008E7	4040404C	A				
	01	008E8	4040404C	A				

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
	01	008E9	40404040	A				
	01	008EA	40404040	A				
2727	01	008EB	10142380	A	SMHDGCTL	ZFMW	1,0,20,BA(SMHDGMSG)	
2728	01	008EC	C209E340	A	SMHDGMSG	TEXT	'BIT DRIPPED PICKED'	
	01	008ED	40C4D9D6	A				
	01	008EE	D7D7C5C4	A				
	01	008EF	4040D7C9	A				
	01	008F0	C3D2C5C4	A				
2729						PAGE		
2730								
2731								
2732								
2733								
2734								
2735								
2736	01	008F1	35F00907		COUPLE	STW,R15	COUPLXIT	
2737	01	008F2	22800000	A		LI,R8	0	
2738	01	008F3	3580058F			STW,R8	P2	
2739	01	008F4	3580091B			STW,R8	CPLERIND	
2740	01	008F5	32800AE7			LW,R8	WBRKADDR	
2741	01	008F6	25800470	A		SAS,R8	-16	
2742	01	008F7	48801000			AND,R8	'X'FFFF'	
2743	01	008F8	3580058E			STW,R8	P1	
2744	01	008F9	6AF00CD2			BAL,R15	SEEK	
2745	01	008FA	22800000	A		LI,R8	0	
2746	01	008FB	3580058E			STW,R8	P1	
2747	01	008FC	6AF00D12			BAL,R15	SENSALT	
2748	01	008FD	32800D1A			LW,R8	SENSSAVE	
2749	01	008FE	32901003			LW,R9	'X'7FFF0000'	
2750	01	008FF	45800AE7			CS,R8	WBRKADDR	
2751	01	00900	E8300907			BCR,3	*COUPLXIT	
2752	01	00901	6AF00908			BAL,R15	CPLERTYP	
2753	01	00902	33F0091B			MTW,-1	CPLERIND	
2754	01	00903	6C000010	A		RD,0	16	
2755	01	00904	68400906			BCR,4	*+2	
2756	01	00905	2E000000	A	WAIT2	WAIT		COUPLER ERROR. SS2 IS SET
2757	01	00906	E8000907			B	*COUPLXIT	
2758	01	00907	00000000	A	COUPLXIT	DATA	0	
2759						PAGE		
2760								
2761								
2762								
2763	01	00908	35F0091A		CPLERTYP	STW,R15	CPLREXIT	
2764	01	00909	32C00C8D			LW,R12	QMSGCTLE	
2765	01	0090A	6AF00E35			BAL,R15	TYPE01	
2766	01	0090B	32C00AE7			LW,R12	WBRKADDR	
2767	01	0090C	6AF0067C			BAL,R15	ADDRGEN	
2768	01	0090D	32800696			LW,R8	ADRGN SAV+2	
2769	01	0090E	3580091E			STW,R8	CPLERMSG+1	
2770	01	0090F	32800697			LW,R8	ADRGN SAV+3	
2771	01	00910	3580091F			STW,R8	CPLERMSG+2	
2772	01	00911	32C00D1A			LW,R12	SENSSAVE	
2773	01	00912	6AF0067C			BAL,R15	ADDRGEN	
2774	01	00913	32800696			LW,R8	ADRGN SAV+2	
2775	01	00914	35800922			STW,R8	CPLERMSG+5	
2776	01	00915	32800697			LW,R8	ADRGN SAV+3	
2777	01	00916	35800923			STW,R8	CPLERMSG+6	
2778	01	00917	32C0091C			LW,R12	CPLERCTL	
2779	01	00918	6AF00E35			BAL,R15	TYPE01	
2780	01	00919	E800091A			B	*CPLREXIT	
2781	01	0091A	00000000	A	CPLREXIT	DATA	0	
2782	01	0091B	00000000	A	CPLERIND	DATA	0	
2783	01	0091C	10202474	A	CPLERCTL	ZFMW	1,0,32,BA(CPLERMSG)	
2784	01	0091D	E2C5C5D2	A	CPLERMSG	TEXT	'SEEK SENS	
	01	0091E	40404040	A				
	01	0091F	40404040	A				
	01	00920	40404040	A				
	01	00921	E2C5C5E2	A				
	01	00922	40404040	A				
	01	00923	40404040	A				
	01	00924	40404040	A				

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2785							PAGE	
2786								* * * * *
2787								*THE DECCNVRT ROUTINE CONVERTS A BINARY WORD TO A 4-BIT DECIMAL WORD. * * * * *
2788								*THE HEXCNVRT ROUTINE CONVERTS IT TO HEXADECIMAL FORMAT BY INSERTING * * * * *
2789								*THE ZONE BITS. LEADING ZEROS ARE SUPPRESSED. * * * * *
2790								* * * * *
2791	01	00925	35F0094B		DECCNVRT	STW,R15	CNVTEXIT	
2792	01	00926	6AF00AEC			BAL,R15	GRSAVE	
2793	01	00927	3300000C	A		MTW,0	R12	
2794	01	00928	6810092C			BCR,1	\$+4	NEG
2795	01	00929	22DFFFFF	A		LI,R13	-1	YES
2796	01	0092A	3AC0000C	A		LCW,R12	R12	
2797	01	0092B	6800092D			B	\$+2	
2798	01	0092C	22D00000	A		LI,R13	0	
2799	01	0092D	35D0094F			STW,R13	NEGIND	
2800	01	0092E	6AF003EC			BAL,R15	ZBTD	
2801	01	0092F	32C0058B			LW,R12	ZTEMP	
2802	01	00930	68000933			B	\$+3	
2803	01	00931	35F0094B		HEXCNVRT	STW,R15	CNVTEXIT	
2804	01	00932	6AF00AEC			BAL,R15	GRSAVE	
2805	01	00933	22800000	A		LI,R8	0	
2806	01	00934	3580094F			STW,R8	NEGIND	
2807	01	00935	6AF003F5			BAL,R15	ZBTH	
2808	01	00936	31C0094C			CW,R12	EBCZER8	
2809	01	00937	6830093B			BCR,3	\$+4	WORD = 0
2810	01	00938	6AF00402			BAL,R15	ZSUP	NO
2811	01	00939	15C00AD8			STD,R12	DBLWDTMP	
2812	01	0093A	68000944			B	CNVTOO	
2813	01	0093B	32C0094C			LW,R12	EBCBLNK	
2814	01	0093C	25C00320	A		SCD,R12	32	
2815	01	0093D	31C0094C			CW,R12	EBCZER8	
2816	01	0093E	68300941			BCR,3	\$+3	WORD = 0
2817	01	0093F	6AF00402			BAL,R15	ZSUP	NO
2818	01	00940	68000942			B	\$+2	
2819	01	00941	32C0094E			LW,R12	EBCBLNK+1	
2820	01	00942	25C00320	A		SCD,R12	32	
2821	01	00943	15C00AD8			STD,R12	DBLWDTMP	
2822	01	00944	6AF00AE9		CNVTOO	BAL,R15	GRRSTR	
2823	01	00945	12C00AD8			LD,R12	DBLWDTMP	
2824	01	00946	3300094F			MTW,0	NEGIND	
2825	01	00947	6830094A			BCR,3	\$+3	
2826	01	00948	4BC01004			AND,R12	X'FFFFFFF'	
2827	01	00949	49C00950			OR,R12	TEXTMNU	
2828	01	0094A	E800094B			B	*CNVTEXIT	
2829	01	0094B	00000000	A	CNVTEXIT	DATA	0	
2830	01	0094C	F0F0F0F0	A	EBCZER8	DATA	X'F0F0F0F0'	
2831	01	0094D	40404040	A	EBCBLNK	DATA	X'40404040'	
2832	01	0094E	404040F0	A	DATA	DATA	X'404040F0'	
2833	01	0094F	00000000	A	NEGIND	DATA	0	
2834	01	00950	60000000	A	TEXTMNU	DATA	X'60000000'	
2835							PAGE	
2836								* * * * *
2837								*THIS WILL INITIATE UP TO 30 DATA CHAINING OPERATIONS, WITH EITHER * * * * *
2838								*READ OR WRITE, AND WITH OR WITHOUT REQUEST FOR INTERRUPT ON ZERO * * * * *
2839								*BYTE COUNT, DEPENDING ON THE PARAMETER SETTINGS. * * * * *
2840								* * * * *
2841	01	00951	20000000	A		DATA	X'20000000'	P1 IF=0 READ, IF=1 WRITE
2842	01	00952	20000000	A		DATA	X'20000000'	P2 IS COUNT D CHAIN IS TO BE DONE
2843	01	00953	20000000	A		DATA	X'20000000'	P3 IF=1 IZC FLAG WILL BE SET
2844	01	00954	20000000	A		DATA	X'20000000'	P4 NUMB OF BYTES IN 1ST COMM DB WRD
2845	01	00955	20000000	A		DATA	X'20000000'	P5 NUMB OF BYTES IN 2ND COMM DB WRD
2846	01	00956	20000000	A		DATA	X'20000000'	P6 NUMB OF BYTES IN 3RD COMM DB WRD
2847	01	00957	20000000	A		DATA	X'20000000'	P7 NUMB OF BYTES IN 4TH COMM DB WRD
2848	01	00958	20000000	A		DATA	X'20000000'	P8 NUMB OF BYTES IN 5TH COMM DB WRD
2849	01	00959	20000000	A		DATA	X'20000000'	P9 NUMB OF BYTES IN 6TH COMM DB WRD
2850	01	0095A	55F20992		DCHN	STW,R15	DCHNEXIT,X1	
2851	01	0095B	3A70058F			LCW,R7	P2	
2852	01	0095C	6830095F			BEZ	\$+3	IFD CHAIN COUNT
2853	01	0095D	217FFFFE2	A		CI,X7	-30	IS > 1
2854	01	0095E	68100960			BGE	\$+2	OR < 30
2855	01	0095F	227FFFA	A		LI,X7	-6	SET IT TO 6

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2856	01	00960	25700401	A		SAS,X7	1	SET UP INDEX FOR DCHNPAIR LIST
2857	01	00961	35700900			STW,X7	NP2SAVE	SAVE INDEX FOR DCHNPAIR LIST
2858	01	00962	20700002	A		AI,X7	2	
2859	01	00963	33000590			MTW,0	P3	IS IZC FLAG TO BE SET
2860	01	00964	69300967			BNEZ	\$+3	
2861	01	00965	32801005			LW,R8	*X'9E000000'	NO-SET DC,ICE,HTC,IVE,SIL FLAGS
2862	01	00966	68000968			B	\$+2	
2863	01	00967	32801006			LW,R8	*X'CE000000'	YES=SET DC,IZC,HTC,IVE,SIL FLAGS
2864	01	00968	358E09CF			STW,R8	DCHNPAIR+59,X7	SET FLAGS
2865	01	00969	33100007	A		MTW,1	R7	IN ALL BUT LAST
2866	01	0096A	65700968			BIR,X7	\$-2	DCHNPAIR WORDS
2867	01	0096B	228009D0			LI,R8	DCHNPAIR+60	SET UP
2868	01	0096C	308009D0			AW,R8	NP2SAVE	DOUBLE WORD ADDRESS
2869	01	0096D	2580047F	A		SAS,R8	-1	AND TIC
2870	01	0096E	30801007			AW,R8	*X'08000000'	IN
2871	01	0096F	35800A8E			STW,R8	COMMPAIR	COMMPAIR
2872	01	00970	327009D0			LW,X7	NP2SAVE	
2873	01	00971	20700001	A		AI,X7	1	
2874	01	00972	226FFFFF	A		LI,X6	-1	
2875	01	00973	32800592		DCHNPAIR	LW,R8	P4+1,X6	
2876	01	00974	69200976			BGZ	\$+2	B IF BYTE COUNT > 0
2877	01	00975	22800400	A		LI,R8	1024	ELSE, FORCE IT TO 1024
2878	01	00976	329E09D0			LW,R9	DCHNPAIR+60,X7	
2879	01	00977	4B901008			AND,R9	*X'FF000000'	
2880	01	00978	30800009	A		AW,R8	R9	STORE BYTE COUNTS
2881	01	00979	358E09D0			STW,R8	DCHNPAIR+60,X7	IN 2ND WORDS
2882	01	0097A	20600001	A		AI,X6	1	OF
2883	01	0097B	21600005	A		CI,X6	5	* IF PARAMETER LIST IS
2884	01	0097C	6910097E			BL	\$+2	* EXHAUSTED, USE
2885	01	0097D	226FFFFF	A		LI,X6	-1	* IT OVER AGAIN
2886	01	0097E	33100007	A		MTW,1	R7	DCHNPAIR
2887	01	0097F	65700973			BIR,X7	DCHNPAIR	LIST
2888	01	00980	327009D0			LW,X7	NP2SAVE	
2889	01	00981	32800587			LW,R8	ZIBADR	SET
2890	01	00982	25800402	A		SAS,R8	2	UP
2891	01	00983	330005FE			MTW,0	P1	FIRST
2892	01	00984	68300987			BEZ	\$+3	WORDS
2893	01	00985	30801009			AW,R8	*X'01000000'	WITH WRITE ORDER
2894	01	00986	6800098A			B	\$+4	OR
2895	01	00987	3080100A			AW,R8	*X'02000000'	READ ORDER
2896	01	00988	22900000	A		LI,R9	0	
2897	01	00989	359009C6			STW,R9	PATTERN]	
2898	01	0098A	358E09D0			STW,R8	DCHNPAIR+60,X7	IN
2899	01	0098B	33100007	A		MTW,1	R7	DCHNPAIR
2900	01	0098C	6570098A			BIR,X7	\$-2	
2901	01	0098D	22800992			LI,R8	DCHNEXIT	
2902	01	0098E	22900991			LI,R9	DCHN01	
2903	01	0098F	15800400			STD,R8	NBRMRETN	
2904	01	00990	680004AF			B	EXECUTE	
2905	01	00991	6AF00A34		DCHN01	BAL,R15	ERRORTYP	
2906	01	00992	68000000	A	DCHNEXIT	B	0	
2907						BOUND	8	
2908	01	00994			DCHNPAIR	RES	58	
2909	01	009CE	00000000	A		DATA	0	
2910	01	009CF	1E000000	A		ZFCP	X'1E',0	
2911	01	009D0	00000000	A		NP2SAVE	DATA	INDEX FOR DCHNPAIR LIST
2912						PAGE		
2913								*
2914								*THIS GENERATES A FIXED DELAY OF D2 PULSES X D1 COUNTER FREQUENCY, IF *
2915								*D1 AND D2 ARE ZERO, A 34 MS DELAY IS GENERATED.*
2916								*
2917	01	00901	20000000	A		DATA	X'20000000'	P1-STANDARD CTR SELECTION(1,2,3,4,)
2918	01	00902	20000000	A		DATA	X'20000000'	P2=NUMBER OF PULSES AT CTR FREQ
2919	01	00903	3280058F		DLY	LW,R8	P2	
2920	01	00904	693009C6			BCS,3	\$+2	IS P1 = 0
2921	01	00905	22800011	A		LI,R8	17	YES
2922	01	00906	3270058E			LW,R7	P1	
2923	01	00907	693009D9			BCS,3	\$+2	
2924	01	00908	22700004	A		LI,R7	4	
2925	01	00909	35F009E2			STW,R15	DLYEXIT	
2926	01	009DA	329009E3			LW,R9	DLYRETN	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
2927	01	009DB	359E0057	A		STW,R9	X'57',X7	
2928	01	009DC	329009EC			LW,R9	DLYSTEP	
2929	01	009DD	359E0051	A		STW,R9	X'51',X7	
2930	01	009DE	32EE09E3			LW,R14	DLYARM=1,X7	
2931	01	009DF	6DE01200	A		WD,R14	X'1200'	
2932	01	009E0	2E000000	A	WAIT3	WAIT		EXECUTE DELAY
2933	01	009E1	680009EC			B	\$-1	
2934	01	009E2	00000000	A	DLYEXIT	DATA	0	
2935	01	009E3	0F0009E8		DLYRETN	XPSD,0	DLYXPSD	
2936	01	009E4	00008200	A	DLYARM	DATA	X'8200'	
2937	01	009E5	00004100	A		DATA	X'4100'	
2938	01	009E6	00002080	A		DATA	X'2080'	
2939	01	009E7	00001040	A		DATA	X'1040'	
2940						BOUND	8	
2941	01	009E8	00000000	A	DLYXPSD	DATA	0	
2942	01	009E9	00000000	A		DATA	0	
2943	01	009EA	000009ED			DATA	DLYICLR	
2944	01	009EB	00000000	A		DATA	0	
2945	01	009EC	33F00008	A	DLYSTEP	MTW,-1	R8	
2946	01	009ED	32EE09E3		DLYICLR	LW,R14	DLYARM=1,X7	
2947	01	009EE	6DE01100	A		WD,R14	X'1100'	
2948	01	009EF	E80009E2			B	*DLYEXIT	
2949						PAGE		
2950					*			
2951					*THIS WILL OUTPUT THE ERROR COUNTERS WHEN IT HAS BEEN EXECUTED			*
2952					*D1+1 TIMES.			*
2953					*			*
2954	01	009F0	20000000	A		DATA	X'20000000'	P1-REPORT FREQUENCY
2955	01	009F1	35F00A03		ERR	STW,R15	ERREXIT	
2956	01	009F2	22600000	A		LI,R6	0	
2957	01	009F3	3560084A			STW,R6	PLBRIND	
2958	01	009F4	3280058E			LW,R8	P1	
2959	01	009F5	683009FD			BEZ	ERR001	IS P1 > 0
2960	01	009F6	33100A04			MTW,1	ERRPSCNT	YES=ADD 1 TO PASS CNT
2961	01	009F7	31800A04			CW,R8	ERRPSCNT	IS P1 > 8R = ERRPSCNT
2962	01	009F8	E8100A03			BGE	*ERREXIT	YES=EXIT
2963	01	009F9	3280100B			LW,R8	=X'FFFF00'	NO
2964	01	009FA	3580058E			STW,R8	P1	
2965	01	009FB	6AF00E66			BAL,R15	TYPC	TYPE CTRS 9=20
2966	01	009FC	68000A00			B	\$+4	
2967	01	009FD	3280100B		ERR001	LW,R8	=X'FFFF00'	CLEAR
2968	01	009FE	3580058E			STW,R8	P1	COUNTERS
2969	01	009FF	6AF00818			BAL,R15	CNTR	9=20
2970	01	00A00	22800000	A		LI,R8	C	CLEAR
2971	01	00A01	35800A04			STW,R8	ERRPSCNT	PASS CBUNT
2972	01	00A02	E800CA03			B	*ERREXIT	
2973	01	00A03	00000000	A	ERREXIT	DATA	0	
2974	01	00A04	00000000	A	ERRPSCNT	DATA	0	
2975	01	00A05			IXSAVE	RES	3	
2976						PAGE		
2977					*			*
2978					*THIS STEPS THE ERROR COUNTERS.			*
2979					*			*
2980	01	00A08	33000CCA		ERRBRCNT	MTW,0	READING	
2981	01	00A09	68300CA0B			BEZ	\$+2	
2982	01	00A0A	3310085A			MTW,1	COUNTER+9	YES
2983	01	00A0B	33000F19			MTW,0	WRTIND	NO
2984	01	00A0C	68300CA0E			BEZ	\$+2	
2985	01	00A0D	3310085B			MTW,1	COUNTER+10	YES
2986	01	00A0E	32A00AC9			LW,R10	H:BSTAT+1	NO
2987	01	00A0F	31A01007			CW,R10	=X'8000000'	
2988	01	00A10	68400A12			BCR,4	\$+2	UNUS END
2989	01	00A11	33100864			MTW,1	COUNTER+19	YES
2990	01	00A12	31A00FFF			CW,R10	=X'400000'	NO
2991	01	00A13	68400A15			BCR,4	\$+2	TRANS DATA ERR
2992	01	00A14	3310085E			MTW,1	COUNTER+13	YES
2993	01	00A15	31A0100C			CW,R10	=X'200000'	NO
2994	01	00A16	68400A18			BCR,4	\$+2	TRANS MEM ERR
2995	01	00A17	3310085F			MTW,1	COUNTER+14	YES
2996	01	00A18	31A0100D			CW,R10	=X'100000'	NO
2997	01	00A19	68400A1B			BCR,4	\$+2	MEM ADDR ERR

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL CRIG	LABEL	OPERATION	OPERAND	COMMENTS
2998	01	00A1A	33100860			MTW,1	COUNTER+15	YES
2999	01	00A1B	31A0100E			CW,R10	=X'80000'	NO
3000	01	00A1C	68400A1E			BCR,4	\$+2	IOP MEM ERR
3001	01	00A1D	33100861			MTW,1	COUNTER+16	YES
3002	01	00A1E	31A010CF			CW,R10	=X'40000'	NO
3003	01	00A1F	68400A21			BCR,4	\$+2	IOP CTRL ERR
3004	01	00A20	33100862			MTW,1	COUNTER+17	YES
3005	01	00A21	32A01210			LW,R10	=X'10000000'	NO
3006	01	00A22	31A00ACB			CW,R10	TDVSTAT+1	
3007	01	00A23	69400A26			BCS,4	\$+3	WP VIOL
3008	01	00A24	31A00ACD			CW,R10	AIBSTAT+1	
3009	01	00A25	68400A27			BCR,4	\$+2	WP VIOL
3010	01	00A26	3310085C			MTW,1	COUNTER+11	YES
3011	01	00A27	32A00FF9			LW,R10	=X'20000000'	NO
3012	01	00A28	31A00ACB			CW,R10	TDVSTAT+1	
3013	01	00A29	69400A2C			BCS,4	\$+3	SECT UNAV
3014	01	00A2A	31A00ACD			CW,R10	AIBSTAT+1	NO
3015	01	00A2B	68400A2D			BCR,4	\$+2	SECT UNAV
3016	01	00A2C	3310085D			MTW,1	COUNTER+12	YES
3017	01	00A2D	32A00FFB			LW,R10	=X'80000000'	NO
3018	01	00A2E	31A00ACB			CW,R10	TDVSTAT+1	
3019	01	00A2F	69400A32			BCS,4	\$+3	RATE ERR
3020	01	00A30	31A00ACD			CW,R10	AIBSTAT+1	NO
3021	01	00A31	68400A33			BCR,4	\$+2	RATE ERR
3022	01	00A32	33100863			MTW,1	COUNTER+18	YES
3023	01	00A33	E80000CF A			B	*R15	NO
3024						PAGE		
3025								
3026								
3027								
3028	01	00A34	35F0CA46		ERRORTYP	STW,R15	ERTYEXIT	
3029	01	00A35	3280CACA			LW,R8	TDVSTAT	GET CURR COMM DW ADR
3030	01	00A36	2580C4C1 A			SAS,R8	1	GEN WORD ADDR
3031	01	00A37	B270C008 A			LW,R7	*R8,X1	
3032	01	00A38	4E70100C			AND,R7	=X'FFFF'	
3033	01	00A39	3570CA47			STW,R7	ELENGTH	
3034	01	00A3A	B270C008 A			LW,R7	*R8	GET ORDER
3035	01	00A3B	226000C0 A			LI,R6	0	AND PULL
3036	01	00A3C	2560C508 A			SAD,R6	8	CORRECT
3037	01	00A3D	4E601011			AND,R6	=7	
3038	01	00A3E	216000C1 A			CI,R6	1	TEXT MSG
3039	01	00A3F	6E100441			BCR,1	\$+2	
3040	01	00A40	68000A43			B	\$+3	
3041	01	00A41	216000C5 A			CI,R6	5	
3042	01	00A42	6E200A45			BCR,2	\$+3	
3043	01	00A43	3280CAAD			LW,R8	TEXTILEG	
3044	01	00A44	6E00CA46			B	\$+2	
3045	01	00A45	3280CAE1			LW,R8	TEXTWRT+1,X6	
3046	01	00A46	3580059E			STW,R8	ZDMPA	SAVE OPER IN OUTPUT
3047	01	00A47	3280094D			LW,R8	ERCBLNK	SAVE BYTE CT
3048	01	00A48	358005A1			STW,R8	ZDMPA+3	
3049	01	00A49	32C0CA47			LW,R12	ELENGTH	
3050	01	00A4A	6AF0C925			RAL,R15	DECCNVRT	CONVERT TO DECIMAL
3051	01	00A4B	35C0059F			STW,R12	ZDMPA+1	
3052	01	00A4C	35D005A0			STW,R13	ZDMPA+2	
3053	01	00A4D	32C0CAE7			LW,R12	WORKADDR	
3054	01	00A4E	6AF0067C			BAL,R15	ADDRGEN	
3055	01	00A4F	227FFFFD A			LI,R7	=3	
3056	01	00A50	328EC698			LW,R8	ADRGNSAV+4,X7	
3057	01	00A51	358EC5A5			STW,R8	ZDMPA+7,X7	
3058	01	00A52	6570CA50			RIR,R7	\$=2	
3059	01	00A53	32F0C94C			LW,R15	ERCBLNK	
3060	01	00A54	35F0059F			STW,R15	ZDMPA+1	
3061	01	00A55	52C20ACB			LH,R12	TDVSTAT+1,X1	
3062	01	00A56	4BC0100C			AND,R12	=X'FFFF'	
3063	01	00A57	6AF00925			BAL,R15	DECCNVRT	
3064	01	00A58	35C005A5			STW,R12	ZDMPA+7	
3065	01	00A59	35D005A6			STW,R13	ZDMPA+8	
3066	01	00A5A	32C0CAAE			LW,R12	ERTYPC00	
3067	01	00A5B	6AF00E35			RAL,R15	TYPE01	
3068	01	00A5C	224FFFFC A			LI,R6	=4	SET UP

