Program Number 06-160R07

MEMORY ACCESS CONTROLLER TEST

Consists of:

Listing Part 1	06-160F01M91R03A13
Listing Part 2	06-160F02M91R03A13
Bootstrap Object Tape Part 1	06-160F01M17R03
Bootstrap Object Tape Part 2	06-160F02M17R03
Program Test Description	06-160M95R04A15
R06 Patch Information	Sheet i/ii
R07 Patch Information	Sheet iii/iv

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R06 Patch Information

This patch is identical to the R05 patch, with the exception of the new information note added at the end.

On a 7/32 or 8/32 with expanded Interrupt Service Pointer Table so that the MAC registers start at an address other than X'300', Subtest B in part 1 fails. Specifically, the unexpected MAC interrupt error message is generated.

FIX:

Patch the program to reference the MAC registers based on the "SEGREG" option value.

LOCATION	CHANGE TO		SYMBOLIC
015F8	2668		A(PATCH)
0164C	C897 003C		LHI R9,X'3C'(R7)
016BA	2668		A(PATCH)
019CC	4300 2670		B PATCH1
02064	587F 0040	MACINT1	L R7,X'40'(R15)
02070	50DF 0040		ST R13,X'40'(R15)
02668	73F0 0B9C	PATCH	LHL R15,SEGREG
0266C	4300 2064		B MACINT1
02670	7370 0B9C		LHL R7,SEGREG
02674	5017 0004		LT R1,4(R7)
02678	4300 19D0		B X'19D0'

NOTE:

This patch is incorporated in object 06-160F01R03.1 on multi-media packages.

R07 Patch Information

To change the default tests selected in Part 1 to include Subtest B and not Subtest A, change location X'0B84' from X'FFE0' to X'FFD0'.

MEMORY ACCESS CONTROLLER TEST

1. RELATED ITEMS

1.1 Related Documents

Test Program Listing Part 1	06-160F01M91R03A13
Test Program Listing Part 2	06-160F02M91R03A13
Test Program Tape Part 1	06-160F01M17R03
Test Program Tape Part 2	06-160F02M17R03

1.2 Related Test Programs

The following test programs are to be run, prior to loading this test:

Series 32 Processor Test Part 1	06-154
Series 32 Processor Test Part 2	06-155
Series 32 Memory Test	06-156

1.3 Other Test Programs

The following test programs are also applicable:

Common Teletype Basic Confidence Test	06-004
Common Current Loop Interface Test	06-184
Common Carousel 300 Test	06-183
Common CRT Test	06-146

2. PURPOSE OF TEST

2.1 Part 1

To detect malfunctions in the Automatic Relocation and Memory Protect features of the Memory Access Controller. A brief description of each subtest follows:

Test 0

This test checks Segmentation Register selection in the Fullword Mode.

Test 1

This test exercises the relocation field of the Memory Access Controller.

Test 2

This test checks the relocation features of the Memory Access Controller throughout the available memory in the system.

Test 3

This test exercises the limit field and checks the Invalid Address Interrupt.

Test 4

This test insures that all Write operations are converted to Read operations when a Protect interrupt is not serviced immediately.

Test 5

This test checks the Execute Protect features of the Memory Access Controller.

Test 6

This test checks the Write Protect features of the Memory Access Controller.

Test 7

This test checks the Write/Interrupt Protection features of the Memory Access Controller.

Test 8

This test is designed to verify the operation of the non-present Address Interrupt of the Memory Access Controller.

Test 9

This test executes a small subroutine through all available memory, with the Memory Access Controller enabled.

Test A

This test checks Segmentation Register selection in the Halfword Mode.

Test B

Test A is a series of Routines designed to test Segmentation Boundary Crossings.

2.2 Part 2

To detect malfunctions in the Automatic Relocation and Memory Protect features of Segmentation Register Zero. A brief description follows:

Test 0

This test checks Segmentation Register Selection in the fullword mode.

Test 1

This test exercises the relocation field of Segmentation Register Zero.

Test 2

This test exercises the limit field and checks the Invalid Address Interrupt of Segmentation Register Zero.

Test 3

This test checks the Execute Protect features of Segmentation Register Zero.

Test 4

This test checks the Write Protect features of Segmentation Register Zero.

Test 5

This test checks the Write/Interrupt protection features of Segmentation Register Zero.

Test 6

This test verifies the operation of the non-present Address Interrupt of Segmentation Register Zero.

Test 7

This test executes a small subroutine through memory from X'A00' to X'FFFF', with the Memory Access Controller enabled.

Test 8

This test is a Series of Routines designed to test Segmentation Boundary Crossings.

3. MINIMUM HARDWARE REQUIRED

The following is a list of the minimum hardware required to run this test:

1. Processor - Model 7/32 or 8/32
2. Minimum Memory Part 1 - 64KB.
3. Minimum Memory Part 2 - 128KB.
4. Console I/O Device - Teletype, GDT, CRT, or Carousel 15/30/35/300 (See Appendix 1).
5. Memory Access Controller (MAC).

4. REQUIREMENTS OF MACHINE UNDER TEST

This program assumes that the tests listed under RELATED TEST PROGRAMS have been run without the detection of an error.

The Memory Access Controller should be strapped for segmentation registers starting at X'300'. If it is different, the SEGREG option must be entered. Refer to Appendix 3.

5. LOADING PROCEDURE

5.1 Test Tape Format

The 06-160M17 tapes are Absolure, non-zoned Memory Image Tapes with Front-End Boot Loaders.

5.2 Normal Loading Procedures

1. Manually enter the X'50' Sequence shown below, into memory:

LOCATION	CONTENTS	
X'30'	X'0000'	
X'32'	X'0000'	
X'34'	X'0000'	
X'36'	X'0050'	
X'50'	X'D500'	
X'52'	X'00CF'	
X'54'	X'4300'	
X'56'	X'0080'	
X'78'	X'0294'	For TTY or Carousel 35
X'78'	X'0399'	For HSPTR
X'78'	X 1399'	For HSPTR/P

2. Place program tape in the Paper Tape Reader.

3. Execute at address X'30'.

4. When the Processor halts, observe the CHKSUM byte, displayed on Processor Display Panel Indicator D1. If it is ZERO, loading is complete; else repeat the loading procedure.

5.3 Multi-Media Diagnostic Loading Procedure

To load this program from the INTERDATA Multi-Media Diagnostic System, refer to Publication Number 06-176A15.

5.4 Program Execution

1. Refer to Appendix 1 and set up the address for the Console I/O Device.

2. For Part 1, address location X'A00' and execute. Note that the following is output to the Console Device:

    MACT 06-160F01R03

3. For Part 2, address location X'10010' and execute. Note that the following is output to the Console Device:

    MACT 06-160F02R03

6. OPERATING PROCEDURES

6.1 Normal Testing (Part 1)

1. After the title is printed, a search for available memory is executed and the message "AVAILABLE MEMORY" is printed followed by a list of memory in the system available to user (See Appendix 5). When the asterisk is printed, enter the desired options via the Console Device (See Appendices 2, 3).

2. Enter the RUN command via the Console Device.

3. Each test selected is executed. If no errors are detected, the message "NO ERROR" is printed. Should an error occur, refer to Section 6.4 for the appropriate action.

4. If all tests (0-9, and Test B) run without detecting an error, normal testing is complete.

6.2 Normal Testing (Part 2)

1. After the title is printed, the program prints an asterisk to indicate that it is ready for operator input. When the asterisk is printed, enter the desired options via the Console Device (See Appendices 2, 3). Part 2 needs to know whether the host processor is a 7/32 or an 8/32. The CPU option must be entered to provide the program with this information. Enter 0 to select 7/32. Enter any non-zero value to select 8/32. The program defaults to 7/32.

2. Enter the RUN command via the Console Device.

3. Each test selected is executed. If no errors are detected, the message "NO ERROR" is printed. Should an error occur, refer to Section 6.4 for the appropriate action.

4. If all tests (0-8) run without detecting an error, normal testing is complete.

6.3 Optional Testing

In order to inhibit all printouts and run the selected tests continuously, the Console Device (except CRT) can be taken off-line. When this is done, the program counts the total number of times the test is repeated in memory location labeled TOTAL. If an error is detected, the count in memory location labeled TOTALERR is incremented. The contents of TOTAL are continuously copied into the Console Panel Display.

In Part 1, to test the MAC in the Halfword Mode, Execute Test A.

6.4 Error Procedures

6.4.1 subtest - Detected Errors

If an error is detected during the execution of a Subtest, an error message is displayed on the Console Device in the following format:

```
ERROR XXYY
```

where: XX = the test number in which the error was detected
YY = the error number

In addition to the error number, other useful information may also be printed. Refer to Appendix 4 for the explanation of an error. The error printout can be terminated at any time by depressing the Break key on the Console Device.

6.4.2 Machine Malfunction Interrupt

If a Machine Malfunction Interrupt occurs, the following error message is displayed:

```
MACHINE MALFUNCTION
X YYYYYY
```

where: X = the condition code, CVGL, when the interrupt occurred. Upon completion of this message, the Processor is placed in the Wait state.

If the Console Device (except CRT) is off-line when the interrupt is generated, X'AAAAAAAA' is written on the Display and the Processor is palced in the Wait state. To continue test execution, depress the RUN Switch on the display.

TABLE 1. MACHINE MALFUNCTION CONDITION CODES

C	V	G	L	MEANING
			1	Early Power Fail
		1		Parity Error (On Instruction FETCH, 7/32)
	1			Boundary Error (8/32), or Parity Error on DATA FETCH (7/32)
1				Auto Driver Channel

6.4.3 Illegal Instruction Interrupt

If an Illegal Instruction Interrupt occurs, the following error message is displayed:

```
ILLEGAL INSTRUCTION
XXXXXXXX XXXXXXXX
```

where: XXXXXXXX XXXXXXXX = the PSW when the interrupt occurred. Upon completion of the message, the Processor is placed in the Wait state.

If the Console Device (except CRT) is off-line when the interrupt is generated, X'55555555' is written on the Display and the Processor is placed in the Wait state.

To continue test execution, depress the RUN Switch on the Display.

7. PROGRAMMING NOTES

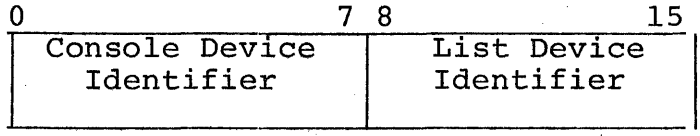
1. If Part 1 of this program is executed on a Model 8/32, Test A should not be executed, and Text B should be executed only if the CPU 'A' Board is at R_ _ or greater.

2. The PSW values used in this program can be modified by inserting a mask value in the location labeled "PSWMASK'. The bits set in the mask value are ORed into the standard PSW value, with the exception of the Relocation and Protection bit (X'400'), which the user is not allowed to modify.

APPENDIX 1

USER DEVICE DEFINITION

The halfword labeled 'IO' (see the Program Listing) has the default value for teletype, CRT, or Carousel 15/30 (all on Current Loop Interface) as the input/output console device. If the setup is different, 'IO' must be changed as follows:



CONSOLE DEVICE IDENTIFIER	MEANING
X'01'	GDT/CRT on PASLA/PALM interface, strapped for FDX operation and highest baud rate.
X'02'	TTY/GDT/CRT/Carousel 15/30/35 on TTY/ Current Loop Interface.
X'03'	Reserved. Interpreted as X'02'.
X'04'	Carousel 300 on PASLA/PALM interface, strapped for FDX operation and highest baud rate.
X'00', X'05' - X'FF'	Reserved. Interpreted as X'02'.

1. The GDT (Graphic Display Terminal), or CRT, if used on PASLA/PALM interface, should be strapped for device address X'10' and X'11' for Receive and Transmit sides, respectively. If the addresses are different, the byte labeled CRTADR (see program listing) must be changed accordingly.

2. The Teletyp or Current Loop Interface, if used, should be strapped for device address X'02'. If it is different, the byte labeled TTYADR (See Program Listing) must be changed accordingly.

3. The Carousel 300 on PASLA/PALM interface, if used, should be strapped for device addresses X'10' and X'11' for Receive and Transmit sides respectively. If the addresses are different, the byte labeled CARADR (See Program Listing) must be changed accordingly.

APPENDIX 2

OPTION/COMMAND INPUT STRUCTURE

An asterisk (*) is output ot the list device to indicate that the program is awaiting an option input. Any opiton may now be typed in from the console input device followed by a space and the desired hexadecimal value; an exception is the TEST option which accepts arguments separated by commas. A Carriage Return (CR) is required to terminate every option input. An invalid command or value causes a '?' followed by a Carriage Return (CR), Line Feed (LF), and an asterisk (*).

APPENDIX 3

OPTION TABLE

OPTION	DEFAULT VALUE	DESCRIPTION
TEST	0 thru B (Part 1) 0 thru 8 (Part 2)	Selects the test or tests to be executed.
NOMSG	0	Determines whether all messages will be printed or only error messages will be printed. 0 = all messages. 1 = error messages only.
CONTIN	0	Enables the user to run all tests selected continuously, until the Break Key returns the program to the Command Mode. 0 = normal execution. 1 = continuous execution.
SEGREG	X'300'	Specifies the location assigned to the first segmentation register. This option should only be altered if the system configuration has provision for more than 256 input/output devices.
HALT	0	Enables the user to halt the program when an error is encountere 0 = Normal execution. (errors printed) 1 = The test halts on error. Errors printed after Run is depressed.
PARITY	0	Specifies whether the system is equipped with parity memory or not. 0 = non-parity memory. 1 = parity memory. (This option is applicable to Part 1 only.)
CPU	0	Specifies the host processor. 0 = 7/32 1 = 8/32 (This option is applicable to Part 2 only.)
RUN	-	Execute selected tests.

APPENDIX 4

ERROR TABLE

ERROR NUMBER	PART	INTERPRETATION	NOTES
XX01	1	Segmentation Register Trap not functioning.	
XX02	1,2	Incorrect Segmentation Register selected.	1
XX03	1,2	Incorrect relocation on an attempted read.	2
XX04	1,2	Write to ISR didn't clear it.	
XX05	1,2	Invalid Address interrupt not generated.	4
XX06	1,2	Invalid Status on Invalid Address interrupt.	
XX07	1	Did not store data before Invalid Address Interrupt.	
XX08	1	Did not convert write to read after interrupt queued.	
XX09	1,2	Incorrect status on Execute Protect interrupt.	
XX10	1,2	Status Register cleared after read.	
XX11	1,2	Execute Protect interrupt but instruction still executed.	
XX12	1,2	Execute Protect interrupt not generated.	3
XX13	1,2	Write Protect interrupt not generated.	3
XX14	1,2	Write/Interrupt interrupt not generated.	3
XX15	1,2	Incorrect status on Write Protect interrupt.	
XX16	1,2	Write Protect interrupt but write still performed.	
XX17	1,2	Incorrect status on Write/Interrupt interrupt.	3
XX18	1,2	Write not performed on Write/Interrupt interrupt.	
XX19	1,2	Non Present interrupt not generated.	3
XX20	1,2	Incorrect Status on Non-Present interrupt.	
XX21	1,2	Address calculated by subroutine incorrect.	1
XX22	1	Incorrect Segmentation Register selected, halfword mode.	1

APPENDIX 4 (Continued)

ERROR TABLE

ERROR NUMBER	PART	INTERPRETATION	NOTES
XX23	1,2	Incorrect relocation on RX2 forward store.	1
XX24	1,2	Incorrect relocation on RX2 forward load.	1
XX25	1,2	Incorrect relocation on RX2 backward store.	1
XX26	1,2	Incorrect relocation on RX2 backward Load.	1
XX27	1,2	No Segment Limit violation on RX2 Store.	
XX28	1,2	No Segment Limit violation on RX2 Load.	
XX29	1,2	Incorrect relocation on RX2 store to zero.	
XX30	1,2	Incorrect relocation on RX2 Load from zero.	
XX31	1	Incorrect relocation on RX1 store thru Seg Reg 1.	1
XX32	2	Incorrect relocation on RX1 stroe thru Seg Reg 2	
XX33	2	Incorrect relocation on RX3 store thru Seg Reg 0	
XX36	1	Incorrect relocation on RX1 Load thru Seg Reg 1	1
XX37	1,2	Incorrect relocation on RX1 Store thru Seg Reg 2	1
XX38	2	Incorrect execution of RX2 instruction across MAC boundary.	
XX39	2	Incorrect execution of RX3 instruction across MAC boundary.	
XX40	2	Incorrect exeuction of RI2 instruction across MAC boundary.	
XX41	2	Incorrect exeuction of RI1 instruction across MAC boundary.	
XX42	2	Incorrect execution of RX1 instruction across MAC boundary.	
XX43	1,2	Marching 1's exercise error.	5
XX44	1,2	Marching 0's exercise error.	5

APPENDIX 4 (Continued)

ERROR TABLE

ERROR NUMBER	PART	INTERPRETATION	NOTES
XXF0	1,2	Unexpected MAC interrupt.	
XXF1	1,2	MAC interrupted when not enabled.	
XXF2	1,2	Supervisor Call Interrupt generated.	
XXF3	1,2	Arithmetic fault Interrupt generated.	
XXF4	1,2	System Queue Interrupt generated.	
XXF5	1,2	External Interrupt Generated.	

NOTES

Note 1: XXEE STATUS SS CONFLD N
000YYYYY 000ZZZZZ

SS = MAC Status
XX = Test number the error occurred in.
EE = Error number
N = Control field value of Segmentation Register under test.
000YYYYY = Relocated address expected.
000ZZZZZ = Relocated address read.

The most significant digit of the address expected indicates the Segmentation Register that should have been selected.

The most significant digit of the address read indicates the Segmentation Register selected.

Note 2: XXEE STATUS SS CONFLD N
00000YYY ZZZZZZZZ

SS = MAC Status
XX = Test number the error occurred in.
EE = Error number.
N = Control field value of Segmentation Register under test.
00000YYY = Data expected.
ZZZZZZZZ = Data read.

The Data Expected field shows the value that should be in the Segmentation Register's relocation field.

Note 3: XXEE STATUS SS CONFLD N
000YYYYY 0000000Z

SS = MAC Status.
XX = Test number the error occurred in.
EE = Error number.
N = Control field value of Segmentation Register under test.

000YYYYY = Address accessed.
0000000Z = Failing register.

Note 4: XXEE STATUS SS CONFLD N
000YYYYY 00000ZZZ

SS = MAC Status.
XX = Test number the error occurred in.
EE = Error number.
N = Control field value of Segmentation Register under test.

000YYYYY = Address accessed.
00000ZZZZ = Limit field value.

000YYYYY and 00000ZZZ are printed only when this error occurs in Test 4.

Note 5: XXEE
DATA AA WAS WRITTEN TO LOCATION 000BBBBB.
DATA READ WAS CC.
SEGMENTATION REGISTER USED WAS D.
SEGMENTATION REGISTER DATA WAS GGGGGGGG
MEMORY BLOCK DISPLACEMENT WAS 000HHHHH.
PROGRAM ADDRESS AT TIME OF FAILURE WAS 000KKKKK.
MM PASSES WERE COMPLETED BEFORE FAILURE.

XX = Test number the error occurred in.
EE = Error number.
AA = Data byte written to test location.
000BBBBB = Physical address of test location.
D = Segmentation Register used.
GGGGGGGG = Segmentation Register contents.
000HHHHH = Program address used.
000KKKKK = Location within the test program following the error message call.
MM = Number of loops made through the sequence before the error occurred. Maximum hexadecimal FF.

APPENDIX 5

AVAILABLE MEMORY SEARCH

The Available Memory Search is accomplished by writing data into the first addressable fullword of each 8KB block of memory and then reading that location. If the data is read back correctly, a bit in a memory table is set. If the data is not read back correctly, the corresponding bit in the memory table is reset. Since a memory failure could cause invalid data to be returned, should any know block of memory be omitted from the available memory list, this memory may be tested by manually setting the corresponding bit in the memory table and executing the program at the location labeled "ENABLE1" (refer to the listing). The table is established such that each bit represents 8KB of memory and each byte represents 64KB of memory. Each byte is labeled with the address of the first 8KB block it controls (i.e., KB008, KB0072, KB0136, etc.).

EXAMPLE 1 - Available Memory Printout for a total 48K Byte Memory.

```
Available Memory
00000-0BFFF
```

EXAMPLE 2 - Available Memory Printout for 48K Bytes of memory and 64K to 17K bytes of memory.

```
Available Memory
00000-0BFFF
10000-2BFFF
```

APPENDIX 6

SAMPLE PRINTOUT (Part 1)

```
MACT 06-160F01R03
AVAILABLE MEMORY
00000 - 3FFFF


*RUN
TEST 00  NO ERROR

TEST 01  NO ERROR

TEST 02  NO ERROR

TEST 03  NO ERROR

TEST 04  NO ERROR

TEST 05  NO ERROR

TEST 06  NO ERROR

TEST 07  NO ERROR

TEST 08  NO ERROR

TEST 09  NO ERROR

TEST 0A  NO ERROR

TEST 0B  NO ERROR

*
```

SAMPLE PRINTOUT (Part 2)

```
MACT 06-160F02R03

*RUN
TEST 00  NO ERROR

TEST 01  NO ERROR

TEST 02  NO ERROR

TEST 03  NO ERROR

TEST 04  NO ERROR

TEST 05  NO ERROR

TEST 06  NO ERROR

TEST 07  NO ERROR

TEST 08  NO ERROR