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL O P I G	LABEL	OPERATION	OPERAND	COMMENTS
3069	01	00A5D	3288CAAD			LW,R8	CURCMHOG+4,X4	CURRENT
3070	01	00A5E	3588C5A2			STW,R8	ZDMPA+4,X4	COMMAND
3071	01	00A5F	65400A5D			BIR,R4	S*2	HEADING
3072	01	00A60	32800ACA			LW,R2	TDVSTAT	SET UP
3073	01	00A61	25800401	A		SAS,R8	1	CURRENT
3074	01	00A62	92C00008	A		LD,R12	*R8	COMMAND
3075	01	00A63	15C00ACA			STD,R12	DBLWDTMP+2	
3076	01	00A64	6AF00931			BAL,R15	HEXCNVRT	
3077	01	00A65	32F0094D			LW,R15	EBCBLNK	
3078	01	00A66	35F005A2			STW,R15	ZDMPA+4	
3079	01	00A67	35C005A3			STW,R12	ZDMPA+5	
3080	01	00A68	35D005A4			STW,R13	ZDMPA+6	
3081	01	00A69	32C00ADB			LW,R12	DBLWDTMP+3	
3082	01	00A6A	6AF00931			RAL,R15	HEXCNVRT	
3083	01	00A6B	32F0094D			LW,R15	EBCBLNK	
3084	01	00A6C	35F005A5			STW,R15	ZDMPA+7	
3085	01	00A6D	35C005A6			STW,R12	ZDMPA+8	
3086	01	00A6E	35D005A7			STW,R13	ZDMPA+9	
3087	01	00A6F	32C00A8			LW,R12	CURCMCTL	TYPE CURRENT
3088	01	00A70	6AF00E37			BAL,R15	TYPE10	COMM DBLWORD
3089	01	00A71	32800AC9			LW,R8	H18STAT+1	
3090	01	00A72	318010C7			CW,R8	=X'8000000'	
3091	01	00A73	68400A76			BCR,4	S*3	UNUS END
3092	01	00A74	32C00C87			LW,R12	QMSGCTL8	YES
3093	01	00A75	6AF00E37			RAL,R15	TYPE10	
3094	01	00A76	32800FF8			LW,R8	=X'80000000'	
3095	01	00A77	31800ACB			CW,R8	TDVSTAT+1	
3096	01	00A78	69400A7B			BCS,4	S*3	RATE ERROR
3097	01	00A79	31800ACD			CW,R8	A18STAT+1	NO
3098	01	00A7A	68400A7D			BCR,4	S*3	RATE ERROR
3099	01	00A7B	32C00C8A			LW,R12	QMSGCTLB	YES
3100	01	00A7C	6AF00E37			BAL,R15	TYPE10	
3101	01	00A7D	3280101C			LW,R8	=X'10000000'	
3102	01	00A7E	31800ACB			CW,R8	TDVSTAT+1	
3103	01	00A7F	69400A82			BCS,4	S*3	WRT PROT VIOL
3104	01	00A80	31800ACD			CW,R8	A18STAT+1	NO
3105	01	00A81	68400A84			BCR,4	S*3	WRT PROT VIOL
3106	01	00A82	32C00C88			LW,R12	QMSGCTL9	YES
3107	01	00A83	6AF00E37			BAL,R15	TYPE10	
3108	01	00A84	32800FF9			LW,R8	=X'20000000'	
3109	01	00A85	31800ACB			CW,R8	TDVSTAT+1	
3110	01	00A86	69400A89			BCS,4	S*3	SECT UNAV
3111	01	00A87	31800ACD			CW,R8	A18STAT+1	NO
3112	01	00A88	68400A89			BCR,4	S*3	SECT UNAV
3113	01	00A89	32C00C89			LW,R12	QMSGCTLA	YES
3114	01	00A8A	6AF00E37			BAL,R15	TYPE10	
3115	01	00A8B	32801012			LW,R8	=X'8000000'	
3116	01	00A8C	31800ACB			CW,R8	TDVSTAT+1	
3117	01	00A8D	69400A90			BCS,4	S*3	INC LEN
3118	01	00A8E	31800ACD			CW,R8	A18STAT+1	NO
3119	01	00A8F	68400A92			BCR,4	S*3	INC LEN
3120	01	00A90	32C00C8C			LW,R12	QMSGCTLD	YES
3121	01	00A91	6AF00E37			BAL,R15	TYPE10	
3122	01	00A92	32800FFF			LW,R8	=X'4000000'	
3123	01	00A93	31800ACB			CW,R8	TDVSTAT+1	
3124	01	00A94	69400A97			BCS,4	S*3	TRANS ERR
3125	01	00A95	31800ACD			CW,R8	A18STAT+1	NO
3126	01	00A96	68400A99			BCR,4	S*3	TRANS ERR
3127	01	00A97	32C00C8B			LW,R12	QMSGCTLC	YES
3128	01	00A98	6AF00E37			BAL,R15	TYPE10	
3129	01	00A99	12C00ACC		ERRTYPOO	LD,R12	A18STAT	
3130	01	00A9A	68300A9D			BCR,3	S*3	
3131	01	00A9B	32800AE1			LW,R11	TEXTA18	
3132	01	00A9C	6AF00D6C			BAL,R15	STATTYPE	
3133	01	00A9D	12C00ACA			LD,R12	TDVSTAT	
3134	01	00A9E	68300AA1			BCR,3	S*3	
3135	01	00A9F	32800AEO			LW,R11	TEXTTDV	
3136	01	00AA0	6AF00D6C			RAL,R15	STATTYPE	
3137	01	00AA1	12C00AC8			LD,R12	H18STAT	
3138	01	00AA2	68300AA5			BCR,3	S*3	
3139	01	00AA3	32800ADF			LW,R11	TEXTH18	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3140	01	00AA4	6AF00D6C			BAL,R15	STATTYPE	
3141	01	00AA5	E2000AA6			B	*ERTYEXIT	
3142	01	00AA6	00000000	A	ERTYEXIT	DATA	0	
3143	01	00AA7	00000000	A	ELENGTH	DATA	0	
3144	01	00AA8	10281678	A	CURCMCTL	ZFM%	1,0,40,BA(ZDMPA)	
3145	01	00AA9	C3E4D9D9	A	CURCMHDG	TEXT	'CURRENT COMMAND'	
	01	00AAA	C5D5E340	A				
	01	00AAB	C3D6D4D4	A				
	01	00AAC	C1D5C440	A				
3146	01	00AAD	C9D3C5C7	A	TEXTILEG	TEXT	'ILEG'	
3147	01	00AAE	10241678	A	ERTYPOOD	ZFM%	1,0,36,BA(ZDMPA)	
3148						PAGE		
3149					*			
3150					*THIS WILL CAUSE THE ORDER STORED IN THE IBCD TO BE EXECUTED.			
3151					*			
3152	01	00AAF	6AF00D67		EXECUTE	BAL,R15	STATCLR	
3153	01	00AB0	22F00000	A		LI,R15	0	
3154	01	00AB1	35F0091B			STW,R15	CPLERIND	
3155	01	00AB2	6AF00D51		LOOP2	BAL,R15	SIBPSCBK	IS SIB POSSIBLE
3156	01	00AB3	68000AB2			B	*-1	NO
3157	01	00AB4	6AF00B1C			BAL,R15	I0ARMENB	YES
3158	01	00AB5	2200055F			LI,RC	DA(C0MMPAIR)	
3159	01	00AB6	CCA00AE7			SIB,R10	*WORKADDR	
3160	01	00AB7	15A00AC4			STD,R10	SIBSTAT	
3161	01	00AB8	74000AC4			STCF	SIBSTAT	
3162	01	00AB9	68000ABC			BCR,12	*+3	SUCCESSFUL START
3163	01	00ABA	6AF00EA7		LOOP3	BAL,R15	UNSTRYP	NO.
3164	01	00ABB	68000AAF			B	EXECUTE	
3165	01	00ABC	6800079F			B	CHENDCHK	
3166					*			
3167					*			
3168						BUND	8	
3169	01	00ABE			C0MMPAIR	RES	2	
3170	01	00AC0			N0RMRETN	RES	1	
3171	01	00AC1			ERR0RETN	RES	1	
3172	01	00AC2			N0RMSAVE	RES	2	
3173	01	00AC4			SIBSTAT	RES	2	
3174	01	00AC6			TIBSTAT	RES	2	
3175	01	00AC8			HIBSTAT	RES	2	
3176	01	00ACA			TDVSTAT	RES	2	
3177	01	00ACC			AIBSTAT	RES	2	
3178	01	00ACE	01000000	A	WRT0RDR	ZFCP	1,0	
3179	01	00ACF	1C000000	A		ZFCP	X'1C',0	
3180	01	00AD0	02000000	A	RDS0RDR	ZFCP	2,0	
3181	01	00AD1	1C000000	A		ZFCP	X'1C',0	
3182	01	00AD2	03000000	A	SEEK0RDR	ZFCP	3,0	
3183	01	00AD3	1C000000	A		ZFCP	X'1C',0	
3184	01	00AD4	04000000	A	SENS0RDR	ZFCP	4,0	
3185	01	00AD5	1C000000	A		ZFCP	X'1C',0	
3186	01	00AD6	05000000	A	CWRT0RDR	ZFCP	5,0	
3187	01	00AD7	1C000000	A		ZFCP	X'1C',0	
3188	01	00AD8			DBLWDTMP	RES	4	
3189					*			
3190					*			
3191	01	00ADC	40406140	A	TEXTSPCE	TEXT	' / '	
3192	01	00ADD	E2C9D640	A	TFXTSIB	TEXT	'SIB'	
3193	01	00ADE	E3C9D640	A	TEXTTIB	TEXT	'TIB'	
3194	01	00ADF	C8C9D640	A	TEXTHIB	TEXT	'HIB'	
3195	01	00AEO	E3C4E540	A	TEXTTDV	TEXT	'TDV'	
3196	01	00AE1	C1C9D640	A	TEXTAIR	TEXT	'AIR'	
3197	01	00AE2	E6D9E340	A	TEXTWRT	TEXT	'WRT'	
3198	01	00AE3	D9C9C1C4	A	TEXTREAD	TEXT	'READ'	
3199	01	00AE4	E2C5C5D2	A	TEXTSEK	TEXT	'SEEK'	
3200	01	00AE5	E7C5D5E2	A	TEXTSENS	TEXT	'SENS'	
3201	01	00AE6	C3E6D9E3	A	TEXTCWT	TEXT	'CWT'	
3202	01	00AE7	00000000	A	*WORKADDR	DATA	0	
3203	01	00AE8	00000000	A	SKWRPRBT	DATA	0	
3204						PAGE		
3205					*			
3206					*THIS WILL RESTORE THE GENERAL-PURPOSE REGISTERS.			
3207					*			
3208	01	00AE9	022000FC	A	GRRSTR	LCI	X'F'	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3209	01	00AEA	0A000AF6			PLM,R0	GRPSHMW	
3210	01	00AEB	E80000CF	A		B	*R15	
3211						PAGE		
3212								
3213								* THIS WILL SAVE THE CONTENTS OF THE GENERAL-PURPOSE REGISTERS *
3214								
3215	01	00AEC	35F00AF8		GRSAVE	STW,R15	GRSAVLBC	
3216	01	00AED	22F00AF8			LI,R15	GRSAVLBC	
3217	01	00AEE	35F00AF6			STW,R15	GRPSHMW	
3218	01	00AEF	22F1001F	A		LI,R15	X'1001F'	
3219	01	00AFO	25F0040F	A		SAS,R15	15	
3220	01	00AF1	35F00AF7			STW,R15	GRPSHMW*1	
3221	01	00AF2	32F00AF8			LW,R15	GRSAVLBC	
3222	01	00AF3	022000FC	A		LCI	X'F'	
3223	01	00AF4	0B000AF6			PSM,R0	GRPSHMW	
3224	01	00AF5	E80000CF	A		B	*R15	
3225						BOUND	8	
3226	01	00AF6	0C000AF8		GRPSHMW	ZFBT	0,0,GRSAVLBC	
3227	01	00AF7	0C100000	A		ZAP1	16,0	
3228	01	00AF8			GRSAVLBC	RES	16	
3229						PAGE		
3230								
3231								* THIS EXECUTES AN HI0 AND OUTPUTS THE STATUS AT MESSAGE LEVEL 3. IF *
3232								* ANY BITS OF THE COMPARE DATA TEST TRUE, A PLACE-MARK BRANCH IS TAKEN. *
3233								* IF SPECIFIED IN THE CONTROL LINE. *
3234								
3235	01	00B08	40000000	A		DATA	X'40000000'	P1-ADDRESS
3236	01	00B09	40000000	A		DATA	X'40000000'	P2-STATUS COMPARE BITS
3237	01	00B0A	35F00B1B		HI0	STW,R15	HI0EXIT	SAVE EXIT
3238	01	00B0B	3280058F			LW,R8	P2	
3239	01	00B0C	358006A7			STW,R8	STCMPSAV	
3240	01	00B0D	6AF00067			BAL,R15	STATCLR	CLR STATUS L0CS
3241	01	00B0E	CF00058E			HI0,R12	*P1	
3242	01	00B0F	15C00AC8			STD,R12	HI0STAT	SAVE HI0 STATUS
3243	01	00B10	74000AC8			STCF	HI0STAT	SAVE CC
3244	01	00B11	3280058E			LW,R8	P1	
3245	01	00B12	35800AE7			STW,R8	WORKADDR	
3246	01	00B13	32800ACF			LW,R11	TEXTHI0	
3247	01	00B14	12C00AC8			LD,R12	HI0STAT	
3248	01	00B15	6AF0006C			BAL,R15	STATTYPE	TYPE STATUS
3249	01	00B16	25D00474	A		SAS,R13	-12	
3250	01	00B17	31D0058F			CW,R13	P2	
3251	01	00B18	68400R1A			BCR,4	*+2	ANY BITS COMPARE
3252	01	00B19	33100R1B			MTW,1	HI0EXIT	YES
3253	01	00B1A	E8000B1B			B	*HI0EXIT	NO
3254	01	00B1B	0C000000	A	HI0EXIT	DATA	0	
3255						PAGE		
3256								
3257								* THIS ARMS AND ENABLES THE I/O INTERRUPT. *
3258								
3259	01	00B1C	32800B21		I0ARMENB	LW,R8	SAI0XPSD	SET UP
3260	01	00B1D	3580005C	A		STW,R8	X'5C'	I/O
3261	01	00B1E	22E0002C	A		LI,R14	X'20'	INTERRUPT
3262	01	00B1F	6DE01200	A		LD,R14	X'1200'	LOCATION
3263	01	00B20	E80000CF	A		B	*R15	EXIT
3264	01	00B21	0F000B22		SAI0XPSD	XPSD,0	STNDAI0	
3265						BOUND	8	
3266	01	00B22	0C000000	A	STNDAI0	DATA	0	
3267	01	00B23	0C000000	A		DATA	0	
3268	01	00B24	0C0000A1			DATA	STDAI0	
3269	01	00B25	0C000000	A		DATA	0	
3270						PAGE		
3271								
3272								* THIS ALLOWS USER SUBROUTINES TO INTERFACE WITH THE DCP. *
3273								
3274	01	00B26	40000000	A		DATA	X'40000000'	P1-MEMORY ADDR OF USER SUB-ROUTINE
3275	01	00B27	40000000	A		DATA	X'40000000'	P2- INPUT
3276	01	00B28	40000000	A		DATA	X'40000000'	P3- PARAMETERS
3277	01	00B29	40000000	A		DATA	X'40000000'	P4- FOR
3278	01	00B2A	40000000	A		DATA	X'40000000'	P5- USE
3279	01	00B2B	40000000	A		DATA	X'40000000'	P6- BY

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3280	01	00B2C	40000000	A		DATA	X'40000000'	P7-
3281	01	00B2D	40000000	A		DATA	X'40000000'	PR-
3282	01	00B2E	40000000	A		DATA	X'40000000'	P9-
3283	01	00B2F	40000000	A		DATA	X'40000000'	P10-
3284	01	00B30	35F00B33		JUMP	STW,P15	JUMPEXIT	
3285	01	00B31	EAF0058E			BAL,R15	*P1	
3286	01	00B32	E8000B33			B	*JUMPEXIT	
3287	01	00B33	00000000	A	JUMPEXIT	DATA	0	
3288						PAGE		
3289								
3290								*THIS ESTABLISHES THE RECORD LENGTH FOR READ, WRITE, CHECKWRITE OR
3291								*COMPARE OPERATIONS. PARAMETER D1 IS THE BYTE COUNT DESIGNATING
3292								*LOGICAL RECORD LENGTH. IF D1 EXCEEDS THE MAXIMUM NUMBER OF BYTES
3293								*AVAILABLE IN THE I/O BUFFER, A MESSAGE WILL BE OUTPUT, AND THE
3294								*LENGTH WILL BE SET TO THE MAXIMUM VALUE.
3295								*IF D2=0, SET SUPPRESS INCORRECT LENGTH FLAG IF LENGTH IS NOT AN
3296								*INTEGRAL MULTIPLE OF 1024 BYTES. IF D2=1, THEN SET SUPPRESS INCORRECT
3297								*LENGTH FLAG=0.
3298								
3299	01	00B34	20000000	A		DATA	X'20000000'	P1=BYTE COUNT
3300	01	00B35	20000000	A		DATA	X'20000000'	P2=SIL FLAG CTL
3301	01	00B36	35F00B6A		LEN	STW,P15	LENEXIT	SAVE RETURN
3302	01	00B37	32A0058R			LW,R10	ZICWDS	GET BFR WD CT
3303	01	00B38	25A00402	A		SAS,R10	2	MAKE IT A BYTE CT
3304	01	00B39	21A0FFFF	A		CI,R10	65535	
3305	01	00B3A	68200B3C			BCR,2	\$+2	IS BYTE CT > 65535
3306	01	00B3B	22A0FFFF	A		LI,P10	65535	YES
3307	01	00B3C	35A00B6B			STW,P10	RECLNGTH	NO-SAVE IT
3308	01	00B3D	32A0058E			LW,R10	P1	
3309	01	00B3E	69300B40			BCS,3	\$+2	P1 > 0
3310	01	00B3F	22A00400	A		LI,R10	1024	
3311	01	00B40	32C00B6B			LW,R12	RECLNGTH	GET 10 BFR BYTE CT
3312	01	00B41	31A00000	A		CW,R10	R12	LENGTH
3313	01	00B42	68200B49			BCR,2	LENO0	> I/O AREA
3314	01	00B43	6AF00925			BAL,R15	DECCNVRT	
3315	01	00B44	35C00F76			STW,R12	MXLNMSG+4	
3316	01	00B45	35D00B77			STW,R13	MXLNMSG+5	
3317	01	00B46	32C00B71			LW,R12	MXLNCTL	TYPE BUT
3318	01	00B47	6AF00E35			BAL,R15	TYPE01	MESSAGE
3319	01	00B48	32AC036B			LW,R10	RECLNGTH	GET MAX BFR BYTES
3320	01	00B49	35A00B6B		LENO0	STW,P10	RECLNGTH	
3321	01	00B4A	3280030A	A		LW,R8	R10	
3322	01	00B4B	21800003	A		CI,PR	3	
3323	01	00B4C	68400B4E			BCR,4	\$+2	
3324	01	00B4D	20800004	A		AI,RR	4	
3325	01	00B4E	2580047E	A		SAS,R8	-2	
3326	01	00B4F	35800B6F			STW,P8	REWCDCNT	
3327	01	00B50	22B00000	A		LI,R11	0	
3328	01	00B51	35B00B06			STW,R11	PATTERNI	
3329	01	00B52	21A00000	A		CI,R10	0	
3330	01	00B53	68200B57			BCR,2	\$+4	< 0
3331	01	00B54	20AFF000	A		AI,R10	-1024	NO
3332	01	00B55	3310000B	A		MTW,1	R11	
3333	01	00B56	68000B52			B	\$=4	
3334	01	00B57	35B00B6C			STW,R11	SECTRCNT	SAVE SECTOR CNT
3335	01	00B58	3300058F			MTW,C	P2	
3336	01	00B59	68300B5C			BCR,3	\$+3	
3337	01	00B5A	22A00000	A		LI,R10	0	
3338	01	00B5B	68000B5F			B	\$+4	
3339	01	00B5C	3300000A	A		MTW,0	R10	
3340	01	00B5D	68300B5F			BCR,3	\$+2	
3341	01	00B5E	32A0100A			LW,R10	=X'02000000'	
3342	01	00B5F	35A00B70			STW,R10	SILIND	
3343	01	00B60	22B00000	A		LI,R11	0	
3344	01	00B61	32A00B6C			LW,R10	SECTRCNT	
3345	01	00B62	20AFF004	A		AI,R10	-12	
3346	01	00B63	69100B66			BCS,1	\$+3	IS SECTOR CNT NEG
3347	01	00B64	3310000B	A		MTW,1	R11	NO
3348	01	00B65	68000B62			B	\$=3	
3349	01	00B66	20A00000	A		AI,R10	12	YES-RESTORE SECTORS
3350	01	00B67	35A00B6E			STW,R10	SECTORS	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL ORIG	LABEL	OPERATION	OPERAND	COMMENTS
3351	01	00B68	35B00B6D			STW,R11	TRACKS	
3352	01	00B69	E8000B6A			B	*LENEXIT	
3353	01	00B6A	00000000 A		LENEXIT	DATA	0	
3354	01	00B6B	00000000 A		RECLNGTH	DATA	0	
3355	01	00B6C	00000000 A		SECTRCNT	DATA	0	
3356	01	00B6D	00000000 A		TRACKS	DATA	0	
3357	01	00B6E	00000000 A		SECTARS	DATA	0	
3358	01	00B6F	00000000 A		REWCNT	DATA	0	
3359	01	00B70	00000000 A		SILIND	DATA	0	
3360	01	00E71	101E20C8 A		MXLNMCTL	ZFMW	1,0,30,BA(MXLNMSG)	
3361	01	00B72	D4C1E740 A		MXLNMSG	TEXT	'MAX REC LENGTH 0000000 BYTES'	
	01	00B73	D9C5C340 A					
	01	00B74	D3C5D5C7 A					
	01	00B75	E3C84040 A					
	01	00B76	FCFCFCFC A					
	01	00B77	F0F0F0F0 A					
	01	00B78	4CC2E8E3 A					
	01	00B79	C5E24040 A					
3362								PAGE
3363								* THIS IS TO MARK A PLACE IN A CONTROL LINE. M1 IS THE MARK IDENTIFIER. *
3364								* *
3365								
3366	01	00B7A	60000000 A			DATA	X'60000000'	
3367	01	00B7B	35F00B84		MARK	STW,R15	MARKEXIT	
3368	01	00B7C	32B0058E			LW,R8	P1	
3369	01	00B7D	3290094D			LW,R9	EBCRLNK	
3370	01	00B7E	25800378 A			SCD,R8	=8	
3371	01	00E7F	35800B87			STW,R8	TEXTMARK+1	
3372	01	00E80	35900B88			STW,R9	TEXTMARK+2	
3373	01	00B81	32C00585			LW,R12	MARKCNTL	
3374	01	00B82	6AF00E33			BAL,R15	TYPE00	
3375	01	00B83	E8000584			B	*MARKEXIT	
3376	01	00B84	00000000 A		MARKEXIT	DATA	0	
3377	01	00E85	10092E18 A		MARKCNTL	ZFMW	1,0,9,BA(TEXTMARK)	
3378	01	00B86	D4C1D9D2 A		TEXTMARK	TEXT	'MARK	
	01	00B87	40404040 A					
	01	00B88	40404040 A					
3379								PAGE
3380								* *
3381								* THIS WILL OUTPUT A MESSAGE WHEN CHANNEL END IS EXPECTED BUT NOT
3382								* RECEIVED. *
3383								* *
3384	01	00B89	CEA00AE7		N0CHEAD	YDV,R10	*WBKADDR	GET DEV DATA
3385	01	00B8A	15A00ACA			STD,R10	TDVSTAT	SAVE STATUS
3386	01	00B8B	74000ACA			STCF	TDVSTAT	SAVE CC
3387	01	00B8C	CFA00AE7			HI0,R10	*WBKADDR	RESET DEV AND CTLR
3388	01	00B8D	15A00AC8			STD,R10	HI0STAT	SAVE STATUS
3389	01	00B8E	74000AC8			STCF	HI0STAT	SAVE CC
3390	01	00E8F	32C00F92			LW,R12	N0CHECTL	
3391	01	00E90	6AF00E35			BAL,R15	TYPE01	
3392	01	00E91	68000DAF			B	STDAI000-2	EXIT
3393	01	00E92	10152E4C A		N0CHECTL	ZFMW	1,0,21,BA(N0CHEMSG)	
3394	01	00E93	C3C8C1D5 A		N0CHEMSG	TEXT	'CHAN END NOT RECEIVED'	
	01	00E94	4CC5D5C4 A					
	01	00E95	40D5D6E3 A					
	01	00E96	40D9C5C3 A					
	01	00E97	C5C9E5C5 A					
	01	00E98	C4404040 A					
3395								PAGE
3396								* *
3397								* THIS GENERATES A TEST PATTERN AND SPREADS IT THROUGH THE I/O BUFFER. *
3398								* *
3399	01	00E99	40000000 A			DATA	X'40000000'	
3400	01	00B9A	20000000 A			DATA	X'20000000'	
3401	01	00B9B	32CC058E		PATT	LW,R12	P1	
3402	01	00B9C	32D0058F			LW,R13	P2	
3403	01	00E9D	35C00B04			STW,R12	P1ST8RE	
3404	01	00E9E	35D00B05			STW,R13	P2ST8RE	
3405	01	00E9F	32400B05		PATTENT1	LW,R4	P2ST8RE	
3406	01	00BA0	32B00B04			LW,R11	P1ST8RE	
3407	01	00BA1	25A0037C A			SCD,R10	=4	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3408	01	00BA2	64400BA1			BDR,R4	\$-1	
3409	01	00BA3	22400000	A		LI,R4	0	
3410	01	00BA4	226FFFFC	A		LI,R6	-32	
3411	01	00BA5	32D000CA	A		LW,R13	R10	
3412	01	00BA6	32500BC5			LW,R5	P2STORE	
3413	01	00BA7	25C00304	A	PATTOO	SCD,R12	4	
3414	01	00BA8	64500BAB			BCR,R5	\$+3	
3415	01	00BA9	32500BC5			LW,R5	P2STORE	
3416	01	00BAA	32C000CA	A		LW,R13	R10	
3417	01	00BAB	25C00304	A		SCD,P12	4	
3418	01	00BAC	64500BAF			BDR,R5	\$+3	
3419	01	00BAD	32500BC5			LW,R5	P2STORE	
3420	01	00BAE	32C000CA	A		LW,R13	R10	
3421	01	00BAF	75C80BC7			STB,P12	PATTSAVE,X4	
3422	01	00BB0	65400BR1			BIR,R4	\$+1	
3423	01	00BB1	65600BA7			BIR,R6	PATTOO	
3424	01	00BB2	32500BC5			LW,R5	P2STORE	
3425	01	00BB3	20500BC7			AI,R5	PATTSAVE	
3426	01	00BB4	30501001			AW,R5	'X'328A0000'	
3427	01	00BB5	35500BHC			STW,R5	PATTLBAD	
3428	01	00BB6	32500B6F			LW,R5	RECDWCNT	
3429	01	00BB7	30500587			AW,R5	Z19ADR	
3430	01	00BB8	30501013			AW,R5	'X'358A0000'	
3431	01	00BB9	35500BED			STW,R5	PATSTORE	
3432	01	00BBA	3A40056F			LCW,R4	RECDWCNT	
3433	01	00BBB	3A500RC5			LCW,R5	P2STORE	
3434	01	00BBC	00000000	A	PATTLBAD	DATA	0	
3435	01	00BBD	00000000	A	PATSTORE	DATA	0	
3436	01	00BBE	655003C0			BIR,R5	\$+2	
3437	01	00BBF	3A500BC5			LCW,R5	P2STORE	
3438	01	00BC0	65400B8C			BIR,R4	PATTLBAD	
3439	01	00BC1	224FFFFFF	A		LI,R4	-1	
3440	01	00BC2	35400BC6			STW,R4	PATTERNI	
3441	01	00BC3	E800000F	A		B	*R15	
3442	01	00BC4	00000000	A	P1STORE	DATA	0	
3443	01	00BC5	00000000	A	P2STORE	DATA	0	
3444	01	00BC6	00000000	A	PATTERNI	DATA	0	
3445	01	00BC7			PATTSAVE	RES	8	
3446						PAGE		
3447					*			
3448					*THIS WILL CYCLE THE PATTERN RIGHT 1 BIT, OR ADD TO IT IF X1 IS A			*
3449					*NON-ZERO VALUE.			*
3450					*			*
3451	01	00BCF	40000000	A		DATA	X'40000000'	
3452	01	00BD0	35F00BE2		PCYC	STW,R15	PCYCEXIT	
3453	01	00BD1	32700BC5			LW,R7	P2STORE	
3454	01	00BD2	3280058E			LW,R8	P1	
3455	01	00BD3	68300BD6			BCR,3	\$+3	P1 = 0
3456	01	00BD4	30800BC4			AW,R8	P1STORE	NO
3457	01	00BD5	680005DF			B	PCYC00	
3458	01	00BD6	32800BC4			LW,R8	P1STORE	
3459	01	00BD7	22900000	A		LI,R9	0	
3460	01	00BD8	2580037F	A		SCD,R8	-1	
3461	01	00BD9	257004C2	A		SAS,R7	2	
3462	01	00BDA	207FFFFFF	A		AI,R7	-32	
3463	01	00BDB	68300BDE			BEZ	\$+3	
3464	01	00BDC	2590027F	A		SCS,R9	-1	
3465	01	00BDD	65700BDC			BIR,R7	\$-1	
3466	01	00BDE	308000C9	A		AW,R8	R9	
3467	01	00BDF	35800BC4		PCYC00	STW,R8	P1STORE	
3468	01	00BE0	6AF0039F			BAL,R15	PATTENT1	
3469	01	00BE1	E8000BE2			B	*PCYCEXIT	
3470	01	00BE2	00000000	A	PCYCEXIT	DATA	0	
3471						PAGE		
3472					*			*
3473					*THIS WILL MOVE A PORTION OF THE PROGRAM INTO THE I/O BUFFER TO BE			*
3474					*USED AS THE PATTERN.			*
3475					*			*
3476	01	00BE3	55F20CC1		PR0GMBVE	STW,R15	PR0GEXIT,X1	
3477	01	00BE4	32700588			LW,R7	Z18WDS	COMPUTE LAST
3478	01	00BE5	30700587			AW,R7	Z19ADR	BYTE ADDRESS
3479	01	00BE6	257000C2	A		SLS,R7	2	OF I/O BUFFER