*
```

PROG= MACF0103 ASSEMBLED BY CAL 03-066R05-01 (32-BIT)

```
                          1  MACF0103 PROG  MEMORY ACCESS CONTROLLER TEST PART 1 06-160F01M91R03A13    MAC00010
                          2           SCRAT                                                           MAC00020
                          3           ERLST                                                           MAC00030
                          4           TARGT 32                                                        MAC00040
                          5           NORX3                                                           MAC00050
                          6           WIDTH 120                                                       MAC00060
                          7           CROSS                                                           MAC00070
                          8           SOCHK                                                           MAC00080
                          9  * COPYRIGHT INTERDATA INC,  MAY, 1977                                    MAC00090
                         10  *                                                 *                     MAC00100
                         11  *                                                 *                     MAC00110
                         12  * ELEVEN TESTS ARE PROVIDED:                     *                     MAC00120
                         13  *                                                 *                     MAC00130
                         14  * TEST 0 - CHECKS SEGMENTATION REGISTER SELECTION IN  *                   MAC00140
                         15  *           THE FULLWORD MODE.                    *                     MAC00150
                         16  *                                                 *                     MAC00160
                         17  * TEST 1 - EXERCISES THE RELOCATION FIELD.        *                     MAC00170
                         18  *                                                 *                     MAC00180
                         19  * TEST 2 - CHECKS THE RELOCATION FEATURES OF MAC  *                     MAC00190
                         20  *           THROUGHOUT THE AVAILABLE MEMORY IN THE SYS *                 MAC00200
                         21  *                                                 *                     MAC00210
                         22  * TEST 3 - EXERCISES THE LIMIT FIELD AND CHECKS THE  *                   MAC00220
                         23  *           INVALID ADDRESS INTERRUPT.            *                     MAC00230
                         24  *                                                 *                     MAC00240
                         25  * TEST 4 - INSURES THAT ALL WRITE OPERATIONS ARE  *                     MAC00250
                         26  *           CONVERTED TO READ OPERATIONS WHEN A PROTECT*                 MAC00260
                         27  *           INTERRUPT IS NOT SERVICED IMMEDIATLEY.  *                     MAC00270
                         28  *                                                 *                     MAC00280
                         29  * TEST 5 - CHECKS THE EXECUTE PROTECT FEATURES OF THE *                  MAC00290
                         30  *           MAC.                                  *                     MAC00300
                         31  *                                                 *                     MAC00310
                         32  * TEST 6 - CHECKS THE WRITE PROTECT FEATURES OF THE  *                   MAC00320
                         33  *           MAC.                                  *                     MAC00330
                         34  *                                                 *                     MAC00340
                         35  * TEST 7 - CHECKS THE WRITE/INTERRUPT PROTECTION  *                     MAC00350
                         36  *           FEATURES OF THE MAC.                  *                     MAC00360
                         37  *                                                 *                     MAC00370
                         38  * TEST 8 - CHECKS THE OPERATION OF THE NON-PRESENT  *                    MAC00380
                         39  *           ADDRESS INTERRUPT OF THE MAC.         *                     MAC00390
                         40  *                                                 *                     MAC00400
                         41  * TEST 9 - RELOCATES AND EXECUTES A SMALL SUBROUTINE *                   MAC00410
                         42  *           THROUGHOUT THE AVAILABLE MEMORY IN THE  *                     MAC00420
                         43  *           SYSTEM WITH THE MAC ENABLED.          *                     MAC00430
                         44  *                                                 *                     MAC00440
                         45  * TEST A - CHECKS SEGMENTATION REGISTER SELECTION IN  *                   MAC00450
                         46  *           THE HALFWORD MODE.                    *                     MAC00460
                         47  *                                                 *                     MAC00470
                         48  * TEST B - CHECKS LIMIT FIELD AND SEGMENTATION    *                     MAC00480
                         49  *           REGISTER SELECTION BOUNDARY CASES     *                     MAC00490
```

```
                                51  * THE PROCESSOR MUST BE EQUIPPED WITH A CONSOLE DEVICE.                    MAC00510
                                52  * ALL OPTIONS ARE CONTROLLED FROM THE CONSOLE AND                          MAC00520
                                53  * MAY BE SELECTED OR CHANGED WITHOUT RESTARTING THE TEST                   MAC00530


          0000 0000             55  R0      EQU   0                                                           MAC00550
          0000 0001             56  R1      EQU   1                                                           MAC00560
          0000 0002             57  R2      EQU   2                                                           MAC00570
          0000 0003             58  R3      EQU   3                                                           MAC00580
          0000 0004             59  R4      EQU   4                                                           MAC00590
          0000 0005             60  R5      EQU   5                                                           MAC00600
          0000 0006             61  R6      EQU   6                                                           MAC00610
          0000 0007             62  R7      EQU   7                                                           MAC00620
          0000 0008             63  R8      EQU   8                                                           MAC00630
          0000 0009             64  R9      EQU   9                                                           MAC00640
          0000 000A             65  R10     EQU   10                                                          MAC00650
          0000 000B             66  R11     EQU   11                                                          MAC00660
          0000 000C             67  R12     EQU   12                                                          MAC00670
          0000 000D             68  R13     EQU   13                                                          MAC00680
          0000 000E             69  R14     EQU   14                                                          MAC00690
          0000 000F             70  R15     EQU   15                                                          MAC00700


000000I                         72          ORG   X'0080'                                                     MAC00720
000080    C810 0A00             73          LHI   R1,ORIGIN1      START ADDRESS FOR LOAD                      MAC00730
000084    2421                  74          LIS   R2,1            INCREMENT VALUE                             MAC00740
000086    C830 2593             75          LHI   R3,LNZB         ADDRESS OF LAST NON-ZERO BYTE               MAC00750
00008A    C860 00FF             76  MN      LHI   R6,X'FF'        CHECKSUM BYTE                               MAC00760
00008E    D340 0078             77          LB    R4,X'78'        BINARY INPUT DEVICE                         MAC00770
000092    DE40 0079             78          OC    R4,X'79'        OUTPUT COMMAND READ                         MAC00780
000096    9D45                  79  LEADER  SSR   R4,R5                                                       MAC00790
000098    2091                  80          BTBS  9,1                                                         MAC00800
00009A    9B45                  81          RDR   R4,R5                                                       MAC00810
00009C    0855                  82          LDAR  R5,R5           TEST THE INPUT CHARACTER                    MAC00820
00009E    2234                  83          BZS   LEADER          IGNORE LEADING ZERO BYTES                   MAC00830
0000A0    D251 0000             84  LOAD    STB   R5,0(R1)       STORE IN MEMORY                             MAC00840
0000A4    0765                  85          XAR   R6,R5           GENERATE CHECKSUM                           MAC00850
0000A6    9A26                  86          WDR   R2,R6           DISPLAY ACCUMULATED CHECKSUM                MAC00860
0000A8    9D45                  87          SSR   R4,R5                                                       MAC00870
0000AA    2091                  88          BTBS  9,1                                                         MAC00880
0000AC    9B45                  89          RDR   R4,R5           NEXT BYTE                                   MAC00890
0000AE    C110 00A0             90          BXLE  R1,LOAD         LOOP                                        MAC00900
0000B2    9826                  91          WHR   R2,R6           DISPLAY FINAL CHECKSUM                      MAC00910
0000B4    C200 00B8             92  HALT3   LPSW  STARTX                                                     MAC00920
0000B8                          93          ALIGN 8                                                           MAC00930
0000B8    0000 80F0             94  STARTX  DC    Y'80F0',START                                               MAC00940
0000BC    0000 0A00
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0000C0                          96            ORG   X'A00'                                                  MAC00960
          0000 0A00             97  ORIGIN1   EQU   *                                                       MAC00970
000A00    4300 214E             98  START     B     DEVCHK                                                  MAC00980
000A04    4300 0A12             99            B     EXEC                                                    MAC00990
                               100  *                                                                       MAC01000
000A08    0002                 101  CLIFADR   DCX   0002          CURRENT LOOP INTERFACE ADDRESS            MAC01010
000A0A    0010                 102  PASADR    DCX   0010          PASLA ADDRESS                             MAC01020
000A0C    0000                 103            DCX   0000                                                    MAC01030
000A0E    0000                 104            DCX   0000                                                    MAC01040
000A10    0202                 105  IO        DCX   0202          INPUT OUTPUT INDICATOR                    MAC01050
                               106  *                                                                       MAC01060
000A12    C800 00F0            107  EXEC      LHI   R0,X'F0'                                                MAC01070
000A16    9510                 108            EPSR  R1,R0         DISABLE INTERRUPTS                        MAC01080
000A18    0700                 109            XR    R0,R0                                                   MAC01090
000A1A    5000 0000            110            ST    R0,0                                                    MAC01100
000A1E    5000 0020            111            ST    R0,X'20'      MACHINE MALFUNCTION INTRPT.               MAC01110
000A22    5000 0024            112            ST    R0,X'24'      OLD PSW                                   MAC01120
000A26    5000 0028            113            ST    R0,X'28'      RESERVED,MUST BE ZERO                     MAC01130
000A2A    5000 002C            114            ST    R0,X'2C'                                                MAC01140
000A2E    07EE                 115            XR    R14,R14                                                 MAC01150
000A30    E6F0 220C            116            LA    R15,ILGINT    ILLEG.INSTR. NEW PSW                      MAC01160
000A34    D0E0 0030            117            STM   R14,X'30'                                               MAC01170
000A38    E6F0 0BC8            118            LA    R15,ENABLE2   MACHINE MALFUNCTION PRESET                MAC01180
000A3C    D0E0 0038            119            STM   R14,X'38'                                               MAC01190
000A40    5000 0040            120            ST    R0,X'40'      RESERVED,MUST BE ZERO                     MAC01200
000A44    5000 0044            121            ST    R0,X'44'                                                MAC01210
000A48    E6F0 21BE            122            LA    R15,ARTFLT    ARITHMETIC FAULT                          MAC01220
000A4C    D0E0 0048            123            STM   R14,X'48'                                               MAC01230
000A50    E610 2594            124            LA    R1,TABLE1     SYSTEM QUEUE POINTER                      MAC01240
000A54    5010 0080            125            ST    R1,X'80'                                                MAC01250
000A58    E610 25A0            126            LA    R1,PSWSAVE    CURRENT PSW SAVE POINTER                  MAC01260
000A5C    4010 0084            127            STH   R1,X'84'                                                MAC01270
000A60    E610 25B8            128            LA    R1,RSAVE      REG.SAV POINTER (SET 1)                   MAC01280
000A64    4010 0086            129            STH   R1,X'86'                                                MAC01290
000A68    E6F0 21C4            130            LA    R15,SYSQ      SYS.Q SERVICE INTRPT.                     MAC01300
000A6C    D0E0 0088            131            STM   R14,X'88'                                               MAC01310
000A70    C8E0 2000            132            LHI   R14,X'2000'                                             MAC01320
000A74    E6F0 21B2            133            LA    R15,MACINT    MEMORY ACCESS CONTROLLER INTRPT.          MAC01330
000A78    D0E0 0090            134            STM   R14,X'90'                                               MAC01340
000A7C    5000 0098            135            ST    R0,X'98'      SVC INTRPT,NEW PSW                        MAC01350
000A80    E640 21B8            136            LA    R4,SVCERR                                               MAC01360
000A84    C810 009C            137            LHI   R1,X'9C'                                                MAC01370
000A88    2422                 138            LIS   R2,2                                                    MAC01380
000A8A    C830 00BA            139            LHI   R3,X'BA'                                                MAC01390
000A8E    4041 0000            140  X9C       STH   R4,0(R1)      SVC CALL,ERR,TRAP                         MAC01400
000A92    C110 0A8E            141            BXLE  R1,X9C                                                  MAC01410
000A96    2424                 142            LIS   R2,4                                                    MAC01420
000A98    C830 00CC            143            LHI   R3,X'CC'                                                MAC01430
000A9C    5001 0000            144  XBC       ST    R0,0(R1)      RESERVED,MUST BE ZERO                     MAC01440
000AA0    C110 0A9C            145            BXLE  R1,XBC                                                  MAC01450
000AA4    E640 21EE            146            LA    R4,EXTINT                                               MAC01460
000AA8    C810 00D0            147            LHI   R1,X'D0'                                                MAC01470
000AAC    2422                 148            LIS   R2,2                                                    MAC01480
000AAE    C830 02CC            149            LHI   R3,X'2CC'                                               MAC01490
000AB2    4041 0000            150  XCC       STH   R4,0(R1)                                                MAC01500
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→ for RS-232-C

→ 0101

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000AB6  C110 0AB2          151           BXLE  R1,XCC                                                  MAC01510
000ABA  58B0 2000          152           L     R11,X'2000'                                               MAC01520
000ABE  50B0 2590          153           ST    R11,SAVE1                                                 MAC01530
000AC2  73B0 2558          154           LAL   R11,CRTFLG = 1                                            MAC01540
000AC6  2335               155           BZS   PRTTITLE                                                  MAC01550
000AC8  48B0 2530          156           LH    R11,ADDRESS = 1B      PICK UP DEVICE NUMBER               MAC01560
000ACC  DEB0 2524          157           OC    R11,CRTCMD = F8                                           MAC01570
000AD0  41F0 239C          158 PRTTITLE  BAL   R15,PRINT             PRINT "MACT 06-160F01R03"           MAC01580
000AD4  23E4               159           DC    Z(TITLE)              START ADDRESS OF MESSAGE            MAC01590
                           160 *                                                                         MAC01600
                           161 *                                                                         MAC01610
                           162 *                                                                         MAC01620
000AD6  41F0 239C          163 TOCS      BAL   R15,PRINT             PRINT AVAILABLE MEMORY MESSAGE      MAC01630
000ADA  2400               164           DC    Z(MEMSG)              START ADDRESS OF MESSAGE            MAC01640
000ADC  0700               165           XR    R0,R0                                                     MAC01650
000ADE  5000 0000          166           ST    R0,0                                                      MAC01660
000AE2  4000 2088          167           STH   R0,FLAG                                                   MAC01670
000AE6  4000 255A          168           STH   R0,WRAPFLG                                                MAC01680
000AEA  D200 250F          169           STB   R0,KB0072                                                 MAC01690
000AEE  5000 2510          170           ST    R0,KB0136                                                 MAC01700
000AF2  5000 2514          171           ST    R0,KB0392                                                 MAC01710
000AF6  5000 2518          172           ST    R0,KB0648                                                 MAC01720
000AFA  4000 251C          173           STH   R0,KB0904                                                 MAC01730
000AFE  C820 2000          174           LAI   R2,X'2000'            LOAD START ADDRESS OF SEARCH        MAC01740
000B02  0832               175           LR    R3,R2                 LOAD SEARCH INCREMENT VALUE         MAC01750
000B04  F840 000F E000     176           LI    R4,Y'FE000'           YES, CHECK FOR WRAP AROUND          MAC01760
000B0A  2451               177           LIS   R5,1                  LOAD STARTING TABLE INDEX           MAC01770
000B0C  0766               178           XR    R6,R6                 ESTABLISH ADRS OF 1ST MEMORY LOC    MAC01780
000B0E  5022 0000          179 REp       ST    R2,0(R2)              STORE INCREMENTED DATA PATERN       MAC01790
000B12  5872 0000          180           L     R7,0(R2)              LOAD DATA PATTERN FROM SEARCH LOC   MAC01800
000B16  2411               181           LIS   R1,1                                                      MAC01810
000B18  0527               182           CLR   R2,R7                 IS DATA READ=DATA STORED            MAC01820
000B1A  2137               183           BNES  MEMLIST                                                   MAC01830
000B1C  5870 0000          184           L     R7,0                  WAS DATA STORED IN LOCATION ZERO?   MAC01840
000B20  4330 0B5A          185           BZ    SETBIT                                                    MAC01850
000B24  4010 255A          186 STFLG     STH   R1,WRAPFLG            SET FLAG IF WRAP AROUND OCCURED     MAC01860
000B28  4010 2088          187 MEMLIST   STH   R1,FLAG                                                   MAC01870
000B2C  0815               188           LR    R1,R5                 NO, WAS LAST BIT SET ?              MAC01880
000B2E  2711               189           SIS   R1,1                                                      MAC01890
000B30  7410 250E          190           TBT   R1,KB0008                                                 MAC01900
000B34  4330 0B6C          191           BZ    NEXT1                 NO, ZERO NEXT BIT IN MEMORY TABLE   MAC01910
000B38  0816               192           LR    R1,R6                 YES, LOAD START ADRS OF MEMORY SEG  MAC01920
000B3A  41E0 235E          193           BAL   R14,CONVERT           CONVERT TO ASCII CHARACTERS.        MAC01930
000B3E  0010               194           DC    X'10'                 SHIFT INDEX                       MAC01940
000B40  2414               195           DC    Z(MEMSG1)             STORE INDEX                       MAC01950
000B42  0812               196           LR    R1,R2                                                     MAC01960
000B44  2711               197           SIS   R1,1                  ESTABLISH LAST ADRS OF MEMORY SEGMENT MAC01970
000B46  5010 2548          198           ST    R1,MEMTOP                                                 MAC01980
000B4A  41E0 235E          199           BAL   R14,CONVERT           CONVERT TO ASCII CHARACTERS         MAC01990
000B4E  0010               200           DC    X'10'                 SHIFT INDEX                       MAC02000
000B50  241C               201           DC    Z(ENDVAL)             STORE INDEX                       MAC02010
000B52  41F0 239C          202           BAL   R15,PRINT             PRINT MEMORY SEGMENT ADDRESSES      MAC02020
000B56  2414               203           DC    Z(MEMSG1)             START ADRS OF MESSAGE             MAC02030
000B58  230A               204           BS    NEXT1                 CHECK NEXT 8K OF MEMORY           MAC02040
000B5A  7550 250E          205 SETBIT    SBT   R5,KB0008             SET BIT IN MEMORY TABLE           MAC02050
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000B5E  7310 2088          206          LHL   R1,FLAG                                                  MAC02060
000B62  2335               207          BZS   NEXT1                                                    MAC02070
000B64  0862               208          LR    R6,R2              LOAD START ADRS OF MEMORY SEGMENT     MAC02080
000B66  0711               209          XR    R1,R1                                                    MAC02090
000B68  4010 2088          210          STH   R1,FLAG                                                  MAC02100
000B6C  7310 255A          211  NEXT1   LHL   R1,WRAPFLG                                               MAC02110
000B70  4230 0BC4          212          BNZ   ENABLE1                                                  MAC02120
000B74  2651               213          AIS   R5,1               INCREMENT TABLE INDEX                 MAC02130
000B76  7650 250E          214          RBT   R5,KB0008          ZERO NEXT BIT IN MEMORY TABLE         MAC02140
000B7A  C120 0B0E          215          BXLE  R2,REP             REPEAT UNTIL ALL OF MEMORY IS CHECKED MAC02150
000B7E  2411               216          LIS   R1,1                                                     MAC02160
000B80  4300 0B24          217  ORG     B     STFLG                                                    MAC02170
                           218  *                                                                      MAC02180
                           219  *                                                                      MAC02190
                           220  *                                                                      MAC02200
000B84  FFE0               221  TEST    DC    X'FFE0',C'TEST  '                                        MAC02210
000B86  5445 5354 2020
000B8C  0000               222  NOMSG   DC    X'0',C'NOMSG '                                           MAC02220
000B8E  4E4F 4D53 4720
000B94  0000               223  CONTIN  DC    X'0',C'CONTIN'                                           MAC02230
000B96  434F 4E54 494E
000B9C  0300               224  SEGREG  DC    X'300',C'SEGREG'                                         MAC02240
000B9E  5345 4752 4547
000BA4  0000               225  HALT1   DC    X'0',C'HALT  '                                           MAC02250
000BA6  4841 4C54 2020
000BAC  0000               226  PARITY  DC    X'0',C'PARITY'                                           MAC02260
000BAE  5041 5249 5459
000BB4  0000               227  RUN     DC    X'0',C'RUN   ',X'0',X'FFFF'                              MAC02270
000BB6  5255 4E20 2020
000BBC  0000
000BBE  FFFF
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000BC0  01FE              229  QUESTN  BALR  R15,R14          OUTPUT A CR,LF,?,CR,LF                MAC02290
000BC2  246E              230         DC    Z(QMARK)                                               MAC02300
                          231  *                                                                    MAC02310
                          232  *                                                                    MAC02320
                          233  *                                                                    MAC02330
000BC4  C200 2568         234  ENABLE1 LPSW  ENABLE           ENABLE INTERRUPTS, GO TO TTYIN        MAC02340
000BC8  E6B0 2238         235  ENABLE2 LA    R11,MALFTN                                             MAC02350
000BCC  50B0 003C         236         ST    R11,X'3C'        SET-UP MACHINE MALFUNCTION            MAC02360
000BD0  58B0 2568         237         L     R11,ENABLE       INTERRUPT NEW PSW                     MAC02370
000BD4  95EB              238         EPSR  R14,R11          RE-ENABLE INTERRUPTS                  MAC02380
000BD6  58B0 2590         239  TTYIN   L     R11,SAVE1                                              MAC02390
000BDA  50B0 2000         240         ST    R11,X'2000'                                            MAC02400
000BDE  48B0 2530         241         LH    R11,ADDRESS      PICK UP DEVICE ADDRESS                MAC02410
000BE2  E6E0 239C         242         LA    R14,PRINT        SET UP R14 FOR PRINT ROUTINE          MAC02420
000BE6  E690 0BC0         243         LA    R9,QUESTN        SET UP R9 FOR ERROR ROUTINE           MAC02430
000BEA  01FE              244  LF      BALR  R15,R14          OUTPUT AN * TO INDICATE               MAC02440
000BEC  2474              245         DC    Z(ASTERISK)      WE ARE READY FOR INPUT                MAC02450
000BEE  F800 2020 2020    246         LI    R0,Y'20202020'   BLANK OUT TTY BUFFER                  MAC02460
000BF4  5000 25B0         247         ST    R0,TTYBUF        WHICH WILL CONTAIN OPTION NAME        MAC02470
000BF8  4000 25B4         248         STH   R0,TTYBUF+4                                            MAC02480
000BFC  0EB0 2528         249         OC    R11,RDCMD        SET READ MODE                         MAC02490
000C00  0711              250         XR    R1,R1            CLEAR TTY INDEX                       MAC02500
000C02  41F0 238E         251  RDCHR   BAL   R15,GETCHR       GET A CHARACTER                       MAC02510
000C06  C500 000D         252         CLHI  R0,X'0D'         IS IT A CR ?                          MAC02520
000C0A  233A              253         BES   OKIN             YES TRY TO MATCH IT TO TABLE          MAC02530
000C0C  C500 0020         254         CLHI  R0,X'20'         IS IT A BLANK ?                       MAC02540
000C10  2337              255         BES   OKIN             YES, TRY A MATCH                      MAC02550
000C12  D201 25B0         256         STB   R0,TTYBUF(R1)    NO, STORE THE CHAR                    MAC02560
000C16  2611              257         AIS   R1,1             BUMP BUFFER INDEX                     MAC02570
000C18  C510 0006         258         CLHI  R1,6             HAVE WE REACHED 6 CHARS ?             MAC02580
000C1C  203D              259         BNES  RDCHR            NO, DO ANOTHER READ                   MAC02590

000C1E  0711              261  OKIN    XR    R1,R1            * MATCH ROUTINE - CLEAR TABLE INDEX   MAC02610
000C20  0733              262  OKIN2   XR    R3,R3            CLEAR TTYBUF INDEX                    MAC02620
000C22  0841              263         LR    R4,R1            SET TABLE INDEX (NEW)                 MAC02630
000C24  4854 0B86         264  LOOKUP  LH    R5,ORG+6(R4)     GET HALFWORD FROM TABLE               MAC02640
000C28  0219              265         BMR   R9               IF MINUS, THEN NO MATCH ,I.E ERROR    MAC02650
000C2A  4553 25B0         266         CLH   R5,TTYBUF(R3)    COMPARE TO TTYBUF HALFWORD            MAC02660
000C2E  4230 0CB2         267         BNE   NEXT             NO MATCH, BUMP TO NEXT TABLE ENTRY    MAC02670
000C32  2642              268         AIS   R4,2             IF EQUAL, TRY NEXT HALFWORD           MAC02680
000C34  2632              269         AIS   R3,2                                                   MAC02690
000C36  C530 0006         270         CLHI  R3,6             HAVE WE FOUND 3 EQUAL HALFWORDS       MAC02700
000C3A  203B              271         BNES  LOOKUP           NO, LOOP                              MAC02710

000C3C  C510 0030         273  MATCH   CLHI  R1,RUN-ORG-4    * OPTION MATCH-CHECK IF RUN CMD       MAC02730
000C40  4330 0CFA         274         BE    SELTST1          YES, SELECT TEST                      MAC02740
000C44  C500 000D         275         CLHI  R0,X'0D'         NO, CHECK IF CR FOLLOWS OPT           MAC02750
000C48  0339              276         BER   R9                                                     MAC02760
000C4A  C510 0018         277  REGCHK  CLHI  R1,SEGREG-ORG-4                                       MAC02770
000C4E  4230 0C6E         278         BNE   LOKAGN                                                 MAC02780
000C52  41D0 0CB8         279         BAL   R13,HEXASC                                             MAC02790
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000C56  C560 0300          280          CLHI  R6,X'300'                                    MAC02800
000C5A  2337               281          BES   STR1                                       MAC02810
000C5C  C560 0500          282          CLHI  R6,X'500'                                    MAC02820
000C60  2334               283          BES   STR1                                       MAC02830
000C62  C560 0900          284          CLHI  R6,X'900'                                    MAC02840
000C66  0239               285          BNER  R9                                         MAC02850
000C68  4061 0B84          286  STR1    STH   R6,ORG+4(R1)                                MAC02860
000C6C  2308               287          BS    LF1                                        MAC02870
000C6E  C510 0000          288  LOKAGN  CLHI  R1,TEST-ORG-4      CHECK IF TEST CMD       MAC02880
000C72  2337               289          BES   TESTST                                     MAC02890
000C74  41D0 0CB8          290          BAL   R13,HEXASC         GET HEX OPERAND         MAC02900
000C78  4061 0B84          291          STH   R6,ORG+4(R1)       STORE IN OPTION TABLE HALFWORD  MAC02910
000C7C  4300 0BEA          292  LF1     B     LF                 GO TO BEGINNING         MAC02920
000C80  0700               293  TESTST  XR    R0,R0              * TEST CMD              MAC02930
000C82  4001 0B84          294          STH   R0,ORG+4(R1)       CLEAR OPTION HALFWORD   MAC02940
000C86  41D0 0CB8          295  TST00   BAL   R13,HEXASC         GET HEX OPERAND         MAC02950
000C8A  C560 000C          296          CLHI  R6,12              12 OR GREATER ?         MAC02960
000C8E  0389               297          BNLR  R9                 YES, ERROR              MAC02970
000C90  2431               298          LIS   R3,1               CONVERT FROM BINARY TO  MAC02980
000C92  C560 000F          299  TST01   CLHI  R6,15              UNARY BIT PATTERN LEFT  MAC02990
000C96  2334               300          BES   TST2                                       MAC03000
000C98  0A33               301          AR    R3,R3                                      MAC03010
000C9A  2661               302          AIS   R6,1                                       MAC03020
000C9C  2205               303          BS    TST01                                      MAC03030
000C9E  4631 0B84          304  TST2    OH    R3,ORG+4(R1)       OR BIT PATTERN INTO     MAC03040
000CA2  4031 0B84          305          STH   R3,ORG+4(R1)       OPTION HALFWORD         MAC03050
000CA6  C500 000D          306          CLHI  R0,X'0D'           WHERE WE TERMINATED BY CR ?  MAC03060
000CAA  4230 0C86          307          BNE   TST00              NO, LOOK FOR ANOTHER HEX OPERAND  MAC03070
000CAE  4300 0BEA          308          B     LF                 YES, GO TO BEGINNING    MAC03080
000CB2  2618               309  NEXT    AIS   R1,8              BUMP TABLE INDEX TO NEXT ENTRY  MAC03090
000CB4  4300 0C20          310          B     OKIN2              RESUME LOOKUP           MAC03100

000CB8  41F0 238E          312  HEXASC  BAL   R15,GETCHR        * HEX CONVERT ROUTINE   MAC03120
000CBC  0766               313          XR    R6,R6              CLEAR BUFFER REGISTER   MAC03130
000CBE  C500 0020          314          CLHI  R0,X'20'           SKIP LEADING SPACES     MAC03140
000CC2  2235               315          BES   HEXASC                                     MAC03150
000CC4  C500 0030          316  HEXLP   CLHI  R0,C'0'           CHECK IF VALID HEX CHARACTER  MAC03160
000CC8  0289               317          BLR   R9                 NO, PRINT ?             MAC03170
000CCA  C500 003A          318          CLHI  R0,X'3A'                                   MAC03180
000CCE  2188               319          BLS   HEX                YES,                    MAC03190
000CD0  C500 0041          320          CLHI  R0,C'A'                                    MAC03200
000CD4  0289               321          BLR   R9                 NO, PRINT ?             MAC03210
000CD6  C500 0047          322          CLHI  R0,X'47'                                   MAC03220
000CDA  0389               323          BNLR  R9                 NO, PRINT ?             MAC03230
000CDC  2609               324          AIS   R0,9               ADJUST A-F TO 10-15     MAC03240
000CDE  C400 000F          325  HEX     NHI   R0,15              ISOLATE 4 BITS          MAC03250
000CE2  1164               326          SLLS  R6,4               SHIFT LEFT 4            MAC03260
000CE4  0660               327          OR    R6,R0              OR IN NEW CHARACTER     MAC03270
000CE6  41F0 238E          328          BAL   R15,GETCHR         GET NEXT CHARACTER      MAC03280
000CEA  C500 000D          329          CLHI  R0,X'0D'                                   MAC03290
000CEE  033D               330          BER   R13                EXIT IF CR              MAC03300
000CF0  C500 002C          331          CLHI  R0,X'2C'                                   MAC03310
000CF4  033D               332          BER   R13                OR COMMA                MAC03320
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000CF6   4300 0CC4          333          B     HEXLP              LOOP TO PROCESS IT                    MAC03330
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000CFA  0722                    335  SELTST1  XR    R2,R2                                                    MAC03350
000CFC  D220 2523               336           STB   R2,TTYFLG          CLEAR DU FLAG                      MAC03360
000D00  5020 2538               337           ST    R2,TOTAL                                                 MAC03370
000D04  5020 253C               338           ST    R2,TOTALERR                                              MAC03380
000D08  4020 2430               339           STH   R2,ERRNUM                                                MAC03390
000D0C  5800 2534               340           L     R0,PSWMASK         LOAD PSW MASK                      MAC03400
000D10  C400 FBFF               341           NHI   R0,X'FBFF'         MASK OFF MAC BIT                   MAC03410
000D14  F830 0000 80F0          342           LI    R3,Y'80F0'         LOAD STANDARD PSW VALUE            MAC03420
000D1A  0630                    343           OR    R3,R0              OR IN PSW MASK                     MAC03430
000D1C  5030 2560               344           ST    R3,SET1            STORE NEW PSW VALUE                MAC03440
000D20  C830 24F0               345           LHI   R3,X'24F0'         LOAD STANDARD PSW VALUE            MAC03450
000D24  0630                    346           OR    R3,R0              OR IN PSW MASK                     MAC03460
000D26  5030 2580               347           ST    R3,ENBMAC          STORE NEW PSW VALUE                MAC03470
000D2A  F830 0000 A0F0          348           LI    R3,Y'A0F0'         LOAD STANDARD PSW VALUE            MAC03480
000D30  0630                    349           OR    R3,R0              OR IN PSW MASK                     MAC03490
000D32  5030 2570               350           ST    R3,HALT            STORE NEW PSW VALUE                MAC03500
000D36  5030 2578               351           ST    R3,ERRHALT                                            MAC03510
000D3A  C830 20F0               352           LHI   R3,X'20F0'         LOAD STANDARD PSW VALUE            MAC03520
000D3E  0630                    353           OR    R3,R0              OR IN PSW MASK                     MAC03530
000D40  5030 2588               354           ST    R3,DISMAC                                             MAC03540
000D44  7320 0884               355  SELTST   LHL   R2,TEST            LOAD INITIAL TEST OPTION           MAC03550
000D48  3422                    356           EXHR  R2,R2                                                   MAC03560
000D4A  5020 2540               357           ST    R2,OPTSAV                                               MAC03570
000D4E  0711                    358           XR    R1,R1                                                   MAC03580
000D50  230D                    359           BS    SHIFT                                                   MAC03590
000D52  0711                    360  TSTSEL   XR    R1,R1                                                   MAC03600
000D54  4010 2430               361           STH   R1,ERRNUM          ZERO ERROR FLAG                    MAC03610
000D58  5820 2540               362  TSTSEL2  L     R2,OPTSAV          LOAD CURRENT TEST OPTION           MAC03620
000D5C  D310 252A               363           LB    R1,SUBTST          LOAD PREVIOUS TEST NUMBER          MAC03630
000D60  2611                    364  BUMP     AIS   R1,1               INCREMENT TEST NUMBER              MAC03640
000D62  C510 000C               365           CLHI  R1,12              HAVE WE REACHED MAX TEST NUMBER    MAC03650
000D66  4380 0DAC               366           BNL   OPTCHK             YES,CHECK FOR CONTIN OPTION        MAC03660
000D6A  1121                    367  SHIFT    SLLS  R2,1               NO, IS NEXT TEST TO BE EXECUTED    MAC03670
000D6C  2286                    368           BNCS  BUMP               NO, INCREMENT TEST NUMBER          MAC03680
000D6E  5020 2540               369           ST    R2,OPTSAV          YES, SAVE CURRENT TEST OPTION      MAC03690
000D72  D210 252A               370           STB   R1,SUBTST          SAVE CURRENT TEST NUMBER           MAC03700
000D76  1111                    371           SLLS  R1,1               ESTABLISH BRANCH INDEX             MAC03710
000D78  7341 0D94               372           LHL   R4,TST(R1)                                            MAC03720
000D7C  7310 0B9C               373           LHL   R1,SEGREG                                             MAC03730
000D80  F850 0FF0 0010          374           LI    R5,Y'0FF00010'                                        MAC03740
000D86  5051 0000               375           ST    R5,0(R1)                                              MAC03750
000D8A  5800 2580               376           L     R0,ENBMAC                                             MAC03760
000D8E  5830 2588               377           L     R3,DISMAC                                             MAC03770
000D92  1803                    378           LPSWR R3               DISABLE MAC, SET F, GO TO TEST       MAC03780
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```
                0000 0D94          380  TST     EQU   *                          MAC03800
000D94  0E40                       381          DC    Z(TEST0)                   MAC03810
000D96  0EC4                       382          DC    Z(TEST1)                   MAC03820
000D98  0FB8                       383          DC    Z(TEST2)                   MAC03830
000D9A  1042                       384          DC    Z(TEST3)                   MAC03840
000D9C  1108                       385          DC    Z(TEST4)                   MAC03850
000D9E  11EC                       386          DC    Z(TEST5)                   MAC03860
000DA0  12B2                       387          DC    Z(TEST6)                   MAC03870
000DA2  1382                       388          DC    Z(TEST7)                   MAC03880
000DA4  13D8                       389          DC    Z(TEST8)                   MAC03890
000DA6  1482                       390          DC    Z(TEST9)                   MAC03900
000DA8  152C                       391          DC    Z(TESTA)                   MAC03910
000DAA  15DE                       392          DC    Z(TESTB)                   MAC03920
```

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000DAC   48B0 2530          394  OPTCHK   LH     R11,ADDRESS        PICK UP DEVICE NUMBER                MAC03940
000DB0   73C0 2558          395           LHL    R12,CRTFLG                                              MAC03950
000DB4   2336               396           BZS    CMD1                                                    MAC03960
000DB6   26B1               397           AIS    R11,1              SELECT TRANSMIT SIDE                 MAC03970
000DB8   DEB0 2527          398           OC     R11,WRTCMD                                              MAC03980
000DBC   27B1               399           SIS    R11,1                                                   MAC03990
000DBE   2303               400           BS     MSGTST                                                  MAC04000
000DC0   DEB0 2527          401  CMD1     OC     R11,WRTCMD                                              MAC04010
000DC4   7310 0B8C          402  MSGTST   LHL    R1,NOMSG                                                MAC04020
000DC8   2134               403           BNZS   DISTOT                                                  MAC04030
000DCA   9DBC               404           SSR    R11,R12            SENSE TTY STATUS                     MAC04040
000DCC   4310 0DEA          405           BNM    CONCHK                                                  MAC04050
000DD0   2411               406  DISTOT   LIS    R1,1                                                    MAC04060
000DD2   5110 2538          407           A      R1,TOTAL           INCREMENT TOTAL COUNT                MAC04070
000DD6   5870 2538          408           L      R7,TOTAL                                                MAC04080
000DDA   41E0 22A0          409           BAL    R14,WRITE          WRITE CURRENT COUNT ON DISPLAY       MAC04090
000DDE   9DBC               410           SSR    R11,R12                                                 MAC04100
000DE0   2315               411           BNMS   CONCHK                                                  MAC04110
000DE2   D2B0 2523          412           STB    R11,TTYFLG         SET CONSOLE DU FLAG                  MAC04120
000DE6   4300 0D44          413           B      SELTST                                                  MAC04130
000DEA   7310 0B94          414  CONCHK   LHL    R1,CONTIN                                               MAC04140
000DEE   4330 0E0E          415           BZ     TTYCHK                                                  MAC04150
000DF2   9DBC               416           SSR    R11,R12            SENSE TTY STATUS                     MAC04160
000DF4   C3C0 0020          417           THI    R12,X'20'          IS BREAK KEY SET ?                   MAC04170
000DF8   4330 0D44          418           BZ     SELTST                                                  MAC04180
000DFC   73F0 2558          419           LHL    R15,CRTFLG                                              MAC04190
000E00   2335               420           BZS    SENSE1                                                  MAC04200
000E02   DEB0 2528          421           OC     R11,RDCMD                                               MAC04210
000E06   9BBF               422           RDR    R11,R15                                                 MAC04220
000E08   2303               423           BS     TTYCHK                                                  MAC04230
000E0A   9DBC               424  SENSE1   SSR    R11,R12            YES, WAIT FOR BREAK STATUS           MAC04240
000E0C   2041               425           BOS    SENSE1             TO GO AWAY                           MAC04250
000E0E   D3C0 2523          426  TTYCHK   LB     R12,TTYFLG         HAS TTY BEEN TURNED OFF ?            MAC04260
000E12   08CC               427           LR     R12,R12                                                 MAC04270
000E14   4330 0BC4          428           BZ     ENABLE1            NO, RETURN TO COMMAND MODE           MAC04280
000E18   5810 2538          429           L      R1,TOTAL                                                MAC04290
000E1C   41E0 235E          430           BAL    R14,CONVERT                                             MAC04300
000E20   001C               431           DC     X'1C'              SHIFT INDEX                          MAC04310
000E22   247C               432           DC     Z(TOTALMSG)                                             MAC04320
000E24   41F0 239C          433           BAL    R15,PRINT                                               MAC04330
000E28   247A               434           DC     Z(TOTMSG)                                               MAC04340
000E2A   5810 253C          435           L      R1,TOTALERR                                             MAC04350
000E2E   41E0 235E          436           BAL    R14,CONVERT                                             MAC04360
000E32   001C               437           DC     X'1C'                                                   MAC04370
000E34   247C               438           DC     Z(TOTALMSG)                                             MAC04380
000E36   41F0 239C          439           BAL    R15,PRINT                                               MAC04390
000E3A   247C               440           DC     Z(TOTALMSG)                                             MAC04400
000E3C   4300 0BC4          441           B      ENABLE1                                                 MAC04410
```

TEST 0