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3480	01	00BE7	22800850			LI,R8	COUNTER+1	GET THE STARTING BYTE ADDRESS
3481	01	00BE8	3080058F			AW,R8	P2	FROM THE COUNTER SPECIFIED
3482	01	00BE9	B2900008 A			LW,R9	*R8	IN P2, INTO R9
3483	01	00BEA	32800009 A			LW,R8	R9	AND R8
3484	01	00BEB	30900865			AW,R9	RECLNGTH	IS STARTING BYTE ADDR+RECLNGTH
3485	01	00BEC	31700009 A			CW,R7	R9	> LAST BYTE ADDR OF I/O BUFFER
3486	01	00BED	68100BF2			BGE	*+5	NO
3487	01	00BEE	32C00003			LW,R12	MXPRCTL	YES
3488	01	00BEF	6AF00E33			BAL,R15	TYPE00	THEN TYPE
3489	01	00BF0	33100001			MTW,1	PRGXEXIT	BUT MESSAGE
3490	01	00BF1	68000001			B	PRGXEXIT	AND EXIT
3491	01	00BF2	35900868			SW,R9	RECLNGTH	
3492	01	00BF3	48901014			AND,R9	=X'13'	SAVE THE 2 LEAST
3493	01	00BF4	35900002			STW,R9	SAVEBITS	SIGNIFICANT BITS
3494	01	00BF5	2580007E A			SLS,R8	=2	MAKE THE START BYTE ADDR A WORD ADD
3495	01	00BF6	3080086F			AW,R8	RECWD CNT	
3496	01	00BF7	55820BFC			STH,R8	WRTPRGG,X1	
3497	01	00BF8	32800587			LW,R8	ZISADR	
3498	01	00BF9	3080086F			AW,R8	RECWD CNT	
3499	01	00BFA	55820BFD			STH,R8	WRTPRGG+1,X1	
3500	01	00BFB	3470086F			LCW,R7	RECWD CNT	
3501	01	00BFC	328E0000 A		WRTPRGG	LW,R8	0,X7	MOVE A NUMBER OF BYTES EQUAL TO THE
3502	01	00BFD	358E0000 A			STW,R8	0,X7	RECORD LENGTH INTO THE I/O BUFFER
3503	01	00BFE	657008FC			BIR,R7	*-2	
3504	01	00BFF	228FFFFF A			LI,R8	=1	
3505	01	00C00	358008C6			STW,R8	PATTERNI	
3506	01	00C01	68000000 A		PRGXEXIT	B	0	
3507	01	00C02	00000000 A		SAVEBITS	DATA	0	
3508	01	00C03	10143010 A		MXPRCTL	ZFMW	1,0,20,BA(MXPRMSG)	
3509	01	00C04	C1C4C4D9 A		MXPRMSG	TEXT	'ADDRESS OUT OF RANGE'	
	01	00C05	C5E2E240 A					
	01	00C06	D6E4E340 A					
	01	00C07	D6C640D9 A					
	01	00C08	C1D5C7C5 A					
3510								PAGE
3511								
3512								*THIS ALLOWS FOR CERTAIN RAD CONDITIONS TO BE TESTED. IF ANY OF THE
3513								*TEST CONDITIONS ARE TRUE, A PLACEMARK BRANCH WILL BE TAKEN IF
3514								*SPECIFIED IN THE CONTROL LINE.
3515								
3516	01	00C09	40000000 A			DATA	X'40000000'	
3517	01	00C0A	35F00053		Q	STW,R15	QEXIT	
3518	01	00C0B	CDC000BE			TIO,R12	*CDA	
3519	01	00C0C	74000009 A			STCF	R9	
3520	01	00C0D	25C00510 A			SAD,R12	16	
3521	01	00C0E	21C06000 A			CI,R12	X'6000'	
3522	01	00C0F	69400012			BCS,4	*+3	READY
3523	01	00C10	22800000 A			LI,R8	0	YES
3524	01	00C11	6800001B			B	Q001	
3525	01	00C12	22800001 A			LI,R8	1	NO
3526	01	00C13	21C02000 A			CI,R12	X'2000'	
3527	01	00C14	69400016			BCS,4	*+2	NOT OPTL OR BUSY
3528	01	00C15	68000018			B	Q001	NO
3529	01	00C16	21C04000 A			CI,R12	X'4000'	YES
3530	01	00C17	6940001A			BCS,4	*+3	BUSY
3531	01	00C18	20800002 A			AI,R8	2	NO
3532	01	00C19	6800001B			B	Q001	
3533	01	00C1A	20800004 A			AI,R8	4	YES
3534	01	00C1B	21C02000 A		Q001	CI,R12	X'200'	
3535	01	00C1C	6840001E			PCR,4	*+2	NOT READY OR BUSY
3536	01	00C1D	20800008 A			AI,R8	8	YES
3537	01	00C1E	21C00600 A			CI,R12	X'600'	
3538	01	00C1F	68400021			PCR,4	*+2	BUSY
3539	01	00C20	20800010 A			AI,R8	16	YES
3540	01	00C21	25900202 A			SCS,R9	2	
3541	01	00C22	21900001 A			CI,R9	1	
3542	01	00C23	68400025			PCR,4	*+2	SIO PASS (CC 2)
3543	01	00C24	20800020 A			AI,R8	X'20'	NO
3544	01	00C25	21900002 A			CI,R9	2	YES
3545	01	00C26	68400028			PCR,4	*+2	ADDR REC (CC 1)
3546	01	00C27	20800040 A			AI,R8	X'40'	NO
3547	01	00C28	21C08000 A			CI,R12	X'8000'	YES

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3548	01	00C29	68400C29			BCR,4	\$+2	INT PDG
3549	01	00C2A	20800080	A		AI,R8	X'80'	YES
3550	01	00C2B	32C00AC9			LW,R12	HI0STAT+1	
3551	01	00C2C	25C00210	A		SCS,R12	16	
3552	01	00C2D	21C00800	A		CI,R12	X'800'	
3553	01	00C2E	68400C30			BCR,4	\$+2	UNUS END
3554	01	00C2F	20800100	A		AI,R8	X'100'	YES
3555	01	00C30	21C00080	A		CI,R12	X'80'	NO
3556	01	00C31	68400C33			BCR,4	\$+2	INC LENGTH
3557	01	00C32	20802000	A		AI,R8	X'2000'	YES
3558	01	00C33	21C00040	A		CI,R12	X'40'	NO
3559	01	00C34	68400C36			BCR,4	\$+2	TRANS ERR
3560	01	00C35	20801000	A		AI,R8	X'1000'	YES
3561	01	00C36	32D00ACD			LW,R13	AI0STAT+1	
3562	01	00C37	25C00510	A		SAD,R12	16	
3563	01	00C38	21C01000	A		CI,R12	X'1000'	
3564	01	00C39	68400C38			BCR,4	\$+2	WRT PROT VIOL
3565	01	00C3A	20800200	A		AI,R8	X'200'	YES
3566	01	00C3B	21C02000	A		CI,R12	X'2000'	NO
3567	01	00C3C	68400C3E			BCR,4	\$+2	SECTOR UNAV
3568	01	00C3D	20800400	A		AI,R8	X'400'	YES
3569	01	00C3E	21C08000	A		CI,R12	X'8000'	NO
3570	01	00C3F	68400C41			BCR,4	\$+2	RATE ERROR
3571	01	00C40	20800500	A		AI,R8	X'800'	YES
3572	01	00C41	33000918			MTW,C	CPLERIND	NO
3573	01	00C42	68100C44			BCR,1	\$+2	CBUPLER ERROR
3574	01	00C43	20804000	A		AI,R8	X'4000'	YES
3575	01	00C44	227FFFF1	A		LI,R7	-15	COMPARE P1
3576	01	00C45	68000C47			B	\$+2	
3577	01	00C46	2580047F	A	5003	SAS,R8	-1	
3578	01	00C47	21800C01	A		CI,R8	1	
3579	01	00C48	68400C4C			BCR,4	\$+4	
3580	01	00C49	32CE002E			LW,R12	MSGCTLO+15,X7	YES+TYPE APPROPRIATE
3581	01	00C4A	6AF00E35			BAL,R15	TYPE01	MESSAGE
3582	01	00C4B	33F00C54			MTW,-1	PBRIND	SET IND FOR PLACEHARK BRANCH
3583	01	00C4C	25900401	A		SAS,R9	1	POSITION MASK FOR NEXT BIT
3584	01	00C4D	65700C46			BIR,R7	0003	ALL BITS CHECKED
3585	01	00C4E	33000C54			MTW,C	PBRIND	YES+TAKE PLACEHARK
3586	01	00C4F	68300C51			BCR,3	\$+2	BRANCH
3587	01	00C50	33100C53			MTW,1	GEXIT	YES
3588	01	00C51	35700C54			STW,R7	PBRIND	NO
3589	01	00C52	ER000C53			B	*GEXIT	
3590	01	00C53	00000000	A	GEXIT	DATA	0	
3591	01	00C54	00000000	A	PBRIND	DATA	0	
3592	01	00C55	C4C5E540	A	MSG0000	TEXT	'DEV NBT RDY'	
	01	00C56	D5D6E340	A				
	01	00C57	D9C4E840	A				
3593	01	00C58	C4C5E540	A	MSG0001	TEXT	'DEV NBT 8PTL'	
	01	00C59	D5D6E340	A				
	01	00C5A	D6D7E3D3	A				
3594	01	00C5B	C4C5E540	A	MSG0002	TEXT	'DEV BUSY'	
	01	00C5C	C2E4E2E8	A				
3595	01	00C5D	C3E3D3D9	A	MSG0003	TEXT	'CTLR NBT 8PTL'	
	01	00C5E	40D5D6E3	A				
	01	00C5F	40D6D7E3	A				
	01	00C60	D3404040	A				
3596	01	00C61	C3E3D3D9	A	MSG0004	TEXT	'CTLR BUSY'	
	01	00C62	40C2E4E2	A				
	01	00C63	E8404040	A				
3597	01	00C64	E2C9D640	A	MSG0005	TEXT	'SIB NBT P8SS'	
	01	00C65	D5D6E340	A				
	01	00C66	D7D6E2E2	A				
3598	01	00C67	D5D640C1	A	MSG0006	TEXT	'NB ADDR REC'	
	01	00C68	C4C4D940	A				
	01	00C69	D9C5C340	A				
3599	01	00C6A	C9D5E340	A	MSG0007	TEXT	'INT PDG'	
	01	00C6B	D7C40740	A				
3600	01	00C6C	E4D5E4E2	A	MSG0008	TEXT	'UNUS END'	
	01	00C6D	40C5D5C4	A				
3601	01	00C6E	E6D9E340	A	MSG0009	TEXT	'WRT PROT VIOL'	
	01	00C6F	D7D9D6E3	A				
	01	00C70	40E5C9D6	A				

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3664	01	00CB1	32A005R7			LW,R10	ZIBADR	
3665	01	00CB2	25A00402	A		SAS,R10	2	
3666	01	00CB3	49A00AD0			BR,R10	RDSORDER	
3667	01	00CB4	49A00CCC			BR,R10	RDMODIFY	
3668	01	00CB5	35A00CABE			STW,R10	COMMPAIR	
3669	01	00CB6	32A00B6R			LW,R10	RECLNGTH	
3670	01	00CB7	49A00AC1			BR,R10	RDSORDER+1	
3671	01	00CB8	49A00B70			BR,R10	SILIND	
3672	01	00CB9	35A00ARF			STW,R10	COMMPAIR+1	
3673	01	00CBA	68000AAF			B	EXECUTE	PERFORM OPERATION
3674	01	00CBB	22800000	A	READ00	LI,R8	0	
3675	01	00CBC	35800CCB			STW,R8	RDSERIND	
3676	01	00CBD	35800CCA			STW,R8	READIND	
3677	01	00CBE	35800BC6			STW,R8	PATTERN1	
3678	01	00CBF	E8000CC9			B	*READEXIT	BACK TO DCP
3679	01	00CC0	6AF00A08		READ01	BAL,R15	ERRBRCT	
3680	01	00CC1	6AF00A34			BAL,R15	ERRBRCTYP	
3681	01	00CC2	33F00E27			MTW,-1	RETRYCTR	
3682	01	00CC3	69100CC5			BCS,1	*+2	RETRY CTR =0
3683	01	00CC4	68000CA5			B	READ02+1	N0
3684	01	00CC5	228FFFFF	A		LI,R8	-1	
3685	01	00CC6	35800CCB			STW,R8	RDSERIND	
3686	01	00CC7	22800000	A		LI,R8	C	
3687	01	00CC8	68000C0D			B	READ00+2	
3688	01	00CC9	00000000	A	READEXIT	DATA	0	
3689	01	00CCA	00000000	A	READIND	DATA	0	
3690	01	00CCB	00000000	A	RDSERIND	DATA	0	
3691	01	00CCC	00000000	A	RDMODIFY	DATA	0	
3692							PAGE	
3693					*			*
3694					*THIS WILL RESET THE I/O SYSTEM.			*
3695					*			*
3696	01	00CCD	6D000042	A	R10	WD,R0	X'42'	
3697	01	00CCE	6D000042	A		WD,R0	X'42'	
3698	01	00CCF	E800000F	A		B	*R15	
3699							PAGE	
3700					*			*
3701					*THIS EXECUTES A SEEK TO THE UNIT CURRENTLY ADDRESSED BY THE PROGRAM			*
3702					*(CDA). X1 IS THE DATA (2 BYTES) THAT IS SENT TO THE RAD ADDRESS			*
3703					*REGISTER. D2 IS THE BYTE COUNT; IF IT IS 0, A COUNT OF 2 IS USED.			*
3704					*			*
3705	01	00CD0	40000000	A		DATA	X'40000000'	P1-ADDRESS TO SEEK
3706	01	00CD1	20000000	A		DATA	X'20000000'	P2-BYTE COUNT
3707	01	00CD2	35F00CE8		SEEK	STW,R15	SEEKEXIT	
3708	01	00CD3	3280058E			LW,R8	P1	
3709	01	00CD4	25800578	A		SAD,R8	-8	
3710	01	00CD5	15800CEA			STD,R8	SEEKSAVE	
3711	01	00CD6	12800AD2			LD,R8	SEEKBRDR	
3712	01	00CD7	22A00CEA			LI,R10	SEEKSAVE	
3713	01	00CD8	25A00402	A		SAS,R10	2	GEN BYTE ADDR
3714	01	00CD9	20A00003	A		AI,R10	3	
3715	01	00CDA	4980000A	A		BR,R8	R10	
3716	01	00CDB	32A0058F			LW,R10	P2	GET CT
3717	01	00CDC	69300CDE			RCS,3	*+2	CT=0
3718	01	00CDD	22A00002	A		LI,R10	2	YES
3719	01	00CDE	4990000A	A		BR,R9	R10	N0
3720	01	00CDF	15800ABE			STD,R8	COMMPAIR	
3721	01	00CE0	22800CE4			LI,R8	SEEK00	SET UP NORMAL
3722	01	00CE1	22900CE5			LI,R9	SEEK00+1	AND ERROR
3723	01	00CE2	15800ACC			STD,R8	NORMRETN	RETURNS
3724	01	00CE3	68000AAF			B	EXECUTE	
3725	01	00CE4	E8000CE8		SEEK00	B	*SEEKEXIT	
3726	01	00CE5	6AF00A08			BAL,R15	ERRBRCT	
3727	01	00CE6	6AF00A34			BAL,R15	ERRBRCTYP	
3728	01	00CE7	68000CE4			B	*-3	
3729	01	00CE8	00000000	A	SEEKEXIT	DATA	0	
3730						ROUND	8	
3731	01	00CEA	00000000	A	SEEKSAVE	DATA	0	
3732	01	00CEB	00000000	A		DATA	0	
3733							PAGE	
3734					*			*
3735					*THIS EXECUTES A SENSE ORDER TO THE CURRENTLY ADDRESSED RAD UNIT (CDA).			*

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3736								*D1 IS THE BYTE COUNT, AND IF IT IS 0, THE COUNT IS SET TO 3.*
3737								*
3738	01	00CEC	20000000	A		DATA	X'20000000'	P1-BYTE COUNT
3739	01	00CED	35F00018		SENS	STW,R15	SENSEXIT	
3740	01	00CEE	32A0058E			LW,R10	P1	
3741	01	00CEF	69300CF1			BCS,3	**2	
3742	01	00CF0	22A00003	A		LI,R10	3	
3743	01	00CF1	12800AD4			LD,R8	SENSBRDR	
3744	01	00CF2	4990000A	A		BR,R9	R10	
3745	01	00CF3	22A0001A			LI,R10	SENSSAVE	
3746	01	00CF4	25A00402	A		SAS,R10	2	
3747	01	00CF5	20A00002	A		AI,R10	2	
3748	01	00CF6	4980000A	A		BR,R8	R10	
3749	01	00CF7	15800ABE			STD,R8	COMMPAIR	
3750	01	00CF8	22800CFC			LI,R8	SENS00	
3751	01	00CF9	22900CFD			LI,R9	SENS00+1	
3752	01	00CFA	15800AC0			STD,R8	NORMRETN	
3753	01	00CFB	68000AAF			B	EXECUTE	
3754	01	00CFC	68000CFF		SENS00	B	**3	
3755	01	00CFD	6AF00A08			BAL,R15	ERRBRCNT	
3756	01	00CFE	6AF00A34			BAL,R15	ERRRTYP	
3757	01	00CFF	12800D1A			LD,R8	SENSSAVE	
3758	01	00D00	25800510	A		SAD,R8	16	
3759	01	00D01	3580001A			STW,R8	SENSSAVE	
3760	01	00D02	33000017			MTW,0	SKSNSTYP	
3761	01	00D03	6930000F			BCS,3	SENS01	SKIP TYPE
3762	01	00D04	32C00D1A			LW,R12	SENSSAVE	NO
3763	01	00D05	25C00478	A		SAS,R12	-8	
3764	01	00D06	6AF00931			BAL,R15	HEXCNVRT	
3765	01	00D07	35C005A0			STW,R12	ZDMPA+2	
3766	01	00D08	35D005A1			STW,R13	ZDMPA+3	
3767	01	00D09	32C0094D			LW,R12	EBCBLNK	
3768	01	00D0A	35C0059F			STW,R12	ZDMPA+1	
3769	01	00D0B	32800AE5			LW,R8	TEXTSENS	
3770	01	00D0C	3580059E			STW,R8	ZDMPA	
3771	01	00D0D	32C00D1C			LW,R12	SENSECTL	
3772	01	00D0E	6AF00E35			BAL,R15	TYPE01	
3773	01	00D0F	22800000	A	SENS01	LI,R8	0	
3774	01	00D10	35800017			STW,R8	SKSNSTYP	
3775	01	00D11	E8000018			B	*SENSEXIT	
3776	01	00D12	228FFFFF	A	SENSALT	LI,R8	-1	
3777	01	00D13	35800017			STW,R8	SKSNSTYP	
3778	01	00D14	22800000	A		LI,R8	0	
3779	01	00D15	3580058E			STW,R8	P1	
3780	01	00D16	68000CED			B	SENS	
3781	01	00D17	00000000	A	SKSNSTYP	DATA	0	
3782	01	00D18	00000000	A	SENSEXIT	DATA	0	
3783						BBUND	8	
3784	01	00D1A	00000000	A	SENSSAVE	DATA	0	
3785	01	00D1B	00000000	A		DATA	0	
3786	01	00D1C	10101678	A	SENSECTL	ZFMW	1,0,16,BA(ZDMPA)	
3787						PAGE		
3788								*
3789								*THIS WILL PERFORM THE ORDER SPECIFIED BY THE INPUT PARAMETERS. THE
3790								*S10 STATUS WILL BE OUTPUT, AND IF ANY BITS OF THE STATUS COMPARE WITH*
3791								*X5 A PLACEMARK BRANCH IS TAKEN, IF SPECIFIED IN THE CONTROL LINE.*
3792								*
3793			40000000	A		DATA	X'40000000'	P1-DEVICE ADDRESS
3794	01	00D1E	40000000	A		DATA	X'40000000'	P2-ORDER
3795	01	00D1F	40000000	A		DATA	X'40000000'	P3-FLAG BITS
3796	01	00D20	20000000	A		DATA	X'20000000'	P4-BYTE COUNT
3797	01	00D21	40000000	A		DATA	X'40000000'	P5-STAT COMP BITS
3798	01	00D22	35F00050		S10	STW,R15	S10EXIT	
3799	01	00D23	6AF00067			BAL,R15	STATCLR	
3800	01	00D24	32800592			LW,R8	P5	
3801	01	00D25	358006A7			STW,R8	STCMPSAV	
3802	01	00D26	32800EBE			LW,R8	CDA	
3803	01	00D27	4B800FF7			AND,R8	=X'FFFFFF00C'	
3804	01	00D28	4980058E			BR,R8	P1	
3805	01	00D29	35800AE7			STW,R8	WERKADDR	
3806	01	00D2A	32800591			LW,R8	P4	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3807	01	00D2B	25800568	A		SAD,R8	-24	
3808	01	00D2C	3280059C			LW,R8	P3	
3809	01	00D2D	25800578	A		SAD,R8	-8	
3810	01	00D2E	35900ABF			STW,P9	C0MMPAIR+1	
3811	01	00D2F	32800587			LW,R8	ZIADR	
3812	01	00D30	2580056A	A		SAD,R8	-22	
3813	01	00D31	3280058F			LW,R8	P2	
3814	01	00D32	25800578	A		SAD,R8	-8	
3815	01	00D33	35900A9E			STW,R9	C0MMPAIR	
3816	01	00D34	32801015			LW,R8	*X'10000000'	
3817	01	00D35	31800ABF			CW,R8	C0MMPAIR+1	
3818	01	00D36	68400044			BCR,4	S1800	WAIT FOR COMPLETION
3819	01	00D37	22800040			LI,R8	S1801	YES
3820	01	00D38	22900041			LI,R9	S1801+1	
3821	01	00D39	15800ACC			STD,R8	N0RMRETN	
3822	01	00D3A	6AF00B1C			BAL,R15	I0ARMENB	
3823	01	00D3B	2200055F			LI,R0	DA(C0MMPAIR)	
3824	01	00D3C	CCA0058E			S10,R10	*P1	
3825	01	00D3D	15A00AC4			STD,R10	S18STAT	
3826	01	00D3E	74000AC4			STCF	S18STAT	
3827	01	00D3F	6800079F			B	CHENDCHK	
3828	01	00D40	68000048		S1801	B	S1802	
3829	01	00D41	6AF00A08			BAL,R15	ERR0RCAT	
3830	01	00D42	6AF00A34			BAL,R15	ERR0RTYP	
3831	01	00D43	68000048			B	S1802	
3832	01	00D44	2200055F		S1800	LI,R0	DA(C0MMPAIR)	
3833	01	00D45	CCA0058E			S10,R10	*P1	
3834	01	00D46	15A00AC4			STD,R10	S18STAT	
3835	01	00D47	74000AC4			STCF	S18STAT	
3836	01	00D48	32800ADD		S1802	LW,R11	TEXTS18	
3837	01	00D49	12C00AC4			LD,R12	S18STAT	
3838	01	00D4A	6AF0006C			BAL,R15	STATTYPE	
3839	01	00D4B	25C00474	A		SAS,R13	-12	
3840	01	00D4C	31D006A7			CW,R13	STCMPSAV	
3841	01	00D4D	6840004F			BCR,4	*+2	
3842	01	00D4E	33100050			MTW,1	S18EXIT	
3843	01	00D4F	E8C00050			B	*S18EXIT	
3844	01	00D50	00000000	A	S18EXIT	DATA	0	
3845						PAGE		
3846					*			*
3847					*THIS CHECKS IF A SUCCESSFUL S10 IS POSSIBLE. IF IT IS NOT, A MESSAGE			*
3848					*IS PUTPUT AND A HALT OCCURS IF SENSE SWITCH 2 IS SET. IF SENSE			*
3849					*SWITCH 2 IS NOT SET, CHECK FOR S10 POSSIBLE AGAIN.			*
3850					*			*
3851	01	00D51	35F00D66		S18PSCHK	STW,R15	S18PSEXT	
3852	01	00D52	CA000AE7			T10,R10	*W0RKADDR	
3853	01	00D53	68800D56			BCR,8	*+3	
3854	01	00D54	69400D56			BCS,4	*+2	
3855	01	00D55	68000D52			B	*-3	
3856	01	00D56	15A00AC6			STD,R10	T18STAT	
3857	01	00D57	74000AC6			STCF	T18STAT	
3858	01	00D58	68C00D64			BCR,12	S18PS00	
3859	01	00D59	32C000R4			LW,R12	QMSGCTL5	
3860	01	00D5A	6AF00E35			PAL,R15	TYPE01	
3861	01	00D5B	32800ADE			LW,R11	TEXTT18	
3862	01	00D5C	12C00AC6			LD,R12	T18STAT	
3863	01	00D5D	6AF0006C			BAL,R15	STATTYPE	
3864	01	00D5E	6C00001C	A		RD,0	X'10'	
3865	01	00D5F	68400D61			BCR,4	*+2	
3866	01	00D60	2E000000	A	WAIT4	WAIT		S10 NOT POSS. SS2 IS SET
3867	01	00D61	CFA00EBE			H10,R10	*CDA	
3868	01	00D62	15A00AC8			STD,R10	H18STAT	
3869	01	00D63	E8000D66			B	*S18PSEXT	
3870	01	00D64	33100D66		S18PS00	MTW,1	S18PSEXT	
3871	01	00D65	68000D63			B	*-2	
3872	01	00D66	00000000	A	S18PSEXT	DATA	0	
3873						PAGE		
3874					*			*
3875					*THIS CLEARS ALL SAVED STATUSES.			*
3876					*			*
3877	01	00D67	224FFF6	A	STATCLR	LI,R4	-10	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3878	01	00D68	22800000	A		LI,R8	0	
3879	01	00D69	35880ACE			STW,R8	ST0STAT+10,X4	
3880	01	00D6A	65400069			BIR,R4	*-1	
3881	01	00D6B	E800000F	A		B	*R15	
3882						PAGE		
3883								
3884								
3885								
3886	01	00D6C	35F00092			STATTYPE STW,R15	STTYEXIT	
3887	01	00D6D	35B00093			STW,R11	STATHDG	
3888	01	00D6E	25C00470	A		SAS,R12	-16	
3889	01	00D6F	4BC01016			AND,R12	*X'0000'	
3890	01	00D70	4BD01017			AND,R13	*X'FFFF3FFF'	
3891	01	00D71	49D0000C	A		BR,R13	R12	
3892	01	00D72	35D0009E			STW,R13	STATSAVE	SAVE STATUS
3893	01	00D73	32C0009F			LW,R12	STHDGCTL	TYPE MESSAGE
3894	01	00D74	6AF00E39			BAL,R15	TYPE11	HEADING
3895	01	00D75	224FFFEC	A		LI,R4	-20	
3896	01	00D76	225FFFEB	A		LI,R5	-5	
3897	01	00D77	32D0009E			LW,R13	STATSAVE	
3898	01	00D78	22C00078	A	STT00	LI,R12	X'78'	FORMAT
3899	01	00D79	25C00501	A		SAD,R12	1	STATUS
3900	01	00D7A	6550007E			BIR,R5	**4	DATA
3901	01	00D7B	25C0057F	A		SAD,R12	-1	FBR
3902	01	00D7C	225FFFEB	A		LI,R5	-5	OUTPUT
3903	01	00D7D	22C00040	A		LI,R12	X'40'	
3904	01	00D7E	75C805A4			STB,R12	ZDMPA+6,X4	
3905	01	00D7F	65400078			BIR,R4	STT00	
3906	01	00D80	224FFFEB	A		LI,R4	-2	SET UP
3907	01	00D81	22C00078	A		LI,R12	X'78'	CBND
3908	01	00D82	25C00501	A		SAD,R12	1	CODE
3909	01	00D83	75C805A6			STB,R12	ZDMPA+8,X4	BITS 1&2
3910	01	00D84	65400081			BIR,R4	*-3	
3911	01	00D85	32800093			LW,R8	STATHDG	
3912	01	00D86	31800AE1			CW,R8	TEXTA18	
3913	01	00D87	6930008A			BCS,3	*+3	
3914	01	00D88	32C00ACD			LW,R12	A18STAT+1	
3915	01	00D89	6800008B			B	*+2	
3916	01	00D8A	32C00AE7			LW,R12	WBRKADDR	SET UP
3917	01	00D8B	4BC00FF2			AND,R12	*X'7FFF'	ADDRESS
3918	01	00D8C	6AF00931			BAL,R15	HEXCNVRT	IN HEX
3919	01	00D8D	35D005A7			STW,R13	ZDMPA+9	FBR
3920	01	00D8E	32C00DA0			LW,R12	STDFACTL	TYPEOUT
3921	01	00D8F	6AF00E39			BAL,R15	TYPE11	TYPE STAT DATA
3922	01	00D90	32D0009E			LW,R13	STATSAVE	GET SAVED STATUS
3923	01	00D91	E8000092			B	*STTYEXIT	
3924	01	00D92	00000000	A	STTYEXIT	DATA	0	
3925	01	00D93	40404040	A	STATHDG	TEXT	' 0123 4567 8901 2345	CC1,2 ADDRESS1
	01	00D94	F0F1F2F3	A				
	01	00D95	40F4F5F6	A				
	01	00D96	F740F8F9	A				
	01	00D97	F0F140F2	A				
	01	00D98	F3F4F540	A				
	01	00D99	4040C3C3	A				
	01	00D9A	F16BF240	A				
	01	00D9B	404040C1	A				
	01	00D9C	C4C409C5	A				
	01	00D9D	E2E24040	A				
3926	01	00D9E	00000000	A	STATSAVE	DATA	0	
3927	01	00D9F	102A364C	A	STHDGCTL	ZFMW	1,0,42,BA(STATHDG)	
3928	01	00DA0	10281678	A	STDFACTL	ZFMW	1,0,40,BA(ZDMPA)	
3929						PAGE		
3930								
3931								
3932								
3933	01	00DA1	6EA00000	A	STDA18	A18,R10	0	
3934	01	00DA2	35A00ACD			STW,R10	A18STAT+1	SAVE STATUS
3935	01	00DA3	74000ACC			STCF	A18STAT	SAVE CC
3936	01	00DA4	31AC100D			CW,R10	*X'100000'	
3937	01	00DA5	69400DA7			BCS,4	*+2	CHAN END
3938	01	00DA6	0E300B22			LPSD,3	STDA18	NO
3939	01	00DA7	70300ACC			LCF	A18STAT	YES

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
3940	01	00DA8	684000B1			BCR,4	STDA1000	ERR0R
3941	01	00DA9	CEA00CAE7			TDV,R10	*WRKADDR	YES*GET DEVICE INFO
3942	01	00DAA	15A00ACA			STD,R10	TDVSTAT	SAVE STATUS
3943	01	00DAB	74000ACA			STCF	TDVSTAT	SAVE CC
3944	01	00DAC	CFA00CAE7			HI0,R10	*WRKADDR	RESET DEVICE AND CONTROLLER
3945	01	00DAD	15A00AC8			STD,R10	HI0STAT	SAVE STATUS
3946	01	00DAE	74000AC8			STCF	HI0STAT	SAVE CC
3947	01	00DAF	32F00AC1			LWR,R15	ERR0RETN	SET UP ERR0R RETURN
3948	01	00DB0	680000B2			B	**+2	
3949	01	00DB1	32F00AC0		STDA1000	LWR,R15	N0R0RETN	SET UP N0R0L RETURN
3950	01	00DB2	55F200C9			STW,R15	STDEXIT,X1	
3951	01	00DB3	22E01060	A		LI,R14	X'1060'	CLEAR I/O
3952	01	00DB4	6DE01100	A		WD,R14	X'1100'	INTERRUPT
3953	01	00DB5	32800CCA			LWR,R8	READING	
3954	01	00DB6	30800F19			AW,R8	WRTIND	
3955	01	00DB7	30800811			AW,R8	WRTIND	
3956	01	00DB8	683000BA			BCR,3	**+2	
3957	01	00DB9	33100859			*TW,1	CBUNTER+8	STEP RECORD CTR
3958	01	00DBA	70300ACC			LCF	AIBSTAT	
3959	01	00DBB	684000C9			BCR,4	STDEXIT	
3960	01	00DBC	72800ABE			LB,R8	COMPPAIR	
3961	01	00DBD	21800005	A		CI,R8	5	
3962	01	00DBE	691000C9			BL	STDEXIT	
3963	01	00DBF	220006E5			LI,R0	DA(STDSENSE)	
3964	01	00DC0	CCA00AE7			SI0,R10	*WRKADDR	
3965	01	00DC1	CDA00AE7			TI0,R10	*WRKADDR	
3966	01	00DC2	684000C4			BI0SP	**+2	
3967	01	00DC3	680000C1			B	**+2	
3968	01	00DC4	6AF00F8B			BAL,R15	SENSDECR	
3969	01	00DC5	32900AE7			LWR,R9	WRKADDR	
3970	01	00DC6	25900210	A		SCS,R9	16	
3971	01	00DC7	25800210	A		SCD,R8	16	
3972	01	00DC8	35800AE7			STW,R8	WRKADDR	
3973	01	00DC9	68000000	A	STDEXIT	B	0	
3974						BEUND	8	
3975	01	00DCA	04003468		STDSENSE	ZFCP	4,BA(SENSSAVE)	
3976	01	00DCB	00000003	A		ZFCP	0,3	
3977						PAGE		
3978					*			*
3979					*THIS ADDS THE NUMBER OF SECTORS REQUIRED TO CONTAIN THE CURRENT			*
3980					*RECORD LENGTH TO THE CURRENT TRACK AND SECTOR ADDRESS. IF THE NEW			*
3981					*TRACK AND SECTOR ADDRESS EXCEEDS THE CURRENT UNIT'S CAPACITY, THE			*
3982					*NEXT ACTIVE UNIT IN THE UNIT LIST IS SELECTED AT ITS STARTING			*
3983					*ADDRESS.			*
3984					*			*
3985	01	00DCC	35F000DB		STEP	STW,R15	STEPEXIT	
3986	01	00DCD	228FFFFFF	A		LI,R8	-1	
3987	01	00DCE	358000DC			STW,R8	STEPIND	
3988	01	00DCF	6AF006AB			BAL,R15	CAPCHECK	SEE IF CURRENT LENGTH EXCEEDS CAP
3989	01	00DD0	3300000E	A		MTW,0	R14	
3990	01	00DD1	69300DD4			RNEZ	**+3	NEW UNIT
3991	01	00DD2	2CAFC000	A		AI,R10	X'FO000'	
3992	01	00DD3	32E0000A	A		LWR,R14	R10	NO
3993	01	00DD4	35E00EBE			STW,R14	CDA	YES
3994	01	00DD5	35E00AE7			STW,R14	WRKADDR	
3995	01	00DD6	35D00EBF			STW,R13	CDAPNTR	
3996	01	00DD7	22800000	A		LI,R8	0	
3997	01	00DD8	35800DDC			STW,R8	STEPIND	
3998	01	00DD9	22100001	A		LI,R1	1	
3999	01	00DDA	E800000B			B	*STEPEXIT	
4000	01	00ddb	00000000	A	STEPEXIT	DATA	0	
4001	01	00DDC	00000000	A	STEPIND	DATA	0	
4002						PAGE		
4003					*			*
4004					*THIS ALLOWS THE USER TO HALT DURING THE EXECUTION OF A CONTROL LINE.			*
4005					*H1 IS THE STEP IDENTIFIER.			*
4006					*			*
4007	01	00DDD	60000000	A		DATA	X'60000000'	
4008	01	00DDE	35F000E8		STEP	STW,R15	STEPEXIT	
4009	01	00DDF	3280058E			LWR,R8	P1	
4010	01	00DE0	32900940			LWR,R9	EBCBLNK	
4011	01	00DE1	25800378	A		SCD,R8	-8	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR IG	LABEL	OPERATION	OPERAND	COMMENTS
4012	01	00DE2	35800DEB			STW,R8	TEXTSTAP+1	
4013	01	00DE3	35900DEC			STW,R9	TEXTSTAP+2	
4014	01	00DE4	32C00DE9			LW,R12	STBPCTL	
4015	01	00DE5	6AF00E35			BAL,R15	TYPE01	
4016	01	00DE6	2E000000	A	WAIT5	WAIT		EXECUTE STBP
4017	01	00DE7	E8000DE8			B	*STBPEXIT	
4018	01	00DE8	00000000	A	STBPEXIT	DATA	0	
4019	01	00DE9	100937A8	A	STBPCTL	ZFMW	1,C,9,BA(TEXTSTBP)	
4020	01	00DEA	E2E3D6D7	A	TEXTSTBP	TEXT	'STBP	
	01	00DEB	40404040	A				
	01	00DEC	40404040	A				
4021						PAGE		
4022					*			*
4023					*THIS OUTPUTS THE CURRENT DEVICE ADDRESS.			*
4024					*			*
4025	01	00DED	35F00DF9		TCD A	STW,R15	TCD AEXIT	
4026	01	00DEE	32C00DEB			LW,R12	CDA	
4027	01	00DEF	6AF00E7C			BAL,R15	ADDRGEN	
4028	01	00DF0	32800DF8			LW,R8	TEXTCDA	
4029	01	00DF1	3580059E			STW,R8	ZDMPA	
4030	01	00DF2	227FFFFC	A		LI,R7	-4	
4031	01	00DF3	328E0698			LW,R8	ADRGN SAV+4,X7	
4032	01	00DF4	358E05A3			STW,R8	ZDMPA+5,X7	
4033	01	00DF5	65700DF3			BIR,R7	\$-2	
4034	01	00DF6	32C00DFA			LW,R12	TCD ACTL	
4035	01	00DF7	6AF00E35			BAL,R15	TYPE01	
4036	01	00DF8	E8000DF9			B	*TCD AEXIT	
4037	01	00DF9	00000000	A	TCD AEXIT	DATA	0	
4038	01	00DFA	10101678	A	TCD ACTL	ZFMW	1,C,16,BA(ZDMPA)	
4039	01	00DFB	C3C4C140	A	TEXTCDA	TEXT	'CDA '	
4040						PAGE		
4041					*			*
4042					*THIS EXECUTES A TDV AND BUTPUTS THE STATUS AT MESSAGE LEVEL 3. IF ANY*			*
4043					*BITS OF THE COMPARE DATA TEST TRUE, A PLACEMARK BRANCH IS TAKEN, IF			*
4044					*SPECIFIED IN THE CONTROL LINE.			*
4045					*			*
4046	01	00DFC	40000000	A		DATA	X'40000000'	P1-ADDRESS
4047	01	00DFD	40000000	A		DATA	X'40000000'	P2-COMPARE DATA
4048	01	00DFE	35F00E0E		TDV	TDV,R15	TDVEXIT	SAVE EXIT
4049	01	00DFE	3280058F			LW,R8	P2	
4050	01	00E00	358006A7			STW,R8	STCMPSAV	
4051	01	00E01	CEC0058E			TDV,R12	*P1	
4052	01	00E02	15C00ACA			STD,R12	TDVSTAT	SAVE STATUS
4053	01	00E03	74000ACA			STCF	TDVSTAT	SAVE CC
4054	01	00E04	3280058E			LW,R8	P1	
4055	01	00E05	35800AE7			STW,R8	WRKADDR	
4056	01	00E06	32B00AEC			LW,R11	TEXTTDV	LOAD HEADING
4057	01	00E07	12C00ACA			LD,R12	TDVSTAT	
4058	01	00E08	6AF00D6C			BAL,R15	STATTYPE	TYPE STATUS
4059	01	00E09	25D00474	A		SAS,R13	-12	
4060	01	00E0A	31D0058F			CW,R13	P2	
4061	01	00E0B	6840CE00			BCR,4	\$+2	ANY COMPARES
4062	01	00E0C	33100ECE			MTK,1	TDVEXIT	YES
4063	01	00E0D	E800CECE			B	*TDVEXIT	NO
4064	01	00ECE	00000000	A	TDVEXIT	DATA	0	
4065						PAGE		
4066					*			*
4067					*THIS EXECUTES A TIB AND BUTPUTS THE STATUS AT MESSAGE LEVEL 3. IF ANY*			*
4068					*BITS OF THE COMPARE DATA TEST TRUE, A PLACEMARK BRANCH IS TAKEN, IF			*
4069					*SPECIFIED IN THE CONTROL LINE.			*
4070					*			*
4071	01	00E0F	40000000	A		DATA	X'40000000'	P1-ADDRESS
4072	01	00E10	40000000	A		DATA	X'40000000'	P2-COMPARE DATA
4073	01	00E11	35F00E21		TIB	STW,R15	TIBEXIT	SAVE EXIT
4074	01	00E12	3280058F			LW,R8	P2	
4075	01	00E13	358006A7			STW,R8	STCMPSAV	
4076	01	00E14	CEC0058E			TIB,R12	*P1	
4077	01	00E15	15C00AC6			STD,R12	TIBSTAT	SAVE STATUS
4078	01	00E16	74000AC6			STCF	TIBSTAT	SAVE CC
4079	01	00E17	3280058E			LW,R8	P1	
4080	01	00E18	35800AE7			STW,R8	WRKADDR	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
4081	01	00E19	32B00ADE			LW,R11	TEXTT10	LOAD HEADING
4082	01	00E1A	12C00AC6			LD,R12	T10STAT	
4083	01	00E1B	6AF00D6C			BAL,R15	STATTYPE	TYPE STATUS
4084	01	00E1C	25D00474 A			SAS,R13	-12	
4085	01	00E1D	31D006A7			CW,R13	STCMPSAV	
4086	01	00E1E	68400E20			BCR,4	*+2	ANY COMPARES
4087	01	00E1F	33100E21			MTW,1	T10EXIT	YES
4088	01	00E20	E8000E21			B	*T10EXIT	NO
4089	01	00E21	00000000 A		T10EXIT	DATA	0	
4090						PAGE		
4091								
4092								*THIS SETS AN ERROR RETRY COUNT. IF AN ERROR IS ENCOUNTERED ON A READ
4093								*WRITE OR CHECKWRITE OPERATION, THE OPERATION IS REPEATED UNTIL EITHER
4094								*IT IS SUCCESSFUL OR THE RETRY COUNTER IS STEPPED TO 0.
4095								
4096	01	00E22	20000000 A			DATA	X'20000000'	P1
4097	01	00E23	32B0058E		TRY	LW,R8	P1	
4098	01	00E24	35800E26			STW,R8	RETRYCNT	
4099	01	00E25	E8C0000F A			B	*R15	
4100	01	00E26	00000000 A		RETRYCNT	DATA	0	
4101	01	00E27	00000000 A		RETRYCTR	DATA	0	
4102						PAGE		
4103								
4104								*THIS UPDATES THE TRACK AND SECTOR ADDRESS BY THE NUMBER OF SECTORS
4105								*REQUIRED TO HOLD THE CURRENT BYTE COUNT.
4106								
4107	01	00E28	22B00000 A		TSUPDATE	LI,R11	0	
4108	01	00E29	25A0020C A			SCS,R10	12	
4109	01	00E2A	3CA0036D			AW,R10	TRACKS	
4110	01	00E2B	25A00304 A			SCD,R10	4	
4111	01	00E2C	30B00B6E			AW,R11	SECTORS	
4112	01	00E2D	21B0000B A			CI,R11	11	
4113	01	00E2E	68200E30			BCR,2	*+2	
4114	01	00E2F	20B00004 A			AI,R11	4	
4115	01	00E30	3CA0000B A			AW,R10	R11	
4116	01	00E31	25A00210 A			SCS,R10	16	
4117	01	00E32	E800000F A			B	*R15	
4118						PAGE		
4119								
4120								*THIS IS THE COMMON TYPE-BUT ROUTINE FOR ALL MESSAGES.
4121								
4122	01	00E33	02200000 A		TYPE00	LCI	12	
4123	01	00E34	68000E3A			B	TWLPGB	
4124	01	00E35	02200000 A		TYPE01	LCI	13	
4125	01	00E36	68000E3A			B	TWLPGB	
4126	01	00E37	02200000 A		TYPE10	LCI	14	
4127	01	00E38	68000E3A			B	TWLPGB	
4128	01	00E39	02200000 A		TYPE11	LCI	15	
4129	01	00E3A	35F00E48		TWLPGB	STW,R15	TYPEEXIT	
4130	01	00E3B	74000E49			STCF	STCFSAVE	
4131	01	00E3C	6AF00AEC			BAL,R15	GRSAVE	
4132	01	00E3D	22F00E4C			LI,R15	TYPEEXIT	
4133	01	00E3E	70300E49			LCF	STCFSAVE	
4134	01	00E3F	680004BF			B	ZTALP	
4135	01	00E40	6AF00AE9		TYPEEXIT	BAL,R15	GRSTR	
4136	01	00E41	35100E49			STW,R1	STCFSAVE	
4137	01	00E42	221FFFEE2 A			LI,R1	*30	
4138	01	00E43	32C0094D			LW,R12	ERCBLAK	
4139	01	00E44	35C205BC			STW,R12	ZDMPA*30,X1	
4140	01	00E45	65100E44			BIR,R1	*+1	
4141	01	00E46	32100E49			LW,R1	STCFSAVE	
4142	01	00E47	E8000E48			B	*TYPEEXIT	
4143	01	00E48	00000000 A		TYPEEXIT	DATA	0	
4144	01	00E49	00000000 A		STCFSAVE	DATA	0	
4145						PAGE		
4146								
4147								*THIS CAUSES THE I/O BUFFER TO BE DUMPED. D1 AND D2 ARE RESPECTIVELY
4148								*THE FIRST AND LAST RELATIVE LOCATIONS TO BE DUMPED.
4149								
4150	01	00E4A	20000000 A			DATA	X'20000000'	P1-
4151	01	00E4B	20000000 A			DATA	X'20000000'	P2-

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
4152	01	00E4C	35F00E60		TYPB	STW,R15	TYPBEXIT	
4153	01	00E4D	6AF000ED			BAL,R15	TCCA	TYPE CDA
4154	01	00E4E	32C00E62			LW,R12	RELBCCTL	TYPE
4155	01	00E4F	6AF00E35			BAL,R15	TYPE01	HEADING
4156	01	00E50	3280058E			LW,R8	P1	
4157	01	00E51	35800590			STW,R8	P3	SET
4158	01	00E52	208FFFFFF A			AI,R8	-1	UP
4159	01	00E53	30800587			AW,R8	ZIADR	PARAMETERS
4160	01	00E54	3580058E			STW,R8	P1	FOR
4161	01	00E55	3280058F			LW,R8	P2	ZDMP
4162	01	00E56	30800587			AW,R8	ZIADR	ROUTINE
4163	01	00E57	208FFFFFF A			AI,R8	-1	
4164	01	00E58	32900588			LW,R8	ZI8WDS	
4165	01	00E59	30900587			AW,R9	ZIADR	
4166	01	00E5A	31900008 A			CW,R9	R8	WILL CT EXCEED
4167	01	00E5B	69200E5D			BCS,2	\$+2	1/8 AREA
4168	01	00E5C	25800320 A			SCD,R8	32	YES=SAVE MAX
4169	01	00E5D	3580058F			STW,R8	P2	NO=SAVE CT
4170	01	00E5E	6AF00462			BAL,R15	ZDMP	
4171	01	00E5F	E8000E60			B	*TYPBEXIT	
4172	01	00E60	00000000 A		TYPBEXIT	DATA	C	
4173	01	00E61	10101A50 A		ADRGNCTL	ZFMW	1,0,16,BA(ADRGNSAV)	
4174	01	00E62	1007398C A		RELBCCTL	ZFMW	1,0,7,BA(RELBCMSG)	
4175	01	00E63	D9C5D340 A		RELOCMSG	TEXT	'REL LBC'	
4176								PAGE
4177								
4178								*THIS OUTPUTS THE CONTENTS OF THE COUNTERS SELECTED BY X1.
4179								
4180	01	00E65	40000000 A			DATA	X'40000000'	P1-SELECT COUNTERS FOR OUTPUT
4181	01	00E66	35F00E72		TYPB	STW,R15	TYPCEXIT	SAVE EXIT
4182	01	00E67	228000C1 A			LI,R8	X'C1'	SET
4183	01	00E68	3580058F			STW,R8	P2	UP
4184	01	00E69	22800000 A			LI,R8	0	PARAMETERS
4185	01	00E6A	35800590			STW,R8	P3	AND
4186	01	00E6B	228FD8F1 A			LI,R8	-9999	GO
4187	01	00E6C	35800591			STW,R8	P4	TO
4188	01	00E6D	228000E3 A			LI,R8	X'E3'	CNTR
4189	01	00E6E	35800592			STW,R8	P5	ROUTINE
4190	01	00E6F	6AF00818			BAL,R15	CNTR	
4191	01	00E70	02000000 A			N8P		
4192	01	00E71	E8000E72			B	*TYPCEXIT	EXIT
4193	01	00E72	00000000 A		TYPCEXIT	DATA	0	
4194								PAGE
4195								
4196								*THIS SETS UP THE UNIT LIST. UP TO 8 UNITS CAN BE ENTERED IN THE UNIT
4197								*LIST. THE ENTRY OF UNITS HERE MEANS THAT THEY ARE AVAILABLE FOR
4198								*TESTING ONLY. THE ADDR DIRECTIVE SPECIFIES WHICH UNITS WILL BE MADE
4199								*ACTIVE. IF PARAMETER F1=0, CLEAR OLD ENTRIES AND ENTER THE NEW ONES;
4200								*IF F1=1, ATTEMPT TO ADD UNITS TO THE LIST.
4201								
4202	01	00E73	40000000 A			DATA	X'40000000'	P1-GEN BR ADD TO LIST CONTROL
4203	01	00E74	40000000 A			DATA	X'40000000'	P2-UNIT
4204	01	00E75	40000000 A			DATA	X'40000000'	P3- ADDRESSES
4205	01	00E76	40000000 A			DATA	X'40000000'	P4- AND
4206	01	00E77	40000000 A			DATA	X'40000000'	P5- CAPACITIES
4207	01	00E78	40000000 A			DATA	X'40000000'	P6- FOR UP TO
4208	01	00E79	40000000 A			DATA	X'40000000'	P7- 8 UNITS
4209	01	00E7A	40000000 A			DATA	X'40000000'	P8-
4210	01	00E7B	40000000 A			DATA	X'40000000'	P9-
4211	01	00E7C	35F00E99		UNIT	STW,R15	UNITEXIT	SAVE RETURN
4212	01	00E7D	32D0058E			LW,R13	P1	
4213	01	00E7E	69300E82			BNEZ	UNIT00	P1=0
4214	01	00E7F	224FFFF8 A			LI,R4	-8	YES=CLEAR
4215	01	00E80	35D80EA7			STW,R13	UNITLIST+8,X4	UNIT
4216	01	00E81	65400E80			BIR,R4	\$-1	LIST
4217	01	00E82	224FFFF8 A		UNIT00	LI,R4	-8	
4218	01	00E83	225FFFF8 A			LI,R5	-8	
4219	01	00E84	32C80597			LW,R12	P2+8,X4	
4220	01	00E85	69300E88			BNEZ	\$+3	PARAMETER=0
4221	01	00E86	65400E84		UNIT01	BIR,R4	\$-2	YES