```
                                443  *                    T E S T 0                                    MAC04430
                                444  *                                                                 MAC04440
                                445  * PURPOSE:                                                       * MAC04450
                                446  *  TO INSURE THAT THE CORRECT SEGMENTATION REGISTERS            * MAC04460
                                447  *  ARE SELECTED IN THE FULLWORD MODE.                           * MAC04470
                                448  *                                                              * MAC04480
                                449  * ASSUMPTIONS:                                                 * MAC04490
                                450  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR               * MAC04500
                                451  *  TESTS AND THE SERIES 32 MEMORY TESTS HAVE RUN                * MAC04510
                                452  *  WITHOUT DETECTING A FAILURE.                                 * MAC04520
                                453  *                                                              * MAC04530
                                454  * DESIGN SPECIFICATIONS:                                       * MAC04540
                                455  *  EACH SEGMENTATION REGISTER, STARTING WITH REGISTER          * MAC04550
                                456  *  1, IS LOADED WITH A RELOCATION FIELD OF 041, 042,           * MAC04560
                                457  *  043,...04F. LOCATIONS X'4100', X'4200',...X'4F00'           * MAC04570
                                458  *  ARE LOAD WITH VALUES OF X'10000', X'20000'...               * MAC04580
                                459  *  X'F0000'. THE MAC IS ENABLED AND ADRS OF X'10000',          * MAC04590
                                460  *  X'20000',...X'F0000' ARE READ. IF THE CORRECT               * MAC04600
                                461  *  REGISTER IS SELECTED THE DATA READ SHOULD EQUAL             * MAC04610
                                462  *  THE ADRS OF THE LOCATION READ.                              * MAC04620
                                463  *                                                              * MAC04630
                                464  * HOW TO RUN THE TEST:                                         * MAC04640
                                465  *  ENTER TEST 0 AND ANY OTHER OPTION INFORMATION               * MAC04650
                                466  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO                    * MAC04660
                                467  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND          * MAC04670
                                468  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION                   * MAC04680
                                469  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED             * MAC04690
                                470  *  BY ENTERING THE RUN COMMAND.                                * MAC04700

000E40  41F0 227C               472  TEST0    BAL    R15,TSTNUM      PRINT TEST NUMBER                MAC04720
000E44  2441                    473           LIS    R4,1                                             MAC04730
000E46  D240 252C               474           STB    R4,CONFLD       STORE CONTROL FLD VALUE          MAC04740
000E4A  7340 0B9C               475           LAL    R4,SEGREG       LOAD START ADRS OF SEG REGISTER  MAC04750
000E4E  2551                    476           LCS    R5,1                                             MAC04760
000E50  5054 0040               477           ST     R5,X'40'(R4)    ALL ONES TO ISR                  MAC04770
000E54  5854 0040               478           L      R5,X'40'(R4)    READ IT BACK.  IF THE MAC        MAC04780
000E58  0766                    479           XR     R6,R6           ADDRESS TRAP IS WORKING,         MAC04790
000E5A  5064 0040               480           ST     R6,X'40'(R4)    THE READ BACK FROM THE ISR       MAC04800
000E5E  2651                    481           AIS    R5,1            SHOULD NOT BE 'FFFFFFFF'         MAC04810
000E60  2134                    482           BNZS   TEST0,1         SKIP IF IT ISN'T                 MAC04820
000E62  41F0 22B8               483           BAL    R15,ERROR1                                       MAC04830
000E66  3031                    484           DCX    3031            ERROR NUMBER          * 0001 *   MAC04840
000E68  2644                    485  TEST0,1  AIS    R4,4            POINT TO SEG REG 1               MAC04850
000E6A  2454                    486           LIS    R5,4            ESTABLISH INCREMENT VALUE        MAC04860
000E6C  C864 003C               487           LHI    R6,60(R4)       ESTABLISH BXLE LIMIT             MAC04870
000E70  F870 0FF0 4110          488           LI     R7,Y'0FF04110'  LOAD VALUE FOR SEG REGISTER 1   MAC04880
000E76  5074 0000               489  STORE    ST     R7,0(R4)        STORE DATA IN SEGMENTATION REG   MAC04890
000E7A  CA70 0100               490           AHI    R7,X'100'       INCREMENT REGISTER VALUE         MAC04900
000E7E  C140 0E76               491           BXLE   R4,STORE        REPEAT UNTIL ALL SEG REGS LOADED MAC04910
000E82  C840 4100               492           LHI    R4,X'4100'      LOAD START ADRS OF BXLE          MAC04920
000E86  C850 0100               493           LHI    R5,X'100'       LOAD INCREMENT VALUE             MAC04930
```

TEST 0

```
000E8A   C860 4F00          494          LHI   R6,X'4F00'        LOAD BXLE LIMIT                          MAC04940
000E8E   F870 0001 0000     495          LI    R7,Y'10000'       LOAD DATA TO BE STORED IN MEMORY         MAC04950
000E94   0887               496          LR    R8,R7             LOAD DATA INCREMENT VALUE                MAC04960
000E96   5074 0000          497  STORE1  ST    R7,0(R4)          STORE DATA IN MEMORY                     MAC04970
000E9A   0A78               498          AR    R7,R8             INCREMENT DATA VALUE                     MAC04980
000E9C   C140 0E96          499          BXLE  R4,STORE1         STORE NEXT VALUE                         MAC04990
000EA0   0848               500          LR    R4,R8                                                      MAC05000
000EA2   0858               501          LR    R5,R8             LOAD BXLE INCREMENT VALUE                MAC05010
000EA4   F860 000F 0000     502          LI    R6,Y'F0000'       LOAD BXLE LIMIT                          MAC05020
000EAA   9530               503  EPSR    EPSR  R3,R0             ENABLE MAC                               MAC05030
000EAC   5814 0000          504          L     R1,0(R4)          LOAD CONTENTS OF MEMORY                  MAC05040
000EB0   9503               505          EPSR  R0,R3             DISABLE MAC                              MAC05050
000EB2   0514               506          CLR   R1,R4             IS DATA READ = CURRENT ADRS ?            MAC05060
000EB4   2334               507          BES   CONT2             YES, CONTINUE WITH PROGRAM               MAC05070
000EB6   41F0 22C0          508          BAL   R15,ERROR         NO, PRINT ERROR                          MAC05080
000EBA   3032               509          DCX   3032              ERROR NUMBER                * 0002 *     MAC05090
000EBC   C140 0EAA          510  CONT2   BXLE  R4,EPSR           REPEAT UNTIL ALL SEG REGS CHECKED        MAC05100
000EC0   4300 20C0          511          B     TSTCHK            CHECK FOR NEXT TEST                      MAC05110
```

TEST 1

```
                                513  *                    T E S T 1                                  MAC05130
                                514  *                                                               MAC05140
                                515  * PURPOSE: TO EXERCISE THE RELOCATION FIELD.                    MAC05150
                                516  *                                                               MAC05160
                                517  * ASSUMPTIONS:                                                 MAC05170
                                518  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR              MAC05180
                                519  *  TESTS AND THE SERIES 32 MEMORY TESTS HAVE RUN               MAC05190
                                520  *  WITHOUT DETECTING A FAILURE.                               MAC05200
                                521  *                                                               MAC05210
                                522  * DESIGN SPECIFICATIONS:                                       MAC05220
                                523  *  THE TEST LOADS EACH SEGMENTATION REGISTER, STARTING        MAC05230
                                524  *  WITH REGISTER 1, WITH A KNOWN RELOCATION FIELD             MAC05240
                                525  *  VALUE. THE VALUE OF THE RELOCATION FIELD IS THEN           MAC05250
                                526  *  STORED IN A PREDETERMINED MEMORY LOCATION. THE MAC         MAC05260
                                527  *  IS ENABLED AND A LOCATION IS READ. IF THE MAC              MAC05270
                                528  *  RELOCATES THE ADRS CORRECTLY THE VALUE READ WILL           MAC05280
                                529  *  EQUAL THE VALUE IN THE RELOCATION FIELD. THIS              MAC05290
                                530  *  SEQUENCE IS REPEATED FOR EACH SEGMENTATION REGISTER        MAC05300
                                531  *  AND THEN THE RELOCATION FIELD VALUE IS CHANGED.            MAC05310
                                532  *  THE TEST IS REPEATED UNTIL ALL THE VALUES LISTED           MAC05320
                                533  *  BELOW HAVE BEEN TESTED IN EACH SEGMENTATION REG.           MAC05330
                                534  *                                                               MAC05340
                                535  *  REL FIELD VAL USED          MEM LOC READ                  MAC05350
                                536  *    000 TO 0DF                   X4000                       MAC05360
                                537  *    F30 TO FFF                   XF000                       MAC05370
                                538  *    0E0 TO 0FF                   X0000                       MAC05380
                                539  *                                                               MAC05390
                                540  *                               X = 1 TO F DEPENDING ON       MAC05400
                                541  *                               SEG REG BEING TESTED.         MAC05410
                                542  *                                                               MAC05420
                                543  *  RELOCATION VALUES OF F00 TO F2F ARE NOT TESTED.             MAC05430
                                544  *                                                               MAC05440
                                545  * HOW TO RUN THE TEST:                                         MAC05450
                                546  *  ENTER TEST 1 AND ANY OTHER OPTION INFORMATION              MAC05460
                                547  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO                   MAC05470
                                548  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND          MAC05480
                                549  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION                  MAC05490
                                550  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED            MAC05500
                                551  *  BY ENTERING THE RUN COMMAND.                               MAC05510

000EC4  41F0 227C               553  TEST1    BAL   R15,TSTNUM       PRINT TEST NUMBER            MAC05530
000EC8  E610 0F94               554           LA    R1,ILGREG       LOAD ADRS OF INTERRUPT ROUTINE MAC05540
000ECC  5010 0094               555           ST    R1,X'94'                                     MAC05550
000ED0  2411                    556           LIS   R1,1                                         MAC05560
000ED2  D210 252C               557           STB   R1,CONFLD                                    MAC05570
000ED6  0744                    558           XR    R4,R4           SETUP FOR FIRST PATTERN  000-0DF MAC05580
000ED8  C860 00DF               559           LHI   R6,X'DF'                                     MAC05590
000EDC  2451                    560           LIS   R5,1            LOAD INCREMENT VALUE         MAC05600
000EDE  C820 4000               561           LHI   R2,X'4000'                                   MAC05610
000EE2  0874                    562  SHIFTVAL LR    R7,R4           LOAD RELOCATION FIELD VALUE  MAC05620
000EE4  1178                    563           SLLS  R7,8            ESTABLISH INDEX              MAC05630
```

TEST 1

```
000EE6  5042 4700 0000        564           ST    R4,0(R2,R7)        STORE EXPECTED DATA IN MEMORY          MAC05640
000EEC  C140 0EE2             565           BXLE  R4,SHIFTVAL                                            MAC05650
000EF0  FA20 0001 0000        566           AI    R2,Y'10000'                                            MAC05660
000EF6  7380 0B9C             567           LHL   R8,SEGREG          LOAD START ADRS OF SEG REGISTERS       MAC05670
000EFA  C870 0010             568           LHI   R7,X'10'           LOAD SEG REGISTER VALUE                MAC05680
000EFE  2494                  569           LIS   R9,4                                                      MAC05690
000F00  24A4                  570           LIS   R10,4                                                     MAC05700
000F02  C8B0 003C             571           LHI   R11,60                                                    MAC05710
000F06  5078 4900 0000        572  STORE5   ST    R7,0(R8,R9)                                            MAC05720
000F0C  C190 0F06             573           BXLE  R9,STORE5                                                 MAC05730
000F10  2494                  574           LIS   R9,4                                                      MAC05740
000F12  1048                  575  SUBTRACT SRLS  R4,8                                                    MAC05750
000F14  2338                  576           BZS   LOAD9                                                     MAC05760
000F16  1041                  577           SRLS  R4,1                                                     MAC05770
000F18  2334                  578           BZS   SETBXLE                                                   MAC05780
000F1A  C840 0F30             579           LHI   R4,X'F30'                                                 MAC05790
000F1E  2303                  580           BS    LOAD9                                                     MAC05800
000F20  C840 00E0             581  SETBXLE  LHI   R4,X'E0'                                                 MAC05810
000F24  F870 FFF0 0010        582  LOAD9    LI    R7,Y'FFF00010'     LOAD SEG REGISTER VALUE             MAC05820
000F2A  08A4                  583           LR    R10,R4                                                    MAC05830
000F2C  11A8                  584           SLLS  R10,8              ESTABLISH RELOCATION FIELD VALUE       MAC05840
000F2E  0A7A                  585           AR    R7,R10             ADD RELOCATION FIELD TO SEG REG VALUE  MAC05850
000F30  5078 4900 0000        586           ST    R7,0(R8,R9)        STORE SEG REG VALUE IN SEG REGISTER    MAC05860
000F36  9530                  587           EPSR  R3,R0              ENABLE MAC                             MAC05870
000F38  5812 0000             588           L     R1,0(R2)           READ DATA FROM MEMORY                  MAC05880
000F3C  9503                  589           EPSR  R0,R3              DISABLE MAC                            MAC05890
000F3E  0514                  590           CLR   R1,R4              IS DATA READ = DATA EXPECTED ?         MAC05900
000F40  2334                  591           BES   CONT25             YES, CHECK NEXT RELOCATION FIELD VAL    MAC05910
000F42  41F0 22C0             592           BAL   R15,ERROR          NO, PRINT ERROR                        MAC05920
000F46  3033                  593           DCX   3033               ERROR NUMBER              * 0103 *     MAC05930
000F48  C140 0F24             594  CONT25   BXLE  R4,LOAD9           REPEAT FOR EACH REL FIELD VALUE        MAC05940
000F4C  C870 0010             595           LHI   R7,X'10'                                                  MAC05950
000F50  5078 4900 0000        596           ST    R7,0(R8,R9)        RESTORE ORIGINAL SEG REGISTER VALUE    MAC05960
000F56  FA20 0001 0000        597           AI    R2,Y'10000'                                            MAC05970
000F5C  2694                  598           AIS   R9,4               INCREMENT SEG REGISTER INDEX           MAC05980
000F5E  C590 0040             599           CLHI  R9,X'40'           HAVE ALL SEG REGISTERS BEEN CHECKED ?  MAC05990
000F62  4230 0F12             600           BNE   SUBTRACT           NO, CHECK NEXT SEG REG REL FIELD VAL   MAC06000
000F66  F420 0000 FFFF        601           NI    R2,Y'FFFF'                                               MAC06010
000F6C  4330 20C0             602           BZ    TSTCHK             CHECKED ? - YES, CHECK FOR NEXT TEST   MAC06020
000F70  C520 2000             603           CLHI  R2,X'2000'         HAS SECOND PATTERN BEEN TESTED ?       MAC06030
000F74  2139                  604           BNES  CONT13             YES, SETUP FOR THIRD PATTERN 0E0-0FF   MAC06040
000F76  C840 0F30             605           LHI   R4,X'F30'          NO, SETUP FOR SECOND PATTERN F30-FFF   MAC06050
000F7A  C860 0FFF             606           LHI   R6,X'FFF'                                                 MAC06060
000F7E  F820 0000 F000        607           LI    R2,Y'F000'         LOAD ADRS TO BE RELOCATED              MAC06070
000F84  2306                  608           BS    RTN                REPEAT TEST                            MAC06080
000F86  C840 00E0             609  CONT13   LHI   R4,X'E0'          SETUP THIRD PATTERN  0E0-0FF           MAC06090
000F8A  C860 00FF             610           LHI   R6,X'FF'                                                  MAC06100
000F8E  0722                  611           XR    R2,R2              LOAD ADRS TO BE RELOCATED              MAC06110
000F90  4300 0EE2             612  RTN      B     SHIFTVAL           REPEAT TEST                            MAC06120
                              613  *                                                                        MAC06130
                              614  *                                                                        MAC06140
                              615  * IF GET MAC INTERRUPT                                                   MAC06150
                              616  *                                                                        MAC06160
```

TEST 1

```
000F94   5830 2588          617  ILGREG   L      R3,DISMAC                                          MAC06170
000F98   9503               618           EPSR   R0,R3          SWITCH BACK TO SET F                MAC06180
000F9A   41F0 22C0          619           BAL    R15,ERROR                                          MAC06190
000F9E   3032               620           DCX    3032           ERROR NUMBER          * 0102 *     MAC06200
000FA0   0711               621           XR     R1,R1                                              MAC06210
000FA2   D218 0043          622           STB    R1,67(R8)      (R8) = SEG REG ORIGIN               MAC06220
000FA6   D318 0043          623           LB     R1,67(R8)      CLEAR MAC STATUS REGISTER           MAC06230
000FAA   0811               624           LR     R1,R1                                              MAC06240
000FAC   2334               625           BZS    RTN6                                               MAC06250
000FAE   41F0 22B8          626           BAL    R15,ERROR1                                         MAC06260
000FB2   3034               627           DCX    3034           ERROR NUMBER          * 0104 *     MAC06270
000FB4   4300 0F48          628  RTN6     B      CONT25         RETURN TO TEST                      MAC06280
```

TEST 2

```
                                630  *                    TEST 2                                *                MAC06300
                                631  *                                                          *                MAC06310
                                632  * PURPOSE:                                                *                MAC06320
                                633  *  TO TEST THE RELOCATION FEATURES OF THE MAC             *                MAC06330
                                634  *  THROUGHOUT THE AVAILABLE MEMORY IN THE SYSTEM.         *                MAC06340
                                635  *                                                          *                MAC06350
                                636  * ASSUMPTIONS:                                           *                MAC06360
                                637  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR         *                MAC06370
                                638  *  TESTS AND THE SERIES 32 MEMORY TESTS HAVE RUN          *                MAC06380
                                639  *  WITHOUT DETECTING A FAILURE.                           *                MAC06390
                                640  *  DETECTING A FAILURE.                                   *                MAC06400
                                641  *                                                          *                MAC06410
                                642  * DESIGN SPECIFICATION:                                  *                MAC06420
                                643  *  THIS TEST WRITES EACH ADRS FROM X'4000' TO THE         *                MAC06430
                                644  *  TOP OF CORE INTO ITSELF. ALL SEGMENTATION REGISTERS    *                MAC06440
                                645  *  ARE LOADED WITH RELOCATION FIELD VALUES OF 000,        *                MAC06450
                                646  *  100, 200,...F00. THE MAC IS ENABLED AND EACH ADRS      *                MAC06460
                                647  *  FROM X'2000' TO THE TOP OF CORE IS READ. IF THE        *                MAC06470
                                648  *  MAC RELOCATES THE ADRS CORRECTLY THE VALUE READ        *                MAC06480
                                649  *  WILL EQUAL THE ADRS READ.                              *                MAC06490
                                650  *                                                          *                MAC06500
                                651  * HOW TO RUN THE TEST:                                   *                MAC06510
                                652  *  ENTER TEST 2 AND ANY OTHER OPTION INFORMATION          *                MAC06520
                                653  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO               *                MAC06530
                                654  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND      *                MAC06540
                                655  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION              *                MAC06550
                                656  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED        *                MAC06560
                                657  *  BY ENTERING THE RUN COMMAND.                           *                MAC06570

000FB8  41F0 227C               659  TEST2    BAL   R15,TSTNUM        PRINT TEST NUMBER                        MAC06590
000FBC  2441                    660           LIS   R4,1                                                        MAC06600
000FBE  D240 252C               661           STB   R4,CONFLD                                                   MAC06610
000FC2  7340 0B9C               662           LHL   R4,SEGREG         LOAD START ADRS OF SEG REGISTER          MAC06620
000FC6  2454                    663           LIS   R5,4              ESTABLISH INCREMENT VALUE                MAC06630
000FC8  C864 003C               664           LHI   R6,60(R4)                                                   MAC06640
000FCC  F870 0FF0 0010          665           LI    R7,Y'0FF00010'    ESTABLISH VALUE FOR 1ST REG              MAC06650
000FD2  5074 0000               666  STRAGN   ST    R7,0(R4)          STORE DATA IN SEGMENTATION REG           MAC06660
000FD6  FA70 1001 0000          667           AI    R7,Y'10010000'    INCREMENT DATA VALUE                     MAC06670
000FDC  C140 0FD2               668           BXLE  R4,STRAGN         REPEAT UNTIL ALL SEG REGS ARE LOADED     MAC06680
000FE0  41F0 20EE               669           BAL   R15,BLKCHK        FIND START & END ADRS OF CURRENT BLK     MAC06690
000FE4  CA20 2000               670           AHI   R2,X'2000'                                                  MAC06700
000FE8  0842                    671  LDADRS   LR    R4,R2             LOAD START ADRS OF BLOCK                 MAC06710
000FEA  2454                    672           LIS   R5,4              ESTABLISH INCREMENT VALUE                MAC06720
000FEC  C862 1FFC               673           LHI   R6,8188(R2)       LOAD END ADRS OF BLOCK                   MAC06730
000FF0  5044 0000               674  STRADRS  ST    R4,0(R4)          STORE ADRS IN ITSELF                     MAC06740
000FF4  0874                    675           LR    R7,R4                                                       MAC06750
000FF6  41E0 22A0               676           BAL   R14,WRITE                                                   MAC06760
000FFA  C140 0FF0               677           BXLE  R4,STRADRS        REPEAT FOR ENTIRE BLOCK                  MAC06770
000FFE  41F0 20FC               678           BAL   R15,BLKCHK1       FIND START & END ADRS OF NEXT BLOCK      MAC06780
001002  4300 0FE8               679           B     LDADRS            REPEAT FOR NEXT BLOCK                    MAC06790
001006  41F0 20EE               680           BAL   R15,BLKCHK        FIND START & END ADRS OF ST BLK          MAC06800
```

TEST 2

```
00100A  CA20 2000      681          AHI   R2,X'2000'                                  MAC06810
00100E  0842           682  LDNXT   LR    R4,R2          LOAD START ADRS OF BLOCK     MAC06820
001010  2454           683          LIS   R5,4                                        MAC06830
001012  C862 1FFC      684          LHI   R6,8188(R2)    LOAD END ADRS OF BLOCK       MAC06840
001016  0874           685  COMPNXT LR    R7,R4                                       MAC06850
001018  41E0 22A0      686          BAL   R14,WRITE                                   MAC06860
00101C  9530           687          EPSR  R3,R0          ENABLE MAC                   MAC06870
00101E  5814 0000      688          L     R1,0(R4)       LOAD CONTENTS OF MEMORY      MAC06880
001022  9503           689          EPSR  R0,R3          DISABLE MAC                  MAC06890
001024  0514           690          CLR   R1,R4          IS DATA READ = CURRENT ADRS  MAC06900
001026  2334           691          BES   CONT11                                      MAC06910
001028  41F0 22C0      692          BAL   R15,ERROR                                   MAC06920
00102C  3033           693          DCX   3033           ERROR NUMBER      * 0203 *   MAC06930
00102E  C140 1016      694  CONT11  BXLE  R4,COMPNXT     REPEAT FOR ENTIRE BLOCK      MAC06940
001032  41F0 20FC      695          BAL   R15,BLKCHK1    FIND START & END ADRS OF NEXT BLOCK MAC06950
001036  4300 100E      696          B     LDNXT          REPEAT FOR NEXT BLOCK        MAC06960
                       697  *                           (NOW CONTIGUOUS MEMORY)      MAC06970
00103A  4300 100E      698          B     LDNXT          REPEAT FOR NEXT BLOCK        MAC06980
                       699  *                           (CONTIGUOUS MEMORY)          MAC06990
00103E  4300 20C0      700          B     TSTCHK         END...CHECK FOR NEXT TEST    MAC07000
```

TEST 3

```
                        702  *                    T E S T 3                                  MAC07020
                        703  *                                                               MAC07030
                        704  * PURPOSE:                                                      MAC07040
                        705  *  TO EXERCISE THE LIMIT FIELD AND CHECK THE INVALID           MAC07050
                        706  *  ADDRESS INTERRUPT.                                          MAC07060
                        707  *                                                               MAC07070
                        708  * ASSUMPTIONS:                                                 MAC07080
                        709  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR              MAC07090
                        710  *  TESTS, THE SERIES 32 MEMORY TESTS, AND TESTS 1 AND          MAC07100
                        711  *  2 HAVE RUN WITHOUT DETECTING A FAILURE.                     MAC07110
                        712  *                                                               MAC07120
                        713  * DESIGN SPECIFICATIONS:                                       MAC07130
                        714  *  SEGMENTATION REGISTER ONES LIMIT FIELD IS LOADED            MAC07140
                        715  *  WITH F00, AN ADRS EXCEEDING THAT LIMIT IS READ              MAC07150
                        716  *  FROM, AN INVALID ADRS INTERRUPT IS EXPECTED, IF             MAC07160
                        717  *  THE INTERRUPT IS NOT GENERATED AN ERROR IS PRINTED.         MAC07170
                        718  *  IF THE INTERRUPT IS GENERATED THE MAC STATUS IS             MAC07180
                        719  *  TESTED TO INSURE THE CORRECT STATUS IS SET, THIS            MAC07190
                        720  *  SEQUENCE IS REPEATED FOR EACH LIMIT FIELD VALUE UP          MAC07200
                        721  *  TO FFF, AFTER TESTING SEGMENTATION REGISTER 1 EACH          MAC07210
                        722  *  REMAINDING REGISTER IS TEST UNTIL ALL REGISTERS             MAC07220
                        723  *  HAVE BEEN TESTED.                                          MAC07230
                        724  *                                                               MAC07240
                        725  * HOW TO RUN THE TEST:                                         MAC07250
                        726  *  ENTER TEST 3 AND ANY OTHER OPTION INFORMATION              MAC07260
                        727  *  DESIRED VIA THE CONSOLE DEVICE, REFER TO                   MAC07270
                        728  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND          MAC07280
                        729  *  INPUT STRUCTURE, AFTER THE DESIRED OPTION                  MAC07290
                        730  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED            MAC07300
                        731  *  BY ENTERING THE RUN COMMAND.                               MAC07310

001042  41F0 227C       733  TEST3    BAL   R15,TSTNUM        PRINT TEST NUMBER          MAC07330
001046  7380 0B9C       734           LHL   R8,SEGREG                                      MAC07340
00104A  0744            735           XR    R4,R4                                        MAC07350
00104C  2454            736           LIS   R5,4                                         MAC07360
00104E  C860 0040       737           LHI   R6,64                                        MAC07370
001052  9530            738           EPSR  R3,R0                                        MAC07380
001054  5048 4400 0000  739  AGNN     ST    R4,0(R8,R4)                                  MAC07390
00105A  C140 1054       740           BXLE  R4,AGNN                                      MAC07400
00105E  9503            741           EPSR  R0,R3                                        MAC07410
001060  E610 10DC       742           LA    R1,ILLADRS      LOAD ADRS OF INT ROUTINE     MAC07420
001064  5010 0094       743           ST    R1,X'94'                                     MAC07430
001068  2411            744           LIS   R1,1                                         MAC07440
00106A  D210 252C       745           STB   R1,CONFLD                                    MAC07450
00106E  F840 0001 0100  746           LI    R4,Y'10100'                                  MAC07460
001074  F850 0001 0000  747           LI    R5,Y'10000'                                  MAC07470
00107A  F860 000F 0100  748           LI    R6,Y'F0100'                                  MAC07480
001080  F870 1000 0010  749           LI    R7,Y'10000010'                               MAC07490
001086  F880 1010 0000  750           LI    R8,Y'10100000'                               MAC07500
00108C  F890 1FE0 0010  751           LI    R9,Y'1FE00010'                               MAC07510
001092  7320 0B9C       752  RESTART2 LHL   R2,SEGREG                                    MAC07520
```

TEST 3

```
001096  0711             753           XR    R1,R1                                                    MAC07530
001098  2614             754  STORE2   AIS   R1,4                                                     MAC07540
00109A  5071 4200 0000   755           ST    R7,0(R1,R2)                                              MAC07550
0010A0  FA70 1000 0000   756           AI    R7,Y'10000000'                                           MAC07560
0010A6  C510 003C        757           CLHI  R1,X'3C'                                                 MAC07570
0010AA  2089             758           BLS   STORE2                                                   MAC07580
0010AC  9530             759  EXCHANGE EPSR  R3,R0          ENABLE MAC                               MAC07590
0010AE  5814 0000        760           L     R1,0(R4)        GENERATE INVALID ADRS INT                MAC07600
0010B2  41F0 2140        761           BAL   R15,DELAY       WAIT FOR INTERRUPT                       MAC07610
0010B6  9503             762           EPSR  R0,R3           DISABLE MAC                              MAC07620
0010B8  0814             763           LR    R1,R4           LOAD ADRS INDEX                          MAC07630
0010BA  CB10 0100        764           SHI   R1,X'100'                                                MAC07640
0010BE  1018             765           SALS  R1,8                                                     MAC07650
0010C0  41F0 22C0        766           BAL   R15,ERROR       PRINT ERROR                              MAC07660
0010C4  3035             767           DCX   3035            ERROR NUMBER              * 0305 *       MAC07670
0010C6  C140 10AC        768  BXLE2    BXLE  R4,EXCHANGE     REPEAT UNTIL ALL SEG REGS TESTED         MAC07680
0010CA  FA40 FFF2 0100   769           AI    R4,Y'FFF20100'                                           MAC07690
0010D0  CA60 0100        770           AHI   R6,X'100'                                                MAC07700
0010D4  C170 1092        771           BXLE  R7,RESTART2                                              MAC07710
0010D8  4300 20C0        772           B     TSTCHK          FIND NEXT TEST                           MAC07720
                         773  *                                                                        MAC07730
                         774  *                                                                        MAC07740
                         775  *                                                                        MAC07750
0010DC  5030 2588        776  ILLADRS  L     R3,DISMAC       INVALID ADDRESS INTERRUPT                MAC07760
0010E0  9503             777           EPSR  R0,R3           SWITCH BACK TO SET F                     MAC07770
0010E2  D312 0043        778           LB    R1,67(R2)                                                MAC07780
0010E6  C710 0010        779           XHI   R1,X'10'        IS CORRECT STATUS SET ?                  MAC07790
0010EA  2334             780           BZS   CONT3                                                    MAC07800
0010EC  41F0 22B8        781           BAL   R15,ERROR1                                               MAC07810
0010F0  3036             782           DCX   3036            ERROR NUMBER              * 0306 *       MAC07820
0010F2  D212 0043        783  CONT3    STB   R1,67(R2)                                                MAC07830
0010F6  D312 0043        784           LB    R1,67(R2)                                                MAC07840
0010FA  0811             785           LR    R1,R1                                                    MAC07850
0010FC  2334             786           BZS   RTN7                                                     MAC07860
0010FE  41F0 22B8        787           BAL   R15,ERROR1                                               MAC07870
001102  3034             788           DCX   3034            ERROR NUMBER              * 0304 *       MAC07880
001104  4300 10C6        789  RTN7     B     BXLE2           YES, CONTINUE WITH TEST                  MAC07890
```

TEST 4

```
                                 791  *                    T E S T 4                                    MAC07910
                                 792  *                                                                 MAC07920
                                 793  * PURPOSE:                                                       MAC07930
                                 794  *  TO INSURE THAT ALL WRITE OPERATIONS ARE CONVERTED             MAC07940
                                 795  *  TO READ OPERATIONS WHEN A PROTECT INTERRUPT IS                MAC07950
                                 796  *  NOT SERVICED IMMEDIATELY.                                    MAC07960
                                 797  *                                                               MAC07970
                                 798  * ASSUMPTIONS:                                                  MAC07980
                                 799  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR               MAC07990
                                 800  *  TESTS, THE SERIES 32 MEMORY TESTS, AND TESTS 1, 2            MAC08000
                                 801  *  AND 3 HAVE RUN WITHOUT DETECTING A FAILURE.                  MAC08010
                                 802  *                                                               MAC08020
                                 803  *  DESIGN SPECIFICATIONS:                                       MAC08030
                                 804  *  SEGMENTATION REGISTER 1 IS LOADED WITH X'02000010',          MAC08040
                                 805  *  THE MAC IS ENABLED AND A STORE MULTIPLE IS EXECUTED          MAC08050
                                 806  *  AT LOCATION X'140F8', WHEN THE STORE IS ATTEMPTED            MAC08060
                                 807  *  AT LOCATION X'14100' AN IN INTERRUPT SHOULD BE               MAC08070
                                 808  *  GENERATED BUT IT WILL NOT BE SERVICED UNTIL THE              MAC08080
                                 809  *  STORE MULTIPLE IS COMPLETE. THE MAC IS DISABLED              MAC08090
                                 810  *  AND THE LOCATIONS FROM X'140F8' TO X'14100' ARE              MAC08100
                                 811  *  CHECKED. THE FIRST WORD SHOULD CONTAIN DATA THE              MAC08110
                                 812  *  REMAINING LOCATIONS SHOULD HAVE ZERO IN THEM. THE            MAC08120
                                 813  *  MAC STATUS IS ALSO CHECKED WHEN THE INTERRUPT IS             MAC08130
                                 814  *  SERVICED.                                                    MAC08140
                                 815  *                                                               MAC08150
                                 816  * HOW TO RUN THE TEST:                                          MAC08160
                                 817  *  ENTER TEST 4 AND ANY OTHER OPTION INFORMATION                MAC08170
                                 818  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO                     MAC08180
                                 819  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND            MAC08190
                                 820  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION                    MAC08200
                                 821  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED              MAC08210
                                 822  *  BY ENTERING THE RUN COMMAND.                                 MAC08220

001108  41F0 227C                824  TEST4    BAL   R15,TSTNUM        PRINT TEST NUMBER                MAC08240
00110C  E610 118C                825           LA    R1,INTRPT        LOAD ADRS OF INTERRUPT ROUTINE   MAC08250
001110  5010 0094                826           ST    R1,X'94'                                          MAC08260
001114  C810 0091                827           LHI   R1,X'91'                                          MAC08270
001118  5010 2550                828           ST    R1,CONVAL                                         MAC08280
00111C  41F0 2126                829  NXTFLD1  BAL   R15,ESTCON       1ST CONTROL FIELD = 1, 2ND = 9   MAC08290
001120  4300 20C0                830           B     TSTCHK                                            MAC08300
001124  C800 24F0                831           LHI   R0,X'24F0'                                        MAC08310
001128  C800 44F0                832           LHI   R0,X'44F0'                                        MAC08320
00112C  C810 40F8                833           LHI   R1,X'40F8'                                        MAC08330
001130  2424                    834           LIS   R2,4             LOAD INCREMENT VALUE             MAC08340
001132  C830 4134                835           LHI   R3,X'4134'                                        MAC08350
001136  0744                    836           XR    R4,R4            ZERO REGISTER R4                 MAC08360
001138  5041 0000                837  STR4     ST    R4,0(R1)         STORE ZERO IN MEMORY             MAC08370
00113C  C110 1138                838           BXLE  R1,STR4                                           MAC08380
001140  F810 0400 0000           839           LI    R1,Y'04000000'                                    MAC08390
001146  0320 252C                840           LB    R2,CONFLD                                         MAC08400
00114A  1124                    841           SLLS  R2,4                                              MAC08410
```

TEST 4

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00114C  0A12           842          AR    R1,R2                                                  MAC08420
00114E  7320 0B9C      843          LHL   R2,SEGREG          ESTABLISH INDEX                       MAC08430
001152  2624           844          AIS   R2,4                                                    MAC08440
001154  5012 0000      845          ST    R1,0(R2)           STORE VALUE IN REGISTER               MAC08450
001158  2511           846          LCS   R1,1               LOAD R1 WITH ALL ONES                 MAC08460
00115A  0821           847          LR    R2,R1                                                  MAC08470
00115C  0841           848          LR    R4,R1                                                  MAC08480
00115E  0851           849          LR    R5,R1                                                  MAC08490
001160  0861           850          LR    R6,R1                                                  MAC08500
001162  0871           851          LR    R7,R1                                                  MAC08510
001164  0881           852          LR    R8,R1                                                  MAC08520
001166  0891           853          LR    R9,R1                                                  MAC08530
001168  08A1           854          LR    R10,R1                                                 MAC08540
00116A  08B1           855          LR    R11,R1                                                 MAC08550
00116C  08C1           856          LR    R12,R1                                                 MAC08560
00116E  08D1           857          LR    R13,R1                                                 MAC08570
001170  08E1           858          LR    R14,R1                                                 MAC08580
001172  08F1           859          LR    R15,R1                                                 MAC08590
001174  9530           860          EPSR  R3,R0              ENABLE MAC                            MAC08600
001176  0801           861          LR    R0,R1                                                  MAC08610
001178  D000           862          DCX   D000,4001,40F8     * STM R0 @ 140F8                      MAC08620
00117A  4001
00117C  40F8
00117E  41F0 2140      863          BAL   R15,DELAY          WAIT FOR INTERRUPT                    MAC08630
001182  9503           864          EPSR  R0,R3              DISABLE MAC                           MAC08640
001184  41F0 22B8      865          BAL   R15,ERROR1                                               MAC08650
001188  3035           866          DCX   3035               ERROR NUMBER          * 0405 *        MAC08660
00118A  230E           867          BS    CONT5                                                    MAC08670
                       868  *                                                                      MAC08680
                       869  *                                                                      MAC08690
                       870  *                                                                      MAC08700
00118C  5800 2588      871  INTRPT  L     R0,DISMAC          MAC INTERRUPT RECEIVED                MAC08710
001190  9503           872          EPSR  R0,R3              SELECT SET F                          MAC08720
001192  7320 0B9C      873          LHL   R2,SEGREG          LOAD START ADRS OF SEG REGISTERS      MAC08730
001196  D312 0043      874          LB    R1,67(R2)          LOAD MAC STATUS                       MAC08740
00119A  C710 0010      875          XHI   R1,X'10'           IS STATUS CORRECT ?                   MAC08750
00119E  2334           876          BZS   CONT5                                                    MAC08760
0011A0  41F0 22B8      877          BAL   R15,ERROR1                                               MAC08770
0011A4  3036           878          DCX   3036               ERROR NUMBER          * 0406 *        MAC08780
0011A6  C840 40F8      879  CONT5   LHI   R4,X'40F8'                                              MAC08790
0011AA  2454           880          LIS   R5,4               LOAD INCREMENT VALUE                  MAC08800
0011AC  C860 40FC      881          LHI   R6,X'40FC'                                               MAC08810
0011B0  5814 0000      882  LDAGN3  L     R1,0(R4)           LOAD DATA FROM MEMORY                 MAC08820
0011B4  0517           883          CLR   R1,R7              IS DATA READ = DATA STORED ?          MAC08830
0011B6  2334           884          BES   BXLE1                                                    MAC08840
0011B8  41F0 22B8      885          BAL   R15,ERROR1                                               MAC08850
0011BC  3037           886          DCX   3037               ERROR NUMBER          * 0407 *        MAC08860
0011BE  C140 11B0      887  BXLE1   BXLE  R4,LDAGN3          REPEAT FOR NEXT LOCATION              MAC08870
0011C2  C860 4134      888          LHI   R6,X'4134'                                               MAC08880
0011C6  5814 0000      889  LDAGN4  L     R1,0(R4)           LOAD DATA FROM MEMORY                 MAC08890
0011CA  2334           890          BZS   CONT6                                                    MAC08900
0011CC  41F0 22B8      891          BAL   R15,ERROR1                                               MAC08910
0011D0  3038           892          DCX   3038               ERROR NUMBER          * 0408 *        MAC08920
```

TEST 4

```
0011D2   C140 11C6          893  CONT6    BXLE   R4,LDAGN4          YES, PRONT ERROR=NO, REPEAT FOR NEXT   MAC08930
0011D6   D212 0043          894           STB    R1,67(R2)                                                 MAC08940
0011DA   D312 0043          895           LB     R1,67(R2)                                                 MAC08950
0011DE   0811               896           LR     R1,R1                                                     MAC08960
0011E0   2334               897           BZS    RTN8                                                      MAC08970
0011E2   41F0 22B8          898           BAL    R15,ERROR1                                                MAC08980
0011E6   3034               899           DCX    3034               ERROR NUMBER              * 0404 *     MAC08990
0011E8   4300 111C          900  RTN8     B      NXTFLD1                                                   MAC09000
```

TEST 5

```
                                902  *                    T E S T 5                                  MAC09020
                                903  *                                                               MAC09030
                                904  * PURPOSE:                                                     MAC09040
                                905  *  TO TEST THE EXECUTE PROTECT FEATURES OF THE MAC.            MAC09050
                                906  *                                                               MAC09060
                                907  * ASSUMPTIONS:                                                 MAC09070
                                908  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR              MAC09080
                                909  *  TESTS, THE SERIES 32 MEMORY TESTS, AND TESTS 1              MAC09090
                                910  *  THRU 4 HAVE RUN WITHOUT DETECTING A FAILURE.               MAC09100
                                911  *                                                               MAC09110
                                912  * DESIGN SPECIFICATIONS:                                       MAC09120
                                913  *  EACH SEGMENTATION REGISTER, STARTING WITH REGISTER          MAC09130
                                914  *  1, IS LOADED WITH X'FFF00090', THE CODE FOR                 MAC09140
                                915  *  "LCS R7" AND "BR R15" IS STORED IN LOCATION X'2000'         MAC09150
                                916  *  AND X'2002'. THE MAC IS ENABLED AND A BRANCH IS             MAC09160
                                917  *  TAKEN THROUGH THE MAC TO LOCATION X'2000'. AN               MAC09170
                                918  *  EXECUTE PROTECT INTERRUPT SHOULD BE GENERATED. THE          MAC09180
                                919  *  "LCS R7" AND "BR R15" IS STORED IN LOCATION X'4000'         MAC09190
                                920  *  AND X'4002'. THE MAC IS ENABLED AND A BRANCH IS             MAC09200
                                921  *  TAKEN THROUGH THE MAC TO LOCATION X'4000'. AN               MAC09210
                                922  *  GENERATED.                                                  MAC09220
                                923  *                                                               MAC09230
                                924  * HOW TO RUN THE TEST:                                         MAC09240
                                925  *  ENTER TEST 5 AND ANY OTHER OPTION INFORMATION               MAC09250
                                926  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO                    MAC09260
                                927  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND          MAC09270
                                928  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION                   MAC09280
                                929  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED             MAC09290
                                930  *  BY ENTERING THE RUN COMMAND.                                MAC09300

0011EC  41F0 227C               932  TEST5    BAL   R15,TSTNUM        PRINT TEST NUMBER            MAC09320
0011F0  E610 1252               933           LA    R1,EXPROINT       LOAD ADDRS OF INT ROUTINE    MAC09330
0011F4  5010 0094               934           ST    R1,X'94'                                       MAC09340
0011F8  7320 0B9C               935           LHL   R2,SEGREG         LOAD START ADRS OF SEG REGISTER MAC09350
0011FC  C610 0FB9               936           LHI   R1,X'0FB9'        LOAD CONTROL FIELD VALUES    MAC09360
001200  5010 2550               937           ST    R1,CONVAL         STORW CONTROL FIELD VALUES   MAC09370
001204  41F0 2126               938  NXTFLD   BAL   R15,ESTCON        EST CURRENT CONTROL FIELD VALUE MAC09380
001208  4300 20C0               939           B     TSTCHK            YES, CHECK FOR NEXT TEST     MAC09390
00120C  2444                    940           LIS   R4,4              SETUP BXLE REGISTERS         MAC09400
00120E  2454                    941           LIS   R5,4                                             MAC09410
001210  C860 003C               942           LHI   R6,60                                            MAC09420
001214  F870 FFF0 0000           943           LI    R7,Y'FFF00000'    LOAD SEG REG VALUE           MAC09430
00121A  D310 252C               944           LB    R1,CONFLD         LOAD CURRENT CONTROL FIELD VALUE MAC09440
00121E  1114                    945           SLLS  R1,4              CHANGE 0X TO X0              MAC09450
001220  0A71                    946           AR    R7,R1             ADD CURRENT VALUE TO SEG REG VALUE MAC09460
001222  5074 4200 0000          947  STRAGN6  ST    R7,0(R4,R2)       STORE VALUE IN SEG REGISTER  MAC09470
001228  C140 1222               948           BXLE  R4,STRAGN6        REPEAT UNTIL ALL REGS LOADED MAC09480
00122C  F840 0001 4000          949           LI    R4,Y'14000'       LOAD START ADRS (VIRTUAL)    MAC09490
001232  F850 0001 0000          950           LI    R5,Y'10000'       (PHYSICAL = X'4000')         MAC09500
001238  F860 000F 4000          951           LI    R6,Y'F4000'                                    MAC09510
00123E  F870 2571 030F          952           LI    R7,Y'2571030F'    LCS R7 & BR R15              MAC09520
```

TEST 5

```
001244  5070 ADB8 =004000     953            ST    R7,X'4000'          STORE INSTRUCTIONS IN MEMORY              MAC09530
001248  E6F0 12A0             954  REPEAT    LA    R15,ERROR7          LOAD BRANCH REG WITH ERROR ADRS           MAC09540
00124C  0777                  955            XR    R7,R7               ZERO REGISTER R7                          MAC09550
00124E  9530                  956            EPSR  R3,R0               ENABLE MAC                                MAC09560
001250  0304                  957            BR    R4                  BRANCH TO X'4000'                         MAC09570
                              958  *                                                                              MAC09580
                              959  *                                                                              MAC09590
                              960  *                                                                              MAC09600
001252  5830 2588             961  EXPROINT  L     R3,DISMAC           EXECUTE PROTECT INTERRUPT                 MAC09610
001256  9503                  962            EPSR  R0,R3               SWITCH BACK TO SET F                      MAC09620
001258  D382 0043             963            LB    R8,67(R2)           LOAD STATUS REGISTER VALUE                MAC09630
00125C  C780 0001             964            XHI   R8,1                IS CORRECT STATUS SET ?                   MAC09640
001260  2337                  965            BZS   CONT7               YES, CHECK FOR INSTRUCTION EXECUTION      MAC09650
001262  0814                  966            LR    R1,R4               LOAD VIRTUAL ADDRESS                      MAC09660
001264  EC10 0010             967            SRL   R1,16               SHIFT IT TO DETERMINE SEG REG NUM         MAC09670
001268  41F0 22B8             968            BAL   R15,ERROR1          PRINT ERROR MESSAGE                       MAC09680
00126C  3039                  969            DCX   3039                ERROR NUMBER                 * 0509 *     MAC09690
00126E  D382 0043             970  CONT7     LB    R8,67(R2)                                                    MAC09700
001272  0888                  971            LR    R8,R8               WAS STATUS REG CLEARED ?                  MAC09710
001274  2134                  972            BNZS  CONT19              NO, CONTINUE TEST                         MAC09720
001276  41F0 22B8             973            BAL   R15,ERROR1          YES, PRINT ERROR MESSAGE                  MAC09730
00127A  3130                  974            DCX   3130                ERROR NUMBER                 * 0510 *     MAC09740
00127C  0877                  975  CONT19    LR    R7,R7               WAS INSTRUCTION EXECUTED ?                MAC09750
00127E  2334                  976            BZS   RETURN              NO, CONTINUE TEST                         MAC09760
001280  41F0 22B8             977            BAL   R15,ERROR1          YES, PRINT ERROR MESSAGE                  MAC09770
001284  3131                  978            DCX   3131                ERROR NUMBER                 * 0511 *     MAC09780
001286  D282 0043             979  RETURN    STB   R8,67(R2)           CLEAR STATUS REGISTER                     MAC09790
00128A  D382 0043             980            LB    R8,67(R2)                                                    MAC09800
00128E  0888                  981            LR    R8,R8               WAS STATUS REG CLEARED ?                  MAC09810
001290  2334                  982            BZS   BXLE4               YES, CONTINUE TEST                        MAC09820
001292  41F0 22B8             983            BAL   R15,ERROR1          NO, PRINT ERROR MESSAGE                   MAC09830
001296  3034                  984            DCX   3034                ERROR NUMBER                 * 0504 *     MAC09840
001298  C140 1248             985  BXLE4     BXLE  R4,REPEAT           REPEAT UNTIL ALL SEG REGS TESTED          MAC09850
00129C  4300 1204             986            B     NXTFLD              REPEAT TEST WITH NEXT CONTROL FLIED       MAC09860
                              987  *                                                                              MAC09870
                              988  *                                                                              MAC09880
                              989  *                                                                              MAC09890
0012A0  9503                  990  ERROR7    EPSR  R0,R3               DISABLE MAC                               MAC09900
0012A2  0814                  991            LR    R1,R4               LOAD VIRTUAL ADDRESS                      MAC09910
0012A4  EC10 0010             992            SRL   R1,16               SHIFT IT TO DETERMINE SEG REG NUMBER      MAC09920
0012A8  41F0 22C0             993            BAL   R15,ERROR           PRINT ERROR MESSAGE                       MAC09930
0012AC  3132                  994            DCX   3132                ERROR NUMBER                 * 0512 *     MAC09940
0012AE  4300 1286             995            B     RETURN              RETURN TO TEST NEXT SEG REGISTER          MAC09950
```

TEST 6

```
                                  997  *                    T E S T 6                                    MAC09970
                                  998  *                                                                 MAC09980
                                  999  * PURPOSE:                                                       MAC09990
                                 1000  *  TO TEST THE WRITE PROTECT FEATURES OF THE MAC.                 MAC10000
                                 1001  *                                                                 MAC10010
                                 1002  * ASSUMPTIONS:                                                   MAC10020
                                 1003  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR                MAC10030
                                 1004  *  TESTS, THE SERIES 32 MEMORY TESTS AND TESTS 1                 MAC10040
                                 1005  *  THRU 4 HAVE RUN WITHOUT DETECTING A FAILURE.                  MAC10050
                                 1006  *                                                                 MAC10060
                                 1007  * DESIGN SPECIFICATIONS:                                         MAC10070
                                 1008  *  EACH SEGMENTATION REGISTER, STARTING WITH REGISTER            MAC10080
                                 1009  *  1, IS LOADED WITH X'FFF00030', THE MAC IS ENABLED             MAC10090
                                 1010  *  AND AN ATTEMPT IS MADE TO STORE DATA THROUGH MAC              MAC10100
                                 1011  *  INTO LOCATION X'4000', A WRITE PROTECT INTERRUPT              MAC10110
                                 1012  *  SHOULD BE GENERATED. THE CONTENTS OF LOCATION                 MAC10120
                                 1013  *  X'4000' ARE THEN CHECKED TO INSURE IT WAS NOT                 MAC10130
                                 1014  *  CHANGED EVEN THOUGH THE INTERRUPT WAS GENERATED.              MAC10140
                                 1015  *                                                                 MAC10150
                                 1016  * HOW TO RUN THE TEST:                                           MAC10160
                                 1017  *  ENTER TEST 6 AND ANY OTHER OPTION INFORMATION                 MAC10170
                                 1018  *  DESIRED VIA THE CONSOLE DEVICE, REFER TO                      MAC10180
                                 1019  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND            MAC10190
                                 1020  *  INPUT STRUCTURE, AFTER THE DESIRED OPTION                     MAC10200
                                 1021  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED               MAC10210
                                 1022  *  BY ENTERING THE RUN COMMAND.                                  MAC10220

0012B2  41F0 227C                1024  TEST6    BAL   R15,TSTNUM      PRINT TEST NUMBER                MAC10240
0012B6  E610 1336                1025           LA    R1,WRTINT       LOAD ADRS OF WRITE PROTECT INT   MAC10250
0012BA  5010 0094                1026           ST    R1,X'94'                                         MAC10260
0012BE  C810 3133                1027           LAI   R1,X'3133'      ERROR NUMBER 0613                MAC10270
0012C2  4010 1330                1028           STH   R1,ERRNUM1                                       MAC10280
0012C6  F810 0000 FB73           1029           LI    R1,Y'FB73'      LOAD CONTROL FIELD VALUES        MAC10290
0012CC  5010 2550                1030           ST    R1,CONVAL       STORE CONTROL FIELD VALUES       MAC10300
0012D0  41F0 2126                1031  RESTART1 BAL   R15,ESTCON      EST CURRENT CONTROL FIELD VALUE  MAC10310
0012D4  4300 20C0                1032           B     TSTCHK                                           MAC10320
0012D8  7320 0B9C                1033           LHL   R2,SEGREG                                        MAC10330
0012DC  2444                     1034           LIS   R4,4                                             MAC10340
0012DE  2454                     1035           LIS   R5,4            ESTABLISH INCREMENT VALUE        MAC10350
0012E0  C860 003C                1036           LHI   R6,60                                            MAC10360
0012E4  F870 FFF0 0000           1037           LI    R7,Y'FFF00000'  LOAD SEG REGISTER VALUE          MAC10370
0012EA  0310 252C                1038           LB    R1,CONFLD       LOAD CURRENT CONTROL FIELD VALUE MAC10380
0012EE  1114                     1039           SLLS  R1,4                                             MAC10390
0012F0  0A71                     1040           AR    R7,R1           ADD CONTROL FIELD TO REG VALUE   MAC10400
0012F2  5074 4200 0000           1041  STRAGN1  ST    R7,0(R4,R2)     STORE VALUE IN SEG REGISTER      MAC10410
0012F8  C140 12F2                1042           BXLE  R4,STRAGN1      REPEAT FOR ALL REGISTERS         MAC10420
0012FC  F840 0001 4000           1043           LI    R4,Y'14000'                                      MAC10430
001302  F850 0001 0000           1044           LI    R5,Y'10000'     LOAD INCREMENT VALUE             MAC10440
001308  F860 000F 4000           1045           LI    R6,Y'F4000'                                      MAC10450
00130E  F870 A5A5 A5A5           1046           LI    R7,Y'A5A5A5A5'  LOAD DATA PATTERN                MAC10460
001314  0788                     1047           XR    R8,R8                                            MAC10470
```

TEST 6

```
001316  5080 ACE6 =004000   1048  REPEAT1  ST    R8,X'4000'                                          MAC10480
00131A  9530                1049  EXPSR    EPSR  R3,R0          ENABLE MAC                          MAC10490
00131C  5074 0000           1050           ST    R7,0(R4)       STORE DATA IN MEMORY                MAC10500
001320  41F0 2140           1051           BAL   R15,DELAY      WAIT FOR INTERRUPT                  MAC10510
001324  9503                1052           EPSR  R0,R3          DISABLE MAC                         MAC10520
001326  0814                1053           LR    R1,R4                                              MAC10530
001328  EC10 0010           1054           SRL   R1,16                                              MAC10540
00132C  41F0 22C0           1055           BAL   R15,ERROR                                          MAC10550
001330  3133                1056  ERRNUM1  DCX   3133           ERROR NUMBER              * 0613 *  MAC10560
                            1057  *    OR  DCX 3134           ERROR NUMBER              * 0714 *  MAC10570
001332  4300 1368           1058           B     CONT15                                             MAC10580
                            1059  *                                                                MAC10590
                            1060  *                                                                MAC10600
                            1061  *                                                                MAC10610
001336  5830 2588           1062  WRTINT   L     R3,DISMAC      WRITE PROTECT INTERRUPT             MAC10620
00133A  9513                1063           EPSR  R1,R3          SWITCH BACK TO SET F                MAC10630
00133C  D312 0043           1064           LB    R1,67(R2)      LOAD STATUS REGISTER VALUE          MAC10640
001340  C710 0004           1065           XHI   R1,4           IS STATUS CORRECT ?                 MAC10650
001344  2334                1066           BZS   CONT8                                              MAC10660
001346  41F0 22B8           1067           BAL   R15,ERROR1                                         MAC10670
00134A  3135                1068           DCX   3135           ERROR NUMBER              * 0615 *  MAC10680
00134C  D312 0043           1069  CONT8    LB    R1,67(R2)                                          MAC10690
001350  0811                1070           LR    R1,R1          DID READ CLEAR STATUS REG ?         MAC10700
001352  2134                1071           BNZS  CONT20         NO, CONTINUE TEST                   MAC10710
001354  41F0 22B8           1072           BAL   R15,ERROR1                                         MAC10720
001358  3130                1073           DCX   3130           ERROR NUMBER              * 0610 *  MAC10730
00135A  5810                1074  CONT20   DCX   5810           L R1,X'4000'                       MAC10740
00135C  4000                1075           DCX   4000                                               MAC10750
00135E  4000                1076           DCX   4000                                               MAC10760
001360  2334                1077           BZS   CONT15                                             MAC10770
001362  41F0 22B8           1078           BAL   R15,ERROR1                                         MAC10780
001366  3136                1079           DCX   3136           ERROR NUMBER              * 0616 *  MAC10790
001368  D212 0043           1080  CONT15   STB   R1,67(R2)                                         MAC10800
00136C  D312 0043           1081           LB    R1,67(R2)      DID WRITE CLEAR STATUS REG ?        MAC10810
001370  0811                1082           LR    R1,R1                                              MAC10820
001372  2334                1083           BZS   BXLE5          YES,CONTINUE TEST                   MAC10830
001374  41F0 22B8           1084           BAL   R15,ERROR1                                         MAC10840
001378  3034                1085           DCX   3034           ERROR NUMBER              * 0604 *  MAC10850
00137A  C140 1316           1086  BXLE5    BXLE  R4,REPEAT1     REPEAT FOR NEXT REGISTER            MAC10860
00137E  4300 12D0           1087           B     RESTART1                                           MAC10870
```

TEST 7

```
                        1089  *                    T E S T 7                                    MAC10890
                        1090  *                                                                 MAC10900
                        1091  * PURPOSE:                                                        MAC10910
                        1092  *  TO TEST THE WRITE/INTERRUPT PROTECTION FEATURES               MAC10920
                        1093  *  OF MAC.                                                       MAC10930
                        1094  *                                                                MAC10940
                        1095  * ASSUMPTIONS:                                                   MAC10950
                        1096  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR                MAC10960
                        1097  *  TESTS, THE SERIES 32 MEMORY TESTS, AND TESTS 2                MAC10970
                        1098  *  THRU 4 HAVE RUN WITHOUT DETECTING A FAILURE.                  MAC10980
                        1099  *                                                                MAC10990
                        1100  * DESIGN SPECIFICATIONS:                                         MAC11000
                        1101  *  EACH SEGMENTATION REGISTER, STARTING WITH REGISTER            MAC11010
                        1102  *  1, IS LOADED WITH X'FFF00050'. THE MAC IS ENABLED             MAC11020
                        1103  *  AND DATA IS STORED THROUGH THE MAC INTO LOCATION              MAC11030
                        1104  *  X'4000', A WRITE/INTERRUPT PROTECT INTERRUPT SHOULD           MAC11040
                        1105  *  BE GENERATED. WHEN THE INTERRUPT IS GENERATED                 MAC11050
                        1106  *  LOCATION X'4000' IS CHECKED TO INSURE THE DATA WAS            MAC11060
                        1107  *  STORED.                                                       MAC11070
                        1108  *                                                                MAC11080
                        1109  * HOW TO RUN THE TEST:                                           MAC11090
                        1110  *  ENTER TEST 7 AND ANY OTHER OPTION INFORMATION                 MAC11100
                        1111  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO                      MAC11110
                        1112  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND             MAC11120
                        1113  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION                     MAC11130
                        1114  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED               MAC11140
                        1115  *  BY ENTERING THE RUN COMMAND.                                  MAC11150

001382  41F0 227C     1117  TEST7   BAL   R15,TSTNUM      PRINT TEST NUMBER                    MAC11170
001386  E610 13A2     1118          LA    R1,INTRPT1      LOAD ADRS OF INTERRUPT ROUTINE       MAC11180
00138A  5010 0094     1119          ST    R1,X'94'                                             MAC11190
00138E  C810 3134     1120          LHI   R1,X'3134'      ERROR NUMBER 0714                    MAC11200
001392  4010 1330     1121          STH   R1,ERRNUM1                                           MAC11210
001396  C810 00D5     1122          LHI   R1,X'00D5'      LOAD CURRENT CONTROL FIELD VALUE     MAC11220
00139A  5010 2550     1123          ST    R1,CONVAL       STORE CURRENT CONTROL FIELD VALUES   MAC11230
00139E  4300 12D0     1124          B     RESTART1                                             MAC11240
                      1125  *                                                                  MAC11250
                      1126  *                                                                  MAC11260
                      1127  *                                                                  MAC11270
0013A2  5830 2588     1128  INTRPT1 L     R3,DISMAC                                            MAC11280
0013A6  9513          1129          EPSR  R1,R3           SWITCH BACK TO SET F                 MAC11290
0013A8  D312 0043     1130          LB    R1,67(R2)       LOAD CONTENTS OF STATUS REGISTER     MAC11300
0013AC  C710 0002     1131          XHI   R1,2            IS CORRECT STATUS SET ?              MAC11310
0013B0  2334          1132          BZS   CONT9                                                MAC11320
0013B2  41F0 22B8     1133          BAL   R15,ERROR1                                           MAC11330
0013B6  3137          1134          DCX   3137            ERROR NUMBER          * 0717 *     MAC11340
0013B8  D312 0043     1135  CONT9   LB    R1,67(R2)                                          MAC11350
0013BC  0611          1136          LR    R1,R1           DID READ CLEAR STATUS REG ?          MAC11360
0013BE  2134          1137          BNZS  CONT21          NO, CONTINUE TEST                    MAC11370
0013C0  41F0 22B8     1138          BAL   R15,ERROR1                                           MAC11380
0013C4  3130          1139          DCX   3130            ERROR NUMBER          * 0710 *     MAC11390
```