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
4222	01	00E87	E8000E99			B	*UNITEXIT	
4223	01	00E88	21C000CF	A		CI,R12	15	
4224	01	00E89	68400EFC			BCR,4	\$+3	IS THIS AN XX UNIT
4225	01	00E8A	22D04800	A		LI,R13	X'4800'	YES-SET ENTRY BIT AND CAP.IND
4226	01	00E8B	6800CE8D			B	\$+2	
4227	01	00E8C	22D04000	A		LI,R13	X'4000'	
4228	01	00E8D	25C0007C	A		SLS,R12	*4	
4229	01	00E8E	49C0000D	A		BR,R12	R13	
4230	01	00E8F	22D04000	A		LI,R13	X'4000'	
4231	01	00E90	31D00EA7			CW,R13	UNITLIST+8,X5	
4232	01	00E91	69400E95			BCS,4	\$+4	
4233	01	00E92	35C00EA7			STW,R12	UNITLIST+8,X5	
4234	01	00E93	33100005	A		MTW,1	R5	
4235	01	00E94	6800CE86			B	UNIT01	
4236	01	00E95	65500E9C			BR,R5	\$-5	ARE THERE 8 ENTRIES IN THIS LIST
4237	01	00E96	32C00E9A			LW,R12	UNIT02	YES
4238	01	00E97	6AF00E35			BAL,R15	TYPE01	
4239	01	00E98	E8000E99			B	*UNITEXIT	
4240	01	00E99	00000000	A	UNITEXIT DATA		0	
4241	01	00E9A	100E3A6C	A	UNIT02	ZFMW	1,0,14,BA(ULISTFUL)	
4242	01	00E9B	E4D5C9E3	A	ULISTFUL	TEXT	'UNIT LIST FULL'	
	01	00E9C	40D3C9E2	A				
	01	00E9D	E340C6E4	A				
	01	00E9E	D3D34040	A				
4243	01	00E9F			UNITLIST RES		8	
4244					PAGE			
4245					*			*
4246					*THIS WILL OUTPUT A MESSAGE ON AN UNSUCCESSFUL START, AND IF SENSE			*
4247					*SWITCH 2 IS SET, THE PROGRAM WILL COME TO A HALT. IF SENSE SWITCH 2			*
4248					*IS NOT SET, THE PROGRAM WILL CONTINUE.			*
4249					*			*
4250	01	00EA7	35F00E84		UNSTRYTP	STW,R15	USTRTEXT	
4251	01	00EA8	CFA00AE7			H10,R10	*WORKADDR	
4252	01	00EA9	15A00AC8			STD,R10	H10STAT	
4253	01	00EAA	74000AC8			STCF	H10STAT	
4254	01	00EAB	32C00E85			LW,R12	USTRCTL	
4255	01	00EAC	6AF00E35			BAL,R15	TYPE01	
4256	01	00EAD	12C00AC4			LD,R12	S10STAT	
4257	01	00EAE	32B00ADD			LW,R11	TEXTS10	
4258	01	00EAF	6AF00D6C			BAL,R15	STATTYPE	
4259	01	00EB0	6C000010	A		RD,0	X'10'	
4260	01	00EB1	68400E83			BCR,4	\$+2	
4261	01	00EB2	2F000000	A	WAIT6	WAIT		UNSUCCESSFUL START. SS2 IS SET
4262	01	00EB3	E8000E84			B	*USTRTEXT	
4263	01	00EB4	00000000	A	USTRTEXT DATA		0	
4264	01	00EB5	1C0C3AD8	A	USTRCTL	ZFMW	1,0,12,BA(USTRMSG)	
4265	01	00EB6	E4D5E2E4	A	USTRMSG	TEXT	'UNSUCC START'	
	01	00EB7	C3C34CF2	A				
	01	00EB8	E3C1D9E3	A				
4266					PAGE			
4267					*			*
4268					*THIS SETS THE STARTING DEVICE ADDRESS (SDA) EQUAL TO THE CURRENT			*
4269					*DEVICE ADDRESS (CDA).			*
4270					*			*
4271	01	00EB9	12800EBE		UPAD	LD,R8	CDA	
4272	01	00EBA	15800ECC			STD,R8	SDA	
4273	01	00EBB	22800000	A		LI,R8	0	
4274	01	00EBC	35800859			STW,R8	COUNTER+8	
4275	01	00EBD	E80000CF	A		B	*R15	
4276						BUND	8	
4277	01	00EBE	00000000	A	CDA	DATA	0	
4278	01	00EBF	00000000	A	CDAPNTR	DATA	0	
4279	01	00EC0	00000000	A	SDA	DATA	0	
4280	01	00EC1	00000000	A	SCAPNTR	DATA	0	
4281					PAGE			
4282					*			*
4283					*THIS CHECKS FOR WRITE PROTECTED TRACKS AND SKIPS THESE UNTIL ONE IS			*
4284					*FOUND THAT IS NOT WRITE PROTECTED.			*
4285					*			*
4286	01	00EC2	35F00EFC		WRPRTCHK	STW,R15	WRPRTXIT	
4287	01	00EC3	6AF008F1			BAL,R15	C0UPLE	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
4288	01	COEC4	32800D1A			LW,R8	SENSSAVE	
4289	01	COEC5	E810CEE0			BCR,1	*WRPRTXIT	
4290	01	COEC6	32C00AE7			LW,R12	WRKADDR	YES=GEN AND TYPE MESSAGE
4291	01	COEC7	6AF0067C			BAL,R15	ADDRGEN	SET
4292	01	COEC8	227FFFFD	A		LI,R7	-3	UP
4293	01	COEC9	328EC698			LW,R8	ADRGNSAV+4,X7	ADDRESS
4294	01	COECA	358E05A4			STW,R8	ZDMPA+6,X7	FOR
4295	01	COECB	65700EC9			BIR,R7	S=2	OUTPUT
4296	01	COECC	32800EE2			LW,R8	WRPRORDR	
4297	01	COECD	3580059E			STW,R8	ZDMPA	
4298	01	COECE	32C00B6B			LW,R12	RECLNGTH	SET
4299	01	COECF	6AF00925			BAL,R15	DECCNVRT	UP
4300	01	COED0	35C005A0			STW,R13	ZDMPA+2	RECRD
4301	01	COED1	3C000FF5			AW,R12	*X'21000000'	LENGTH
4302	01	COED2	35C0059F			STW,R12	ZDMPA+1	FOR OUTPUT
4303	01	COED3	32800C6E			LW,R8	QMSG0009	SET
4304	01	COED4	32900C6F			LW,R9	QMSG0009+1	UP
4305	01	COED5	358005A4			STW,R8	ZDMPA+6	WRT
4306	01	COED6	359005A5			STW,R9	ZDMPA+7	PRST
4307	01	COED7	32C00EE1			LW,R12	WRPRTCTL	TYPE
4308	01	COED8	6AF00E37			BAL,R15	TYPE10	MESSAGE
4309	01	COED9	32900CAE7			LW,R9	WRKADDR	
4310	01	COEDA	6AF0064C			BAL,R15	CAPCHECK+1	
4311	01	COEDB	33C000E	A		MTW,0	R14	
4312	01	COEDC	68300EDE			BEZ	S+2	
4313	01	COEDD	32A0000E	A		LW,R10	R14	
4314	01	COEDE	35A00AE7			STW,R10	WRKADDR	
4315	01	COEDF	68000EC3			B	WRPRTCHK+1	
4316	01	COEE0	00000000	A	WRPRTXIT DATA		0	
4317	01	COEE1	10201678	A	WRPRTCTL ZFMW		1,0,32,BA(ZDMPA)	
4318	01	COEE2	00000000	A	WRPRORDR DATA		0	
4319							PAGE	
4320								
4321								* THIS WILL WRITE A RECRD AT THE SPECIFIED LOCATION ON THE RAD. *
4322								* IF F1=0, WRITE ALL TRACKS. IF F1=1, SKIP WRITE PROTECTED TRACKS. *
4323								* IF D2 IS 1 THROUGH 8, THE CONTENTS OF THE COUNTER SPECIFIED BY D2 IS *
4324								* USED AS THE STARTING BYTE ADDRESS FOR THE OPERATION. *
4325								
4326	01	COEE3	20000000	A		DATA	X'20000000'	P1
4327	01	COEE4	20000000	A		DATA	X'20000000'	P2
4328	01	COEE5	35F00F18		WRT	STW,R15	WRTEXIT	SAVE EXIT
4329	01	COEE6	32800AE2			LW,R8	TEXTWRT	
4330	01	COEE7	35800EE2			STW,R8	WRPRORDR	
4331	01	COEE8	33C005BF			MTW,0	P2	
4332	01	COEE9	68300EED			BEZ	WRT03	
4333	01	COEEA	6AF00BE3			BAL,R15	PR5GMOVE	
4334	01	COEEB	68000EED			B	WRT03	
4335	01	COEEC	E8000F18			B	*WRTEXIT	
4336	01	COEED	32800E26		WRT03	LW,R8	RETRYCNT	
4337	01	COEEE	35800E27			STW,R8	RETRYCTR	LOAD RETRY COUNTER
4338	01	COEEF	3280058E			LW,R8	P1	
4339	01	COEFC	35800AE8			STW,R8	SKWRPRST	
4340	01	COEF1	33000BC6			MTW,0	PATTERN1	
4341	01	COEF2	69300EF4			BCS,3	S+2	
4342	01	COEF3	6AF00B9F			BAL,R15	PATTENT1	GEN PATTERN
4343	01	COEF4	6AF006AB		WRT02	BAL,R15	CAPCHECK	
4344	01	COEF5	33000AE8			MTW,0	SKWRPRST	
4345	01	COEF6	68300EF9			BCR,3	S+3	
4346	01	COEF7	6AF00EC2			BAL,R15	WRPRTCHK	
4347	01	COEF8	68000EFC			B	S+4	
4348	01	COEF9	22800000	A		LI,R8	0	
4349	01	COEFA	35800F19			STW,R8	WRTIND	
4350	01	COEFB	6AF008F1			BAL,R15	CRUPLE	
4351	01	COEFC	228FFFFF	A		LI,R8	-1	
4352	01	COEFD	35800F19			STW,R8	WRTIND	
4353	01	COEFE	22800FCB			LI,R8	WRT00	
4354	01	COEFF	22900F0E			LI,R9	WRT01	
4355	01	COEF0	15800ACC			STD,R8	NBRMRETN	
4356	01	COEF1	32A00587			LW,R10	Z10ADR	
4357	01	COEF2	25A00C02	A		SAS,R10	2	
4358	01	COEF3	30A00C02			AW,R10	SAVEBITS	
4359	01	COEF4	49ACCACE			BR,R10	WRPRORDR	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
4360	01	00F05	35A00ABE			STW,R10	COMMPAIR	
4361	01	00F06	32A00B6B			LW,R10	RECLNGTH	
4362	01	00F07	49A00ACF			RR,R10	WRT9RDR+1	
4363	01	00F08	49A00B70			RR,R10	SILIND	
4364	01	00F09	35A00ABF			STW,R10	COMMPAIR+1	
4365	01	00F0A	68000AAF			B	EXECUTE	PERFORM OPERATION
4366	01	00F0B	22800000	A	WRT00	LI,R8	0	
4367	01	00F0C	35800F19			STW,R8	WRTIND	
4368	01	00F0D	E8000F18			B	*WRTEXIT	BACK TO DCP
4369	01	00F0E	6AF00AC8		WRT01	BAL,R15	ERR9RCNT	
4370	01	00F0F	6AF00A34			BAL,R15	ERR9RTYP	
4371	01	00F10	33F00E27			MTW,-1	RETRYCTR	
4372	01	00F11	69100F13			PCS,1	\$+2	RETRY CTR =0
4373	01	00F12	68000EF5			B	WRT02+1	N8
4374	01	00F13	22800000	A		LI,R8	0	
4375	01	00F14	35800F19			STW,R8	WRTIND	
4376	01	00F15	35800AE8			STW,R8	SKWRPRBT	
4377	01	00F16	35800C02			STW,R8	SAVEBITS	
4378	01	00F17	E8000F18			B	*WRTEXIT	
4379	01	00F18	00000000	A	WRTEXIT	DATA	0	
4380	01	00F19	00000000	A	WRTIND	DATA	0	
4381						PAGE		
4382					*			*
4383					*THIS WILL GENERATE A LIST OF 4 UNITS MAXIMUM, AS WELL AS A LIST OF			*
4384					*THEIR RESPECTIVE STARTING ADDRESSES. PARAMETERS ARE ENTERED AS			*
4385					*FOLLOWS: UNIT ADDRESS, STARTING TRACK,			*
4386					*AS THIS IS AN ENVIRONMENTAL TYPE OF DIRECTIVE, IT SHOULD BE PERFORMED			*
4387					*BEFORE THE FIRST XCWT,XRDS OR XWRT IS ATTEMPTED.			*
4388					*			*
4389	01	00F1A	40000000	A		DATA	X'40000000'	X1
4390	01	00F1B	20000000	A		DATA	X'20000000'	D2
4391	01	00F1C	40000000	A		DATA	X'40000000'	X3
4392	01	00F1D	20000000	A		DATA	X'20000000'	D4
4393	01	00F1E	40000000	A		DATA	X'40000000'	X5
4394	01	00F1F	20000000	A		DATA	X'20000000'	D6
4395	01	00F20	40000000	A		DATA	X'40000000'	X7
4396	01	00F21	20000000	A		DATA	X'20000000'	D8
4397	01	00F22	55F20F34		XGEN	STW,R15	XGENEXIT,X1	
4398	01	00F23	33100F3E			MTW,1	XGENFLG	SET XGENFLG TO INDICATE THAT XGEN =B
4399	01	00F24	22800000	A		LI,R8	0	
4400	01	00F25	227FFFF8	A		LI,R7	=8	
4401	01	00F26	35800F35			STW,R8	XXCNTR	CLEAR XX UNIT COUNTER
4402	01	00F27	358E0F3E			STW,R8	XXULIST+8,X7	CLEAR XX UNIT AND START ADDR LISTS
4403	01	00F28	65700F27			BIR,R7	\$=1	
4404	01	00F29	227FFFF8	A		LI,R7	=8	
4405	01	00F2A	226FFFFC	A		LI,R6	=4	
4406	01	00F2B	328E0596		L0DXUNIT	LW,R8	P1+8,X7	GET NEXT XX UNIT ADDRESS
4407	01	00F2C	68300F34			BEZ	XGENEXIT	IF THIS PARAM = 0, EXIT
4408	01	00F2D	358CCF3A			STW,R8	XXULIST+4,X6	
4409	01	00F2E	328E0597			LW,R8	P2+8,X7	GET NEXT XX STARTING ADDRESS
4410	01	00F2F	2580007C	A		SLS,8	=4	NORMALIZE ADDRESS TO RIGHT *B
4411	01	00F30	358CCF3E			STW,R8	XXSTADDR+4,X6	
4412	01	00F31	33200007	A		MTW,2	R7	
4413	01	00F32	33100F35			MTW,1	XXCNTR	INCREMENT XX UNIT COUNTER
4414	01	00F33	65600F28			BIR,R6	L0DXUNIT	
4415	01	00F34	68000000	A	XGENEXIT	B	0	
4416	01	00F35	00000000	A	XXCNTR	DATA	0	
4417	01	00F36			XXULIST	RES	4	
4418	01	00F3A			XXSTADDR	RES	4	
4419	01	00F3E	00000000	A	XGENFLG	DATA	0	XGEN SUBROUTINE ENTRY FLAG *B
4420						PAGE		
4421					*			*
4422					*THIS CHECK-WRITES 6:44 SECTORS USING DATA CHAINING			*
4423					*			*
4424	01	00F3F	55F20FDA		XCWT	STW,R15	XXCREDIT,X1	
4425	01	00F40	33000F3E			MTW,0	XGENFLG	HAS XGEN BEEN USED *B
4426	01	00F41	68200F4E			BCR,2	9PERR	N8, G8. TO ERROR MSG *B
4427	01	00F42	22800005	A		LI,R8	X'05'	
4428	01	00F43	68000F69			B	XWRCMBN	
4429						SPACE	5	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
4475	01	00F7A	32800FEB			LW,R8	XSCCTEMP	
4476	01	00F7B	35800FE8			STW,R8	XSECTCNT	
4477	01	00F7C	33000BC6			MTW,0	PATTERN1	
4478	01	00F7D	69300F7F			BNEZ	\$+2	
4479	01	00F7E	6AF0039F			BAL,R15	PATTENT1	
4480	01	00F7F	3A800E26			LCW,R8	RETRYCNT	
4481	01	00F80	35800E27			STW,R8	RETRYCTR	
4482	01	00F81	B2800FEE			LW,R8	*XXADDPTR	
4483	01	00F82	3580058E			STW,R8	P1	
4484	01	00F83	6AF00C02			BAL,R15	SEEK	
4485	01	00F84	6AF00051		GB	BAL,R15	SI0PSCHK	
4486	01	00F85	68000F84			B	\$=1	
4487	01	00F86	22800F8E			LI,R8	XWAIT+1	
4488	01	00F87	22900FA3			LI,R9	XSENSAVE	
4489	01	00F88	15800AC0			STD,R8	NORMRETN	
4490	01	00F89	6AF0031C			BAL,R15	IBARMENB	
4491	01	00F8A	6AF00067			BAL,R15	STATCLR	
4492	01	00F8B	220007F1			LI,RC	DA(XORDER)	
4493	01	00F8C	CCA00AE7			SI0,R10	*W0RKADDR	
4494	01	00F8D	2E000000	A	XWAIT	WAIT		
4495	01	00F8E	CDA00AE7			TI0,R10	*W0RKADDR	
4496	01	00F8F	68800F92			BCR,3	\$+3	
4497	01	00F90	69400F92			BCS,4	\$+2	
4498	01	00F91	68000F8E			B	\$=3	
4499	01	00F92	15A00AC6			STD,R10	TI0STAT	
4500	01	00F93	4B800FE9			AND,R11	XMASK1	
4501	01	00F94	31B00FE9			CW,R11	XMASK1	
4502	01	00F95	69300F9F			BNE	XN0TBUSY	
4503	01	00F96	32800ACB			LW,RR	TDVSTAT+1	
4504	01	00F97	4B800FEA			AND,R8	XMASK2	
4505	01	00F98	69300FC6			BCS,3	HALTI0	
4506	01	00F99	3A800E26			LCW,R8	RETRYCNT	
4507	01	00F9A	35800E27			STW,R8	RETRYCTR	
4508	01	00F9B	33100FE8			MTW,1	XSECTCNT	
4509	01	00F9C	68300FC8			BEZ	SETINTFL	
4510	01	00F9D	6AF00B1C			BAL,R15	IBARMENB	
4511	01	00F9E	68000F8D			B	XWAIT	
4512	01	00F9F	32800ACB		XN0TBUSY	LW,R8	TDVSTAT+1	
4513	01	00FA0	4B800FEA			AND,R8	XMASK2	
4514	01	00FA1	69300FA3			BCS,3	XSENSAVE	
4515	01	00FA2	68000FD1			B	XWEXIT	
4516	01	00FA3	227FFFFD	A	XSENSAVE	LI,X7	=3	
4517	01	00FA4	128E0ACE			LD,R8	HIBSTAT+6,X7	
4518	01	00FA5	158E0FE2			STD,R8	XSTATSAV+6,X7	
4519	01	00FA6	65700FA4			BIR,X7	\$=2	
4520	01	00FA7	6AF00D12			BAL,R15	SENSALT	
4521	01	00FA8	6AF00FB3			BAL,R15	SENSDECR	
4522	01	00FA9	32900AE7			LW,R9	W0RKADDR	
4523	01	00FAA	25900210	A		SCS,R9	16	
4524	01	00FAB	25800310	A		SCD,R8	16	
4525	01	00FAC	35800AE7			STW,R8	W0RKADDR	
4526	01	00FAD	227FFFFD	A		LI,X7	=3	
4527	01	00FAE	128E0FE2			LD,R8	XSTATSAV+6,X7	
4528	01	00FAF	158E0ACE			STD,R8	HIBSTAT+6,X7	
4529	01	00FB0	65700FAE			BIR,X7	\$=2	
4530	01	00FB1	6AF00A34			BAL,R15	ERR0RTYP	
4531	01	00FB2	33000E26			MTW,0	RETRYCNT	
4532	01	00FB3	68300PCD			BCR,3	STEPCNT	
4533	01	00FB4	33000E27			MTW,0	RETRYCTR	
4534	01	00FB5	68300FCB			BEZ	LDRETRY	
4535	01	00FB6	33100E27			MTW,1	RETRYCTR	
4536	01	00FB7	32800AE7			LW,R8	W0RKADDR	
4537	01	00FB8	25800210	A		SCS,R8	16	
4538	01	00FB9	3580058E			STW,R8	P1	
4539	01	00FBA	68000FC4			B	HALTI0-2	
4540	01	00FBB	52800D1A		SENSDECR	LH,R8	SENSSAVE	
4541	01	00FBC	4B800FF4			AND,R8	=X'F'	
4542	01	00FBD	68300PC0			BEZ	\$+3	
4543	01	00FBE	228FFFFFF	A		LI,RR	=1	
4544	01	00FBF	68000FC1			B	\$=2	
4545	01	00FC0	228FFFFFF	A		LI,RR	X'FFFFFF'	

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL ORIG	LABEL	OPERATION	OPERAND	COMMENTS
4546	01	00FC1	5080001A			AH,R8	SENSSAVE	
4547	01	00FC2	3580058E			STW,R8	P1	
4548	01	00FC3	E800000F A			E	*R15	
4549	01	00FC4	6AF00002			BAL,R15	SEEK	
4550	01	00FC5	68000F84			B	GO	
4551	01	00FC6	CF800AE7		HALTIB	HIB,R10	*WBRKADDR	
4552	01	00FC7	65000FA3			B	XSENSAVE	
4553	01	00FC8	32800FE7		SETINTFL	LW,R8	XFLAGS	
4554	01	00FC9	35800FF3			STW,R8	XORDER+1	
4555	01	00FCA	68000F8C			B	XWAIT	
4556	01	00FCB	3A800E26		LEDRETRY	LCW,R8	RETRYCNT	
4557	01	00FCC	35800E27			STW,R8	RETRYCTR	
4558	01	00FCD	33100FE8		STEPCNT	MTW,1	XSECTCNT	
4559	01	00FCE	32800FE8			LW,R8	XSECTCNT	
4560	01	00FCF	21800002 A			CI,R8	2	
4561	01	00FDC	69100FE4			BL	GO	
4562	01	00FD1	22800000 A		XEXIT	LI,R8	0	
4563	01	00FD2	35800BC6			STW,R8	PATTERNI	
4564	01	00FD3	33100FEC			MTW,1	XUNITCTR	
4565	01	00FD4	68300FDA			BEZ	XWCREXIT	
4566	01	00FD5	33100FEE			MTW,1	XXADDPTR	
4567	01	00FD6	33100FED			MTW,1	XUNITPTR	
4568	01	00FD7	B2800FED			LW,R8	*XUNITPTR	
4569	01	00FDR	35800CAF7			STW,R8	WBRKADDR	
4570	01	00FD9	68000F78			B	XXUNITG9	
4571	01	00FDA	68000000 A		XWCREXIT	B	0	
4572					*			
4573						BBOUND	8	
4574	01	00FDC			XSTAYSAV	RES	6	
4575	01	00FDE	00000000 A		XORDER	DATA	0	
4576	01	00FDE	00000000 A			DATA	0	
4577	01	00FE4	080007F1			ZFCP	X'08',DA(XORDER)	
4578	01	00FE5	00000000 A			DATA	0	
4579	01	00FE6	00000400 A		XDCHNFLG	ZFCP	X'DC',1024	
4580	01	00FE7	10000400 A		XFLAGS	ZFCP	X'1C',1024	
4581	01	00FE8	00000000 A		XSECTCNT	DATA	0	
4582	01	00FE9	60000000 A		XMASK1	DATA	X'60000000'	
4583	01	00FEA	80FF0000 A		XMASK2	DATA	X'80FF0000'	
4584	01	00FEB	00000000 A		XSECTEMP	DATA	0	
4585	01	00FEC	00000000 A		XUNITCTR	DATA	0	
4586	01	00FED	00000000 A		XUNITPTR	DATA	0	
4587	01	00FEE	00000000 A		XXADDPTR	DATA	0	
4588		01 00FEF			ZEXADR	EGU	\$	
4589	01	00FEF	00001018			DATA	L(ZEXADR)	BASE TABLE ADDRESS
4590		01 00580			END	ZCM\$		TO COMPUTE MEMORY SIZE
	01	00FF0	FFFF7FFF A					
	01	00FF1	00007FFF A					
	01	00FF2	000007FF A					
	01	00FF3	00000FFF A					
	01	00FF4	0000000F A					
	01	00FF5	21000000 A					
	01	00FF6	40404061 A					
	01	00FF7	FFFF0000 A					
	01	00FF8	80000000 A					
	01	00FF9	20000000 A					
	01	00FFA	10000002 A					
	01	00FFB	10000400 A					
	01	00FFC	F0000000 A					
	01	00FFD	00110011 A					
	01	00FFE	FFF3FFF4 A					
	01	00FFF	00400000 A					
	01	01000	0000FFFF A					
	01	01001	328A0000 A					
	01	01002	FFFFFFFF A					
	01	01003	7FFF0000 A					
	01	01004	00FFFFFF A					
	01	01005	9E000000 A					
	01	01006	CF000000 A					
	01	01007	08000000 A					
	01	01008	FF000000 A					
	01	01009	01000000 A					
	01	0100A	02000000 A					

LINE NO.	MEM PROT KEY	MEMORY ADDRESS	MEMORY CONTENTS	ABS OR REL OR I G	LABEL	OPERATION	OPERAND	COMMENTS
01		0100B	000FFF00	A				
01		0100C	00200000	A				
01		0100D	00100000	A				
01		0100E	00080000	A				
01		0100F	00040000	A				
01		01010	10000000	A				
01		01011	00000007	A				
01		01012	00800000	A				
01		01013	35880000	A				
01		01014	00000003	A				
01		01015	10000000	A				
01		01016	00000000	A				
01		01017	FFFF3FFF	A				
01		01018	00000FEF					
CONTRBL SECTION SUMMARY: 01 01019 PT 0								

XDS 901540

SECTION V
CONCORDANCE LISTING

SIGMA 5/7 EXTENDED PERFORMANCE RAD TEST 704978-51000

ABSVL	314/GEN 323/GEN 338/GEN	314/GEN 330/GEN	314/GEN 330/GEN	315/GEN 331/GEN	322/GEN 331/GEN	322/GEN 331/GEN	322/GEN 338/GEN
ADDR	30/DATA	2039/ZFSAT	2101-STW				
ADDREXIT	2101/STW	2120/B*	2143-DATA				
ADDRGEN	2152*STW 4291/BAL	2512/BAL	2655/BAL	2767/BAL	2773/BAL	3054/BAL	4027/BAL
ADDRINDX	30-DATA						
ADDR00	2112/BCS	2125-LW					
ADDR01	2121/LW	2144-ZFMW					
ADDR02	2117-BIR	2128/B	2142/B				
ADDR03	2134/BCS	2141-LI					
ADRGNCTL	4173-ZFMW						
ADRGNSAV	2153/STW 2176-RES 3056/LW	2158/STW 2514/LW 4031/LW	2159/LW 2657/LW 4173/ZFMW	2163/STW 2768/LW 4293/LW	2164/LW 2770/LW	2171/STW 2774/LW	2173/STW 2776/LW
ADRGNXIT	2152/STW	2174/B*	2175-DATA				
AF	314/GEN 323/GEN 338/GEN	314/GEN 330/GEN	314/GEN 330/GEN	315/GEN 331/GEN	322/GEN 331/GEN	322/GEN 331/GEN	322/GEN 338/GEN
A18	32/DATA	2040/ZFSAT	2185-STW				
A18EXIT	2185/STW	2195/MTW	2196/B*	2197-DATA			
A18HDG	2198-TEXT						
A18INDX	32-DATA						
A18STAT	2504/LW 3118/CW 3935/STCF	3008/CW 3125/CW 3939/LCF	3014/CW 3129/LD 3958/LCF	3020/CW 3177-RES	3097/CW 3561/LW	3104/CW 3914/LW	3111/CW 3934/STW
	459/ZFMW 1905/ZFMW 2723/ZFMW 3360/ZFMW 3610/ZFMW 3617/ZFMW 3928/ZFMW 4264/ZFMW	510/ZFMW 2144/ZFMW 2724/ZFMW 3377/ZFMW 3611/ZFMW 3618/ZFMW 3975/ZFCP 4317/ZFMW	561/ZFMW 2387/ZFMW 2725/ZFMW 3393/ZFMW 3612/ZFMW 3619/ZFMW 4019/ZFMW 4450/ZFMW	1150/ZFCP 2389/ZFMW 2727/ZFMW 3508/ZFMW 3613/ZFMW 3620/ZFMW 4038/ZFMW	1174/ZFMW 2539/ZFMW 2783/ZFMW 3607/ZFMW 3614/ZFMW 3621/ZFMW 4173/ZFMW	1460/ZFMW 2608/ZFMW 3144/ZFMW 3608/ZFMW 3615/ZFMW 3786/ZFMW 4174/ZFMW	1584/ZFMW 2722/ZFMW 3147/ZFMW 3609/ZFMW 3616/ZFMW 3927/ZFMW 4241/ZFMW
BACK	34/DATA	2041/ZFSAT	2205-LD				
BACKINDX	34-DATA						
CAPCHECK	2215-LW	2480/BAL	3651/BAL	3988/BAL	4310/BAL	4343/BAL	
CAPCHKOO	2229/BCR	2238-STW					
CCHN	35/DATA	2042/ZFSAT	2260-STW				
CCHNEXIT	2260/STW	2311/B*	2312-DATA				
CCHNINDX	35-DATA						
HN00	2290-STD	2295-BIR					
CDA							

2135/STW	2206/STD	2215/LW	2282/LW	2284/LW	2328/LW	2348/LW
2350/LW	2420/LW	2*22/LW	3515/TIB*	3802/LW	3867/HIB*	3993/STW
4026/LW	4271/LD	4277=DATA				
CDAPNTR						
2138/STW	2230/LW	2243/LW	3995/STW	4278=DATA		
CHAINCTL						
2370/LW	2387=ZFMW					
CHAINMSG						
2368/STW	2369/STW	2387/ZFMW	2388=TEXT			
CHAINTIC						
2315=ZFCP	2333/LD					
CHANCTLO						
2383/LW	2389=ZFMW					
CHANEXEC						
2306/BAL	2327=STW					
CHANLIST						
2290/STD	2291/STD	2302/STD	2315/ZFCP	2317=RES		
CHDTACHK						
2307/BAL	2346=STW					
CHDTAUPD						
2296/BAL	2355/BAL	2395=STW	2429/BAL			
CHDTAXIT						
2346/STW	2363/B*	2386=DATA				
CHDTA00						
2355=BAL	2362/BIR					
CHDTA01						
2361=HIR	2385/B					
CHENDCHK						
2409=LW	3165/B	3827/B				
CHENDLAY						
2409/LW	2412=DATA					
CHNEXE00						
2330/LI	2331/LI	2336=B				
CHNEXXIT						
2327/STW	2336/B*	2339/MTW	2340/B*	2341=DATA		
CHNGEN00						
2305/BAL	2418=STH					
CHNGEN01						
2427=STW	2431/BIR					
CHNGXIT						
2418/STH	2432=B					
CHUPDXIT						
2395/STH	2402=B					
COMPAREXT						
2615/STW	2688/BCS*	2693/BCR*	2715/B*	2716=DATA		
CMPERIND						
2449/MTW	2623/STW	2686/STW	2692/MTW	2719=DATA		
CMPR						
38=DATA	2043/ZFSAT	2440=STW				
CMPREXIT						
2440/STW	2451/MTW	2452/B*	2453=DATA			
CMPRINDX						
38=DATA						
CMPROO						
2447/BCS	2451=MTW					
CMPW						
41=DATA	2044/ZFSAT	2466=STW				
CMPWECTL						
2522/LW	2535=ZFMW					
CMPWEMSG						
2508/LW	2538=TEXT	2649/LW				
CMPWEXIT						
2466/STW	2532/MTW	2536/B*	2537=DATA			
CMPWINDX						
41=DATA						
CMPW00						
2499/LI	2500/LI	2503=B				
CMPW01						
2506/BCR	2525=BAL					
CMPW02						
2476/BCS	2480=BAL	2529/B				

CMPW03	2503/B	2533=LI					
CNTR	43/DATA	2045/ZFSAT	2556=STW	2969/BAL	4190/BAL		
CNTRXIT	2556/STW	2603/MTW	2604/B*	2605=DATA			
CNTRINDX	43=DATA						
CNTRMCTL	2593/LW	2608=ZFMW					
CNTRMSG	2588/STW	2589/STW	2592/STW	2607=TEXT	2608/ZFMW		
CNTRSAVE	2584/STW	2585/STW	2586/STW	2590/LW	2595/LW	2596/LW	2597/LW
	2610=RES						
CNTR00	2563/BCR	2578/BCR	2583/BCR	2598=SAS			
CNTR01	2566/BCR	2573=LW					
CNTR02	2584=STW						
CNTR04	2562=CI	2600/BIR					
CNVTEXT	2791/STW	2803/STW	2828/B*	2829=DATA			
CNVTOO	2812/B	2822=BAL					
COMMPAIR	2334/STD	2494/STW	2498/STW	2671/STW	3158/LI	3169=RES	3668/STW
	3672/STW	3720/STD	3749/STD	3810/STW	3815/STW	3817/CW	3823/LI
	3832/LI	3960/LB	4360/STW	4364/STW			
COMPARE	2448/BAL	2615=STW					
COMPAR03	2620/STW	2628=DATA	2676/LW*	2691/BIR			
COMPAR00	2630/BCR	2689=BIR					
COMPAR04	2702=LI	2714/BIR					
COMPAR02	2653/BCS	2660=LI					
COMPAR01	2639=CW	2646/BIR	2647/BIR				
COMPRTMP	2721=DATA						
CUNTER	2104/STW	2564/LW	2574/STW	2581/LW	2609=RES	2982/MTW	2985/MTW
	2989/MTW	2992/MTW	2995/MTW	2998/MTW	3001/MTW	3004/MTW	3010/MTW
	3016/MTW	3022/MTW	3480/LI	3957/MTW	4274/STW		
COUPLE	2487/BAL	2736=STW	3658/BAL	4287/BAL	4350/BAL		
COUPLXIT	2736/STW	2751/BCR*	2757/B*	2758=DATA			
CPASIND	2622/STW	2652/MTW	2720=DATA				
CPCHKXIT	2218/STW	2245/B*	2246=DATA				
CPERCTL0	2664/LW	2722=ZFMW					
CPERCTL3	2712/LW	2725=ZFMW					
CPERCTL1	2683/LW	2723=ZFMW					
CPERCTL2	2694/LW	2724=ZFMW					
CPLERCTL	2778/LW	2783=ZFMW					
CPLERIND	2739/STW	2753/MTW	2782=DATA	3154/STW	3572/MTW		
CPLERMSG	2769/STW	2771/STW	2775/STW	2777/STW	2783/ZFMW	2784=TEXT	

CPLERTYP	2752/BAL	2763=STW					
CPLREXIT	2763/STW	2780/B*	2781=DATA				
CURCMCTL	3087/LW	3144=ZFMW					
CURCMMDG	3069/LW	3145=TEXT					
CWERRIND	2470/STW	2524/MTW	2530/MTW	2541=DATA			
CWRTIND	2486/STW	2489/STW	2534/STW	2540=DATA	3955/AW		
CWRTBRDR	2493/BR	2496/BR	3186=ZFCP				
DA	1138/LI	1637/LI	1646/LI	1652/LI	1670/LI	1682=DATA	2315/ZFCP
	3158/LI	3823/LI	3832/LI	3963/LI	4492/LI	4577/ZFCP	
DBLWDTMP	2811/STD	2821/STD	2823/LD	3075/STD	3081/LW	3188=RES	
DCHN	44=DATA	2046/ZFSAT	2850=STW				
DCHNEXIT	2850/STW	2901/LI	2906=B				
DCHNINDX	44=DATA						
DCHNPAIR	2864/STW	2867/LI	2878/LW	2881/STW	2898/STW	2908=RES	
DCHNPARM	2875=LW	2887/BIR					
DCHNO1	2902/LI	2905=BAL					
DECCNVRT	2162/BAL	2167/BAL	2367/BAL	2519/BAL	2587/BAL	2591/BAL	2669/BAL
	2704/BAL	2707/BAL	2710/BAL	2791=STW	3050/BAL	3063/BAL	3314/BAL
	4299/BAL						
DLY	45=DATA	2047/ZFSAT	2919=LW				
DLYARM	2930/LW	2936=DATA	2946/LW				
DLYEXIT	2925/STW	2934=DATA	2948/B*				
DLYICLR	2943=DATA	2946=LW					
DLYINDX	45=DATA						
DLYRETN	2926/LW	2935=XPSD					
DLYSTEP	2928/LW	2945=MTW					
DLYXPSD	2935/XPSD	2941=DATA					
DR6PS	2625/STW	2641/MTW	2706/LW	2717=RES			
EBCBLNK	2380/LW	2680/LW	2698/LW	2813/LW	2819/LW	2831=DATA	3047/LW
	3059/LW	3077/LW	3083/LW	3369/LW	3767/LW	4010/LW	4138/LW
EBCZER0	2808/CW	2815/CW	2830=DATA				
ELENGTH	3033/STW	3049/LW	3143=DATA				
ERR	47=DATA	2048/ZFSAT	2955=STW				
ERREXIT	2955/STW	2962/BGE*	2972/B*	2973=DATA			
ERRINDX	47=DATA						
ERRORCNT	2337/BAL	2526/BAL	2980=MTW	3679/BAL	3726/BAL	3755/BAL	3829/BAL
	4369/BAL						
ERRBRETN	3171=RES	3947/LW					