TEST 7

```
0013C6   5810 AC36 =004000    1140  CONT21   L     R1,X'4000'                                    MAC11400
0013CA   0517                 1141           CLR   R1,R7          AS CORRECT DATA STORED IN MEMORY ?  MAC11410
0013CC   2334                 1142           BES   RTN9                                          MAC11420
0013CE   41F0 2288            1143           BAL   R15,ERROR1                                    MAC11430
0013D2   3138                 1144           DCX   3138            ERROR NUMBER          * 0718 *  MAC11440
0013D4   4300 1368            1145  RTN9     B     CONT15                                        MAC11450
```

TEST 8

```
                                1147  *                    T E S T  8                                    MAC11470
                                1148  *                                                                  MAC11480
                                1149  * PURPOSE:                                                        MAC11490
                                1150  *  TO INSURE THE OPERATION OF THE NON PRESENT                     MAC11500
                                1151  *  ADDRESS INTERRUPT OF THE MAC.                                  MAC11510
                                1152  *                                                                  MAC11520
                                1153  * ASSUMPTIONS:                                                    MAC11530
                                1154  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR                 MAC11540
                                1155  *  TESTS, THE SERIES 32 MEMORY TESTS, AND TESTS 1                 MAC11550
                                1156  *  THRU 4 HAVE RUN WITHOUT DETECTING A FAILURE.                   MAC11560
                                1157  *                                                                  MAC11570
                                1158  * DESIGN SPECIFICATIONS:                                          MAC11580
                                1159  *  EACH SEGMENTATION REGISTER, STARTING WITH REGISTER             MAC11590
                                1160  *  1, IS LOADED WITH X'FFF00000', THE MAC IS ENABLED              MAC11600
                                1161  *  AND AN ATTEMPT IS MADE TO ACCESS MEMORY CONTROLLED             MAC11610
                                1162  *  BY EACH SEGMENTATION REGISTER, AN INTERRUPT SHOULD             MAC11620
                                1163  *  BE GENERATED EACH TIME AN ATTEMPT IS MADE TO ACCESS            MAC11630
                                1164  *  MEMORY.                                                       MAC11640
                                1165  *                                                                  MAC11650
                                1166  * HOW TO RUN THE TEST:                                            MAC11660
                                1167  *  ENTER TEST 8 AND ANY OTHER OPTION INFORMATION                  MAC11670
                                1168  *  DESIRED VIA THE CONSOLE DEVICE, REFER TO                      MAC11680
                                1169  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND             MAC11690
                                1170  *  INPUT STRUCTURE, AFTER THE DESIRED OPTION                     MAC11700
                                1171  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED                MAC11710
                                1172  *  BY ENTERING THE RUN COMMAND.                                   MAC11720

0013D8  41F0 227C               1174  TEST8    BAL   .R15,TSTNUM       PRINT TEST NUMBER               MAC11740
0013DC  E610 1448               1175           LA    R1,PRESINT        LOAD ADRS OF INT ROUTINE        MAC11750
0013E0  5010 0094               1176           ST    R1,X'94'                                          MAC11760
0013E4  F810 ECA8 6420          1177           LI    R1,Y'ECA864  '    LOAD CURRENT CONTROL FIELD VALUES MAC11770
0013EA  5010 2550               1178           ST    R1,CONVAL         STORE CURRENT CONTROL FIELD VALUES MAC11780
0013EE  7320 0B9C               1179           LHL   R2,SEGREG                                         MAC11790
0013F2  41F0 2126               1180  RESTART3 BAL   R15,ESTCON                                       MAC11800
0013F6  4300 20C0               1181           B     TSTCHK            CHECK FOR NEXT TEST             MAC11810
0013FA  2444                    1182           LIS   R4,4                                              MAC11820
0013FC  2454                    1183           LIS   R5,4              LOAD INCREMENT VALUE            MAC11830
0013FE  C860 003C               1184           LHI   R6,60                                             MAC11840
001402  D310 252C               1185           LB    R1,CONFLD                                         MAC11850
001406  1114                    1186           SLLS  R1,4                                              MAC11860
001408  F870 FFF0 0000          1187           LI    R7,Y'FFF00000'                                    MAC11870
00140E  0A71                    1188           AR    R7,R1             ADD CONTROL FIELD TO REG VALUE  MAC11880
001410  5072 4400 0000          1189  STORE3   ST    R7,0(R2,R4)                                       MAC11890
001416  C140 1410               1190           BXLE  R4,STORE3         REPEAT UNTIL ALL SEG REGISTERS LOADED MAC11900
00141A  F850 0001 0000          1191           LI    R5,Y'10000'       LOAD INCREMENT VALUE            MAC11910
001420  0845                    1192           LR    R4,R5                                             MAC11920
001422  F860 000F 0000          1193           LI    R6,Y'F0000'       ESTABLISH BXLE LIMIT            MAC11930
001428  9530                    1194  EXPSR1   EPSR  R3,R0             ENABLE MAC                      MAC11940
00142A  5814 0000               1195           L     R1,0(R4)          GENERATE PRESENT  INTERRUPT     MAC11950
00142E  41F0 2140               1196           BAL   R15,DELAY         WAIT FOR INTERRUPT              MAC11960
001432  9503                    1197           EPSR  R0,R3             DISABLE MAC                     MAC11970
```

TEST 8

```
001434  0814           1198           LR    R1,R4                                                    MAC11980
001436  EC10 0010      1199           SRL   R1,16                                                    MAC11990
00143A  41F0 22C0      1200           BAL   R15,ERROR      PRINT ERROR                               MAC12000
00143E  3139           1201           DCX   3139           ERROR NUMBER              * 0819 *        MAC12010
001440  C140 1428      1202  BXLE3    BXLE  R4,EXPSR1      REPEAT UNTIL ALL SEG REGS ARE TESTED      MAC12020
001444  4300 13F2      1203           B     RESTART3                                                  MAC12030
                       1204  *                                                                       MAC12040
                       1205  *                                                                       MAC12050
                       1206  *                                                                       MAC12060
001448  5830 2588      1207  PRESINT  L     R3,DISMAC      NON-PRESENT ADDRESS                       MAC12070
00144C  9513           1208           EPSR  R1,R3          SWITCH BACK TO SET F                      MAC12080
00144E  D312 0043      1209           LB    R1,67(R2)      LOAD STATUS                               MAC12090
001452  C710 0008      1210           XHI   R1,8           IS CORRECT STATUS SET ?                   MAC12100
001456  2334           1211           BZS   CONT26         YES, CONTINUE WITH TEST                   MAC12110
001458  41F0 22B8      1212           BAL   R15,ERROR1                                               MAC12120
00145C  3230           1213           DCX   3230           ERROR NUMBER              * 0820 *        MAC12130
00145E  D312 0043      1214  CONT26   LB    R1,67(R2)                                                MAC12140
001462  0811           1215           LR    R1,R1                                                    MAC12150
001464  2134           1216           BNZS  CONT22                                                   MAC12160
001466  41F0 22B8      1217           BAL   R15,ERROR1                                               MAC12170
00146A  3130           1218           DCX   3130           ERROR NUMBER              * 0810 *        MAC12180
00146C  D212 0043      1219  CONT22   STB   R1,67(R2)                                                MAC12190
001470  D312 0043      1220           LB    R1,67(R2)                                                MAC12200
001474  0811           1221           LR    R1,R1                                                    MAC12210
001476  2334           1222           BZS   RTNA                                                     MAC12220
001478  41F0 22B8      1223           BAL   R15,ERROR1                                               MAC12230
00147C  3034           1224           DCX   3034           ERROR NUMBER              * 0804 *        MAC12240
00147E  4300 1440      1225  RTNA     B     BXLE3                                                    MAC12250
```

TEST 9

```
                        1227  *                    T E S T 9                                    MAC12270
                        1228  *                                                                 MAC12280
                        1229  * PURPOSE:                                                        MAC12290
                        1230  *  TO ENSURE THAT A PROGRAM CAN BE RELOCATED THROUGH             MAC12300
                        1231  *  MEMORY AND EXECUTED WITH THE MAC ENABLED.                     MAC12310
                        1232  *                                                                 MAC12320
                        1233  * ASSUMPTIONS:                                                    MAC12330
                        1234  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR                MAC12340
                        1235  *  TESTS, THE SERIES 32 MEMORY TESTS, AND TESTS 2                MAC12350
                        1236  *  AND 3 HAVE BEEN RUN WITHOUT DETECTING AN ERROR                MAC12360
                        1237  *                                                                 MAC12370
                        1238  * DESIGN SPECIFICATION:                                           MAC12380
                        1239  *  EACH SEGMENTATION REGISTER IS SET UP FOR                      MAC12390
                        1240  *  NO-TRANSLATION, A SUBROUTINE IS THEN STORED INTO              MAC12400
                        1241  *  MEMORY STARTING AT LOCATION X'4000', THE MAC IS               MAC12410
                        1242  *  ENABLED AND THE SUBROUTINE EXECUTED, THE MAC IS               MAC12420
                        1243  *  DISABLED AND THE SUBROUTINE IS MOVED UP ONE WORD              MAC12430
                        1244  *  IN MEMORY, THE MAC IS AGAIN ENABLED AND THE                   MAC12440
                        1245  *  SUBROUTINE EXECUTED. THIS ROUTINE IS REPEATED                 MAC12450
                        1246  *  UNTIL ALL AVAILABLE MEMORY HAS BEEN TESTED.                   MAC12460
                        1247  *                                                                 MAC12470
                        1248  * HOW TO RUN THE TEST:                                            MAC12480
                        1249  *  ENTER TEST 9 AND NAY OTHER OPTION INFORMATION                 MAC12490
                        1250  *  DESIRED VIA THE CONSOLE DEVICE, REFER TO                      MAC12500
                        1251  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND             MAC12510
                        1252  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION                     MAC12520
                        1253  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED               MAC12530
                        1254  *  BY ENTERING THE RUN COMMAND.                                  MAC12540

001482  41F0 227C       1256  TEST9    BAL   R15,TSTNUM      PRINT TEST NUMBER                 MAC12560
001486  C840 0571       1257           LHI   R4,X'571'                                         MAC12570
00148A  5040 2550       1258           ST    R4,CONVAL                                         MAC12580
00148E  41F0 2126       1259  NXTFLD2  BAL   R15,ESTCON                                        MAC12590
001492  4300 20C0       1260           B     TSTCHK                                            MAC12600
001496  7340 0B9C       1261           LHL   R4,SEGREG       LOAD START ADRS OF SEG REGISTERS  MAC12610
00149A  2454            1262           LIS   R5,4            ESTABLISH INCREMENT VALUE         MAC12620
00149C  C864 003C       1263           LHI   R6,60(R4)                                         MAC12630
0014A0  F870 0FF0 0000  1264           LI    R7,Y'0FF00000'  ESTABLISH VALUE FOR 1ST REGISTER MAC12640
0014A6  D380 252C       1265           LB    R8,CONFLD                                         MAC12650
0014AA  1184            1266           SLLS  R8,4                                              MAC12660
0014AC  0A78            1267           AR    R7,R8                                             MAC12670
0014AE  5074 0000       1268  STRAGNN  ST    R7,0(R4)        STORE DATA IN SEGMENTATION REGISTER MAC12680
0014B2  FA70 1001 0000  1269           AI    R7,Y'10010000'  INCREMENT DATA VALUE              MAC12690
0014B8  C140 14AE       1270           BXLE  R4,STRAGNN      REPEAT UNTIL ALL SEG REGS ARE LOADED MAC12700
0014BC  41F0 20EE       1271           BAL   R15,BLKCHK      FIND START ADRS OF CURRENT BLOCK  MAC12710
0014C0  CA20 2000       1272           AHI   R2,X'2000'                                        MAC12720
0014C4  0842            1273  ADD0     LR    R4,R2           LOAD START ADR OF BLOCK           MAC12730
0014C6  C890 002E       1274  ADD1     LHI   R9,X'2E'        LOAD SUBROUTINE SIZE              MAC12740
0014CA  0A49            1275           AR    R4,R9           ESTABLISH END ADRS OF SUBROUTINE  MAC12750
0014CC  C542 1FFE       1276  ADD2     CLHI  R4,8190(R2)     IS ADDRESS WITHIN CORRECT BLOCK   MAC12760
0014D0  2189            1277           BLS   LOADSUB         YES, LOAD SUBROUTINE INTO MEMORY  MAC12770
```

TEST 9

```
0014D2  41F0 20FC          1278          BAL   R15,BLKCHK1       NO, FIND START ADRS OF NEXT BLOCK      MAC12780
0014D6  4300 14C4          1279          B     ADD1-2                                                   MAC12790
0014DA  4300 14CC          1280          B     ADD2                                                     MAC12800
0014DE  4300 148E          1281          B     NXTFLD2                                                  MAC12810
0014E2  0777               1282  LOADSUB XR    R7,R7             SETUP BXLE REGISTERS                   MAC12820
0014E4  2484               1283          LIS   R8,4                                                     MAC12830
0014E6  0B49               1284          SR    R4,R9             CORRECT EARLIER ADDITION               MAC12840
0014E8  5867 2094          1285  LOAGN   L     R6,SUBRTN(R7)     LOAD IMAGE FROM PATTERN                MAC12850
0014EC  5064 4700 0000     1286          ST    R6,0(R4,R7)       STORE IMAGE IN MEMORY                  MAC12860
0014F2  C170 14E8          1287          BXLE  R7,LOAGN          REPEAT UNTIL SUBRTN STORED IN MEMORY   MAC12870
0014F6  0874               1288          LR    R7,R4             START ADDRESS                          MAC12880
0014F8  C860 20F0          1289          LHI   R6,X'20F0'                                               MAC12890
0014FC  9506               1290          EPSR  R0,R6                                                    MAC12900
0014FE  41E0 22A0          1291          BAL   R14,WRITE         WRITE SUBRTN ADRS TO DISPLAY           MAC12910
001502  0869               1292          LR    R6,R9             SETUP REGISTERS FOR SUBROUTINE         MAC12920
001504  0854               1293          LR    R5,R4             R6 = LENGTH                            MAC12930
001506  0A56               1294          AR    R5,R6             R5 = START+LENGTH = END ADRS           MAC12940
001508  2482               1295          LIS   R11,2                                                    MAC12950
00150A  C200 2580          1296          LPSW  ENBMAC            ENABLE MAC AND THEN                    MAC12960
00150E  0304               1297  BRANCH  BR    R4                BRANCH TO SUBROUTINE                   MAC12970
001510  0817               1298  ERR     LR    R1,R7             SETUP REGISTERS FOR ERROR MESSAGE      MAC12980
001512  5040 2544          1299          ST    R4,LOCSAVE                                               MAC12990
001516  0848               1300          LR    R4,R8                                                    MAC13000
001518  41F0 22C0          1301          BAL   R15,ERROR         PRINT ERROR MESSAGE                    MAC13010
00151C  3231               1302          DCX   3231              ERROR NUMBER              * 0921 *     MAC13020
00151E  5840 2544          1303          L     R4,LOCSAVE                                               MAC13030
001522  C200 2588          1304  RTN4    LPSW  DISMAC                                                   MAC13040
001526  2644               1305  INCR    AIS   R4,4              INCREMENT START ADRS OF SUBRTN         MAC13050
001528  4300 14C6          1306          B     ADD1              REPEAT TEST FOR NEXT LOCATION          MAC13060
```

TEST A

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                                1308  *                    T E S T A                                    MAC13080
                                1309  *                                                                 MAC13090
                                1310  * PURPOSE:                                                       MAC13100
                                1311  *  TO INSURE THAT THE CORRECT SEGMENTATION REGISTERS  *          MAC13110
                                1312  *  ARE SELECTED IN THE HALFWORD MODE.                 *          MAC13120
                                1313  *                                                    *          MAC13130
                                1314  * ASSUMPTIONS:                                                  MAC13140
                                1315  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR     *          MAC13150
                                1316  *  TESTS AND THE SERIES 32 MEMORY TESTS HAVE RUN      *          MAC13160
                                1317  *  WITHOUT DETECTING A FAILURE.                       *          MAC13170
                                1318  *                                                    *          MAC13180
                                1319  * DESIGN SPECIFICATIONS:                                        MAC13190
                                1320  *  EACH SEGMENTATION REGISTER, STARTING WITH REGISTER *          MAC13200
                                1321  *  0, IS LOADED WITH A RELOCATION FIELD OF 000, 010,  *          MAC13210
                                1322  *  020,...0F0, LOCATIONS 0, X'1000', X'2000',...      *          MAC13220
                                1323  *  X'F000' ARE LOADED WITH THEIR ADDRESSES. THE       *          MAC13230
                                1324  *  PROCESSOR IS PLACED IN THE HALFWORD MODE AND THE   *          MAC13240
                                1325  *  MAC IS ENABLED. ADDRESSES OF 0, X'1000', X'2000',  *          MAC13250
                                1326  *  ...X'F000' ARE READ AND IF THE CORRECT REGISTER IS *          MAC13260
                                1327  *  SELECTED THE DATA READ SHOULD EQUAL THE ADDRESS OF *          MAC13270
                                1328  *  THE LOCATION READ.                                 *          MAC13280
                                1329  *                                                    *          MAC13290
                                1330  * HOW TO RUN THE TEST:                                          MAC13300
                                1331  *  ENTER TEST B AND ANY OTHER OPTION INFORMATION      *          MAC13310
                                1332  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO           *          MAC13320
                                1333  *  06-160F01R02A15 APPENDIX 3 FOR THE OPTION/COMMAND  *          MAC13330
                                1334  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION          *          MAC13340
                                1335  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED    *          MAC13350
                                1336  *  BY ENTERING THE RUN COMMAND.                       *          MAC13360