ERRORTYP	2338/BAL	2525/BAL	2905/BAL	3028*STW	3680/BAL	3727/BAL	3756/BAL
	3830/BAL	4370/BAL	4530/BAL				
ERRPSCNT	2960/MTW	2961/CW	2971/STW	2974*DATA			
ERRTYPOO	3129-LD						
ERROO1	2959/BEZ	2967-LW					
ERTYEXIT	3028/STW	3141/B*	3142*DATA				
ERTYPOO0	3066/LW	3147-ZFMW					
EXECUTE	2335/B	2502/B	2904/B	3152-BAL	3164/B	3673/B	3724/B
	3753/B	4365/B					
GB	4485-BAL	4550/B	4561/BL				
GRPSHMW	3209/PLM	3217/STW	3220/STW	3223/PSM	3226-ZFOT		
GRRSTR	2822/BAL	3208-LCI	4135/BAL				
GRSAVE	2792/BAL	2804/BAL	3215-STW	4131/BAL			
GRSAVLBC	3215/STW	3216/LI	3221/LW	3226-ZFOT	3228-RES		
HALTIO	4505/BCS	4539/B	4551-HIO				
HEXCNVRT	2155/BAL	2373/BAL	2377/BAL	2673/BAL	2677/BAL	2803*STW	3076/BAL
	3082/BAL	3764/BAL	3918/BAL				
HIO	49/DATA	2049/ZFSAT	3237*STW				
HIOEXIT	3237/STW	3252/MTW	3253/B*	3254*DATA			
HIOINDX	49-DATA						
HIOSTAT	2986/LW	3089/LW	3137/LD	3175-RES	3242/STD	3243/STCF	3247/LD
	3388/STD	3389/STCF	3550/LW	3868/STD	3945/STD	3946/STCF	4252/STD
	4253/STCF	4517/LD	4528/STD				
I0ARMENB	3157/BAL	3259-LW	3822/BAL	4490/BAL	4510/BAL		
IXSAVE	2975-RES						
JUMP	51/DATA	2050/ZFSAT	3284*STW				
JUMPEXIT	3284/STW	3286/B*	3287*DATA				
JUMPINDX	51-DATA						
L	4589/DATA						
LEN	53/DATA	2051/ZFSAT	3301*STW				
LENEXIT	3301/STW	3352/B*	3353*DATA				
LENINDX	53-DATA						
LEN00	3313/BCR	3320*STW					
LF	314-GEN	322-GEN	330-GEN	338-GEN			
L0DRETRY	4534/BEZ	4556-LCW					
L0DXUNIT	4406-LW	4414/BIR					
L00P01	118-DATA						
L00P02	120-DATA						

L00P03	122=DATA							
L00P1	118/DATA	2410=BDR						
L00P2	120/DATA	3155=BAL						
L00P3	122/DATA	3163=BAL						
MARK	56/DATA	2052/ZFSAT	3367=STW					
MARKCNTL	3373/LW	3377=ZFMW						
MARKEXIT	3367/STW	3375/B*	3376=DATA					
MARKINDX	56=DATA							
MXLNMCTL	3317/LW	3360=ZFMW						
MXLNMSG	3315/STW	3316/STW	3360/ZFMW	3361=TEXT				
MXPRCTL	3487/LW	3508=ZFMW						
MXPRMSG	3508/ZFMW	3509=TEXT						
NEGIND	2799/STW	2806/STW	2824/MTW	2833=DATA				
N0CHECKTL	3390/LW	3393=ZFMW						
N0CHEMSG	3393/ZFMW	3394=TEXT						
N0CHEND	2411/B	3384=TDV						
N0RMRETN	2332/STD	2501/STD	2903/STD	3170=RES	3663/STD	3723/STD	3752/STD	
	3821/STD	3949/LW	4355/STD	4489/STD				
N0RMSAVE	3172=RES							
N0UNITS	2144/ZFMW	2145=TEXT						
NP2SAVE	2857/STW	2868/AW	2872/LW	2888/LW	2911=DATA			
NSECTCNT	2267/STW	2319=DATA	2347/LW	2419/LW				
0PERMSGC	4447/LW	4450=ZFMW						
0PERMSG	4450/ZFMW	4451=TEXT						
0PERR	4426/BCR	4435/BCR	4444/BCR	4447=LW				
PAGE	21/0PEN							
PAGE	21/0PEN	22=CNAME						
PATSTORE	3431/STW	3435=DATA						
PATT	58/DATA	2053/ZFSAT	3401=LW					
PATTENT1	2479/BAL	3405=LW	3468/BAL	4342/BAL	4479/BAL			
PATTERN1	2477/MTW	2897/STW	3328/STW	3440/STW	3444=DATA	3505/STW	3677/STW	
	4340/MTW	4477/MTW	4563/STW					
PATTINDX	58=DATA							
PATTL0AD	2629/CW*	2632/LW*	2672/LW*	3427/STW	3434=DATA	3438/BIR		
PATTSAVE	3421/STB	3425/AI	3445=RES					
PATTOO	3413=SCD	3423/BIR						
PBRIND								

PCYC	3582/MTW	3585/MTW	3588/STW	3591=DATA		
	60/DATA	2054/ZFSAT	3452=STW			
PCYCEXIT	3452/STW	3469/B*	3470=DATA			
PCYCINDX	60=DATA					
PCYC00	3457/B	3467=STW				
PICKS	2644/MTW	2709/LW	2718=RES			
PLBRIND	2558/STW	2580/STW	2601/LW	2606=DATA	2957/STW	
PRGEXIT	3476/STH	3489/MTW	3490/B	3506=B		
PRGMOVE	3476=STH	*333/BAL				
PTCHAREA	128/DATA	2092=RES				
TCHINDX	128=DATA					
PX	1321/STW	1328/S*	1329/MTW	1334/S*	1949=EGU	1950/EQU
PO	603/STW	608/LI	619/MTW	621/LI	1933=EGU	1934/EQU
P1	1420/AND	1431/LW	1440/AND	1449/LW	1456/AND	1512/LW
	1527/LW*	1528/CW*	1534/LW	1543/LW*	1557/MTW	1562/MTW
	1580/LW	1581/MTW	1934=EGU	1935/EQU	2110/LW	2186/LW
	2441/LW	2471/LW	2561/LW	2743/STW	2746/STW	2891/MTW
	2958/LW	2964/STW	2968/STW	3241/H10*	3244/LW	3285/BAL*
	3368/LW	3401/LW	3454/LW	3642/LW	3708/LW	3740/LW
	3804/SR	3824/S10*	3833/S10*	4009/LW	4051/TDV*	4054/LW
	4079/LW	4097/LW	4156/LW	4160/STW	4212/LW	4338/LW
	4483/STW	4538/STW	4547/STW			4406/LW
P1ST0RE	3403/STW	3406/LW	3442=DATA	3456/AW	3458/LW	3467/STW
P10	1943=EGU	1944/EQU				
P11	1944=EGU	1945/EQU				
P12	1945=EGU	1946/EQU				
P13	1946=EGU	1947/EQU				
P14	1526/STW	1530/MTW	1559/MTW	1563/MTW	1947=EGU	1948/EQU
P15	1448/STW	1457/BCR*	1459/B*	1498/STW	1554/B*	1729/STW
	1949/EQU					1948=EGU
P2	1505/LW	1509/MTW	1582/CW	1935=EGU	1936/EQU	2107/LW
	2475/MTW	2565/LW	2738/STW	2851/LCW	2919/LW	3238/LW
	3335/MTW	3402/LW	3481/AW	3645/MTW	3716/LW	3813/LW
	4060/CW	4074/LW	4161/LW	4169/STW	4183/STW	4219/LW
	4409/LW					4331/MTW
P2ST0RE	2627/LCW	2690/LCW	3404/STW	3405/LW	3412/LW	3415/LW
	3424/LW	3433/LCW	3437/LCW	3443=DATA	3453/LW	3419/LW
P3	1500/LW	1502/STW	1510/LW	1513/SW	1514/STW	1516/SW
	1936=EGU	1937/EQU	2105/LW	2569/SW	2571/AW	2573/LW
	3808/LW	4157/STW	4185/STW			1535/SW
P4	1937=EGU	1938/EQU	2576/LW	2875/LW	3806/LW	4187/STW
P5	1938=EGU	1939/EQU	2582/LW	3800/LW	4189/STW	
P6	1939=EGU	1940/EQU				
P7	1940=EGU	1941/EQU				

P8	1941=EQU	1942/EQU		
P9	1942=EQU	1943/EQU		
Q	62=DATA	2055/ZFSAT	3517=STW	
QEXIT	3517/STW	3587/MTW	3589/B*	3590=DATA
QINDX	62=DATA			
QMSGCTLE	2764/LW	3621=ZFMW		
QMSGCTL8	3092/LW	3615=ZFMW		
QMSGCTL9	3106/LW	3616=ZFMW		
QMSGCTLB	3099/LW	3618=ZFMW		
QMSGCTL7	3614=ZFMW			
QMSGCTL6	3613=ZFMW			
QMSGCTL5	3612=ZFMW	3859/LW		
QMSGCTL4	3611=ZFMW			
QMSGCTL3	3610=ZFMW			
QMSGCTL2	3609=ZFMW			
QMSGCTL1	3608=ZFMW			
QMSGCTLC	3127/LW	3619=ZFMW		
QMSGCTLO	3580/LW	3607=ZFMW		
QMSGCTLD	3120/LW	3620=ZFMW		
QMSGCTLA	3113/LW	3617=ZFMW		
QMSG0000	3592=TEXT	3607/ZFMW		
QMSG0001	3593=TEXT	3608/ZFMW		
QMSG0003	3595=TEXT	3610/ZFMW		
QMSG0002	3594=TEXT	3609/ZFMW		
QMSG000B	3603=TEXT	3618/ZFMW		
QMSG000A	3602=TEXT	3617/ZFMW		
QMSG0009	3601=TEXT	3616/ZFMW	4303/LW	4304/LW
QMSG0008	3600=TEXT	3615/ZFMW		
QMSG0007	3599=TEXT	3614/ZFMW		
QMSG0006	3598=TEXT	3613/ZFMW		
QMSG0005	3597=TEXT	3612/ZFMW		
QMSG0004	3596=TEXT	3611/ZFMW		
QMSG000E	3606=TEXT	3621/ZFMW		
QMSG000D	3605=TEXT	3620/ZFMW		
QMSG000C	3604=TEXT	3619/ZFMW		
Q001				

0003	3524/B	3528/B	3532/B	3534*CI			
RDMODIFY	3577*SAS	3584/BIR					
RDSEKIND	3648/STW	3667/BR	3691*DATA				
RDSORDER	2446/MTW	3675/STW	3685/STW	3690*DATA			
READ	2275/LD	3180-ZFCP	3666/BR	3670/BR			
READEXIT	64*DATA	2056/ZFSAT	2445/BAL	3631*STW			
READINDX	3631/STW	3678/B*	3688*DATA				
READIND	64*DATA						
READ00	2274/STW	2303/MTW	2309/STW	2980/MTW	3657/STW	3660/STW	3676/STW
READ01	3689*DATA	3953/LW					
READ02	3661/LI	3674*LI	3687/B				
RECLNGTH	3662/LI	3679*BAL					
RECWDcnt	3651*BAL	3683/B					
RELBCCTL	2495/LW	3307/STW	3311/LW	3319/LW	3320/STW	3354*DATA	3484/AW
RELBCMSG	3491/SW	3669/LW	4298/LW	4361/LW			
RETRYCNT	2616/LCW	2618/AW	2667/AW	3326/STW	3358*DATA	3428/LW	3432/LCW
RETRYCTR	3495/AW	3498/AW	3500/LCW	3637/LW			
RIB	4154/LW	4174*ZFMW					
RIBINDX	4174/ZFMW	4175*TEXT					
RO	2473/LW	3649/LW	4098/STW	4100*DATA	4336/LW	4480/LCW	4506/LCW
R1	4531/MTW	4556/LCW					
R10	2474/STW	2527/MTW	3650/STW	3681/MTW	4101*DATA	4337/STW	4371/MTW
	4481/STW	4507/STW	4533/MTW	4535/MTW	4557/STW		
	65*DATA	2057/ZFSAT	3696*WD				
	65*DATA						
	251*EQU	449/LW	461/LW	466/LW	471/LW	478/LW	480/STW
	517/STW	518/STW	519/STH	628/STW	1138/LI	1397/LI	1419/LI
	1420/AND	1421/STW	1422/STH	1423/LH	1424/STH	1431/LW	1432/AND
	1433/STH	1439/LI	1440/AND	1441/STH	1512/LW	1513/SW	1514/STW
	1621/STH	1637/LI	1646/LI	1652/LI	1670/LI	1675/LW	1676/AW
	1677/STH	1772/H10	3158/LI	3209/PLM	3223/PSM	3696/WD	3697/WD
	3823/LI	3832/LI	3963/LI	4492/LI			
	252*EQU	851/CB	1345/STW	1356/LW	1372/LW	1381/STW	1391/LW
	1392/XW	1624/STB	1645/STB	1657/LI	1659/MTW	1667/MTW	1669/LI
	2230/LW	2231/BIR	2232/LI	2239/CI	2241/STW	2244/LI	3998/LI
	4135/STW	4137/LI	4140/BIR	4141/LW			
	261*EQU	532/LB	533/STW	542/CB	545/CI	547/CI	549/LW
	553/CB	649/CB	859/CB	865/CB	867/CB	879/CB	905/CB
	907/CB	922/CB	924/LI	927/CB	1019/CB	1021/CB	1026/CI
	1028/CI	1030/AI	1031/LW	1101/STB	1106/CI	1116/LW	1117/STW
	1122/LW	1123/SAS	1124/SH	1126/CI	1128/LI	1132/LI	1133/STH
	1134/AH	1135/STH	1145/LB	1146/STW	1481/CI	1866/LW	1867/SW
	1868/STW	1869/STW	1869/STW*	1870/MTW	1871/SAS	1872/STW	1873/SAS
	1874/STW	1875/AW	1876/STW	1877/AWM	1878/SW	1879/STW	1880/STW
	1881/SW	1882/STW	1883/STW	1884/LW	1885/SW	1886/STW	1888/LW
	1889/SW	1890/STW	1891/STW	1892/LW	1893/STW	1895/LW	1896/STW
	2105/LW	2106/SAD	2107/LW	2108/SAD	2216/LW	2222/AI	2226/CS
	2223/CS	2276/LD	2280/BR	2290/STD	2255/AI	2353/LI	2358/AI
	2366/AW	2490/LW	2491/SAS	2492/AW	2493/BR	2494/STW	2495/LW

	2496/BR	2497/BR	2498/STW	2632/LW	2633/AND	2634/EBR	2635/EBR
	2636/AND	2986/LW	2987/CW	2990/CW	2993/CW	2996/CW	2999/CW
	3002/CW	3005/LW	3006/CW	3008/CW	3011/LW	3012/CW	3014/CW
	3017/LW	3018/CW	3020/CW	3159/SIB	3160/STD	3302/LW	3303/SAS
	3304/CI	3306/LI	3307/STW	3308/LW	3310/LI	3312/CW	3319/LW
	3320/STW	3321/LW	3329/CI	3331/AI	3337/LI	3339/MTW	3341/LW
	3342/STW	3344/LW	3345/AI	3349/AI	3350/STW	3384/TDV	3385/STD
	3387/HIB	3388/STD	3407/SCD	3411/LW	3416/LW	3420/LW	3664/LW
	3665/SAS	3666/BR	3667/BR	3668/STW	3669/LW	3670/BR	3671/BR
	3672/STW	3712/LI	3713/SAS	3714/AI	3715/BR	3716/LW	3718/LI
	3719/BR	3740/LW	3742/LI	3744/BR	3745/LI	3746/SAS	3747/AI
	3748/BR	3824/SIB	3825/STD	3833/SIB	3834/STD	3852/TIB	3856/STD
	3867/HIB	3868/STD	3933/AIB	3934/STW	3936/CW	3941/TDV	3942/STD
	3944/HIG	3945/STD	3964/SIB	3965/TIB	3991/AI	3992/LW	4108/SCS
	4109/AW	4110/SCD	4115/AW	4116/SCS	4251/HIB	4252/STD	4313/LW
	4314/STW	4356/LW	4357/SAS	4358/AW	4359/BR	4360/STW	4361/LW
	4362/BR	4363/BR	4364/STW	4493/SIB	4495/TIB	4499/STD	4551/HIB
R11	262*EQU	520/LI	521/STH	522/LW	523/STW	524/LW	525/STW
	526/LW	528/LW	529/STW	541/LW	542/CB	552/LW	553/STW
	558/BAL*	608/LI	610/STW	611/LI	612/STH	621/LI	624/LW
	625/BAL*	629/LI	630/STH	631/LW	658/LW	776/LW	777/SAS
	780/CI	782/CW	786/CI	788/AI	789/CW	791/LI	792/AND
	793/STW	797/AND	798/CW	802/LW	803/STW	805/LW	807/STW
	821/LW	822/MTW	823/CW	825/STW	843/LW	844/STW	851/CB
	853/SCS	854/SAS	855/STB	871/CB	873/SCS	874/SAS	875/STB
	889/LW	890/STW	891/STW	892/LB	893/SAS	894/STW	895/STB
	896/LW	897/SW	898/STW	920/STW	926/LW	927/CB	932/LW
	933/SW	934/SAS	938/BR	939/STB	983/LW	984/STW	986/LW
	987/CW	989/STW	991/LW	992/CW	1001/LW	1003/LW*	1003/LW*
	1004/STH	1182/LB	1183/AI	1184/SAS	1185/AW	1190/STW	1191/STW
	1196/LW	1197/CW	1220/LB	1221/CI	1223/LH	1224/SAS	1225/STW
	1233/LB	1234/CI	1236/CI	1246/AND	1247/STB	1691/LW	1712/LB
	1714/CI	1719/CI	1722/SAS	1725/MTW	1738/LB	1739/CI	1742/LH
	1743/CH	1752/LB	1753/CI	1791/LH	1792/CH	1794/LW	1795/STW
	1802/LI	1826/LW	1827/CW	1830/LW	1831/STW	1839/LW	1843/CW
	1851/STW	1872/STW	1878/SW	1881/SW	1887/LI	1889/SW	1900/LW
	2102/LI	2104/STW	2130/BR	2131/AI	2132/STW	2135/STW	2136/STW
	2137/STW	2141/LI	2190/LW	2223/LW	2287/AW	3131/LW	3135/LW
	3139/LW	3246/LW	3327/LI	3328/STW	3332/MTW	3334/STW	3343/LI
	3347/MTW	3351/STW	3406/LW	3836/LW	3861/LW	3887/STW	4056/LW
	4081/LW	4107/LI	4111/AW	4112/CI	4114/AI	4115/AW	4257/LW
	4500/AND	4501/CW					
R12	263*EQU	450/LW	462/LW	467/LW	472/LW	479/LW	481/STW
	482/LW	500/LW	530/LW	556/LI	644/LI	660/LI	661/STW
	662/LW	686/LI	722/LI	784/LI	820/LI	841/LI	845/LB
	846/AND	850/LI	870/LI	911/LI	930/LI	985/LI	990/LI
	998/LI	1005/LH	1006/STH	1007/LW	1059/XW	1061/XW	1136/TIB
	1139/SIB	1141/TIB	1156/LI	1162/LH	1163/STH	1164/LW	1199/LI
	1245/LI	1246/AND	1251/LW	1252/SAS	1253/STW	1264/LI	1277/LI
	1284/LI	1292/XW	1308/XW	1320/XW	1321/STW	1322/LI	1323/STW
	1324/LI	1327/XW	1328/S	1330/AKM	1332/LW	1333/XW	1334/S
	1335/BR	1336/STW	1348/SCD	1354/LW	1367/CB	1370/STB	1373/STW
	1383/MTW	1384/CI	1386/CI	1388/MTW	1389/SCS	1391/LW	1449/LW
	1452/LW	1500/LW	1501/AND	1502/STW	1510/LW	1515/LW	1516/SW
	1519/STH	1520/SCD	1521/STW	1527/LW	1528/CW	1532/LI	1533/STB
	1534/LW	1535/SW	1538/STH	1539/SCD	1540/STW	1543/LW	1545/STW
	1549/LW	1565/LW	1569/SCD	1580/LW	1582/CW	1611/STH	1612/LH
	1612/LH	1613/STB	1614/LB	1614/LB	1616/AND	1617/SAS	1618/STB
	1619/LW	1619/LW	1626/LB	1627/SAS	1628/MTW	1631/MTW	1638/LB
	1640/LI	1641/MTW	1643/AI	1644/STB	1647/LB	1653/LB	1660/BDR
	1662/LB	1664/AND	1668/BDR	1671/STB	1673/TIB	1713/LI	1716/LH
	1717/STW	1724/LI	1727/LW	1729/STW	1756/LW	1789/MTW	1790/MTW*
	1791/LH*	1792/CH*	1801/LI	1825/LI	1838/LW	1840/MTW	1841/CW
	1843/CW*	1845/STW	1846/LI	1902/LW	2110/LW	2111/CI	2116/SAS
	2121/LW	2153/STW	2154/AND	2160/SAD	2161/AND	2165/SAD	2166/AND
	2189/STCF	2272/LD	2275/LD	2281/BR	2291/STD	2294/AI	2301/AI
	2302/STD	2364/LW	2365/SW	2366/AW	2368/STW	2370/LW	2372/LW
	2374/STW	2376/LW	2378/STW	2380/LW	2381/STW	2382/STW	2383/LW
	2511/LW	2517/LW	2518/AND	2520/STW	2522/LW	2564/LW	2569/SW

2571/AW	2573/LW	2574/STW	2577/CW	2581/LW	2588/STW	2590/LW
2593/LW	2654/LW	2664/LW	2666/LW	2667/AW	2668/AI	2672/LW
2674/STW	2676/LW	2678/STW	2683/LW	2694/LW	2696/LW	2702/LI
2703/AW	2706/LW	2709/LW	2712/LW	2764/LW	2766/LW	2772/LW
2778/LW	2793/MTW	2796/LCW	2796/LCW	2801/LW	2808/CW	2811/STD
2813/LW	2814/SCD	2815/CW	2819/LW	2820/SCD	2821/STD	2823/LD
2826/AND	2827/BR	3049/LW	3051/STW	3053/LW	3061/LW	3062/AND
3064/STW	3066/LW	3074/LD	3075/STD	3079/STW	3081/LW	3085/STW
3087/LW	3092/LW	3099/LW	3106/LW	3113/LW	3120/LW	3127/LW
3129/LD	3133/LD	3137/LD	3241/H18	3242/STD	3247/LD	3311/LW
3312/CW	3315/STW	3317/LW	3373/LW	3390/LW	3401/LW	3403/STW
3413/SCD	3417/SCD	3421/STB	3487/LW	3518/T18	3520/SAD	3521/CI
3526/CI	3529/CI	3534/CI	3537/CI	3547/CI	3550/LW	3551/SCS
3552/CI	3555/CI	3558/CI	3562/SAD	3563/CI	3566/CI	3569/CI
3580/LW	3762/LW	3763/SAS	3765/STW	3767/LW	3768/STW	3771/LW
3837/LD	3859/LW	3862/LD	3888/SAS	3889/AND	3891/BR	3893/LW
3898/LI	3899/SAD	3901/SAD	3903/LI	3904/STB	3907/LI	3908/SAD
3909/SYB	3914/LW	3916/LW	3917/AND	3920/LW	4014/LW	4026/LW
4034/LW	4051/TDV	4052/STD	4057/LD	4076/T18	4077/STD	4082/LD
4138/LW	4139/STW	4154/LW	4219/LW	4223/CI	4228/SLS	4229/BR
4233/STW	4237/LW	4254/LW	4256/LD	4290/LW	4298/LW	4301/AW
4302/STW	4307/LW	4447/LW				

R13

264-EQU	1142/LB	1142/LB	1143/CI	1158/SCS	1159/STW	1318/STW
1319/LI	1320/XW	1325/CI	1333/XW	1347/LI	1349/CI	1351/AI
1352/STB	1355/LW	1451/STW	1505/LW	1506/MTW	1507/CW	1522/SYW
1541/STW	1546/STW	1570/STB	1588/LH	1589/CH	1615/LI	1616/AND
1622/AH	1623/STH	1847/LW	1848/MTW	1849/CW	2103/LI	2118/MTW
2133/MTW	2140/MTW	2156/SLS	2157/AI	2158/STW	2159/LW	2163/STW
2164/LW	2168/SAS	2169/AW	2170/AI	2171/STW	2172/LW	2173/STW
2188/AI8	2192/SAS	2193/CW	2241/STW	2243/LW	2288/AW	2300/AW
2369/STW	2375/STW	2379/STW	2521/STW	2565/LW	2567/CI	2576/LW
2577/CW	2582/LW	2589/STW	2592/STW	2670/STW	2675/STW	2679/STW
2705/STW	2708/STW	2711/STW	2795/LI	2798/LI	2799/STW	3052/STW
3065/STW	3080/STW	3086/STW	3249/SAS	3250/CW	3316/STW	3402/LW
3404/STW	3411/LW	3416/LW	3420/LW	3561/LW	3766/STW	3839/SAS
3840/CW	3890/AND	3891/BR	3892/STW	3897/LW	3919/STW	3922/LW
3995/STW	4059/SAS	4060/CW	4084/SAS	4085/CW	4212/LW	4215/STW
4225/LI	4227/LI	4229/BR	4230/LI	4231/CW	4300/STW	

R14

265-EQU	1016/STW	1033/LB	1034/LW	1034/LW*	1037/SAD	1039/STW
1046/BAL	1052/BAL	1067/BAL	1073/BAL	1080/BAL	1083/BAL	1089/BAL
1092/BAL	1206/STW	1213/STW	1215/LW	1408/BAL	1414/BAL	1421/STW*
1718/LW	1721/MTW	1727/LW*	1728/MTW	2113/LW	2114/AND	2115/STW
2125/LW	2126/CI	2129/AND	2130/BR	2217/LI	2233/LW	2234/CI
2237/LW	2396/LI	2399/CS	2579/LI	2580/STW	2930/LW	2931/WD
2946/LW	2947/WD	3261/LI	3262/WD	3951/LI	3952/WD	3969/MTW
3992/LW	3993/STW	3994/STW	4311/MTW	4313/LW		

R15

266-EQU	483/BAL	489/BAL	490/LW	491/STW	492/LI	493/WD
494/LW	495/SAS	496/STH	497/STH	498/LH	499/STH	501/BAL
503/BAL	505/LI	506/STH	508/BAL	516/BAL	527/BAL	531/BAL
539/BAL	550/BAL	558/BAL	559/BAL	601/STW	602/BAL	606/LW
607/STW	609/BAL	617/STW	618/BAL	622/BAL	623/BAL	625/BAL
627/BAL	632/BAL	643/STW	645/LW	646/CB	648/BAL	657/STW
659/BAL	663/BAL	673/STW	674/BAL	676/BAL	699/STW	700/BAL
701/LW	702/STW	703/BAL	704/LI	707/LW	708/STW	712/BAL
719/STW	720/BAL	721/BAL	723/LW	724/CW	726/LW	727/STW
729/LW	731/STW	732/BAL	741/STW	742/BAL	743/BAL	744/BAL
753/STW	754/BAL	755/LI	756/STW	759/LW	760/STW	761/BAL
762/BAL	763/BAL	772/STW	794/BAL	796/LI	797/AND	801/LW
803/STW*	818/BAL	836/STW	856/BAL	857/BAL	858/LI	861/BAL
864/LI	874/BAL	877/BAL	878/LI	888/STW	917/BAL	935/LI
937/AND	945/BAL	946/BAL	947/BAL	948/BAL	949/BAL	950/BAL
951/BAL	952/BAL	979/STW	980/BAL	996/BAL	997/BAL	1002/BAL
1008/BAL	1017/STW	1018/BAL	1023/LI	1024/CW	1031/LW	1035/SCS
1038/LB	1039/STW*	1057/STW	1058/BAL	1060/BAL	1099/STW	1100/BAL
1102/LH	1103/STW	1104/BAL	1115/STW	1129/LH	1130/CH	1157/BAL
1160/LI	1161/STB	1165/BAL	1166/LB	1167/CI	1169/LH	1170/CH
1172/LI	1198/BCS*	1206/STW	1207/BAL	1213/STW	1214/BAL	1215/LW
1222/BCR*	1226/B*	1248/B*	1263/BCS*	1270/BCR*	1276/BCR*	1283/BCR*