001528  41F0 227C             1338  TESTA   BAL   R15,TSTNUM      PRINT TEST NUMBER                   MAC13380
001530  2441                  1339          LIS   R4,1                                                 MAC13390
001532  D240 252C             1340          STB   R4,CONFLD       STORE CONTROL FLD VALUE             MAC13400
001536  5840 1000             1341          L     R4,X'1000'      LOAD CONTENTS OF LOC X'1000'        MAC13410
00153A  5040 2544             1342          ST    R4,LOCSAVE      SAVE CONTENTS OF LOC X'1000'        MAC13420
00153E  5840 2000             1343          L     R4,X'2000'                                          MAC13430
001542  5040 254C             1344          ST    R4,SAVE7                                            MAC13440
001546  7340 0B9C             1345          LHL   R4,SEGREG       LOAD START ADRS OF SEG REGISTERS    MAC13450
00154A  2454                  1346          LIS   R5,4            ESTABLISH INCREMENT VALUE           MAC13460
00154C  C864 003C             1347          LHI   R6,60(R4)       ESTABLISH BXLE LIMIT                MAC13470
001550  F870 0FF0 0010        1348          LI    R7,Y'0FF00010'  LOAD VALUE FOR SEG REGISTERS        MAC13480
001556  5074 0000             1349  LDREG   ST    R7,0(R4)        STORE DATA IN SEGMENTATION REG      MAC13490
00155A  CA70 1000             1350          AHI   R7,X'1000'                                          MAC13500
00155E  C140 1556             1351          BXLE  R4,LDREG        REPEAT UNTIL ALL SEG REGS LOADED    MAC13510
001562  0744                  1352          XR    R4,R4           ZERO REGISTER R4                    MAC13520
001564  C850 1000             1353          LHI   R5,X'1000'      LOAD INCREMENT VALUE                MAC13530
001568  F860 0000 F000        1354          LI    R6,Y'F000'      LOAD BXLE LIMIT                     MAC13540
00156E  4044 0000             1355  SETADRS STH   R4,0(R4)        STORE EXPECTED DATA IN MEMORY       MAC13550
001572  C140 156E             1356          BXLE  R4,SETADRS      REPEAT UNTIL ALL DATA STORED        MAC13560
001576  F800 0010 04F0        1357          LI    R0,Y'1004F0'    LOAD HALFWORD MODE PSW              MAC13570
00157C  5030 0030             1358          ST    R3,X'30'        SET UP NEW ILLEGAL INSTRUCTION TRAP MAC13580
```

TEST A

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001580   E640 1596            1359           LA     R4,FULLRTN                                                  MAC13590
001584   5040 0034            1360           ST     R4,X'34'                                                    MAC13600
001588   0744                 1361           XR     R4,R4              ZERO REGISTER R4                         MAC13610
00158A   9530                 1362  EPSR2    EPSR   R3,R0              ENABLE MAC IN HALFWORD MODE              MAC13620
00158C   4814 0000            1363           LH     R1,0(R4)           LOAD HALFWORD FROM MEMORY                MAC13630
00158E   9503                 1364           EPSR   R0,R3              DISABLE MAC IN HALFWORD MODE             MAC13640
001592   73F0 0000            1365           LHL    R15,0              GENERATE ILL INST TO RETURN TO FULL-     MAC13650
001596   F800 0010 04F0       1366  FULLRTN  LI     R0,Y'1004F0'       WORD MODE.                               MAC13660
00159C   0514                 1367           CLR    R1,R4              IS DATA READ = CURRENT ADRS ?            MAC13670
00159E   233D                 1368           BES    CONT18             YES, CONTINUE WITH TEST                  MAC13680
0015A0   5840 254C            1369           L      R4,SAVE7                                                    MAC13690
0015A4   5040 2000            1370           ST     R4,X'2000'                                                  MAC13700
0015A8   5840 2544            1371           L      R4,LOCSAVE                                                  MAC13710
0015AC   5040 1000            1372           ST     R4,X'1000'                                                  MAC13720
0015B0   41F0 22C0            1373           BAL    R15,ERROR          NO, PRINT ERROR MESSAGE                  MAC13730
0015B4   3232                 1374           DCX    3232               ERROR NUMBER                 * 0A22 *    MAC13740
0015B6   3235                 1375           DC     X'3235'            ERROR NUMBER                             MAC13750
0015B8   C140 158A            1376  CONT18   BXLE   R4,EPSR2           REPEAT UNTIL ALL SEG REGISTER CHECKED    MAC13760
0015BC   5840 2544            1377           L      R4,LOCSAVE                                                  MAC13770
0015C0   5040 1000            1378           ST     R4,X'1000'         RESTORE LOCATION X'1000'                 MAC13780
0015C4   5840 254C            1379           L      R4,SAVE7                                                    MAC13790
0015C8   5040 2000            1380           ST     R4,X'2000'                                                  MAC13800
0015CC   0700                 1381           XR     R0,R0              RESTORE ILLEGAL INSTRUCTION TRAP         MAC13810
0015CE   5000 0030            1382           ST     R0,X'30'                                                    MAC13820
0015D2   E600 220C            1383           LA     R0,ILGINT                                                   MAC13830
0015D6   5000 0034            1384           ST     R0,X'34'                                                    MAC13840
0015DA   4300 20C0            1385           B      TSTCHK             CHECK FOR NEXT TEST                      MAC13850
                              1386  *                                                                          MAC13860
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                        1388  *                    T E S T B                          *              MAC13880
                        1389  *                                                       *              MAC13890
                        1390  * PURPOSE:                                             *              MAC13900
                        1391  *  TO TEST ALL WORST CASE BOUNDARY SITUATIONS          *              MAC13910
                        1392  *                                                       *              MAC13920
                        1393  * ASSUMPTIONS:                                        *              MAC13930
                        1394  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR     *              MAC13940
                        1395  *  TESTS AND THE SERIES 32 MEMORY TESTS HAVE BEEN     *              MAC13950
                        1396  *  RUN WITHOUT DETECTING A FAILURE.  FURTHER, TESTS   *              MAC13960
                        1397  *  0 THRU 9 HAVE BEEN RUN WITHOUT DETECTING AN ERROR. *              MAC13970
                        1398  *                                                       *              MAC13980
                        1399  * DESIGN SPECIFICATIONS:                              *              MAC13990
                        1400  *  1) TEST VARIOUS RX2 FORMAT INSTRUCTIONS WHERE THE  *              MAC14000
                        1401  *     PROGRAM ADDRESS IS FOUR BYTES AWAY FROM CAUSING *              MAC14010
                        1402  *     A LIMIT VIOLATION                              *              MAC14020
                        1403  *  2) TEST VARIOUS RX2 FORMAT INSTRUCTIONS WHERE THE  *              MAC14030
                        1404  *     PROGRAM ADDRESS IS FOUR BYTES AWAY FROM CAUSING *              MAC14040
                        1405  *     SELECTION OF A DIFFERENT SEGMENTATION REGISTER  *              MAC14050

0015DE  2400            1407  TESTB    LIS   R0,0                                    MAC14070
0015E0  9560            1408           EPSR  R6,0          SET PSW = 0               MAC14080
0015E2  2400            1409           LIS   R0,0                                    MAC14090
0015E4  41F0 227C       1410           BAL   R15,TSTNUM    PRINT TEST NUMBER         MAC14100
0015E8  7370 0B9C       1411           LHL   R7,SEGREG                               MAC14110
0015EC  5007 0040       1412           ST    R0,X'40'(R7)  INITIALIZE ISR            MAC14120
0015F0  24A0            1413           LIS   R10,0                                   MAC14130
0015F2  50A0 0090       1414           ST    R10,X'90'     MACINT NEW PSW STATUS     MAC14140
0015F6  E610 2064       1415           LA    R1,MACINT1                              MAC14150
0015FA  5010 0094       1416           ST    R1,X'94'      MACINT NEW PSW LOC        MAC14160
0015FE  F810 03F0 0010  1417           LI    R1,Y'03F00010'  SET SEG REG 0 SLF = 3F SRF =000  MAC14170
001604  5017 0000       1418           ST    R1,0(R7)      P = 1 E = 0 WP = 00.      MAC14180
001608  50A0 2088       1419           ST    R10,FLAG      RESET EXPECTED INTERRUPT FLAG  MAC14190
                        1420  *                                                       MAC14200
                        1421  *                           SEG REGS 1 THRU 15 ARE INITIALLY  MAC14210
                        1422  *                           SETUP TO MAP TO LOCATIONS 60FC THRU  MAC14220
                        1423  *                           6EFC AT INTERVALS OF 100 LOCATIONS  MAC14230
00160C  C820 60FC       1424           LHI   R2,X'60FC'                              MAC14240
001610  C830 0100       1425           LHI   R3,X'100'                               MAC14250
001614  C840 6EFC       1426           LHI   R4,X'6EFC'    BXLE SETUP                MAC14260
001618  26A1            1427  SEGRESTR AIS   R10,1                                   MAC14270
00161A  D2A2 0000       1428           STB   R10,0(R2)                               MAC14280
00161E  C120 1618       1429           BXLE  R2,SEGRESTR                             MAC14290
                        1430  *                                                       MAC14300
001622  C810 6010       1431           LHI   R1,X'6010'    GET SEG REG SETUP SLF = 000  MAC14310
                        1432  *                           SRF = 061 THRU 06E P= 1 E= 0  MAC14320
                        1433  *                           WP = 00.                  MAC14330
001626  7320 0B9C       1434           LHL   R2,SEGREG                               MAC14340
00162A  2624            1435           AIS   R2,4          SEG REG 1 ADRS            MAC14350
00162C  2434            1436           LIS   R3,4          BXLE INCREMENT            MAC14360
00162E  0842            1437           LR    R4,R2                                   MAC14370
001630  CA40 003C       1438           AHI   R4,X'3C'      ADRS OF ISR               MAC14380
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001634   5012 0000          1439  SEGSETUP ST    R1,0(R2)            INIT SEG REGS                          MAC14390
                            1440  *                                                                         MAC14400
001638   CA10 0100          1441           AHI   R1,X'0100'          INCREMENT SEG REG SRF BY               MAC14410
                            1442  *                                  100. FOR NEXT SEG REG                  MAC14420
                            1443  *                                                                         MAC14430
00163C   C120 1634          1444           BXLE  R2,SEGSETUP                                                MAC14440
001640   07BB               1445  RX2P4T   XR    R11,R11             CLEAR REG COUNT                        MAC14450
001642   C850 7F10          1446           LHI   R5,X'7F10'          GET SEG REG PRESENCE BIT               MAC14460
001646   7370 0B9C          1447           LHL   R7,SEGREG           SET SEG REG SLF TO FF                  MAC14470
00164A   2484               1448           LIS   R8,4                SRF TO 110 WITH PRESCENCE BIT          MAC14480
00164C   C890 033C          1449           LHI   R9,X'33C'           ON.                                    MAC14490
001650   C070 16A8          1450  LOOP     BXH   R7,DONE                                                    MAC14500
001654   41E0 22A0          1451           BAL   R14,WRITE                                                  MAC14510
001658   5057 0000          1452           ST    R5,0(R7)                                                   MAC14520
00165C   C800 0400          1453           LHI   R0,X'400'           SET MAC R/P BIT IN PSW                 MAC14530
001660   C810 7FFC          1454           LHI   R1,X'7FFC'                                                 MAC14540
001664   4001 0000          1455           STH   R0,0(R1)            INITIALIZE CELL                        MAC14550
001668   9560               1456           EPSR  R6,0                ENABLE MAC                             MAC14560
00166A   F810 0000 E97A     1457           LI    R1,X'FEFC'-LOC1+X'FC'                                      MAC14570
001670   083B               1458           LR    R3,R11              GET UPDATED SEG REG # -1               MAC14580
001672   F8D0 0001 0000     1459           LI    R13,Y'10000'                                               MAC14590
001678   1C2D               1460           MR    R2,R13              (REG # -1 X 10000).                    MAC14600
00167A   0A13               1461           AR    R1,R3               ADD IT TO R1                           MAC14610
00167C   26B1               1462           AIS   R11,1               INCREMENT REG COUNT                    MAC14620
00167E   5011               1463  LOC1     DCX   5011,8100           * ST R1,*+X'100'+4(R1)                 MAC14630
001680   8100
001682   2400               1464           LIS   R0,0                                                       MAC14640
001684   9560               1465           EPSR  R6,R0               DISABLE MAC                            MAC14650
001686   C880 7FFC          1466           LHI   R8,X'7FFC'                                                 MAC14660
00168A   5838 0000          1467           L     R3,0(R8)                                                   MAC14670
00168E   0531               1468           CLR   R3,R1               COMPARE WITH REG 1                     MAC14680
001690   2334               1469           BES   RX2P4T1                                                    MAC14690
001692   41F0 22C0          1470           BAL   R15,ERROR                                                  MAC14700
001696   3233               1471           DCX   3233                ERROR NUMBER              * 0B23 *     MAC14710
001698   C8A0 6010          1472  RX2P4T1  LHI   R10,X'6010'         GET SEG REG N RESTORE VALUE            MAC14720
                            1473  *                                  SLF = 000 SRF = 060 THRU 06E           MAC14730
                            1474  *                                  P = 1 E = 0 WP = 00                    MAC14740
00169C   50A7 0000          1475           ST    R10,0(R7)           CLEAR CURRENT SEG REG                  MAC14750
0016A0   CAA0 0100          1476           AHI   R10,X'0100'         INCREMENT SRF FIELD BY 100             MAC14760
0016A4   4300 1650          1477           B     LOOP                                                       MAC14770
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TEST B

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0016A8  2400           1479  DONE    LIS   R0,0                                          MAC14790
0016AA  9560           1480          EPSR  R6,R0          DISABLE MAC                    MAC14800
0016AC  2410           1481  IEPROW  LIS   R1,0                                          MAC14810
0016AE  9561           1482          EPSR  R6,R1          SET PSW = 0 DISABLE MAC        MAC14820
0016B0  7370 0B9C      1483          LHL   R7,SEGREG                                     MAC14830
0016B4  5017 0040      1484          ST    R1,X'40'(R7)   INITIALIZE MAC STATUS REG      MAC14840
0016B8  E610 2064      1485          LA    R1,MACINT1                                    MAC14850
0016BC  5010 0094      1486          ST    R1,X'94'       INIT MAC INTERRUPT VECTOR      MAC14860
0016C0  F810 03F0 0010 1487          LI    R1,Y'03F00010'                                MAC14870
0016C6  5017 0000      1488          ST    R1,0(R7)       SET UP SEG REG 0               MAC14880
0016CA  C827 0008      1489          LHI   R2,8(R7)                                      MAC14890
0016CE  2434           1490          LIS   R3,4                                          MAC14900
0016D0  C847 0040      1491          LHI   R4,X'40'(R7)   BXLE SET-UP                    MAC14910
0016D4  2400           1492          LIS   R0,0                                          MAC14920
0016D6  5002 0000      1493  IEPROW2 ST    R0,0(R2)                                      MAC14930
0016DA  C120 16D6      1494          BXLE  R2,IEPROW2     CLEAR SEG REGS 2 THRU 15       MAC14940
0016DE  C800 7F90      1495          LHI   R0,X'7F90'     SET UP SEG REG 1 FOR EXECUTE   MAC14950
0016E2  5007 0004      1496          ST    R0,4(R7)       PROTECT.  SLF = 00 SRF = 7F    MAC14960
0016E6  C800 171A      1497          LHI   R0,IEPROW1                                    MAC14970
0016EA  4000 2090      1498          STH   R0,RETURN1                                    MAC14980
                       1499  *                            P = 1, E = 1, WP = 00          MAC14990
0016EE  244F           1500          LIS   R4,15          SET FLAG2 TO INDICATE TO MACINT MAC15000
0016F0  5040 2088      1501          ST    R4,FLAG        THAT AN EXECUTE PROTECT        MAC15010
                       1502  *                            INTERRUPT IS EXPECTED          MAC15020
0016F4  C850 0307      1503          LHI   R5,X'0307'     GET INST BR R7                 MAC15030
0016F8  F810 0001 1000 1504          LI    R1,Y'11000'                                   MAC15040
0016FE  4051 0000      1505          STH   R5,0(R1)                                      MAC15050
001702  E670 1714      1506          LA    R7,ERROR9                                     MAC15060
001706  C810 0400      1507          LHI   R1,X'400'                                     MAC15070
00170A  9561           1508          EPSR  R6,R1          ENABLE MAC                     MAC15080
00170C  F880 0001 0000 1509          LI    R8,Y'00010000' BRANCH TO LOCATION 7F00 THRU   MAC15090
001712  0308           1510          BR    R8             MAC USING SEG REG 1,           MAC15100
001714  41F0 22C0      1511  ERROR9  BAL   R15,ERROR      EXPECTED EXECUTE PROTECT       MAC15110
001718  3132           1512          DCX   3132           ERROR NUMBER          * 0B12 * MAC15120
                       1513  *                                                           MAC15130
                       1514  *                                                           MAC15140
                       1515  *                                                           MAC15150
00171A  2440           1516  IEPROW1 LIS   R4,0            RESET EXECUTE PROTECT VIOLATE MAC15160
00171C  7370 0B9C      1517          LHL   R7,SEGREG                                     MAC15170
001720  5047 0040      1518          ST    R4,X'40'(R7)   CLEAR MAC ISR                  MAC15180
001724  5040 2088      1519          ST    R4,FLAG        CLEAR INTERRUPT EXPECTED FLAG  MAC15190
001728  C840 0400      1520          LHI   R4,X'400'                                     MAC15200
00172C  9564           1521          EPSR  R6,R4          ENABLE MAC                     MAC15210
00172E  F840 AAAA AAAA 1522  ENTRY1  LI    R4,Y'AAAAAAAA' GET TEST PATTERN AND STORE IT  MAC15220
001734  F810 0001 0000 1523          LI    R1,Y'10000'                                   MAC15230
00173A  5041 0000      1524          ST    R4,0(R1)       STORE CONTENTS OF REG 4 AT LOC MAC15240
                       1525  *                            11000 THRU MAC USING SEG REG 1 MAC15250
                       1526  *                            COMPARE R4 AND R4              MAC15260
                       1527  *                            ERROR1 IF DIFFERENT            MAC15270
00173E  2400           1528          LIS   R0,0                                          MAC15280
001740  9560           1529          EPSR  R6,R0                                         MAC15290
001742  C810 7F00      1530          LHI   R1,X'7F00'                                    MAC15300
001746  5851 0000      1531          L     R5,0(R1)       FETCH FROM 7F00 THRU MAC       MAC15310
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TEST B

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                                *                      USING SEG REG 1                           MAC15320
00174A   0545                             CLR   R4,R5                                            MAC15330
00174C   2334                             BES   ENTRY1.5                                         MAC15340
00174E   41F0 22C0                        BAL   R15,ERROR          DATA COMPARE FAILURE (READ)   MAC15350
001752   3331                             DCX   3331               ERROR NUMBER         * 0B31 * MAC15360
001754   C800 7F70              ENTRY1.5  LHI   R0,X'7F70'         SEG REG INITIAL VALUE         MAC15370
001758   2410                   ENTRY1.6  LIS   R1,0                                             MAC15380
00175A   5010 2088                        ST    R1,FLAG            CLEAR INTERRUPT EXPECRED FLAG MAC15390
00175E   9561                             EPSR  R6,R1              DISABLE MAC                   MAC15400
001760   7350 0B9C                        LHL   R5,SEGREG          SEG REG ORIGIN ADDRESS        MAC15410
001764   5005 0004                        ST    R0,4(R5)           SET-UP SEG REG 1              MAC15420
001768   F870 4300 0000                   LI    R7,Y'43000000'                                   MAC15430
00176E   C670 1788                        OHI   R7,ENTRY2          FORM INSTRUCTION:   B   ENTRY2 MAC15440
001772   C810 7F10                        LHI   R1,X'7F10'                                       MAC15450
001776   5071 0000                        ST    R7,0(R1)           STORE BRANCH INSTR AT '07F10' MAC15460
00177A   F820 0001 0010                   LI    R2,Y'10010'        PROGRAM ADRS THAT EQUALS '07F10' MAC15470
001780   C810 0400                        LHI   R1,X'400'                                        MAC15480
001784   9561                             EPSR  R6,R1              ENABLE MAC                    MAC15490
001786   0302                             BR    R2                 GO TO '07F10' THRU SEG REG 1  MAC15500
                                *                                                                MAC15510
001788   C810 0400              ENTRY2    LHI   R1,X'400'                                        MAC15520
00178C   9561                             EPSR  R6,R1              ENABLE MAC                    MAC15530
00178E   F810 0001 0000                   LI    R1,Y'10000'                                      MAC15540
001794   5831 0000                        L     R3,0(R1)           LOOKING FOR Y'AAAAAAAA'       MAC15550
001798   0534                             CLR   R3,R4                                            MAC15560
00179A   2334                             BES   ENTRY3                                           MAC15570
00179C   41F0 22C0                        BAL   R15,ERROR                                        MAC15580
0017A0   3336                             DCX   3336               ERROR NUMBER         * 0B36 * MAC15590
0017A2   C810 17B8              ENTRY3    LHI   R1,ENTRY2.5        RETURN FROM MACINT            MAC15600
0017A6   4010 2090                        STH   R1,RETURN1                                       MAC15610
0017AA   5010 2088                        ST    R1,FLAG            SET INTERRUPT EXPECTED FLAG   MAC15620
0017AE   F810 0001 0000                   LI    R1,Y'10000'                                      MAC15630
0017B4   5041 0000                        ST    R4,0(R1)                                         MAC15640
                                *                                                                MAC15650
0017B8   C880 0020              ENTRY2.5  LHI   R8,X'20'           DECREMENT SEG REG BY 20 TO TEST MAC15660
0017BC   0B08                             SR    R0,R8              WP = 11 10 01.                MAC15670
0017BE   C500 7F10                        CLHI  R0,X'7F10'                                       MAC15680
0017C2   4230 1758                        BNE   ENTRY1.6                                         MAC15690

0017C6   2410                   RX2P4T1A  LIS   R1,0                                             MAC15710
0017C8   9561                             EPSR  R6,R1              DISABLE MAC  CLEAR MAC ISR    MAC15720
0017CA   7370 0B9C                        LHL   R7,SEGREG                                        MAC15730
0017CE   5017 0040                        ST    R1,X'40'(R7)       CLEAR MAC ISR                 MAC15740
0017D2   5010 2088                        ST    R1,FLAG            CLEAR INTERRUPT EXPECTED FLAG MAC15750
0017D6   F800 03F0 0010                   LI    R0,Y'03F00010'     SET SEG REG 0 SLF = 3F SRF = 0 MAC15760
0017DC   5007 0000                        ST    R0,0(R7)                                         MAC15770
0017E0   C800 7F10                        LHI   R0,X'7F10'         SET SEG REG 1 SLF = 0 SRF = 7F MAC15780
0017E4   5007 0004                        ST    R0,4(R7)                                         MAC15790
0017E8   C827 0008                        LHI   R2,8(R7)           BXLE SET-UP FOR CLEARING MAC  MAC15800
0017EC   2434                             LIS   R3,4               SEG REGISTERS 2 THRU 15       MAC15810
0017EE   C847 003C                        LHI   R4,X'3C'(R7)                                     MAC15820
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TEST B

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0017F2  5012 0000          1583  RX2P4T1B ST    R1,0(R2)                                          MAC15830
0017F6  C120 17F2          1584           BXLE  R2,RX2P4T1B                                       MAC15840
0017FA  2400               1585  RX2P4T2  LIS   R0,0          RX2 FORWARD STORE TO LOC  7FFC     MAC15850
0017FC  9560               1586           EPSR  R6,R0          DISABLE MAC                       MAC15860
0017FE  C830 7FFC          1587           LHI   R3,X'7FFC'                                        MAC15870
001802  5003 0000          1588           ST    R0,0(R3)                                          MAC15880
001806  C800 0400          1589           LHI   R0,X'400'                                         MAC15890
00180A  9560               1590           EPSR  R6,R0          ENABLE MAC                        MAC15900
00180C  F810 0000 E8E6     1591           LI    R1,Y'100FC'-LOC1A                                 MAC15910
001812  5011               1592           DCX   5011,8000      * ST R1,0(R1) STORE CONTENTS OF   MAC15920
001814  8000
                           1593  *                                R1 (7FFC - LOC1A) AT LOC 7FFC  MAC15930
001816  2400               1594  LOC1A    LIS   R0,0                                              MAC15940
001818  9560               1595           EPSR  R6,R0          DISABLE MAC                       MAC15950
00181A  5823 0000          1596           L     R2,0(R3)                                          MAC15960
00181E  0521               1597           CLR   R2,R1                                             MAC15970
001820  2334               1598           BES   RX2P4T3                                           MAC15980
001822  41F0 22C0          1599           BAL   R15,ERROR      DATA COMPARE FAILURE (READ)       MAC15990
001826  3233               1600           DCX   3233           ERROR NUMBER              * 0823 * MAC16000
001828  C800 0400          1601  RX2P4T3  LHI   R0,X'400'      RX2 FORWARD LOAD FROM LOC 7FFC    MAC16010
00182C  9560               1602           EPSR  R6,R0          ENABLE MAC                        MAC16020
00182E  F810 0000 E8C4     1603           LI    R1,Y'100FC'-LOC1B                                 MAC16030
001834  5831               1604           DCX   5831,8000      * L R3,0(R1) GET CONTENTS OF      MAC16040
001836  8000
                           1605  *                                LOC (7FFC)ADDR BY RX2 L R3.    MAC16050
001838  2400               1606  LOC1B    LIS   R0,0                                              MAC16060
00183A  9560               1607           EPSR  R6,0           DISABLE MAC                       MAC16070
00183C  0523               1608           CLR   R2,R3                                             MAC16080
00183E  2334               1609           BES   RX2P4T4                                           MAC16090
001840  41F0 22C0          1610           BAL   R15,ERROR      DATA COMPARE FAILURE (WRITE)      MAC16100
001844  3234               1611           DCX   3234           ERROR NUMBER              * 0824 * MAC16110
001846  C800 0400          1612  RX2P4T4  LHI   R0,X'400'      RX2 BACKWARD STORE TO LOC 0       MAC16120
00184A  4000 0000          1613           STH   R0,0           INIT TEST LOC                     MAC16130
00184E  9560               1614           EPSR  R6,R0          ENABLE MAC                        MAC16140
001850  C810 E7A8          1615           LHI   R1,0-LOC1C                                        MAC16150
001854  5011               1616           DCX   5011,8000      R1 (0-LOC1C) AT LOC 0.            MAC16160
001856  8000
001858  2400               1617  LOC1C    LIS   R0,0                                              MAC16170
00185A  9560               1618           EPSR  R6,R0          DISABLE MAC                       MAC16180
00185C  5820 0000          1619           L     R2,0                                              MAC16190
001860  0512               1620           CLR   R1,R2          COMPARE R1 AND R2 IF NOT = BR     MAC16200
001862  2334               1621           BES   RX2P4T5        TO ERROR5                         MAC16210
001864  41F0 22C0          1622           BAL   R15,ERROR      DATA COMPARE FAILURE (READ)       MAC16220
001868  3235               1623           DCX   3235           ERROR NUMBER              * 0825 * MAC16230
00186A  C800 0400          1624  RX2P4T5  LHI   R0,X'400'      RX2 BACKWARD LOAD FROM LOC 0      MAC16240
00186E  9560               1625           EPSR  R6,R0          ENABLE MAC                        MAC16250
001870  C810 E788          1626           LHI   R1,0-LOC1D                                        MAC16260
001874  5821               1627           DCX   5821,8000      LOC (0) ADDR BY RX2 L R2.         MAC16270
001876  8000
001878  2400               1628  LOC1D    LIS   R0,0                                              MAC16280
00187A  9560               1629           EPSR  R6,R0          DISABLE MAC                       MAC16290
00187C  5520 0000          1630           CL    R2,0           COMPARE R2 AND LOC 0 IF NOT =     MAC16300
001880  2335               1631           BES   RX2SLT0                                           MAC16310
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001882  41F0 22C0          1632           BAL   R15,ERROR                                        MAC16320
001886  3236               1633           DCX   3236          ERROR NUMBER          * 0B26 *   MAC16330
001888  3332               1634           DC    X'3332'                                        MAC16340
00188A  C800 7010          1635  RX2SLT0  LHI   R0,X'7010'    SET SEG REG 1 SLF = 0 SRF = 70   MAC16350
00188E  7370 0B9C          1636           LHL   R7,SEGREG6                                       MAC16360
001892  5007 0004          1637           ST    R0,4(R7)                                         MAC16370
001896  5000 2088          1638           ST    R0,FLAG      SET INTERRUPT EXPECTED FLAG         MAC16380
                           1639  *                           RX2 FORWARD STORE SEG LIMIT        MAC16390
                           1640  *                           VIOLATION TEST                     MAC16400
00189A  C800 0400          1641  RX2SLT1  LHI   R0,X'400'                                       MAC16410
00189E  9560               1642           EPSR  R6,R0        ENABLE MAC                          MAC16420
0018A0  C810 664C          1643           LHI   R1,X'7F00'-LOC2                                  MAC16430
0018A4  5010 2088          1644           ST    R1,FLAG      SET SEGMENT LIMIT VIOLATE FLAG      MAC16440
0018A8  C800 18BA          1645           LHI   R0,LOC2.1    INTERRUPT EXPECTED                  MAC16450
0018AC  4000 2090          1646           STH   R0,RETURN1   SET RETURN FROM MACINT              MAC16460
0018B0  5001               1647           DCX   5001,8000                                        MAC16470
0018B2  8000
0018B4  41F0 22B8          1648  LOC2     BAL   R15,ERROR1   SEGMENT LIMIT VIOLATION INTER-      MAC16480
0018B8  3237               1649           DCX   3237         RUPT DID NOT OCCUR    * 0B27 *   MAC16490
0018BA  C370 0010          1650  LOC2.1   THI   R7,X'0010'                                      MAC16500
0018BE  2134               1651           BNZS  RX2SLT2                                          MAC16510
0018C0  41F0 22C0          1652           BAL   R15,ERROR                                        MAC16520
0018C4  3036               1653           DCX   3036         DATA COMPARE FAIL (READ)  * 0B06 *  MAC16530
                           1654  *                           RX2 FORWARD LOAD SEG LIMIT         MAC16540
                           1655  *                                VIOLATION TEST.               MAC16550
0018C6  2400               1656  RX2SLT2  LIS   R0,0                                            MAC16560
0018C8  7370 0B9C          1657           LHL   R7,SEGREG6                                       MAC16570
0018CC  5007 0040          1658           ST    R0,X'40'(R7) CLEAR MAC ISR                       MAC16580
0018D0  C800 0400          1659           LHI   R0,X'400'                                        MAC16590
0018D4  9560               1660           EPSR  R6,R0        ENABLE MAC                          MAC16600
0018D6  C810 6616          1661           LHI   R1,X'7F00'-LOC2A                                 MAC16610
0018DA  5010 2088          1662           ST    R1,FLAG      SET SEGMENT LIMIT VIOLATE FLAG      MAC16620
0018DE  C800 18F0          1663           LHI   R0,LOC2A.1                                       MAC16630
0018E2  4000 2090          1664           STH   R0,RETURN1   SET RETURN FROM MACINT              MAC16640
0018E6  5811               1665           DCX   5811,8000    * L R1,0(R1)                        MAC16650
0018E8  8000
0018EA  41F0 22B8          1666  LOC2A    BAL   R15,ERROR1                                       MAC16660
0018EE  3238               1667           DCX   3238         ERROR NUMBER          * 0B28 *   MAC16670
0018F0  C370 0010          1668  LOC2A.1  THI   R7,X'0010'                                      MAC16680
0018F4  2134               1669           BNZS  RX2SLT3                                          MAC16690
0018F6  41F0 22C0          1670           BAL   R15,ERROR    INVALID ADDRESS BIT NOT SET         MAC16700
0018FA  3036               1671           DCX   3036         ERROR NUMBER          * 0B06 *   MAC16710
0018FC  C800 0400          1672  RX2SLT3  LHI   R0,X'400'                                       MAC16720
001900  9560               1673           EPSR  R6,R0        ENABLE MAC                          MAC16730
001902  2400               1674           LIS   R0,0                                             MAC16740
001904  5000 2088          1675           ST    R0,FLAG      RESET INTERRUPT EXPECTED FLAG       MAC16750
001908  C810 E6F0          1676           LHI   R1,0-LOC2B                                       MAC16760
00190C  5011               1677           DCX   5011,8000    * ST R0,0(R1)                       MAC16770
00190E  8000
001910  2400               1678  LOC2B    LIS   R0,0                                             MAC16780
001912  9560               1679           EPSR  R6,R0        DISABLE MAC                         MAC16790
001914  5820 0000          1680           L     R2,0                                             MAC16800
001918  0521               1681           CLR   R2,R1        COMPARE R2 AND R1 IF NOT = BR       MAC16810
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00191A  2334                1682          BES   RX2SLT4                                                  MAC16820
00191C  41F0 2288           1683          BAL   R15,ERROR1                                               MAC16830
001920  3239                1684          DCX   3239              ERROR NUMBER              * 0B29 *     MAC16840
                            1685  *                               RX2 BACKWARD STORE NO SEG LIMIT        MAC16850
001922  C800 0400           1686  RX2SLT4 LHI   R0,X'400'                                                 MAC16860
001926  9560                1687          EPSR  R6,R0             ENABLE MAC                             MAC16870
001928  C810 E6D0           1688          LHI   R1,0-LOC2C                                               MAC16880
00192C  5831                1689          DCX   5831,8000         * L R3,0(R1)                           MAC16890
00192E  8000
001930  2400                1690  LOC2C   LIS   R0,0                                                     MAC16900
001932  9560                1691          EPSR  R6,R0             DISABLE MAC                            MAC16910
001934  5820 0000           1692          L     R2,0                                                     MAC16920
001938  0523                1693          CLR   R2,R3             COMPARE R2 AND R3 IF NOT EQUAL         MAC16930
00193A  2334                1694          BES   RX1P4T                                                   MAC16940
00193C  41F0 2288           1695          BAL   R15,ERROR1                                               MAC16950
001940  3330                1696          DCX   3330              ERROR NUMBER              * 0B30 *     MAC16960


001942  2400                1698  RX1P4T  LIS   R0,0             MAC RX1 INST TEST                      MAC16980
001944  9560                1699          EPSR  R6,R0             DISABLE MAC                            MAC16990
001946  F810 0840 0010      1700          LI    R1,Y'08400010'                                           MAC17000
00194C  7370 0B9C           1701          LHL   R7,SEGREG                                                MAC17010
001950  5017 0000           1702          ST    R1,0(R7)          SET-UP SEG REG 0                       MAC17020
001954  C810 3010           1703          LHI   R1,X'3010'                                               MAC17030
001958  5017 0004           1704          ST    R1,4(R7)          SET-UP SEG REG 1                       MAC17040
00195C  C840 0400           1705          LHI   R4,X'400'                                                MAC17050
001960  F850 0001 0000      1706          LI    R5,Y'10000'                                              MAC17060
001966  247F                1707          LIS   R7,15                                                    MAC17070
001968  D270 2093           1708          STB   R7,FLOP                                                  MAC17080
00196C  C860 0100           1709          LHI   R6,X'100'                                                MAC17090
001970  C880 3000           1710          LHI   R11,X'3000'                                              MAC17100
001974  D320 2093           1711  RX1P4T1 LB    R2,FLOP           TEST ALT PATTERN FLIP-FLOP             MAC17110
001978  0875                1712          LR    R7,R5                                                    MAC17120
00197A  41E0 22A0           1713          BAL   R14,WRITE                                                MAC17130
00197E  0822                1714          LR    R2,R2                                                    MAC17140
001980  233A                1715          BZS   ALTPAT2                                                  MAC17150