1292/XW	1293/STW	1294/AND	1295/SCS	1296/MI	1297/AN	1298/STW
1299/AND	1300/SCS	1301/MI	1302/AW	1303/STW	1304/LW	1304/LH
1305/MI	1306/AW	1307/STW	1308/XW	1309/B*	1337/H*	1357/B*
1363/STW	1366/LI	1367/CB	1369/LI	1370/STB	1393/B*	1401/B*
1425/B*	1434/B*	1442/B*	1448/STW	1450/BAL	1454/BAL	1455/LI
1456/AND	1466/STW	1467/BAL	1468/BAL	1469/BAL	1470/LI	1471/AND
1475/BAL	1476/BAL	1482/BCR*	1498/STW	1504/BAL	1517/BAL	1518/LI
1519/STH	1523/STB	1525/LI	1526/STW	1536/BAL	1537/LI	1538/STW
1542/STB	1544/BAL	1551/BAL	1552/BAL	1560/BAL	1566/BAL	1573/LI
1574/STB	1577/BAL	1583/B*	1590/B*CR*	1599/B*CR*	1600/STCF	1601/STW
1602/BAL	1603/LR	1604/SAS	1605/AND	1609/CI	1625/LW	1630/LI
1633/LI	1634/CW	1636/STH	1651/STH	1656/LI	1658/STB	1661/LI
1666/STB	1692/BAL	1693/BAL	1694/BAL	1695/LI	1696/WD	1697/WD
1698/LI	1699/WD	1701/LW	1702/BAL	1702/BAL*	1731/B*	1736/BAL
1737/BAL	1745/BAL	1750/BAL	1751/BAL	1755/LI	1764/BCR*	1769/LI
1770/WD	1771/WD	1809/BAL	1810/BAL	1853/B*	1898/BAL	1901/BAL
1903/BAL	2101/STW	2122/BAL	2152/STW	2155/BAL	2162/BAL	2167/BAL
2185/STW	2191/BAL	2207/B*	2218/STW	2219/BAL	2260/STW	2296/BAL
2305/BAL	2306/BAL	2307/BAL	2327/STW	2337/BAL	2338/BAL	2346/STW
2355/BAL	2367/BAL	2371/BAL	2373/BAL	2377/BAL	2384/BAL	2395/STW
2397/LI	2418/STH	2429/BAL	2440/STW	2445/BAL	2448/BAL	2466/STW
2479/BAL	2480/BAL	2483/BAL	2487/BAL	2512/BAL	2519/BAL	2523/BAL
2525/BAL	2526/BAL	2556/STW	2587/BAL	2591/BAL	2594/BAL	2615/STW
2655/BAL	2665/BAL	2669/BAL	2673/BAL	2677/BAL	2680/LW	2681/STW
2682/STW	2684/BAL	2695/BAL	2697/BAL	2704/BAL	2707/BAL	2710/BAL
2713/BAL	2736/STW	2744/BAL	2747/BAL	2752/BAL	2762/STW	2765/BAL
2767/BAL	2773/BAL	2779/BAL	2791/STW	2792/BAL	2800/BAL	2803/STW
2804/BAL	2807/BAL	2810/BAL	2817/BAL	2822/BAL	2850/STH	2905/BAL
2925/STW	2955/STW	2965/BAL	2969/BAL	3023/B*	3028/STW	3050/BAL
3054/BAL	3059/LW	3060/STW	3063/BAL	3067/BAL	3076/BAL	3077/LW
3078/STW	3082/BAL	3083/LW	3084/STW	3088/BAL	3093/BAL	3100/BAL
3107/BAL	3114/BAL	3121/BAL	3128/BAL	3132/BAL	3136/BAL	3140/BAL
3152/BAL	3153/LI	3154/STW	3155/BAL	3157/BAL	3163/BAL	3210/B*
3215/STW	3216/LI	3217/STW	3218/LI	3219/SAS	3220/STW	3221/LW
3224/B*	3237/STW	3240/BAL	3248/BAL	3263/B*	3284/STW	3285/BAL
3301/STW	3314/BAL	3318/BAL	3367/STW	3374/BAL	3391/BAL	3441/B*
3452/STW	3468/BAL	3476/STH	3488/BAL	3517/STW	3581/BAL	3631/STW
3651/BAL	3654/BAL	3658/BAL	3679/BAL	3680/BAL	3698/B*	3707/STW
3726/BAL	3727/BAL	3739/STW	3755/BAL	3756/BAL	3764/BAL	3772/BAL
3798/STW	3799/BAL	3822/BAL	3829/BAL	3830/BAL	3838/BAL	3851/STW
3860/BAL	3863/BAL	3881/B*	3886/STW	3894/BAL	3918/BAL	3921/BAL
3947/LW	3949/LW	3950/STH	3968/BAL	3985/STW	3988/BAL	4008/STW
4015/BAL	4025/STW	4027/BAL	4035/BAL	4048/STW	4058/BAL	4073/STW
4083/BAL	4099/B*	4117/B*	4129/STW	4131/BAL	4132/LI	4135/BAL
4152/STW	4153/BAL	4155/BAL	4170/BAL	4181/STW	4190/BAL	4211/STW
4238/BAL	4250/STW	4255/BAL	4258/BAL	4275/B*	4286/STW	4287/BAL
4291/BAL	4299/BAL	4308/BAL	4310/BAL	4328/STW	4333/BAL	4342/BAL
4343/BAL	4346/BAL	4350/BAL	4369/BAL	4370/BAL	4397/STH	4424/STW
4433/STH	4442/STH	4448/BAL	4479/BAL	4484/BAL	4485/BAL	4490/BAL
4491/BAL	4510/BAL	4520/BAL	4521/BAL	4530/BAL	4548/B*	4549/BAL
R2	253*EQU	871/CB				
R3	254*EQU	846/AND	1432/AND	1605/AND		
R4	255*EQU	2109/LI	2117/BIR	2138/STW	2139/STW	2627/LCW
	2690/LCW	3068/LI	3071/BIR	3405/LW	3408/SDR	2689/BIR
	3432/LCW	3438/BIR	3439/LI	3440/STW	3877/LI	3422/BIR
	3905/BIR	3906/LI	3910/BIR	4214/LI	4216/BIR	3895/LI
R5	256*EQU	2616/LCW	2666/LW	2691/BIR	3412/LW	4221/BIR
	3418/BDR	3419/LW	3424/LW	3425/AI	3426/AW	3414/BDR
	3429/AW	3430/AW	3431/STW	3433/LCW	3436/BIR	3427/STW
	3900/BIR	3902/LI	4218/LI	4234/MTW	4236/BIR	3437/LCW
R6	257*EQU	2289/LI	2293/MTW	2299/MTW	2347/LW	2362/BIR
	2428/BDR	2559/LI	2584/STW	2595/LW	2600/BIR	2637/LI
	2956/LI	2957/STW	3035/LI	3036/SAD	3037/AND	2426/LI
	3410/LI	3423/BIR	4405/LI	4414/BIR	4463/LCW	2647/BIR
R7	258*EQU	446/STCF	447/LB	447/LB	448/SAS	3038/CI
						902/LB
						909/CI

913/SAS	936/LB	937/AND	938/BR	1118/LI	1119/CI	1121/STW
1547/LI	1548/STB	2261/LI	2266/BIR	2267/STW	2298/BIR	2356/LI
2361/BIR	2409/LW	2410/BDR	2419/LW	2431/BIR	2507/LI	2510/BIR
2513/LI	2516/BIR	2560/LI	2585/STW	2596/LW	2599/BIR	2624/LI
2626/BIR	2638/LI	2646/BIR	2648/LI	2651/BIR	2656/LI	2659/BIR
2660/LI	2663/BIR	2671/LI	2701/LI	2703/AW	2714/BIR	2851/LCW
2865/MTW	2886/MTW	2899/MTW	2922/LW	2924/LI	3031/LW	3032/AND
3033/STW	3034/LW	3055/LI	3058/BIR	3453/LW	3461/SAS	3462/AI
3465/BIR	3477/LW	3478/AW	3479/SLS	3485/CW	3500/LCW	3503/BIR
3575/LI	3584/BIR	3588/STW	4030/LI	4033/BIR	4292/LI	4295/BIR
4400/LI	4403/BIR	4404/LI	4412/MTW			
259/EQU	538/LI	549/LW	675/LW	677/MTW	681/CW	691/STW
834/MTW	838/CW	862/LI	899/LI	901/STW	1082/LI	1091/LI
1275/MTW	2186/LW	2187/STW	2205/LD	2206/STD	2262/LI	2263/CW
2265/AI	2268/LI	2271/STW	2274/STW	2277/LI	2279/SAD	2280/BR
2283/SAD	2285/SAD	2292/STW	2308/LI	2309/STW	2310/STW	2328/LW
2329/STW	2330/LI	2332/STD	2333/LD	2334/STD	2348/LW	2349/SAD
2351/SAD	2359/CW	2372/LW	2398/AW	2399/CS	2401/AW	2420/LW
2421/SAD	2423/SAD	2427/STW	2441/LW	2442/STW	2443/LI	2444/STW
2467/LW	2468/STW	2469/LI	2470/STW	2471/LW	2472/STW	2473/LW
2474/STW	2485/LI	2486/STW	2488/LI	2489/STW	2499/LI	2501/STD
2504/LW	2505/CW	2508/LW	2509/STW	2514/LW	2515/STW	2533/LI
2534/STW	2535/STW	2557/LI	2558/STW	2561/LW	2562/CI	2586/STW
2597/LW	2598/SAS	2601/LW	2617/LW	2618/AW	2619/AW	2620/STW
2621/LI	2622/STW	2623/STW	2625/STW	2629/CW	2631/LW	2633/AND
2634/EOR	2639/CW	2645/SCD	2649/LW	2650/STW	2657/LW	2658/STW
2661/LW	2662/STW	2685/LI	2686/STW	2698/LW	2699/STW	2700/STW
2737/LI	2738/STW	2739/STW	2740/LW	2741/SAS	2742/AND	2743/STW
2745/LI	2746/STW	2748/LW	2750/CS	2768/LW	2769/STW	2770/LW
2771/STW	2774/LW	2775/STW	2776/LW	2777/STW	2805/LI	2806/STW
2861/LW	2863/LW	2864/STW	2867/LI	2868/AW	2869/SAS	2870/AW
2871/STW	2875/LW	2877/LI	2880/AW	2881/STW	2889/LW	2890/SAS
2893/AW	2895/AW	2898/STW	2901/LI	2903/STD	2919/LW	2921/LI
2945/MTW	2958/LW	2961/CW	2963/LW	2964/STW	2967/LW	2968/STW
2970/LI	2971/STW	3029/LW	3030/SAS	3031/LW*	3034/LW*	3043/LW
3045/LW	3046/STW	3047/LW	3048/STW	3056/LW	3057/STW	3069/LW
3070/STW	3072/LW	3073/SAS	3074/LD*	3089/LW	3090/LW	3094/LW
3095/CW	3097/CW	3101/LW	3102/CW	3104/CW	3108/LW	3109/CW
3111/CW	3115/LW	3116/CW	3118/CW	3122/LW	3123/CW	3125/CW
3238/LW	3239/STW	3244/LW	3245/STW	3259/LW	3260/STW	3321/LW
3322/CI	3324/AI	3325/SAS	3326/STW	3368/LW	3370/SCD	3371/STW
3454/LW	3456/AW	3458/LW	3460/SCD	3466/AW	3467/STW	3480/LI
3481/AW	3482/LW*	3483/LW	3494/SLS	3495/AW	3496/STW	3497/LW
3498/AW	3499/STW	3501/LW	3502/STW	3504/LI	3505/STW	3523/LI
3525/LI	3531/AI	3533/AI	3536/AI	3539/AI	3543/AI	3546/AI
3549/AI	3554/AI	3557/AI	3560/AI	3565/AI	3568/AI	3571/AI
3574/AI	3577/SAS	3578/CI	3632/LW	3633/STW	3634/LW	3635/AND
3636/STW	3639/LW	3640/AND	3641/STW	3642/LW	3643/STW	3644/LI
3647/AW	3648/STW	3649/LW	3650/STW	3656/LI	3657/STW	3659/LI
3660/STW	3661/LI	3663/STD	3674/LI	3675/STW	3676/STW	3677/STW
3684/LI	3685/STW	3686/LI	3708/LW	3709/SAD	3710/STD	3711/LD
3715/BR	3720/STD	3721/LI	3723/STD	3743/LD	3748/BR	3749/STD
3750/LI	3752/STD	3757/LD	3758/SAD	3759/STW	3769/LW	3770/STW
3773/LI	3774/STW	3776/LI	3777/STW	3778/LI	3779/STW	3800/LW
3801/STW	3802/LW	3803/AND	3804/BR	3805/STW	3806/LW	3807/SAD
3808/LW	3809/SAD	3811/LW	3812/SAD	3813/LW	3814/SAD	3816/LW
3817/CW	3819/LI	3821/STD	3878/LI	3879/STW	3911/LW	3912/CW
3953/LW	3954/AW	3955/AW	3960/LB	3961/CI	3971/SCD	3972/STW
3986/LI	3987/STW	3996/LI	3997/STW	4009/LW	4011/SCD	4012/STW
4028/LW	4029/STW	4031/LW	4032/STW	4049/LW	4050/STW	4054/LW
4055/STW	4074/LW	4075/STW	4079/LW	4080/STW	4097/LW	4098/STW
4156/LW	4157/STW	4158/AI	4159/AW	4160/STW	4161/LW	4162/AW
4163/AI	4166/CW	4168/GCD	4169/STW	4182/LI	4183/STW	4184/LI
4185/STW	4186/LI	4187/STW	4188/LI	4189/STW	4271/LD	4272/STD
4273/LI	4274/STW	4288/LW	4293/LW	4294/STW	4296/LW	4297/STW
4303/LW	4305/STW	4329/LK	4330/STW	4336/LW	4337/STW	4338/LW
4339/STW	4348/LI	4349/STW	4351/LI	4352/STW	4353/LI	4355/STD
4366/LI	4367/STW	4374/LI	4375/STW	4376/STW	4377/STW	4399/LI
4401/STW	4402/STW	4406/LW	4408/STW	4409/LW	4411/STW	4427/LI
4436/LI	4445/LI	4458/SCS	4461/AW	4462/STW	4471/LI	4472/STW

RB

	4473/LW	4474/STW	4475/LW	4476/STW	4480/LCW	4481/STW	4482/LW
	4483/STW	4487/LI	4489/STD	4503/LW	4504/AND	4506/LCW	4507/STW
	4512/LW	4513/AND	4517/LD	4518/STD	4524/SCD	4525/STW	4527/LD
	4528/STD	4536/LW	4537/SCS	4538/STW	4540/LH	4541/AND	4543/LI
	4545/LI	4546/AW	4547/STW	4553/LW	4554/STW	4556/LCW	4557/STW
	4559/LW	4560/CI	4562/LI	4563/STW	4568/LW	4569/STW	
R9							
	260=EGU	502/LI	603/STW	675/LW	683/CW	688/CW	705/MTW
	710/MTW	757/MTW	771/AI	778/CI	782/CW	789/CW	798/CW
	810/CI	812/SAS	813/BR	816/SAS	817/BR	819/STW	863/LI
	900/LI	915/STW	918/MTW	994/MTW	1045/LI	1051/LI	1059/XW
	1061/XW	1066/LI	1072/LI	1079/LI	1088/LI	1105/LW	1238/MTW
	1240/CI	1243/MTW	1249/CI	1251/LW	1260/MTW	1262/CI	1269/MTW
	1471/AND	1472/CW	1474/STW	1477/STW	1479/LW	2215/LW	2216/LW
	2224/CI	2237/LW	2238/STW	2278/LW	2281/BR	2282/LW	2284/LW
	2286/LI	2292/STW*	2297/AI	2331/LI	2350/LW	2352/LW	2357/AI
	2359/CW*	2364/LW	2376/LW*	2422/LW	2424/LW	2425/AI	2427/STW*
	2430/AI	2500/LI	2631/LW	2636/AND	2642/CW	2749/LW	2878/LW
	2879/AND	2880/AW	2896/LI	2897/STW	2902/LI	2928/LW	2927/STW
	2928/LW	2929/STW	3369/LW	3372/STW	3459/LI	3464/SCS	3466/AW
	3482/LW	3483/LW	3484/AW	3485/CW	3491/SW	3492/AND	3493/STW
	3519/STCF	3540/SCS	3541/CI	3544/CI	3583/SAS	3662/LI	3719/BR
	3722/LI	3744/BR	3751/LI	3810/STW	3815/STW	3820/LI	3969/LW
	3970/SCS	4010/LW	4013/STW	4164/LW	4165/AW	4166/CW	4304/LW
	4306/STW	4309/LW	4354/LI	4459/LW	4460/SAS	4461/AW	4465/LI
	4466/STW	4467/LW	4468/STW	4469/LI	4470/STW	4488/LI	4522/LW
	4523/SCS						
SAI8XPSD							
	3259/LW	3264*XPSD					
SAVEBITS							
	2492/AW	2535/STW	3493/STW	3507*DATA	4358/AW	4377/STW	
SDA							
	2136/STW	2205/LD	4272/STD	4279*DATA			
SDAPNTR							
	2139/STW	4280*DATA					
SECTORS							
	3350/STW	3357*DATA	4111/AW				
SECTRCNT							
	3334/STW	3344/LW	3355*DATA				
SEEK							
	66*DATA	2058/ZFSAT	2744/BAL	3707*STW	4484/BAL	4549/BAL	
SEEKEXIT							
	3707/STW	3725/B*	3729*DATA				
SEEKINDX							
	66*DATA						
SEEKORDR							
	2276/LD	3182*ZFCP	3711/LD				
SEEKSAVE							
	3710/STD	3712/LI	3731*DATA				
SEEK00							
	3721/LI	3722/LI	3725*B				
SENS							
	68*DATA	2059/ZFSAT	3739*STW	3780/B			
SENSALT							
	2747/BAL	3776*LI	4520/BAL				
SENSDECR							
	3968/BAL	4521/BAL	4540*LH				
SENSECTL							
	3771/LW	3786*ZFMW					
SENSEXIT							
	3739/STW	3775/B*	3782*DATA				
SENSINDX							
	68*DATA						
SENSORDR							
	3184*ZFCP	3743/LD					
SENSSAVE							
	2748/LW	2772/LW	3745/LI	3757/LD	3759/STW	3762/LW	3784*DATA
	3975/ZFCP	4288/LW	4540/LH	4546/AW			
SENS00							
	3750/LI	3751/LI	3754*B				
SENS01							

	3761/BCS	3773=LI					
SETINTFL	4509/BEZ	4553=LW					
SILIND	2497/BR	3342/STW	3359=DATA	3671/BR	4363/BR		
SIB	70/DATA	2060/ZFSAT	3798=STW				
SIBEXIT	3798/STW	3842/MTW	3843/B*	3844=DATA			
SIBINDX	70=DATA						
SIBPSCBK	3155/BAL	3851=STW	4485/BAL				
SIBPSEXT	3851/STW	3869/B*	3870/MTW	3872=DATA			
SIBPSOO	3858/BCR	3870=MTW					
SIBSTAT	3160/STD	3161/STCF	3173=RES	3825/STD	3826/STCF	3834/STD	3835/STCF
	3837/LD	3879/STW	4256/LD				
SIBOO	3818/BCR	3832=LI					
SIB01	3819/LI	3820/LI	3828=B				
SIB02	3828/B	3831/B	3836=LW				
SKSNSTYP	3760/MTW	3774/STW	3777/STW	3781=DATA			
SKWRPIND	2247=DATA						
SKWRPRBT	2442/STW	2472/STW	2481/MTW	3203=DATA	3643/STW	3652/MTW	4339/STW
	4344/MTW	4376/STW					
KOO	2277/LI	2286/LI	2318=RES				
SMHDGCTL	2696/LW	2727=ZFMW					
SMHDGMSG	2727/ZFMW	2728=TEXT					
STATCLR	3152/BAL	3240/BAL	3799/BAL	3877=LI	4491/BAL		
STATHDG	3887/STW	3911/LW	3925=TEXT	3927/ZFMW			
STATSAVE	3892/STW	3897/LW	3922/LW	3926=DATA			
STATTYPE	2191/BAL	3132/BAL	3136/BAL	3140/BAL	3248/BAL	3838/BAL	3863/BAL
	3886=STW	4058/BAL	4083/BAL	4258/BAL			
STCFSAVE	4130/STCF	4133/LCF	4136/STW	4141/LW	4144=DATA		
STCHPSAV	2187/STW	2193/CW	2199=DATA	3239/STW	3801/STW	3840/CW	4050/STW
	4075/STW	4085/CW					
STDAIB	3268/DATA	3933=AIB					
STDAIBOO	3392/B	3940/BCR	3949=LW				
STDEXIT	3950/STH	3959/BCR	3962/BL	3973=B			
STDSENSE	3963/LI	3975=ZFCP					
STDTACTL	3920/LW	3928=ZFMW					
STEP	72/DATA	2061/ZFSAT	3985=STW				
STEPCNT	4532/BCR	4558=MTW					
STEPEXIT	3985/STW	3999/B*	4000=DATA				
STEPINDX	72=DATA						

STEPIND	2220/MTW	3987/STW	3997/STW	4001=DATA			
STHDGCTL	3893/LW	3927=ZFMW					
STNDAIB	3264/XPSD	3266=DATA	3938/LPSD				
STBP	75/DATA	2062/ZFSAT	4008=STW				
STBPCTL	4014/LW	4019=ZFMW					
STBPEXIT	4008/STW	4017/B*	4018=DATA				
STBPINDX	75=DATA						
STTYEXIT	3886/STW	3923/B*	3924=DATA				
STT00	3898=LI	3905/BIR					
TCDA	77/DATA	2063/ZFSAT	4025=STW	4153/BAL			
TCDAEXIT	4025/STW	4036/B*	4037=DATA				
TCDAINDX	77=DATA						
TCDAMCTL	4034/LW	4038=ZFMW					
TDV	78/DATA	2064/ZFSAT	4048=STW				
TDVEXIT	4048/STW	4062/MTW	4063/B*	4064=DATA			
TDVINDX	78=DATA						
TDVSTAT	2517/LW	3006/CW	3012/CW	3018/CW	3029/LW	3061/LH	3072/LW
	3095/CW	3102/CW	3109/CW	3116/CW	3123/CW	3133/LD	3176=RES
	3385/STD	3386/STCF	3942/STD	3943/STCF	4052/STD	4053/STCF	4057/LD
	4503/LW	4512/LW					
TEXTAIB	2190/LW	3131/LW	3196=TEXT	3912/CW			
TEXTCDA	4028/LW	4039=TEXT					
TEXTCWRT	2467/LW	3201=TEXT					
TEXTHIB	3139/LW	3194=TEXT	3246/LW				
TEXTILEG	3043/LW	3146=TEXT					
TEXTMARK	3371/STW	3372/STW	3377/ZFMW	3378=TEXT			
TEXTMNUS	2827/BR	2834=DATA					
TEXTREAD	3198=TEXT	3632/LW					
TEXTSEEK	3199=TEXT						
TEXTSENS	3200=TEXT	3769/LW					
TEXTSIB	3192=TEXT	3836/LW	4257/LW				
TEXTSPCE	3191=TEXT						
TEXTSTBP	4012/STW	4013/STW	4019/ZFMW	4020=TEXT			
TEXTTDV	3135/LW	3195=TEXT	4056/LW				
TEXTTIB	3193=TEXT	3861/LW	4081/LW				
TEXTWRT	3045/LW	3197=TEXT	4329/LW				
TIB	80/DATA	2065/ZFSAT	4073=STW				

TIBEXIT	4073/STW	4087/MTW	4088/B*	4089=DATA				
TIBINDX	80=DATA							
TIBSTAT	3174=RES 4499/STD	3856/STD	3857/STCF	3862/LD	4077/STD	4078/STCF	4082/LD	
TRACKS	3351/STW	3356=DATA	4109/AW					
TRY	82/DATA	2066/ZFSAT	4097=LW					
TRYINDX	82=DATA							
TSUPDATE	2219/BAL	4107=LI						
TWLPGB	4123/B	4125/B	4127/B	4129=STW				
TXTSUMRY	2658/STW	2661/LW	2724/ZFMW	2726=TEXT				
PE	83/DATA	2067/ZFSAT	4152=STW					
TYPBEXIT	4152/STW	4171/B*	4172=DATA					
TYPBINDX	83=DATA							
TYPC	84/DATA	2068/ZFSAT	2965/BAL	4181=STW				
TYPCEXIT	4181/STW	4192/B*	4193=DATA					
TYPCINDX	84=DATA							
TYPEXIT	4129/STW	4142/B*	4143=DATA					
TYPEOXIT	4132/LI	4135=BAL						
TYPE00	3374/BAL	3488/BAL	4122=LCI	4448/BAL				
TYPE01	2122/BAL 2765/BAL 3860/BAL	2371/BAL 2779/BAL 4015/BAL	2384/BAL 3067/BAL 4035/BAL	2523/BAL 3318/BAL 4124=LCI	2594/BAL 3391/BAL 4155/BAL	2665/BAL 3581/BAL 4238/BAL	2684/BAL 3772/BAL 4255/BAL	
TYPE10	3088/BAL 4126=LCI	3093/BAL 4308/BAL	3100/BAL	3107/BAL	3114/BAL	3121/BAL	3128/BAL	
TYPE11	2695/BAL	2697/BAL	2713/BAL	3894/BAL	3921/BAL	4128=LCI		
ISTFUL	4241/ZFMW	4242=TEXT						
UNIT	85/DATA	2069/ZFSAT	4211=STW					
UNITEXIT	4211/STW	4222/B*	4239/B*	4240=DATA				
UNITINDX	85=DATA							
UNITLIST	2113/LW 4233/STW	2115/STW 4243=RES	2125/LW	2132/STW	2233/LW	4215/STW	4231/CW	
UNIT00	4213/BNEZ	4217=LI						
UNIT01	4221=BIR	4235/B						
UNIT02	4237/LW	4241=ZFMW						
UNSTRYP	3163/BAL	4250=STW						
UPAD	86/DATA	2070/ZFSAT	4271=LD					
UPADINDX	86=DATA							
STRCTL	4254/LW	4264=ZFMW						

UBSTRTEXT	4250/STW	4262/B*	4263*DATA				
USTRMSG	4264/ZFMW	4265*TEXT					
WAIT01	103*DATA						
WAIT02	105*DATA						
WAIT03	107*DATA						
WAIT04	109*DATA						
WAIT05	111*DATA						
WAIT06	113*DATA						
WAIT07	115*DATA						
WAIT1	103/DATA	2123*WAIT					
WAIT2	105/DATA	2756*WAIT					
WAIT3	107/DATA	2932*WAIT					
WAIT4	109/DATA	3866*WAIT					
WAIT5	111/DATA	4016*WAIT					
WAIT6	113/DATA	4261*WAIT					
WRKADDR	2137/STW	2238/STW	2329/STW	2511/LW	2654/LW	2740/LW	2750/CS
	2766/LW	3053/LW	3159/SI*	3202*DATA	3245/STW	3384/TDV*	3387/HI*
	3805/STW	3852/TI*	3916/LW	3941/TDV*	3944/HI*	3964/SI*	3965/TI*
	3969/LW	3972/STW	3994/STW	4055/STW	4080/STW	4251/HI*	4290/LW
	4309/LW	4314/STW	4468/STW	4493/SI*	4495/TI*	4522/LW	4525/STW
	4536/LW	4551/HI*	4569/STW				
WRPRBRDR	2468/STW	3633/STW	4296/LW	4318*DATA	4330/STW		
WRPRTCHK	2483/BAL	3654/BAL	4286*STW	4315/B	4346/BAL		
WRPRTCTL	4307/LW	4317*ZFMW					
WRPRTXIT	4286/STW	4289/BCR*	4316*DATA				
WRT	88/DATA	2071/ZFSAT	4328*STW				
WRTEXT	4328/STW	4335/B*	4368/B*	4378/B*	4379*DATA		
WRTIND	2271/STW	2310/STW	2983/MTW	3954/AW	4349/STW	4352/STW	4367/STW
	4375/STW	4380*DATA					
WRTINDX	88*DATA						
WRTBRDR	2272/LD	3178*ZFCP	4359/BR	4362/BR			
WRTPRBG	3496/STH	3499/STH	3501*LW				
WRT00	4353/LI	4366*LI					
WRT01	4354/LI	4369*BAL					
WRT02	4343*BAL	4373/B					
WRT03	4332/BEZ	4334/B	4336*LW				
XCWT	89/DATA	2072/ZFSAT	4424*STH				
XCWTINDX	89*DATA						
XDCNFLG							

XFLAGS	4473/LW	4579>ZFCP				
XGEN	4553/LW	4580>ZFCP				
XGENEXIT	90/DATA	2073/ZFSAT	4397=STH			
XGENFLG	4397/STH	4407/BEZ	4415=B			
XGENINDX	4398/MTW	4419=DATA	4425/MTW	4434/MTW	4443/MTW	
XMASK1	90=DATA					
XMASK2	4500/AND	4501/CW	4582=DATA			
XNOTBUSY	4504/AND	4513/AND	4583=DATA			
XORDER	4502/BNE	4512=LW				
XDS	4462/STW	4474/STW	4492/LI	4554/STW	4575=DATA	4577/ZFCP
XRDSINDX	93/DATA	2074/ZFSAT	4442=STH			
XSCCTEMP	93=DATA					
XSECTCNT	4472/STW	4475/LW	4584=DATA			
XSENSAVE	4476/STW	4506/MTW	4558/MTW	4559/LW	4581=DATA	
XSTATSAV	4488/LI	4514/BCS	4516=LI	4552/B		
XUNITCTR	4518/STD	4527/LD	4574=RES			
XUNITPTR	4464/STW	4564/MTW	4585=DATA			
XWAIT	4466/STW	4467/LW*	4567/MTW	4568/LW*	4586=DATA	
XWCREXIT	115/DATA	4487/LI	4494=WAIT	4511/B	4555/B	
XWEXIT	4424/STH	4433/STH	4442/STH	4449/B	4565/BEZ	4571=B
XWRCMBN	4515/B	4562=LI				
XWRT	4428/B	4437/B	4446/B	4458=SCS		
XWRTINDX	94/DATA	2075/ZFSAT	4433=STH			
XADDPTR	94=DATA					
XXCNR	4470/STW	4482/LW*	4566/MTW	4587=DATA		
XXSTADDR	4401/STW	4413/MTW	4416=DATA	4463/LCW		
XXULIST	4411/STW	4418=RES	4469/LI			
XXUNITGB	4402/STW	4408/STW	4417=RES	4465/LI		
X1	4473=LW	4570/B				
	241=EGU	496/STH	497/STH	498/LH	499/STH	506/STH
	521/STH	612/STH	613/B	630/STH	898/LH	1004/STH
	1006/STH	1019/CB	1102/LH	1121/STH	1124/SW	1129/LH
	1133/STH	1134/AH	1135/STH	1162/LH	1163/STH	1169/LH
	1346/LI	1352/STB	1353/BIR	1364/STW	1365/LI	1367/CB
	1371/BIR	1382/LI	1390/BIR	1398/LI	1422/STH	1423/LH
	1433/STH	1441/STH	1457/BCR	1459/B	1528/CW	1548/STB
	1589/CH	1611/STH	1621/STH	1622/AH	1623/STH	1636/STH
	1658/STB	1666/STB	1675/LH	1676/AH	1677/STH	1716/LH
	1791/LH	2233/LW	2395/STH	2418/STH	2850/STH	3031/LW
	3476/STH	3496/STH	3499/STH	3550/STH	4139/STW	4397/STH
	4433/STH	4442/STH				519/STH
						1005/LH
						1130/CH
						1170/CH
						1370/STB
						1424/STH
						1588/LH
						1651/STH
						1742/LH
						3061/LH
						4424/STH