001982  F830 AAAA AAAA      1716          LI    R3,Y'AAAAAAAA'                                           MAC17160
001988  9564                1717          EPSR  R6,R4             ENABLE MAC                             MAC17170
00198A  5035 0000           1718          ST    R3,0(R5)                                                 MAC17180
00198E  D200 2093           1719          STB   R0,FLOP           RESET FLOP                             MAC17190
001992  230A                1720          BS    RX1P4T1A                                                 MAC17200
001994  F830 5555 5555      1721  ALTPAT2 LI    R3,Y'55555555'                                           MAC17210
00199A  9564                1722          EPSR  R6,R4                                                    MAC17220
00199C  5035 0000           1723          ST    R3,0(R5)                                                 MAC17230
0019A0  247F                1724          LIS   R7,15                                                    MAC17240
0019A2  D270 2093           1725          STB   R7,FLOP                                                  MAC17250
0019A6  9560                1726  RX1P4T1A EPSR R6,R0                                                    MAC17260
0019A8  589B 0000           1727          L     R9,0(R11)                                                MAC17270
0019AC  0593                1728          CLR   R9,R3                                                    MAC17280
0019AE  2336                1729          BES   RX1P4T2                                                  MAC17290
0019B0  081B                1730          LR    R1,R11                                                   MAC17300
0019B2  0849                1731          LR    R4,R9                                                    MAC17310
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TEST B

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001984   41F0 22C0          1732          BAL   R15,ERROR                                        MAC17320
001988   3337               1733          DCX   3337              ERROR NUMBER      * 0B37 *   MAC17330
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TEST B

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0019BA  2654           1735  RX1P4T2  AIS   R5,4                                                  MAC17350
0019BC  26B4           1736           AIS   R11,4                                                 MAC17360
0019BE  08AB           1737           LR    R10,R11                                               MAC17370
0019C0  C4A0 00FF      1738           NHI   R10,X'00FF'                                           MAC17380
0019C4  4230 1974      1739           BNZ   RX1P4T1                                               MAC17390
0019C8  0858           1740           SR    R5,R8                                                 MAC17400
0019CA  0A18           1741           AR    R1,R8                                                 MAC17410
0019CC  5010 0304      1742           ST    R1,X'304'                                             MAC17420
0019D0  F510 0000 8010 1743           CLI   R1,Y'00008010'                                        MAC17430
0019D6  4230 1974      1744           BNE   RX1P4T1                                               MAC17440
0019DA  2400           1745  RX3P4T   LIS   R0,0           MAC RX3 INST TEST                     MAC17450
0019DC  9570           1746           EPSR  R7,R0          DISABLE MAC                           MAC17460
0019DE  C810 3000      1747           LHI   R1,X'3000'     SEG REG 1 IS SET UP TO RELOCATE       MAC17470
0019E2  C8B0 3010      1748           LHI   R11,X'3010'    TO 3000 WITH A LIMIT FIELD OF 0       MAC17480
0019E6  7350 0B9C      1749           LHL   R5,SEGREG                                             MAC17490
0019EA  50B5 0004      1750           ST    R11,4(R5)      AN ALTERNATING DATA PATTERN IS        MAC17500
0019EE  F820 0840 0010 1751           LI    R2,Y'08400010' STORED AND READ AT LOCATIONS          MAC17510
0019F4  5025 0000      1752           ST    R2,0(R5)       3000-30FF.  THE RELOCATION            MAC17520
0019F8  C830 0100      1753           LHI   R3,X'0100'     FIELD IS INCREMENTED TO 3100          MAC17530
0019FC  C850 0400      1754           LHI   R5,X'400'      AND THE TEST IS REPEATED.  THIS       MAC17540
001A00  F860 0001 0000 1755           LI    R6,Y'10000'    PROCES IS CONTINUED TO LOC 7FFF       MAC17550
001A06  248F           1756           LIS   R8,15                                                 MAC17560
001A08  24A0           1757           LIS   R10,0                                                 MAC17570
001A0A  D200 2093      1758           STB   R0,FLOP        RESET ALT DATA FLOP                   MAC17580
001A0E  D320 2093      1759  RX3P4T1  LB    R2,FLOP                                              MAC17590
001A12  0871           1760           LR    R7,R1                                                 MAC17600
001A14  41E0 22A0      1761           BAL   R14,WRITE      SHOW PHYSICAL ADDRESS                 MAC17610
001A18  0822           1762           LR    R2,R2                                                 MAC17620
001A1A  233B           1763           BZS   ALTPAT1                                               MAC17630
001A1C  F840 AAAA AAAA 1764           LI    R4,Y'AAAAAAAA'                                        MAC17640
001A22  9575           1765           EPSR  R7,R5          ENABLE MAC                            MAC17650
001A24  5046 4A00 0000 1766           ST    R4,0(R6,R10)   RX3 STORE, R6 CONSTANT '10000'        MAC17660
001A2A  D200 2093      1767           STB   R0,FLOP        R10 RUNS FROM 'D0000' TO 'D00FC'      MAC17670
001A2E  230A           1768           BS    RX3P4T1A                                              MAC17680
001A30  D280 2093      1769  ALTPAT1  STB   R8,FLOP        SET ALT DATA FLOP                     MAC17690
001A34  F840 5555 5555 1770           LI    R4,Y'55555555'                                        MAC17700
001A3A  9575           1771           EPSR  R7,R5          ENABLE MAC                            MAC17710
001A3C  5046 4A00 0000 1772           ST    R4,0(R6,R10)                                          MAC17720
001A42  9570           1773  RX3P4T1A EPSR  R7,R0          DISABLE MAC                           MAC17730
001A44  5891 0000      1774           L     R9,0(R1)                                              MAC17740
001A48  2614           1775           AIS   R1,4                                                  MAC17750
001A4A  0594           1776           CLR   R9,R4          COMPARE DATA WRITTEN AND DATA         MAC17760
001A4C  2334           1777           BES   RX3P4T1B       READ.                                 MAC17770
001A4E  41F0 22B8      1778           BAL   R15,ERROR1                                            MAC17780
001A52  3333           1779           DCX   3333           ERROR NUMBER              * 0B43 *    MAC17790
001A54  26A4           1780  RX3P4T1B AIS   R10,4                                                 MAC17800
001A56  C4A0 00FF      1781           NHI   R10,X'00FF'    MASK AND TEST SECOND INDEX            MAC17810
001A5A  4230 1A0E      1782           BNZ   RX3P4T1        LOOP UNTIL X'100'                     MAC17820
                       1783  *                             R10 EQUALS ZERO                       MAC17830
001A5E  0AB3           1784           AR    R11,R3         INCREMENT SEG REG 1 VALUE             MAC17840
001A60  7370 0B9C      1785           LHL   R7,SEGREG                                             MAC17850
001A64  50B7 0004      1786           ST    R11,4(R7)      SET SEG REG                           MAC17860
001A68  F5B0 0000 8010 1787           CLI   R11,Y'00008010'                                       MAC17870
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TEST 8

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001A6E   4230 1A0E          1788          BNE   RX3P4T1           80 ? IF NO CONT IF YES DONE.        MAC17880


001A72   2400               1790  MALXTRX1 LIS   R0,0              DISABLE MAC                         MAC17900
001A74   4000 255C          1791          STH   R0,MARCHCNT                                            MAC17910
001A78   95E0               1792          EPSR  R14,R0                                                 MAC17920
001A7A   C890 0400          1793          LHI   R9,X'400'                                              MAC17930
001A7E   7310 0B9C          1794          LHL   R1,SEGREG                                              MAC17940
001A82   2614               1795          AIS   R1,4              SET UP SEGMENTATION REGISTERS        MAC17950
001A84   2424               1796          LIS   R2,4              1 THRU 15.                           MAC17960
001A86   0831               1797          LR    R3,R1                                                  MAC17970
001A88   CA30 0040          1798          AHI   R3,X'40'                                               MAC17980
001A8C   5001 0000          1799  SEGINIT ST    R0,0(R1)                                               MAC17990
001A90   C110 1A8C          1800          BXLE  R1,SEGINIT                                             MAC18000
001A94   F810 0360 0010     1801          LI    R1,Y'03600010'    SET UP SEGMENTATION REGISTER 0.     MAC18010
001A9A   7370 0B9C          1802          LHL   R7,SEGREG                                              MAC18020
001A9E   5017 0000          1803          ST    R1,0(R7)                                               MAC18030
001AA2   C810 3F10          1804          LHI   R1,X'3F10'        SET UP SEGMENTATION REGISTER 8       MAC18040
001AA6   5017 0020          1805          ST    R1,X'20'(R7)                                           MAC18050
001AAA   E610 1F68          1806          LA    R1,MALX.TBL       GET MALX TBL INDEX REGISTER        MAC18060
001AAE   E620 1F8C          1807          LA    R2,BR.TBL         GET BR.TBL INDEX REGISTER          MAC18070
001AB2   E630 2010          1808          LA    R3,SEGR.TBL       GET SEG REG TBL INDEX REGISTER     MAC18080
001AB6   E640 203A          1809          LA    R4,PROG.TBL       GET PROGRAM ADDRESS TBL INDEX      MAC18090
001ABA   D200 2093          1810          STB   R0,FLOP                                                MAC18100
001ABE   2461               1811          LIS   R6,1                                                   MAC18110
001AC0   2471               1812          LIS   R7,1                                                   MAC18120
001AC2   C880 0015          1813          LHI   R8,X'15'          BXLE SETUP                           MAC18130
001AC6   4854 0000          1814  MALXRX1A LH   R5,0(R4)                                               MAC18140
001ACA   D205 0000          1815          STB   R0,0(R5)                                               MAC18150
001ACE   2642               1816          AIS   R4,2                                                   MAC18160
001AD0   C160 1AC6          1817          BXLE  R6,MALXRX1A       INITIALIZE TEST LOCATIONS.           MAC18170
001AD4   E640 203A          1818          LA    R4,PROG.TBL       RESET PROG.TBL INDEX                 MAC18180
001AD8   5852 0000          1819  MALXRX1C L    R5,0(R2)          BASE REGISTER VALUE                  MAC18190
001ADC   5871 0000          1820          L     R7,0(R1)                                               MAC18200
001AE0   41E0 22A0          1821          BAL   R14,WRITE         SHOW CURRENT PROGRAM ADDRESS         MAC18210
001AE4   7360 0B9C          1822          LHL   R6,SEGREG                                              MAC18220
001AE8   4A63 0000          1823          AH    R6,0(R3)          ADDRESS OF SEGMENTATION REGISTER   MAC18230
001AEC   5056 0000          1824          ST    R5,0(R6)          BASE REGISTER SETUP                  MAC18240
001AF0   D3C0 2093          1825          LB    R12,FLOP                                               MAC18250
001AF4   08CC               1826          LR    R12,R12                                                MAC18260
001AF6   2136               1827          BNZS  ALTPAT3                                                MAC18270
001AF8   D360 208C          1828          LB    R6,AAA                                                 MAC18280
001AFC   D260 2093          1829          STB   R6,FLOP           SET ALT DATA FLOP                    MAC18290
001B00   2305               1830          BS    MALXRX1B                                               MAC18300
001B02   D360 208D          1831  ALTPAT3 LB    R6,FIVES                                               MAC18310
001B06   D200 2093          1832          STB   R0,FLOP           RESET ALT PATTERN FLIP-FLOP          MAC18320
001B0A   5881 0000          1833  MALXRX1B L    R8,0(R1)                                               MAC18330
001B0E   95E9               1834          EPSR  R14,R9            ENABLE MAC                           MAC18340
001B10   D268 0000          1835          STB   R6,0(R8)                                               MAC18350
001B14   95E0               1836          EPSR  R14,R0            DISABLE MAC                          MAC18360
001B16   48A4 0000          1837          LH    R10,0(R4)                                              MAC18370
001B1A   D3BA 0000          1838          LB    R11,0(R10)                                             MAC18380
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TEST B

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001B1E  056B             1839          CLR   R6,R11                                                  MAC18390
001B20  2334             1840          BES   MALXRX1D                                                MAC18400
001B22  41F0 1D38        1841          BAL   R15,MALXERR       ERROR 0A32                              MAC18410
001B26  3433             1842          DCX   3433              ERROR NUMBER              * 0B43 *      MAC18420
001B28  2614             1843  MALXRX1D AIS   R1,4             INC MALX TABLE INDEX REGISTER           MAC18430
001B2A  2624             1844          AIS   R2,4             INC BR TABLE INDEX REGISTER             MAC18440
001B2C  2632             1845          AIS   R3,2             INC SEG REG TBL INDEX REGISTER          MAC18450
001B2E  2642             1846          AIS   R4,2             INC PROGRAM ADDRESS INDEX               MAC18460
001B30  F580 000F FFFF   1847          CLI   R8,Y'FFFFF'                                              MAC18470
001B36  4230 1AD8        1848          BNE   MALXRX1C                                                 MAC18480
001B3A  2714             1849  MALXRX1E SIS   R1,4             MALX MARCHING 0'S TEST                  MAC18490
001B3C  2724             1850          SIS   R2,4             DECREMENT MALX,TBL BR,TBL SEGR,         MAC18500
001B3E  2732             1851          SIS   R3,2             TBL AND PROG,TBL POINTERS               MAC18510
001B40  2742             1852          SIS   R4,2                                                     MAC18520
001B42  4874 0000        1853          LH    R7,0(R4)                                                 MAC18530
001B46  41E0 22A0        1854          BAL   R14,WRITE         SHOW CURRENT PROGRAM ADDRESS            MAC18540
001B4A  5852 0000        1855          L     R5,0(R2)                                                 MAC18550
001B4E  7360 0B9C        1856          LHL   R6,SEGREG                                                MAC18560
001B52  4A63 0000        1857          AH    R6,0(R3)          ADRS OF SEG REG                        MAC18570
001B56  5056 0000        1858          ST    R5,0(R6)          BASE REGISTER SET-UP                   MAC18580
001B5A  D3C0 2093        1859          LB    R12,FLOP                                                 MAC18590
001B5E  08CC             1860          LR    R12,R12                                                  MAC18600
001B60  2136             1861          BNZS  ALTPAT4                                                  MAC18610
001B62  D360 208C        1862          LB    R6,AAA            DATA PATTERN ALL A,S                   MAC18620
001B66  D260 2093        1863          STB   R6,FLOP           SET FLOP                               MAC18630
001B6A  2305             1864          BS    MALXRX1F                                                 MAC18640
001B6C  D360 208D        1865  ALTPAT4  LB    R6,FIVES          DATA PATTERN ALL 5'S                   MAC18650
001B70  D200 2093        1866          STB   R0,FLOP                                                  MAC18660
001B74  5881 0000        1867  MALXRX1F L     R8,0(R1)                                                 MAC18670
001B78  95E9             1868          EPSR  R14,R9            ENABLE MAC                             MAC18680
001B7A  D268 0000        1869          STB   R6,0(R8)                                                 MAC18690
001B7E  95E0             1870          EPSR  R14,R0            DISABLE MAC                            MAC18700
001B80  48A4 0000        1871          LH    R10,0(R4)                                                MAC18710
001B84  D3BA 0000        1872          LB    R11,0(R10)                                               MAC18720
001B88  056B             1873          CLR   R6,R11                                                   MAC18730
001B8A  2334             1874          BES   MALXRX16          READ                                   MAC18740
001B8C  41F0 1D38        1875          BAL   R15,MALXERR                                              MAC18750
001B90  3434             1876          DCX   3434              ERROR NUMBER              * 0B44 *     MAC18760
001B92  58C1 0000        1877  MALXRX16 L     R12,0(R1)                                                MAC18770
001B96  F5C0 0008 0000   1878          CLI   R12,Y'80000'      END OF TEST ?                          MAC18780
001B9C  4230 1B3A        1879          BNE   MALXRX1E                                                 MAC18790
001BA0  2461             1880          LIS   R6,1                                                     MAC18800
001BA2  6160 255C        1881          AHM   R6,MARCHCNT                                              MAC18810
001BA6  4860 255C        1882          LH    R6,MARCHCNT                                              MAC18820
001BAA  C560 0100        1883          CLHI  R6,X'100'                                                MAC18830
001BAE  4230 1AD8        1884          BNE   MALXRX1C                                                 MAC18840
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TEST B

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                                1886  * MARCHING 1,S TEST FOR SEGMENTATION REGISTERS 1 THRU F.                  MAC18860
001BB2  2400                    1887  BRRX1T1  LIS   R0,0                                                      MAC18870
001BB4  4000 255C               1888           STH   R0,MARCHCNT                                               MAC18880
001BB8  F8B0 03F0 0010          1889  BRRX1T1B LI    R11,Y'03F00010'                                           MAC18890
001BBE  7310 0B9C               1890           LHL   R1,SEGREG                                                 MAC18900
001BC2  50B1 0000               1891           ST    R11,0(R1)          SET SEG REG 0                        MAC18910
001BC6  D200 2093               1892           STB   R0,FLOP                                                   MAC18920
001BCA  F890 0001 0000          1893           LI    R9,Y'10000'                                               MAC18930
001BD0  E630 1EC6               1894           LA    R3,SEGTBL          SET SEGTBL INDEX                     MAC18940
001BD4  E610 1EE4               1895  BRRX1T1A LA    R1,MALX            SET MALX INDEX                       MAC18950
001BD8  E620 1F00               1896           LA    R2,BR              SET BR INDEX                         MAC18960
001BDC  E640 1F34               1897           LA    R4,PROADD          SET PROADD INDEX                     MAC18970
001BE0  95E0                    1898           EPSR  R14,R0             DISABLE MAC                          MAC18980
001BE2  5854 0000               1899  BRRX1T2  L     R5,0(R4)           GET CURRENT PROGRAM ADDRESS          MAC18990
001BE6  5860 2548               1900           L     R6,MEMTOP          IF ITS OVER TOP OF MEMORY,           MAC19000
001BEA  0565                    1901           CLR   R6,R5              GO TO NEXT PART OF TEST              MAC19010
001BEC  4280 1C78               1902           BL    BRRX1T7                                                   MAC19020
001BF0  F870 A5A5 A5A5          1903  BRRX1T3  LI    R7,Y'A5A5A5A5'     CHECK TO SEE WHICH IF ANY 8KB        MAC19030
001BF6  5075 0000               1904           ST    R7,0(R5)           BLOCK OF MEMORY IS PRESENT IN        MAC19040
001BFA  5885 0000               1905           L     R8,0(R5)           THIS 64KB BLOCK                      MAC19050
001BFE  0587                    1906           CLR   R8,R7                                                     MAC19060
001C00  233A                    1907           BES   BRRX1T4            FOUND AN 8KB BLOCK OF MEMORY         MAC19070
001C02  2612                    1908           AIS   R1,2               NO MEMORY FOUND IN THIS BLOCK        MAC19080
001C04  2624                    1909           AIS   R2,4               INCREMENT TO NEXT ONE                MAC19090
001C06  2644                    1910           AIS   R4,4                                                     MAC19100
001C08  C520 1F34               1911           CLHI  R2,PROADD          END OF TABLE?                        MAC19110
001C0C  4280 1BE2               1912           BL    BRRX1T2            NO                                   MAC19120
001C10  4300 1C78               1913           B     BRRX1T7            NEXT PART OF TEST                    MAC19130
001C14  5874 0000               1914  BRRX1T4  L     R7,0(R4)                                                  MAC19140
001C18  41E0 22A0               1915           BAL   R14,WRITE          SHOW CURRENT ADDRESS                 MAC19150
001C1C  C8D0 0400               1916           LHI   R13,X'400'                                               MAC19160
001C20  D3C0 2093               1917           LB    R12,FLOP                                                 MAC19170
001C24  08CC                    1918           LR    R12,R12                                                  MAC19180
001C26  2337                    1919           BZS   BRRX1T5                                                  MAC19190
001C28  F860 AAAA AAAA          1920           LI    R6,Y'AAAAAAAA'     GET DATA PATTERN OF ALL A'S          MAC19200
001C2E  D200 2093               1921           STB   R0,FLOP            RESET ALT DATA FLIP - FLOP           MAC19210
001C32  2306                    1922           BS    BRRX1T6                                                  MAC19220
001C34  F860 5555 5555          1923  BRRX1T5  LI    R6,Y'55555555'     GET DATA PATTERN OF ALL 5'S          MAC19230
001C3A  D260 2093               1924           STB   R6,FLOP            SET ALT DATA FLOP                    MAC19240
001C3E  5852 0000               1925  BRRX1T6  L     R5,0(R2)           BASE REGISTER VALUE                  MAC19250
001C42  7370 0B9C               1926           LHL   R7,SEGREG                                                MAC19260
001C46  4A73 0000               1927           AH    R7,0(R3)           SEG REG ADRS                         MAC19270
001C4A  5057 0000               1928           ST    R5,0(R7)           SET UP SEGMENTATION REGISTER 1:F     MAC19280
001C4E  4881 0000               1929           LH    R8,0(R1)                                                 MAC19290
001C52  95ED                    1930           EPSR  R14,R13            ENABLE MAC                           MAC19300
001C54  5069 4800 0000          1931           ST    R6,0(R9,R8)        RX3 STORE, R9 RUNS FROM '10000'      MAC19310
001C5A  95E0                    1932           EPSR  R14,R0             TO 'F0000',  DISABLE MAC             MAC19320
001C5C  58A4 0000               1933           L     R10,0(R4)                                                MAC19330
001C60  58BA 0000               1934           L     R11,0(R10)         READ DATA                            MAC19340
001C64  056B                    1935           CLR   R6,R11             COMPARE DATA READ AND DATA           MAC19350
001C66  4230 1D24               1936           BNE   BRRX1TA            WRITTEN                              MAC19360
001C6A  2612                    1937           AIS   R1,2               INCREMENT PROGRAM ADDRESS, MALX      MAC19370
001C6C  2624                    1938           AIS   R2,4               AND BR TABLE POINTERS                MAC19380
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TEST B

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001C6E   2644            1939           AIS   R4,4                                    MAC19390
001C70   C520 1F34       1940           CLHI  R2,PROADD          END OF TABLE&          MAC19400
001C74   4280 18E2       1941           BL    BRRX1T2            CONTINUE IF NO         MAC19410



                         1943  * MARCHING 0'S TEST FOR SEGMENTATION REGISTERS 1 THRU F  MAC19430
001C78   2712            1944  BRRX1T7  SIS   R1,2               DECREMENT POINTERS     MAC19440
001C7A   2724            1945           SIS   R2,4                                    MAC19450
001C7C   2744            1946           SIS   R4,4                                    MAC19460
001C7E   C510 1EE4       1947           CLHI  R1,MALX            BACK AT START?         MAC19470
001C82   4280 1D20       1948           BL    BRRX1END           END OF TEST            MAC19480
001C86   5854 0000       1949           L     R5,0(R4)                                 MAC19490
001C8A   5860 2548       1950           L     R6,MEMTOP                                MAC19500
001C8E   0565            1951           CLR   R6,R5              END OF MEMORY?         MAC19510
001C90   4280 1C78       1952           BL    BRRX1T7            YES, MAKE ANOTHER SELECTION  MAC19520
001C94   F870 5A5A 5A5A  1953           LI    R7,Y'5A5A5A5A'                           MAC19530
001C9A   5075 0000       1954           ST    R7,0(R5)                                 MAC19540
001C9E   5885 0000       1955           L     R8,0(R5)                                 MAC19550
001CA2   0587            1956           CLR   R8,R7              AVAILABLE MEMORY?      MAC19560
001CA4   4230 1C78       1957           BNE   BRRX1T7            NO, SELECT ANOTHER     MAC19570
001CA8   C8D0 0400       1958           LHI   R13,X'400'                                 MAC19580
001CAC   D3C0 2093       1959           LB    R12,FLOP                                 MAC19590
001CB0   08CC            1960           LR    R12,R12            TEST ALT DATA FLIP - FLOP  MAC19600
001CB2   2337            1961           BZS   BRRX1T8                                  MAC19610
001CB4   F860 AAAA AAAA  1962           LI    R6,Y'AAAAAAAA'                           MAC19620
001CBA   D200 2093       1963           STB   R0,FLOP            RESET ALT DATA FLIP - FLOP  MAC19630
001CBE   2306            1964           BS    BRRX1T9                                  MAC19640
001CC0   F860 5555 5555  1965  BRRX1T8  LI    R6,Y'55555555'     GET DATA PATTERN ALL 5'S  MAC19650
001CC6   D260 2093       1966           STB   R6,FLOP            SET ALT DATA FLOP      MAC19660
001CCA   5852 0000       1967  BRRX1T9  L     R5,0(R2)           BASE REGISTER VALUE    MAC19670
001CCE   7370 0B9C       1968           LHL   R7,SEGREG                                MAC19680
001CD2   4A73 0000       1969           AH    R7,0(R3)           SEG REG ADRS           MAC19690
001CD6   5057 0000       1970           ST    R5,0(R7)           SET UP SEGMENTATION REGISTER  MAC19700
001CDA   95ED            1971           EPSR  R14,R13            ENABLE MAC             MAC19710
001CDC   4851 0000       1972           LH    R5,0(R1)                                 MAC19720
001CE0   0A59            1973           AR    R5,R9                                    MAC19730
001CE2   5065 0000       1974           ST    R6,0(R5)           WRITE PATTERN TO TEST LOCATION  MAC19740
001CE6   95E0            1975           EPSR  R14,R0             DISABLE MAC            MAC19750
001CE8   58A4 0000       1976           L     R10,0(R4)                                MAC19760
001CEC   58BA 0000       1977           L     R11,0(R10)         READ DATA PATTERN FROM TEST LOC  MAC19770
001CF0   05B6            1978           CLR   R11,R6             IF DATA READ DOES NOT EQUAL  MAC19780
001CF2   4230 1D2E       1979           BNE   BRRX1TB            DATA WRITTEN GO TO ERROR  MAC19790
001CF6   C540 1F34       1980           CLHI  R4,PROADD          SEE IF BACK AT START   MAC19800
001CFA   4230 1C78       1981           BNE   BRRX1T7                                  MAC19810
001CFE   FA90 0001 0000  1982           AI    R9,Y'10000'        INCREMENT FIRST INDEX  MAC19820
001D04   2632            1983           AIS   R3,2               INCREMENT TO NEXT SEG REG  MAC19830
001D06   C530 1EE4       1984           CLHI  R3,MALX            DONE ALL REGISTERS?    MAC19840
001D0A   4230 1BD4       1985           BNE   BRRX1T1A                                 MAC19850
001D0E   2461            1986           LIS   R6,1                                     MAC19860
001D10   6160 255C       1987           AHM   R6,MARCHCNT                              MAC19870
001D14   4860 255C       1988           LH    R6,MARCHCNT                              MAC19880
001D18   C560 0100       1989           CLHI  R6,X'100'                                MAC19890
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TEST B

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001D1C   4230 1BB8          1990           BNE   BRRX1T1B                                          MAC19900
001D20   4300 20C0          1991  BRRX1END B     TSTCHK                                            MAC19910
001D24   41F0 1D38          1992  BRRX1TA  BAL   R15,MALXERR                                        MAC19920
001D28   3433               1993           DCX   3433              ERROR NUMBER        * 0B43 *  MAC19930
001D2A   4300 20C0          1994           B     TSTCHK                                            MAC19940
001D2E   41F0 1D38          1995  BRRX1TB  BAL   R15,MALXERR                                        MAC19950
001D32   3434               1996           DCX   3434              ERROR NUMBER        * 0B44 *  MAC19960
001D34   4300 20C0          1997           B     TSTCHK                                            MAC19970
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TEST B

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001D38  D000 2638          1999  MALXERR  STM   R0,REGSAVE          SAVE ALL REGISTERS                        MAC19990
001D3C  481F 0000          2000           LH    R1,0(R15)                                                     MAC20000
001D40  4010 1DBC          2001           STH   R1,MALXERNO         SAVE ERROR NUMBER                         MAC20010
001D44  26F2               2002           AIS   R15,2                                                         MAC20020
001D46  4813 0000          2003           LH    R1,0(R3)            GET SEGMENTATION REGISTER ADDR            MAC20030
001D4A  1012               2004           SRLS  R1,2                GET SEGMENTATION REG NUMBER               MAC20040
001D4C  D210 2529          2005           STB   R1,SEGREGN          SAVE SEG REG NUMBER (HEX)                 MAC20050
                           2006  *                                  CONVERT FROM HEX TO                       MAC20060
001D50  41E0 235E          2007           BAL   R14,CONVERT         ASCII AND STORE IN ERROR MSG.             MAC20070
001D54  0000               2008           DCX   0                   ONE DIGIT                                 MAC20080
001D56  1E20               2009           DC    Z(SEGREGA)                                                    MAC20090
001D58  5812 0000          2010           L     R1,0(R2)                                                      MAC20100
001D5C  41E0 235E          2011           BAL   R14,CONVERT                                                   MAC20110
001D60  001C               2012           DCX   1C                  CONVERT SEG REG DATA FROM HEX             MAC20120
001D62  1E44               2013           DC    Z(SEGDATA)          TO ASCII AND STORE IN ERR MSG.            MAC20130
001D64  0816               2014           LR    R1,R6                                                         MAC20140
001D66  41E0 235E          2015           BAL   R14,CONVERT         CONVERT DATA WRITTEN TO TEST              MAC20150
001D6A  0004               2016           DCX   4                   LOCATION FROM HEX TO ASCII AND            MAC20160
001D6C  1DC8               2017           DC    Z(WRITDAT)          STORE IT IN ERROR MSG.                    MAC20170
001D6E  0815               2018           LR    R1,R5               PROGRAM ADDRESS USED                      MAC20180
001D70  41E0 235E          2019           BAL   R14,CONVERT         CONVERT MEMORY BLOCK DISPL FROM           MAC20190
001D74  001C               2020           DCX   1C                  HEX TO ASCII AND STORE IT IN              MAC20200
001D76  1E62               2021           DC    Z(MBDA)             ERROR MSG.                                MAC20210
001D78  5810 2660          2022           L     R1,REGSAVE+40       R10                                       MAC20220
001D7C  41E0 235E          2023           BAL   R14,CONVERT         GET DATA READ FROM RELOCATED              MAC20230
001D80  001C               2024           DCX   1C                  IT FROM HEX TO ASCII AND STORE            MAC20240
001D82  1DE4               2025           DC    Z(RELADDR)          IT IN ERROR MSG.                          MAC20250
001D84  5810 2664          2026           L     R1,REGSAVE+44       R11                                       MAC20260
001D88  41E0 235E          2027           BAL   R14,CONVERT         GET DATA READ FROM RELOCATED              MAC20270
001D8C  0004               2028           DCX   4                   ADDR AND CONVERT FROM HEX TO              MAC20280
001D8E  1DFC               2029           DC    Z(DATRED)           ASCII AND STORE IN ERROR MSG.             MAC20290
001D90  4810 255C          2030           LH    R1,MARCHCNT                                                   MAC20300
001D94  41E0 235E          2031           BAL   R14,CONVERT         GET NUMBER OF PASSES COMPLETED            MAC20310
001D98  0004               2032           DCX   4                   CONVERT TO ASCII AND STORE IN             MAC20320
001D9A  1E9A               2033           DC    Z(PASSCNT)          ERROR MSG.                                MAC20330
001D9C  C810 FFFF          2034           LHI   R1,X'FFFF'                                                    MAC20340
001DA0  4010 2430          2035           STH   R1,ERRNUM           SET ERROR FLAG                            MAC20350
001DA4  41F0 239C          2036           BAL   R15,PRINT                                                     MAC20360
001DA8  1DB2               2037           DC    Z(MALXERRM)                                                   MAC20370
001DAA  D100 2638          2038           LM    R0,REGSAVE                                                    MAC20380
001DAE  430F 0002          2039           B     2(R15)                                                        MAC20390
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001DB2  0D0A                    2041  MALXERRM DCX   0D0A                                          MAC20410
001DB4  4552 524F 5220 3041     2042           DC    C'ERROR 0A'                                   MAC20420
001DBC  0000                    2043  MALXERNO DC    X'0000',X'0D0A',X'0000'                       MAC20430
001DBE  0D0A
001DC0  0000
001DC2  4441 5441 2020          2044           DC    C'DATA '                                      MAC20440
001DC8  0000                    2045  WRITDAT  DC    X'0000'                                       MAC20450
001DCA  2057 4153 2057 5249     2046           DC    C' WAS WRITTEN TO LOCATION '                  MAC20460
001DD2  5454 454E 2054 4F20
001DDA  4C4F 4341 5449 4F4E
001DE2  2020
001DE4  0000 0000               2047  RELADDR  DC    Y'00000000'                                   MAC20470
001DE8  0000                    2048           DCX   0,0                                           MAC20480
001DEA  0000
001DEC  0D0A                    2049           DC    X'0D0A'                                       MAC20490
001DEE  4441 5441 2052 4541     2050           DC    C'DATA READ WAS'                              MAC20500
001DF6  4420 5741 5320
001DFC  0000                    2051  DATRED   DC    X'0000'                                       MAC20510
001DFE  0D0A                    2052           DC    X'0D0A'                                       MAC20520
001E00  5345 474D 454E 5441     2053           DC    C'SEGMENTATION REGISTER USED WAS '            MAC20530
001E08  5449 4F4E 2052 4547
001E10  4953 5445 5220 5553
001E18  4544 2057 4153 2020
001E20  0000                    2054  SEGREGA  DC    X'0000'                                       MAC20540
001E22  0D0A                    2055           DC    X'0D0A'                                       MAC20550
001E24  5345 474D 454E 5441     2056           DC    C'SEGMENTATION REGISTER DATA WAS '            MAC20560
001E2C  5449 4F4E 2052 4547
001E34  4953 5445 5220 4441
001E3C  5441 2057 4153 2020
001E44  0000 0000               2057  SEGDATA  DC    Y'00000000'                                   MAC20570
001E48  0000                    2058           DCX   0,0                                           MAC20580
001E4A  0000
001E4C  0D0A                    2059           DC    X'0D0A'                                       MAC20590
001E4E  5052 4F47 5241 4D20     2060           DC    C'PROGRAM ADDRESS WAS '                       MAC20600
001E56  4144 4452 4553 5320
001E5E  5741 5320
001E62  0000 0000               2061  MBDA     DC    Y'00000000'                                   MAC20610
001E66  0000 0000               2062           DC    Y'00000000'                                   MAC20620
001E6A  0D0A                    2063           DC    X'0D0A'                                       MAC20630
001E6C  5052 4F47 5241 4D20     2064           DC    C'PROGRAM ADDRESS AT TIME OF FAILURE WAS '    MAC20640
001E74  4144 4452 4553 5320
001E7C  4154 2054 494D 4520
001E84  4F46 2046 4149 4C55
001E8C  5245 2057 4153 2020
001E94  0000 0000               2065  PROGADDR DC    Y'00000000'                                   MAC20650
001E98  0D0A                    2066           DC    X'0D0A'                                       MAC20660
001E9A  0000                    2067  PASSCNT  DC    X'0000'                                       MAC20670
001E9C  2050 4153 5345 5320     2068           DC    C' PASSES WERE COMPLETED BEFORE FAILURE'      MAC20680
001EA4  5745 5245 2043 4F4D
001EAC  504C 4554 4544 2042
001EB4  4546 4F52 4520 4641
001EBC  494C 5552 4520
001EC2  0D0A                    2069           DC    X'0D0A'                                       MAC20690
001EC4  FFFF                    2070           DCX   FFFF                                          MAC20700
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001EC6   0004                2072  SEGTBL   DCX   4                1          MAC20720
001EC8   0008                2073           DCX   8                2          MAC20730
001ECA   000C                2074           DCX   C                3          MAC20740
001ECC   0010                2075           DCX   10               4          MAC20750
001ECE   0014                2076           DCX   14               5          MAC20760
001ED0   0018                2077           DCX   18               6          MAC20770
001ED2   001C                2078           DCX   1C               7          MAC20780