X3	242=EQU	1021/CB	1399/LI	1614/LB			
	243=EQU	895/STB	907/CB	922/CP	1101/STB	1161/STB	1400/LI
	1497/STCF	1613/STB	1618/STB	1638/LP	1645/STB	1647/LB	1653/LB
	1662/LB	1665/MTB					
X4	244=EQU	2113/LW	2115/STW	2125/LW	2132/STW	2629/CW	2632/LW
	2672/LW	3069/LW	3070/STW	3421/STB	3879/STW	3904/STB	3909/STB
	4215/STW	4219/LW					
X5	245=EQU	2676/LW	4231/CW	4233/STW			
X6	246=EQU	680/STW	691/STW	1568/LI	1572/BIR	2290/STD	2291/STD
	2302/STD	2427/STW	2564/LW	2574/STW	2581/LW	2874/LI	2875/LW
	2882/AI	2883/CI	2885/LI	3045/LW	4408/STW	4411/STW	
X7	247=EQU	449/LW	540/LI	541/LW	544/BIR	551/LI	552/LW
	555/BIR	679/LI	680/STW	681/CW	683/CW	685/BIR	688/CW
	690/BIR	773/LW	774/SW	776/LW	792/AND	801/LW	806/MTW
	807/STW	809/BIR	837/LI	838/CW	840/BIR	843/LW	914/EXU
	925/LI	926/LW	929/BIR	1032/LCW	1035/SCS	1036/LW	1037/SAD
	1145/LB	1499/LI	1500/LW	1502/STW	1503/BIR	1524/LI	1533/STB
	1555/CI	1567/MTW	1570/STB	1571/MTW	1574/STB	1575/CI	1723/LI
	1729/STW	1730/BIR	1894/LI	1896/STW	1897/BIR	2359/CW	2376/LW
	2508/LW	2509/STW	2514/LW	2515/STW	2625/STW	2641/MTW	2644/MTW
	2649/LW	2650/STW	2657/LW	2658/STW	2661/LW	2662/STW	2706/LW
	2709/LW	2853/CI	2855/LI	2856/SAS	2857/STW	2858/AI	2864/STW
	2866/BIR	2872/LW	2873/AI	2878/LW	2881/STW	2887/BIR	2888/LW
	2898/STW	2900/BIR	2927/STW	2929/STW	2930/LW	2946/LW	3056/LW
	3057/STW	3501/LW	3502/STW	3580/LW	3637/LW	3638/AW	3639/LW
	3641/STW	4031/LW	4032/STW	4293/LW	4294/STW	4402/STW	4406/LW
	4409/LW	4516/LI	4517/LD	4518/STD	4519/BIR	4526/LI	4527/LD
	4528/STD	4529/BIR					
ZADCRC	1206=STW	1745/BAL					
ZADPTR	712/BAL	732/BAL	763/BAL	861/BAL	1182=LB	1207/BAL	
ZALT	1466=STW	2035/ZFSAT					
ZALT05	1472=CW	1480/B					
ZALT10	1467/BAL	1469/BAL	1476/BAL	1481=CI			
ZAP1	336=CNAME						
ZAS	582=ZFBT						
ZASLNK	282=EQU	753/STW	764/B*				
ZASPRB	759/LW	1817/ZFST2	1818=B				
ZASTRN	582/ZFBT	753=STW					
ZASTRN10	758/BCR	763=BAL					
ZBPT1	1737/BAL	1751/BAL	1763=RD	1809/BAL			
ZBTD	1318=STW	2800/BAL					
ZBTD10	1324=LI	1331/B					
ZBTD20	1326/BCS	1332=LW					
ZBTD30	1327/DW	1338=DATA					
ZBTH	1157/BAL	1345=STW	1353/BIR	1450/BAL	1517/BAL	1536/BAL	1544/BAL
	1566/BAL	2807/BAL					
ZCFR	1016=STW	1040/B	1046/BAL	1052/BAL	1067/BAL	1073/BAL	1080/BAL
	1083/BAL	1089/BAL	1092/BAL				

ZCFRCA	295=EGU 1036/LW*	1016/STW 1038/LB*	1019/CB*	1021/CB*	1024/CW	1032/LCW*	1033/LB*
ZCFRLNK	294=EGU	1017/STW	1020/BCS*	1022/BCS*	1029/BCS*		
ZCHAR	299=EGU	533/STW	1116/LW	1146/STW			
ZCL	585=ZFBT						
ZCLLNK	275=EGU	643/STW	651/B*				
ZCLTRN	585/ZFBT	643=STW					
ZCMS	1865=LPSD	1913/DATA	1920/EGU	4590/END			
ZCMST40	375/XPSD	1865/LPSD	1911=DATA				
ZCMS2	1902/LW	1905=ZFMW					
ZCMS3	1905/ZFMW	1906=TEXT					
ZCMS5	1892/LW	1908=XPSD					
ZCMS6	1867/SW	1909=DATA					
ZC0	583=ZFBT	905/CB					
ZC0LNK	284=EGU	888/STW	940/B*				
ZC0NINT	440/DATA	1769=LI	2023/ZFSAT				
ZC0TRN	857/BAL	877/BAL	888=STW				
ZC0TRN10	899=LI	919/BCR	921/B				
ZC0TRN30	906/BCR	908/BCR	913=SAS				
ZC0TRN40	910/BCR	916=MTW					
ZC0TRN50	904/BCS	922=CB					
ZC0TRN60	928/BCR	932=LW					
ZCRC	1220=LB						
ZCSRL	1057/STW 1374/B* 1608/BCS*	1062/B* 1402=PZE 1610/BCS*	1318/STW 1466/STW 1626/LB	1332/LW 1473/BCS* 1678/B*	1345/STW 1483/B*	1356/LW 1601/STW	1363/STW 1603/LB
ZCTL	377/XPSD 386/XPSD 397/XPSD 405/XPSD	379/XPSD 387/XPSD 398/XPSD 406/XPSD	380/XPSD 388/XPSD 399/XPSD 407/XPSD	382/XPSD 389/XPSD 400/XPSD 409/XPSD	383/XPSD 390/XPSD 402/XPSD 410/XPSD	384/XPSD 395/XPSD 403/XPSD 442=DATA	385/XPSD 396/XPSD 404/XPSD
ZDCR	1169/LH	1414=BAL	1588/LH	2032/ZFSAT			
ZDECA DER	1381=STW						
ZDKB	498/LH	1129/LH	1408=BAL	1625/LW	1634/CW	2031/ZFSAT	
ZDMP	1492/B	1496=LCF1	2036/ZFSAT	4170/BAL			
ZDMPA	1521/STW 1545/STW 2375/STW 2515/STW 2674/STW 2700/STW 3046/STW 3065/STW	1522/STW 1546/STW 2378/STW 2520/STW 2675/STW 2705/STW 3048/STW 3070/STW	1523/STB 1570/STB 2379/STW 2521/STW 2678/STW 2708/STW 3051/STW 3078/STW	1533/STB 1574/STB 2381/STW 2539/ZFMW 2679/STW 2711/STW 3052/STW 3079/STW	1540/STW 1584/ZFMW 2382/STW 2650/STW 2681/STW 2722/ZFMW 3057/STW 3080/STW	1541/STW 1950=EGU 2389/ZFMW 2662/STW 2682/STW 2723/ZFMW 3060/STW 3084/STW	1542/STB 2374/STW 2509/STW 2670/STW 2699/STW 2725/ZFMW 3064/STW 3085/STW

	3086/STW 3786/ZFMW 4038/ZFMW 4306/STW	3144/ZFMW 3904/STB 4139/STW 4317/ZFMW	3147/ZFMW 3909/STB 4294/STW	3765/STW 3919/STW 4297/STW	3766/STW 3928/ZFMW 4300/STW	3768/STW 4029/STW 4302/STW	3770/STW 4032/STW 4305/STW
ZDMP10	1515=LW	1553/BCS					
ZDMP20	1527=LW	1561/BCS	1578/BCS				
ZDMP22	1534=LW	1564/BCS					
ZDMP24	1497/STCF	1548=STB	1558/B	1576/BCS	1579/B		
ZDMP30	1529/BCR	1555=CI					
ZDMP40	1531/BCR	1566=BAL					
ZDMP50	1552/BAL	1560/BAL	1577/BAL	1580=LW			
ZDMP70	1548/STB	1549/LW	1584=ZFMW				
ZDS	510/ZFMW	580=ZFOT					
ZDSFLG	302=EQU 1282/MTW	518/STW 1899/STW	604/MTW	610/STW	628/STW	848/MTW	981/MTW
ZDSLNK	292=EQU	601/STW	613/B*	617/STW	633/B*		
ZDSPTR	293=EQU	607/STW	631/LW				
ZDSSET	508/BAL	611/LI	617=STW				
ZDSSET10	620/BCR	628=STW					
ZDSTRN	503/BAL	580/ZFOT	601=STW				
ZDTB	1060/BAL	1292=XW					
ZDTB10	1294/AND	1310=DATA					
ZDTB20	1299/AND	1311=DATA					
ZEMS	1472/CW 1888/LW	1501/AND	1507/CW	1863=DATA	1866/LW	1868/STW	1884/LW
ZEQ	586=ZFOT						
ZEQLNK	276=EQU	673/STW	692/B*				
ZEQTRN	586/ZFOT	673=STW					
ZEQTRN10	678/BCR	682/BCR	686=LI	689/BCR			
ZEQTRN20	684/BCR	690=BIR					
ZEXADR	526/LW	986/LW	1875/AW	1900/LW	4588=EQU	4589/DATA	
ZEXPT0	606/LW 756/STW* 875/STB* 1001/LW 1701/LW* 1929=EQU	624/LW* 760/STW* 892/LB* 1182/LB* 1712/LB* 1930/EGU	658/LW 802/LW 896/LH* 1185/AW 1738/LB*	661/STW* 813/BR 936/LR* 1190/STW 1752/LR*	702/STW* 844/STW* 939/STB* 1220/LB* 1795/STW	707/LW 845/LB* 984/STW* 1233/LB* 1831/STW	727/STW* 855/STB* 987/CW 1247/STB* 1839/LW
ZEXPT1	731/STW* 1103/STW* 1225/STW* 1743/CH*	793/STW* 1105/LW* 1253/STW* 1788/LW*	817/BR 1108/MTB* 1691/LW* 1794/LW*	889/LW 1191/STW 1716/LW* 1930=EGU	901/STW* 1195/MTW 1718/LW 1931/EGU	915/STW* 1196/LW 1741/MTW*	989/STW* 1223/LH* 1742/LH*
ZEX00	1009/B	1691=LW	1755/LI	1804/B	1811/B		
ZEX01							

ZFA	1693-BAL	1744/BCR	1746/B					
ZFAN	550/BAL	676/BAL	1082-LI					
ZFCP	1091-LI							
ZFH	307-FORM							
ZFMW	949/BAL	1023/LI	1072-LI	1468/BAL	1475/BAL			
ZFN	312-CNAME							
ZFNDB	946/BAL	1051-LI	1058/BAL					
ZFNUP	539/BAL	947/BAL	1057-STW					
ZFBC	945/BAL	1045-LI						
ZFCT	648/BAL	1018/BAL	1100/BAL	1104/BAL	1115-STW			
ZFOT	948/BAL	1066-LI						
ZFS	308-FORM							
ZFSAT	572-ZFOT	865/CB	866/BCR*					
ZFSLNK	328-CNAME							
ZFSPR0	285-EQU	979/STW	982/BCS*					
ZFSTRN	983/LW	1808/ZFST2	1809-BAL	1818/B				
ZFST2	572-ZFOT	979-STW						
ZFTF	320-CNAME							
ZG0PR0	301-EQU	1717/STW						
ZG0PTR	1801-LI	2030/ZFSAT						
ZHLT	519/STH	1004/STH	1802-LI					
ZHLTMSG	1448-STW	2038/ZFSAT						
ZIL5F	1451/STW	1452/LW	1460/ZFMW	1461-TEXT				
ZIL56	410-XPSD	1895/LW	1896/STW					
ZIL56M	436/DATA	478-LW						
ZI0ADR	476-TEXT	478/LW	479/LW					
ZI0WDS	1122/LW	1874/STW	1877/AWM	1885/SW	1927-EQU	1928-EQU	2278/LW	
ZISD	2352/LW	2365/SW	2424/LW	2490/LW	2617/LW	2889/LW	3429/AW	
ZIS6	3478/AW	3497/LW	3634/LW*	3636/STW*	3638/AW	3664/LW	3811/LW	
ZKBCR10A	4159/AW	4162/AW	4165/AW	4356/LW	4459/LW			
ZLBADR	1886/STW	1928-EQU	1929-EQU	2263/CW	3302/LW	3477/LW	4164/LW	
ZLBPTR	408/XPSD	438-DATA						
ZKADR	401/XPSD	434-DATA						
ZL56	1408/BAL	1414/BAL	1419-LI					
ZL56M	528/LW	724/CW	992/CW	1890/STW	1920-EQU	1921-EQU		
ZL56M	529/STW	708/STW*	709/MTW	723/LW	728/MTW	729/LW*	991/LW	
ZL56M	1891/STW	1921-EQU	1922-EQU					
ZL56M	524/LW	1197/CW	1827/CW	1841/CW	1882/STW	1922-EQU	1923-EQU	

ZLKA8	755/LI	1825•LI					
ZLKPTR	525/STW 1851/STW*	1826/LW 1852/MTW	1829/MTW 1883/STW	1830/LW* 1923•EQU	1838/LW 1924/EQU	1845/STW	1847/LW
ZLKSET	1756/B	1810/BAL	1838-LW				
ZLP	581•ZF0T						
ZLPD	1632/BCR	1636•STH					
ZLPD10	1642/BCR	1647•LB					
ZLPLNK	278•EQU	699/STW	711/BCR*	713/B*			
ZLPPR0	701/LW	1780•ZFST2					
ZLPTRN	581/ZF0T	699•STW					
ZLSTCH	300•EQU	645/LW	1117/STW				
ZMFRCWO	1121/STH	1138/LI	1150•ZFCP				
ZMFRCW1	1133/STH	1151•ZFCP					
ZMFRDA	499/STH 1589/CH	1130/CH	1136/TT0*	1139•S10	1141/TT0*	1170/CH	1422/STH
ZMFRI0AD	494/LW	823/CW	1876/STW	1926•EQU	1927/EQU		
ZMFRI0F	1125/BCR	1156•LI					
ZMFRLNK	297•EQU	1115/STW	1148/B*				
ZMFRNBA	497/STH	1006/STH	1119•CI	1124/SH	1135/STH	1163/STH	1424/STH
ZMFRTCBA	1120/BCS	1145•LB					
ZMFRX7	496/STH 1423/LH	1005/LH	1102/LH	1118•LI	1134/AH	1147/MTW	1162/LH
ZML1E	273•EQU						
ZML1F	274•EQU						
ZML10	271•EQU	1644/STB	1658/STB	1666/STB			
ZML14	272•EQU						
ZMPTWA	623/BAL	1694/BAL	1712•LB				
ZMS	577•ZF0T	859/CB	860/BCR*	879/CB	880/BCR*	1173/B*	
ZMSGKEY	1433/STH	1609•CI					
ZMSLNK	277•EQU	657/STW	664/B*				
ZMSTRN	577/ZF0T	657•STW					
ZNL	532/LB	561/ZFMW	574•ZF0T	646/CB	649/CB		
Z0PBEG	570•EQU	579/EQU	596/EQU				
Z0PLEN	540/LI	551/LI	596•EQU				
Z0PLN2	579•EQU	925/LI					
Z0PTBL	541/LW	552/LW	595•EQU				
Z0PTB2	578•EQU	926/LW					

ZPCHK							
ZPCHK1	290=EQU	890/STW	933/SW				
ZPCNT	291=EQU	891/STW	920/STW	932/LW			
ZPC010	289=EQU	894/STW	897/SW	903/MTW			
ZPC020	489=BAL	511/B	1168/BCS	1171/BCP	1773/B	1904/B	
ZPC030	500=LW	509/B					
ZPC050	505/LI	508=BAL					
ZPC200	500/LW	510=ZFMW					
ZPC210	516=BAL	2028/ZFSAT					
ZPC5	507/B	532-LB					
ZPC6	950/BAL	1079-LI					
ZPC7	951/BAL	1088-LI					
ZPC7LNK	952/BAL	1099=STW					
ZPC7M	296=EQU	1099/STW	1107/BCR*				
ZPD	895/STB	907/CB	922/CB	1101/STB	1106=CI		
ZPDLNK	584=ZF0T						
ZPDTRN	281=EQU	741/STW	745/B*				
ZPL	584/ZF0T	741=STW					
ZPLLNK	575=ZF0T						
ZPLTRN	286=EQU	836/STW	869/B*				
ZPLTRN20	573/ZF0T	574/ZF0T	575/ZF0T	576/ZF0T	583/ZF0T	720/BAL	834=MTW
ZPLTRN30	980/BAL						
ZPMADR	839/BCR	843=LW					
ZPMEN	849/BCS	870-LI					
ZPMEN10	522/LW	773/LW	1849/CW	1879/STW	1924=EQU	1925/EQU	
ZPMEN20	744/BAL	772=STW	808/B				
ZPMEN30	776=LW	809/B1R					
ZPMEN40	779/BCS	786=CI					
ZPMLNK	781/BCS	796-LI					
ZPMPTR	775/BCR	783/BCS	787/BCS	790/BCS	799/BCS	810=CI	
ZPMRQ	283=EQU	772/STW	795/B*	826/B*			
ZPRTYP	523/STW	774/SW	776/LW*	792/AND*	801/LW*	804/MTW	805/LW*
ZPTY	807/STW*	819/STW*	821/LW	825/STW	1880/STW	1925=EQU	1926/EQU
ZRECOV	762/BAL	771=AI	997/BAL	1242/B			
ZTN1	914/EXU	945=BAL					
	288=EQU	898/STW	902/LB*	916/MTW			
	490/LW	511-B					

ZREYN1A	1706/B	1736=BAL					
ZRETN2	1740/BCR	1745=BAL	1754/BCR	1750/ZFST2	1793/BCS	1796/B	1832/B
ZRP	1707/B	1750=BAL					
ZRPLNK	571=ZFOT	867/CB	868/BCR*				
ZRPPR0	279=EQU	719/STW	730/BCR*	733/B*			
ZRPTRN	726/LW	1787/ZFST2	1788=LW				
ZSCIR	571/ZFOT	719=STW					
ZSHD	489/BAL	516/BAL	618/BAL	627/BAL	1397-LI	1504/BAL	1602/BAL
ZSML	1693/BAL	1736/BAL	1750/BAL	1898/BAL			
ZSML40	1439=LI	2034/ZFSAT					
ZSNER	1431=LW	2033/ZFSAT					
ZSNERMW	483/BAL	1165/BAL	1594=LCFI	1903/BAL			
ZSNMSG	557/B	647/BCS	687/B	725/BCR	785/B	824/BCS	842/B
ZSP	852/BCR	872/BCR	912/B	931/B	988/BCR	993/BCS	1000/BCS
ZSRADR	1157=BAL	1200/B	1265/B	1278/B	1285/B	1803/BCR	1828/BCR
ZSRBEG	1850/BCS						
ZSRLEN	1164/LW	1174=ZFMW					
ZSRBL	1159/STW	1161/STB	1166/LB	1174/ZFMW	1175=TEXT		
ZSTCRC	573=ZFOT						
ZSTPTR	843/LW	2076=EQU					
ZSUP	1959=EQU	2009=EQU					
ZTEMP	679/LI	837/LI	2009=EQU				
ZTLHLT	681/CW	683/CW	688/CW	691/STW	838/CW	2008=EQU	
ZTLMSG	1213=STW	1692/BAL					
ZTL40	527/BAL	609/BAL	622/BAL	632/BAL	659/BAL	1002/BAL	1190=STW
ZTL40M	1214/BAL	1901/BAL					
ZTL40M1	1363=STW	1371/BIR	2810/BAL	2817/BAL			
ZTL41	1293/STW	1297/AW	1298/STW	1302/AW	1303/STW	1306/AW	1307/STW
ZTL41M	1323/STW	1330/AWM	1335/BR	1336/STW	1354/LW	1364/STW	1372/LW
ZTL43	1373/STW	1381/STW	1392/XW	1474/STW	1477/STW*	1478/MTW	1479/LW
ZTL43	1931=EQU	1932=EQU	2801/LW				
ZTL43	1352/STB	1355/LW	1932=EQU	1933=EQU			
ZTL43	444/DATA	484=WAIT					
ZTL43	451/B	463/B	468/B	473/B	480=STW		
ZTL43	420/DATA	446=STCF					
ZTL43	449/LW	450/LW	452=TEXT	480/STW	481/STW	482/LW	
ZTL43	457=TEXT	459/ZFMW					
ZTL43	424/DATA	461=LW					
ZTL43	461/LW	462/LW	464=TEXT				
ZTL43	428/DATA	466=LW					

ZTL43M			469=TEXT				
ZTL46	466/LW	467/LW					
ZTL46M	432/DATA	471=LW					
ZTMNCR	471/LW	472/LW	474=TEXT				
ZTRN10	501/BAL	531/BAL	663/BAL	1008/BAL	1588=LH		
ZTRN100	520/LI	538=LI	559/BAL	560/B	629/LI		
ZTRN40	530/LW	561=ZFMW	662/LW	1007/LW			
	546/BCS	548/BCS	556=LI	567/ZFOT	588/ZFOT	589/ZFOT	590/ZFOT
	591/ZFOT	592/ZFOT	593/ZFOT	594/ZFOT			
ZTRN50	543/BCR	554/BCR	558=BAL	847/BCR			
ZTRN60	506/STH	521/STH	559=BAL	612/STH	630/STH	858/LI	864/LI
	578/LI	881/B	1172/LI				
ZSTLNK							
	298=EGU						
ZTST1	703/BAL	856/BAL	1233=LB				
ZTST1A							
	1237/BCS	1243=MTW					
ZTST1AA							
	1239/BCR	1245=LI					
ZTST1B							
	1244/BCS	1249=CI					
ZTST1C							
	1253=STW						
ZTST2							
	743/BAL	761/BAL	996/BAL	1260=MTW			
ZTST2A							
	1241/BCS	1250/BCS	1261/BCR	1264=LI	1271/B		
ZTST3							
	602/BAL	674/BAL	835/BCR	876/BAL	1235/BCR	1269=MTW	
ZTST4							
	794/BAL	818/BAL	917/BAL	1195=MTW	1254/B		
ZTST6							
	1275=MTW						
ZTST7							
	700/BAL	721/BAL	742/BAL	754/BAL	1282=MTW		
ZTW							
	1629/BCR	1635/BCR	1651=STH				
ZTWLP							
	1454/BAL	1551/BAL	1599=BCR	1664/AND	4134/B		
ZTWLPA							
	1636/STH	1650/B	1651/STH	1654/BCR	1671=STH	1673/TI8*	1772/HI8*
ZTWLPB							
	1441/STH	1633=LI					
ZTWLP01							
	1606/BCR	1611=STH					
ZTWLP10							
	1618/STB	1638/LB	1645/STB	1646/LI	1653/LB	1665/MTB	1670/LI
	1680=ZFCP						
ZTWLP11							
	1621/STH	1622/AH	1623/STH	1624/STB	1637/LI	1647/LB	1649/MTB
	1655/MTB	1662/LB	1676/AH	1677/STH	1682=DATA		
ZTWLP12							
	1611/STH	1613/STB	1652/LI	1675/LH	1682=DATA	1684=ZFCP	
ZTW10							
	1663/BCR	1669=LI					
ZTYP							
	1491=LCFI	2037/ZFSAT					
ZT40							
	418=DATA	1908/XPSD					
ZT41							
	376/XPSD	422=DATA					

ZT46	378/XPSD	426-DATA					
ZUDFPM	381/XPSD	430-DATA					
	287-EQU	517/STW	800/MTW	815/MTW	999/MTW		
	504/B	544/BIR	555/BIR	570/EQU	578/EQU	579/EQU	595/EQU
	596/EQU	605/BCS	626/B	650/BCS	685/BIR	690/BIR	706/BCR
	811/BCS	814/B	840/BIR	923/BCS	929/BIR	995/BCR	1025/BCS
	1027/BCS	1109/B	1127/BCS	1131/BCS	1137/BCS	1140/BCS	1144/BCS
	1150/ZFCP	1208/B	1350/BCS	1368/BCS	1385/BCR	1387/BCR	1390/BIR
	1503/BIR	1508/BCR	1511/BCR	1556/BCR	1572/BIR	1620/BCR	1639/BCS
	1648/BCS	1660/BDR	1668/BDR	1672/BCS	1674/BCS	1715/BCR	1720/BCR
	1726/BCS	1730/BIR	1842/BCS	1844/BCS	1897/BIR	1959/EQU	2008/EQU
	2009/EQU	2076/EQU	2117/BIR	2119/BCR	2124/B	2127/BCS	2194/BCR
	2221/BEZ	2225/BCS	2227/B	2231/BIR	2235/BCS	2236/B	2240/BE
	2242/B	2264/BCR	2266/BIR	2270/BCR	2273/B	2304/BCS	2354/B
	2360/BCS	2361/BIR	2400/BCR	2410/BDR	2428/BDR	2450/BCR	2478/BCS
	2482/BCR	2484/B	2510/BIR	2516/BIR	2528/BCS	2531/BCR	2568/BCS
	2570/B	2572/B	2575/BCS	2599/BIR	2602/BCR	2626/BIR	2640/BCR
	2643/BCR	2651/BIR	2659/BIR	2663/BIR	2689/BIR	2755/BCR	2794/BCR
	2797/B	2802/B	2809/BCR	2816/BCR	2818/B	2825/BCR	2852/BEZ
	2854/BGE	2860/BNEZ	2862/B	2866/BIR	2876/BGZ	2884/BL	2892/BEZ
	2894/B	2900/BIR	2920/BCS	2923/BCS	2933/B	2966/B	2981/BEZ
	2984/BEZ	2988/BCR	2991/BCR	2994/BCR	2997/BCR	3000/BCR	3003/BCR
	3007/BCS	3009/BCR	3013/BCS	3015/BCR	3019/BCS	3021/BCR	3039/BCR
	3040/B	3042/BCR	3044/B	3058/BIR	3071/BIR	3091/BCR	3096/BCS
	3098/BCR	3103/BCS	3105/BCR	3110/BCS	3112/BCR	3117/BCS	3119/BCR
	3124/BCS	3126/BCR	3130/BCR	3134/BCR	3138/BCR	3156/B	3162/BCR
	3251/BCR	3305/BCR	3309/BCS	3323/BCR	3330/BCR	3333/B	3336/BCR
	3338/B	3340/BCR	3346/BCS	3348/B	3408/BDR	3414/BDR	3418/BDR
	3422/BIR	3436/BIR	3455/BCR	3463/BEZ	3465/BIR	3486/BGE	3503/BIR
	3522/BCS	3527/BCS	3530/BCS	3535/BCR	3538/BCR	3542/BCR	3545/BCR
	3548/BCR	3553/BCR	3556/BCR	3559/BCR	3564/BCR	3567/BCR	3570/BCR
	3573/BCR	3576/B	3579/BCR	3586/BCR	3646/BCR	3653/BCR	3655/B
	3682/BCS	3717/BCS	3728/B	3741/BCS	3754/B	3841/BCR	3853/BCR
	3854/BCS	3855/B	3865/BCR	3871/B	3880/BIR	3900/BIR	3910/BIR
	3913/BCS	3915/B	3937/BCS	3948/B	3956/BCR	3966/BIOSE	3967/B
	3990/BNEZ	4033/BIR	4061/BCR	4086/BCR	4113/BCR	4140/BIR	4167/BCS
	4216/BIR	4220/BNEZ	4221/BIR	4224/BCR	4226/B	4232/BCS	4236/BIR
	4260/BCR	4295/BIR	4312/BEZ	4341/BCS	4345/BCR	4347/B	4372/BCS
	4403/BIR	4478/BNEZ	4486/B	4496/BCR	4497/BCS	4498/B	4513/BIR
	4529/BIR	4542/BEZ	4544/B	4588/EQU			