001ED4   0020                2079           DCX   20               8          MAC20790
001ED6   0024                2080           DCX   24               9          MAC20800
001ED8   0028                2081           DCX   28               A          MAC20810
001EDA   002C                2082           DCX   2C               B          MAC20820
001EDC   0030                2083           DCX   30               C          MAC20830
001EDE   0034                2084           DCX   34               D          MAC20840
001EE0   0038                2085           DCX   38               E          MAC20850
001EE2   003C                2086           DCX   3C               F          MAC20860
                             2087  *                                          MAC20870
001EE4   3F00                2088  MALX     DC    X'3F00'                      MAC20880
001EE6   3E00                2089           DC    X'3E00'                      MAC20890
001EE8   3C00                2090           DC    X'3C00'                      MAC20900
001EEA   3800                2091           DC    X'3800'                      MAC20910
001EEC   3000                2092           DC    X'3000'                      MAC20920
001EEE   2000                2093           DC    X'2000'                      MAC20930
001EF0   0000                2094           DC    X'0'                         MAC20940
001EF2   0000                2095           DC    X'0'                         MAC20950
001EF4   0000                2096           DC    X'0'                         MAC20960
001EF6   0000                2097           DC    X'0'                         MAC20970
001EF8   0000                2098           DC    X'0'                         MAC20980
001EFA   0000                2099           DC    X'0'                         MAC20990
001EFC   4000                2100           DC    X'4000'                      MAC21000
                             2101  *                                          MAC21010
001F00                       2102           ALIGN 4                            MAC21020
001F00   03F0 0010           2103  BR       DC    Y'03F00010'                  MAC21030
001F04   03F0 0110           2104           DC    Y'03F00110'                  MAC21040
001F08   03F0 0310           2105           DC    Y'03F00310'                  MAC21050
001F0C   03F0 0710           2106           DC    Y'03F00710'                  MAC21060
001F10   03F0 0F10           2107           DC    Y'03F00F10'                  MAC21070
001F14   0200 1F10           2108           DC    Y'02001F10'                  MAC21080
001F18   0000 3F10           2109           DC    Y'00003F10'                  MAC21090
001F1C   0000 7F10           2110           DC    Y'00007F10'                  MAC21100
001F20   0000 FF10           2111           DC    Y'0000FF10'                  MAC21110
001F24   0001 FF10           2112           DC    Y'0001FF10'                  MAC21120
001F28   0003 FF10           2113           DC    Y'0003FF10'                  MAC21130
001F2C   0007 FF10           2114           DC    Y'0007FF10'                  MAC21140
001F30   0FFF FF10           2115           DC    Y'0FFFFF10'                  MAC21150
                             2116  *                                          MAC21160
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001F34   0000 3F00            2118  PROADD    DC     Y'3F00'                          MAC21180
001F38   0000 3F00            2119             DC     Y'3F00'                          MAC21190
001F3C   0000 3F00            2120             DC     Y'3F00'                          MAC21200
001F40   0000 3F00            2121             DC     Y'3F00'                          MAC21210
001F44   0000 3F00            2122             DC     Y'3F00'                          MAC21220
001F48   0000 3F00            2123             DC     Y'3F00'                          MAC21230
001F4C   0000 3F00            2124             DC     Y'3F00'                          MAC21240
001F50   0000 7F00            2125             DC     Y'7F00'                          MAC21250
001F54   0000 FF00            2126             DC     Y'FF00'                          MAC21260
001F58   0001 FF00            2127             DC     Y'1FF00'                         MAC21270
001F5C   0003 FF00            2128             DC     Y'3FF00'                         MAC21280
001F60   0007 FF00            2129             DC     Y'7FF00'                         MAC21290
001F64   0000 3F00            2130             DC     Y'3F00'                          MAC21300
                              2131  *                                                 MAC21310
001F68   0008 0000            2132  MALX.TBL  DC     Y'80000'                         MAC21320
001F6C   0008 0001            2133             DC     Y'80001'                         MAC21330
001F70   0008 0003            2134             DC     Y'80003'                         MAC21340
001F74   0008 0007            2135             DC     Y'80007'                         MAC21350
001F78   0008 000F            2136             DC     Y'8000F'                         MAC21360
001F7C   0008 001F            2137             DC     Y'8001F'                         MAC21370
001F80   0008 003F            2138             DC     Y'8003F'                         MAC21380
001F84   0008 007F            2139             DC     Y'8007F'                         MAC21390
001F88   0008 00FF            2140             DC     Y'800FF'                         MAC21400
001F8C   0008 01FF            2141             DC     Y'801FF'                         MAC21410
001F90   0008 03FF            2142             DC     Y'803FF'                         MAC21420
001F94   0008 07FF            2143             DC     Y'807FF'                         MAC21430
001F98   0008 0FFF            2144             DC     Y'80FFF'                         MAC21440
001F9C   0008 1FFF            2145             DC     Y'81FFF'                         MAC21450
001FA0   0008 3FFF            2146             DC     Y'83FFF'                         MAC21460
001FA4   0008 7FFF            2147             DC     Y'87FFF'                         MAC21470
001FA8   0008 FFFF            2148             DC     Y'8FFFF'                         MAC21480
001FAC   0001 FFFF            2149             DC     Y'1FFFF'                         MAC21490
001FB0   0003 FFFF            2150             DC     Y'3FFFF'                         MAC21500
001FB4   0007 FFFF            2151             DC     Y'7FFFF'                         MAC21510
001FB8   000F FFFF            2152             DC     Y'FFFFF'                         MAC21520
                              2153  *                                                 MAC21530
001FBC   0000 3F10            2154  BR.TBL    DC     Y'00003F10'                      MAC21540
001FC0   0000 3F10            2155             DC     Y'00003F10'                      MAC21550
001FC4   0000 3F10            2156             DC     Y'00003F10'                      MAC21560
001FC8   0000 3F10            2157             DC     Y'00003F10'                      MAC21570
001FCC   0000 3F10            2158             DC     Y'00003F10'                      MAC21580
001FD0   0000 3F10            2159             DC     Y'00003F10'                      MAC21590
001FD4   0000 3F10            2160             DC     Y'00003F10'                      MAC21600
001FD8   0000 3F10            2161             DC     Y'00003F10'                      MAC21610
001FDC   0000 3F10            2162             DC     Y'00003F10'                      MAC21620
001FE0   0010 3F10            2163             DC     Y'00103F10'                      MAC21630
001FE4   0040 3F10            2164             DC     Y'00403F10'                      MAC21640
001FE8   0080 3F10            2165             DC     Y'00803F10'                      MAC21650
001FEC   0170 3F10            2166             DC     Y'01703F10'                      MAC21660
001FF0   0330 3F10            2167             DC     Y'03303F10'                      MAC21670
001FF4   0650 3F10            2168             DC     Y'06503F10'                      MAC21680
001FF8   081F FF10            2169             DC     Y'081FFF10'                      MAC21690
001FFC   0FFF 7F10            2170             DC     Y'0FFF7F10'                      MAC21700
002000   0FFF 7F10            2171             DC     Y'0FFF7F10'                      MAC21710
002004   0FFF 7F10            2172             DC     Y'0FFF7F10'                      MAC21720
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002008   0FFF 7F10            2173            DC    Y'0FFF7F10'                                MAC21730
00200C   0FFF 7F10            2174            DC    Y'0FFF7F10'                                MAC21740



002010   0020                 2176  SEGR.TBL  DCX   20                 8                       MAC21760
002012   0020                 2177            DCX   20                 8                       MAC21770
002014   0020                 2178            DCX   20                 8                       MAC21780
002016   0020                 2179            DCX   20                 8                       MAC21790
002018   0020                 2180            DCX   20                 8                       MAC21800
00201A   0020                 2181            DCX   20                 8                       MAC21810
00201C   0020                 2182            DCX   20                 8                       MAC21820
00201E   0020                 2183            DCX   20                 8                       MAC21830
002020   0020                 2184            DCX   20                 8                       MAC21840
002022   0020                 2185            DCX   20                 8                       MAC21850
002024   0020                 2186            DCX   20                 8                       MAC21860
002026   0020                 2187            DCX   20                 8                       MAC21870
002028   0020                 2188            DCX   20                 8                       MAC21880
00202A   0020                 2189            DCX   20                 8                       MAC21890
00202C   0020                 2190            DCX   20                 8                       MAC21900
00202E   0020                 2191            DCX   20                 8                       MAC21910
002030   0020                 2192            DCX   20                 8                       MAC21920
002032   0004                 2193            DCX   04                 1                       MAC21930
002034   000C                 2194            DCX   0C                 3                       MAC21940
002036   001C                 2195            DCX   1C                 7                       MAC21950
002038   003C                 2196            DCX   3C                 F                       MAC21960
                              2197  *                                                          MAC21970
00203A   3F00                 2198  PROG.TBL  DC    X'3F00'                                    MAC21980
00203C   3F01                 2199            DC    X'3F01'                                    MAC21990
00203E   3F03                 2200            DC    X'3F03'                                    MAC22000
002040   3F07                 2201            DC    X'3F07'                                    MAC22010
002042   3F0F                 2202            DC    X'3F0F'                                    MAC22020
002044   3F1F                 2203            DC    X'3F1F'                                    MAC22030
002046   3F3F                 2204            DC    X'3F3F'                                    MAC22040
002048   3F7F                 2205            DC    X'3F7F'                                    MAC22050
00204A   3FFF                 2206            DC    X'3FFF'                                    MAC22060
00204C   40FF                 2207            DC    X'40FF'                                    MAC22070
00204E   42FF                 2208            DC    X'42FF'                                    MAC22080
002050   46FF                 2209            DC    X'46FF'                                    MAC22090
002052   4EFF                 2210            DC    X'4EFF'                                    MAC22100
002054   5EFF                 2211            DC    X'5EFF'                                    MAC22110
002056   7EFF                 2212            DC    X'7EFF'                                    MAC22120
002058   7EFF                 2213            DC    X'7EFF'                                    MAC22130
00205A   7EFF                 2214            DC    X'7EFF'                                    MAC22140
00205C   7EFF                 2215            DC    X'7EFF'                                    MAC22150
00205E   7EFF                 2216            DC    X'7EFF'                                    MAC22160
002060   7EFF                 2217            DC    X'7EFF'                                    MAC22170
002062   7EFF                 2218            DC    X'7EFF'                                    MAC22180
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                0000 2064          2220  MACINT1  EQU   *                                                    MAC22200
002064          5870 0340          2221            L     R7,X'340'          LOAD MAC STATUS                 MAC22210
002068          24D0               2222            LIS   R13,0                                               MAC22220
00206A          58A0 2088          2223            L     R10,FLAG           WAS INTERRUPT EXPECTED ?        MAC22230
00206E          2338               2224            BZS   MAC.1              BRANCH IF NO                    MAC22240
002070          50D0 0340          2225            ST    R13,X'340'         CLEAR MAC ISR                   MAC22250
002074          50D0 2088          2226            ST    R13,FLAG           RESET FLAG                      MAC22260
002078          48F0 2090          2227            LH    R15,RETURN1                                        MAC22270
00207C          180E               2228            LPSWR R14                RETURN TO OLD PSW LOC           MAC22280
00207E          41F0 22C0          2229  MAC.1     BAL   R15,ERROR                                         MAC22290
002082          4630               2230            DCX   4630               ERROR NUMBER          * NNF0 *  MAC22300
002084          4300 20C0          2231            B     TSTCHK                                             MAC22310
                                   2232  *                                                                  MAC22320
002088                             2233            ALIGN 4                                                  MAC22330
002088          0000 0000          2234  FLAG      DC    Y'0'                                               MAC22340
                                   2235  *                                                                  MAC22350
00208C          AA                 2236  AAA       DB    X'AA'                                              MAC22360
00208D          55                 2237  FIVES     DB    X'55'                                              MAC22370
00208E          00                 2238  FLAG2     DB    0                  EXECUTE PROTECT VIOLATE FLAG    MAC22380
002090                             2239            ALIGN 4                                                  MAC22390
002090          0000               2240  RETURN1   DC    X'0'                                               MAC22400
002092          00                 2241  FLAG3     DB    0                  WRITE PROTECT VIOLATE FLAG      MAC22410
002093          00                 2242  FLOP      DB    0                                                  MAC22420
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                                2244  * SUBROUTINE IMAGE USED IN TEST 9                                        MAC22440


002094                          2246          ALIGN 4                                                         MAC22460
002094   E674 002A              2247  SUBRTN  LA    R7,42(R4)          RX1 FORMAT                           MAC22470
002098   E680 8022              2248          DC    Y'E6808022'        LA R8,STRLOC                         MAC22480
                                2249  *                                RX2 FORMAT  POSITIVE D2 FIELD        MAC22490
00209C   0A78                   2250          AR    R7,R8                                                   MAC22500
00209E   E686 FFEE              2251          DC    Y'E686FFEE'        LA R8, SUBRTN-4(R6)                  MAC22510
                                2252  *                                RX2 FORMAT  NEGATIVE D2 FIELD        MAC22520
0020A2   E695 DF56              2253          LA    R9,-4(R5)          RX3 FORMAT                           MAC22530
0020A6   0A89                   2254          AR    R8,R9                                                   MAC22540
0020A8   E694 4B00 0028         2255          LA    R9,40(R4,R11)      RX3 FORMAT - DOUBLE INDEX            MAC22550
0020AE   0B79                   2256          SR    R7,R9                                                   MAC22560
0020B0   0B89                   2257          SR    R8,R9                                                   MAC22570
0020B2   0578                   2258          CLR   R7,R8              ARE ALL ADRS EQUAL ?                 MAC22580
0020B4   4230 1510              2259          BNE   ERR                NO, PRINT ERROR                      MAC22590
0020B8   4300 1522              2260          B     RTN4               YES, RETURN TO MAIN PROGRAM          MAC22600
0020BC   0000 0000              2261  STRLOC  DC    0                                                       MAC22610
                                2262  *                                                                     MAC22620
0020C0   5810 2588              2263  TSTCHK  L     R1,DISMAC                                               MAC22630
0020C4   9531                   2264          EPSR  R3,R1                                                   MAC22640
0020C6   E610 21B2              2265          LA    R1,MACINT                                               MAC22650
0020CA   5010 0094              2266          ST    R1,X'94'                                                MAC22660
0020CE   C830 2000              2267          LHI   R3,X'2000'                                              MAC22670
0020D2   5030 0090              2268          ST    R3,X'90'                                                MAC22680
0020D6   7310 2430              2269          LHL   R1,ERRNUM          IS ERROR FLAG SET ?                  MAC22690
0020DA   4230 0D52              2270          BNZ   TSTSEL             NO, CHECK FOR NEXT TEST              MAC22700
0020DE   7310 0B8C              2271          LHL   R1,NOMSG                                                MAC22710
0020E2   2134                   2272          BNZS  RTN1                                                    MAC22720
0020E4   41F0 239C              2273          BAL   R15,PRINT          PRINT 'NO ERROR'                     MAC22730
0020E8   249A                   2274          DC    Z(NOERR)                                                MAC22740
0020EA   4300 0D58              2275  RTN1    B     TSTSEL2            CHECK FOR NEXT TEST                  MAC22750
                                2276  *                                                                     MAC22760
                                2277  *                                                                     MAC22770
                                2278  *                                                                     MAC22780
0020EE   0722                   2279  BLKCHK  XR    R2,R2              ZERO REGISTER 2                      MAC22790
0020F0   2511                   2280          LCS   R1,1                                                    MAC22800
0020F2   D210 252E              2281          STB   R1,SAVE+1                                               MAC22810
0020F6   0711                   2282          XR    R1,R1              ZERO REGISTER ONE                    MAC22820
0020F8   2611                   2283          AIS   R1,1                                                    MAC22830
0020FA   2304                   2284          BS    ADD                                                     MAC22840
0020FC   2611                   2285  BLKCHK1 AIS   R1,1                                                    MAC22850
0020FE   D210 252E              2286          STB   R1,SAVE+1                                               MAC22860
002102   2611                   2287  ADD     AIS   R1,1               INCREMENT TABLE INDEX                MAC22870
002104   CA20 2000              2288          AHI   R2,X'2000'         INCREMENT BLOCK ADRS                 MAC22880
002108   7410 250E              2289          TBT   R1,KB0008          IS THIS BLOCK IN SYSTEM ?            MAC22890
00210C   2235                   2290          BZS   ADD                NO, CHECK FOR NEXT 8K BLOCK          MAC22900
00210E   D210 252D              2291          STB   R1,SAVE            YES, SAVE TABLE INDEX                MAC22910
002112   C510 007F              2292          CLHI  R1,127             IS THIS THE END OF THE TABLE ?       MAC22920
002116   438F 0008              2293          BNL   8(R15)             YES RETURN ON R15+8                  MAC22930
00211A   2711                   2294          SIS   R1,1               NO,DECREMENT INDEX                   MAC22940
00211C   D410 252E              2295          CLB   R1,SAVE+1          IS MEMORY CONTIGUOUS                 MAC22950
002120   433F 0004              2296          BE    4(R15)             YES CONTINUE WITH CURRENT  LOC       MAC22960
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002124  030F              2297            BR    R15               NO START NEW LOC                        MAC22970
                          2298  *                                                                       MAC22980
                          2299  *                                                                       MAC22990
                          2300  *                                                                       MAC23000
002126  58E0 2550         2301  ESTCON    L     R14,CONVAL        LOAD CONTROL FIELD VALUES             MAC23010
00212A  033F              2302            BZR   R15               IF ZERO TAKE RETURN                   MAC23020
00212C  93DE              2303            LBR   R13,R14                                               MAC23030
00212E  C4D0 000F         2304            NHI   R13,X'F'          ISOLATE CURRENT CONTROL FIELD VALUE   MAC23040
002132  10E4              2305            SRLS  R14,4             REMOVE CURRENT VALUE FROM LIST        MAC23050
002134  50E0 2550         2306            ST    R14,CONVAL        STORE VALUE FOR NEXT PASS             MAC23060
002138  D2D0 252C         2307            STB   R13,CONFLD        STORE CURRENT VALUE                   MAC23070
00213C  430F 0004         2308            B     4(R15)            RETURN TO TEST                        MAC23080
                          2309  *                                                                       MAC23090
                          2310  *                                                                       MAC23100
                          2311  *                                                                       MAC23110
002140  07BB              2312  DELAY     XR    R11,R11                                                 MAC23120
002142  24C1              2313            LIS   R12,1                                                   MAC23130
002144  58D0 2554         2314            L     R13,DELAYVAL                                            MAC23140
002148  C1B0 2148         2315            BXLE  R11,*                                                   MAC23150
00214C  030F              2316            BR    R15                                                     MAC23160
                          2317  *                                                                       MAC23170
                          2318  *                                                                       MAC23180
                          2319  *                                                                       MAC23190
00214E  D300 0A10         2320  DEVCHK    LB    R0,IO                                                   MAC23200
002152  C500 0002         2321            CLHI  R0,2              IS IT A DEVICE ON A CURRENT LOO       MAC23210
002156  4230 217C         2322            BNE   CRTORCAR          NO                                    MAC23220
00215A  D300 2521         2323  TTY       LB    R0,TTYWRT                                               MAC23230
00215E  D200 2527         2324            STB   R0,WRTCMD                                             MAC23240
002162  D300 2522         2325            LB    R0,TTYRD                                                MAC23250
002166  D200 2528         2326            STB   R0,RDCMD                                                MAC23260
00216A  4800 0A08         2327            LH    R0,CLIFADR                                              MAC23270
00216E  4000 2530         2328            STH   R0,ADDRESS                                              MAC23280
002172  0700              2329            XR    R0,R0                                                   MAC23290
002174  4000 2558         2330            STH   R0,CRTFLG                                               MAC23300
002178  4300 0A12         2331            B     EXEC                                                    MAC23310
                          2332  *                                                                       MAC23320
                          2333  *                                                                       MAC23330
                          2334  *                                                                       MAC23340
00217C  C500 0004         2335  CRTORCAR  CLHI  R0,4              IS IT CAROUSEL 300                    MAC23350
002180  2134              2336            BNES  CRT1              NO THEN CRT                           MAC23360
002182  C800 00F0         2337            LHI   R0,X'F0'          SET UP OUTPUT COM                     MAC23370
002186  2303              2338            BS    CRT               GO THROUGH CRT DRIVER                 MAC23380
002188  C800 00F8         2339  CRT1      LHI   R0,X'F8'          SET UP FOR OUTPUT COM                 MAC23390
00218C  D200 2524         2340  CRT       STB   R0,CRTCMD = F8                                          MAC23400
002190  D300 2525         2341            LB    R0,CRTWRT = A3                                          MAC23410
002194  D200 2527         2342            STB   R0,WRTCMD                                               MAC23420
002198  D300 2526         2343            LB    R0,CRTRD  = B1                                          MAC23430
00219C  D200 2528         2344            STB   R0,RDCMD                                                MAC23440
0021A0  4800 0A0A         2345            LH    R0,PASADR = 1A                                          MAC23450
0021A4  4000 2530         2346            STH   R0,ADDRESS                                              MAC23460
0021A8  2401              2347            LIS   R0,1                                                    MAC23470
0021AA  4000 2558         2348            STH   R0,CRTFLG = 1                                           MAC23480
0021AE  4300 0A12         2349            B     EXEC                                                    MAC23490
                          2350  *                                                                       MAC23500
                          2351  *                                                                       MAC23510
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A1 A3

CRT 2ND = BE 61

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                                2352  *                                                                                    MAC23520
0021B2   C800 4631              2353  MACINT   LHI    R0,C'F1'                                                       MAC23530
0021B6   2309                   2354           BS     COMRTN                                                         MAC23540
                                2355  *                                                                              MAC23550
0021B8   C800 4632              2356  SVCERR   LHI    R0,C'F2'                                                       MAC23560
0021BC   2306                   2357           BS     COMRTN                                                         MAC23570
                                2358  *                                                                              MAC23580
0021BE   C800 4633              2359  ARTFLT   LHI    R0,C'F3'                                                       MAC23590
0021C2   2303                   2360           BS     COMRTN                                                         MAC23600
                                2361  *                                                                              MAC23610
0021C4   C800 4634              2362  SYSQ     LHI    R0,C'F4'                                                       MAC23620
                                2363  *                                                                              MAC23630
0021C8   082E                   2364  COMRTN   LR     R2,R14                                                         MAC23640
0021CA   083F                   2365           LR     R3,R15                                                         MAC23650
0021CC   4000 21D4              2366           STH    R0,DC                                                          MAC23660
0021D0   41F0 2288              2367           BAL    R15,ERROR1                                                     MAC23670
0021D4   0000                   2368  DC       DC     X'0000'                                                        MAC23680
0021D6   7340 089C              2369           LHL    R4,SEGREG                                                      MAC23690
0021DA   D214 0043              2370           STB    R1,67(R4)                                                      MAC23700
0021DE   D314 0043              2371           LB     R1,67(R4)                                                      MAC23710
0021E2   0811                   2372           LR     R1,R1                                                          MAC23720
0021E4   2334                   2373           BZS    RTNB                                                           MAC23730
0021E6   41F0 2288              2374           BAL    R15,ERROR1                                                     MAC23740
0021EA   3034                   2375           DCX    3034             ERROR NUMBER              * NN04 *            MAC23750
0021EC   1802                   2376  RTNB     LPSWR  R2                                                             MAC23760
                                2377  *                                                                              MAC23770
                                2378  *                                                                              MAC23780
                                2379  *                                                                              MAC23790
0021EE   0850                   2380  EXTINT   LR     R5,R0                                                          MAC23800
0021F0   0861                   2381           LR     R6,R1                                                          MAC23810
0021F2   0812                   2382           LR     R1,R2                                                          MAC23820
0021F4   41E0 235E              2383           BAL    R14,CONVERT                                                    MAC23830
0021F8   0008                   2384           DC     X'8'                                                           MAC23840
0021FA   24AE                   2385           DC     Z(DEVADRS)                                                     MAC23850
0021FC   7310 242E              2386           LHL    R1,TESTNUM                                                     MAC23860
002200   4010 24A8              2387           STH    R1,INTMSG                                                      MAC23870
002204   41F0 239C              2388           BAL    R15,PRINT                                                      MAC23880
002208   24A6                   2389           DC     Z(INTMSG1)                                                     MAC23890
00220A   1805                   2390           LPSWR  R5                                                             MAC23900
                                2391  *                                                                              MAC23910
                                2392  *                                                                              MAC23920
                                2393  *                                                                              MAC23930
00220C   081E                   2394  ILGINT   LR     R1,R14           LOAD DATA TO BE CONVERTED                     MAC23940
00220E   41E0 235E              2395           BAL    R14,CONVERT      CONVERT TO ASCII CHARACTERS                   MAC23950
002212   001C                   2396           DC     X'1C'                                                          MAC23960
002214   24CE                   2397           DC     Z(ADRS2)                                                       MAC23970
002216   081F                   2398           LR     R1,R15           LOAD DATA TO BE CONVERTED                     MAC23980
002218   41E0 235E              2399           BAL    R14,CONVERT      CONVERT TO ASCII CHARACTERS                   MAC23990
00221C   001C                   2400           DC     X'1C'                                                          MAC24000
00221E   24D8                   2401           DC     Z(ADRS1)                                                       MAC24010
002220   41F0 239C              2402           BAL    R15,PRINT        PRINT ILLEGAL INSTRUCTION MESSAGE             MAC24020
002224   24B6                   2403           DC     Z(ILGMSG)                                                      MAC24030
002226   9DBA                   2404           SSR    R11,R10          IS TTY OFF ?                                  MAC24040
002228   2316                   2405           BNMS   CONT14           NO, LOAD NEW PSW                              MAC24050
00222A   F870 5555 5555         2406           LI     R7,Y'55555555'   YES, WRITE TO DISPLAY PANEL                   MAC24060
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002230  41E0 22A0           2407           BAL   R14,WRITE                                    MAC24070
002234  C200 2570           2408  CONT14   LPSW  HALT              LOAS NEW PSW AND HALT      MAC24080
                            2409  *                                                          MAC24090
                            2410  *                                                          MAC24100
                            2411  *                                                          MAC24110
002238  9511                2412  MALFTN   EPSR  R1,R1                                       MAC24120
00223A  24C1                2413           LIS   R12,1                                      MAC24130
00223C  04C1                2414           NR    R12,R1                                     MAC24140
00223E  2335                2415           BZS   CONT4                                      MAC24150
002240  5890 0024           2416           L     R9,X'24'                                   MAC24160
002244  4300 2278           2417           B     CONT16                                     MAC24170
002248  0811                2418  CONT4    LR    R1,R1                                      MAC24180
00224A  2133                2419           BNZS  CONT17                                     MAC24190
00224C  5090 0024           2420           ST    R9,X'24'                                   MAC24200
002250  41E0 235E           2421  CONT17   BAL   R14,CONVERT                                MAC24210
002254  0000                2422           DC    X'0'                                       MAC24220
002256  24FC                2423           DC    Z(CCADRS)                                  MAC24230
002258  5810 0024           2424           L     R1,X'24'                                   MAC24240
00225C  41E0 235E           2425           BAL   R14,CONVERT                                MAC24250
002260  0010                2426           DC    X'10'                                      MAC24260
002262  2500                2427           DC    Z(MMADRS)                                  MAC24270
002264  41F0 239C           2428           BAL   R15,PRINT                                  MAC24280
002268  24E4                2429           DC    Z(MACHMAL)                                 MAC24290
00226A  9D8A                2430           SSR   R11,R10                                    MAC24300
00226C  2316                2431           BNMS  CONT16                                     MAC24310
00226E  F870 AAAA AAAA      2432           LI    R7,Y'AAAAAAAA'                             MAC24320
002274  41E0 22A0           2433           BAL   R14,WRITE                                  MAC24330
002278  C200 2570           2434  CONT16   LPSW  HALT                                       MAC24340
                            2435  *                                                          MAC24350
                            2436  *                                                          MAC24360
                            2437  *                                                          MAC24370
00227C  D310 252A           2438  TSTNUM   LB    R1,SUBTST                                  MAC24380
002280  41E0 235E           2439           BAL   R14,CONVERT                                MAC24390
002284  0004                2440           DC    X'4'                                       MAC24400
002286  242E                2441           DC    Z(TESTNUM)                                 MAC24410
002288  4810 242E           2442           LH    R1,TESTNUM                                 MAC24420
00228C  4010 246A           2443           STH   R1,VALUE                                   MAC24430
002290  08EF                2444           LR    R14,R15                                    MAC24440
002292  73F0 0B8C           2445           LHL   R15,NOMSG                                  MAC24450
002296  023E                2446           BNZR  R14                                        MAC24460
002298  41F0 239C           2447           BAL   R15,PRINT                                  MAC24470
00229C  2462                2448           DC    Z(TESTMSG)                                 MAC24480
00229E  030E                2449           BR    R14                                        MAC24490
                            2450  *                                                          MAC24500
                            2451  *                                                          MAC24510
                            2452  *                                                          MAC24520
0022A0  24D1                2453  WRITE    LIS   R13,1              PUT DISPLAY IN INCREMENTAL MODE  MAC24530
0022A2  DED0 2520           2454           OC    R13,INCRMT         LOAD CONTENTS OF R7 INTO R12 AND MAC24540
0022A6  08C7                2455           LR    R12,R7             WRITE VALUE ON DISPLAY PANEL  MAC24550
0022A8  94CC                2456           EXBR  R12,R12                                    MAC24560
0022AA  98DC                2457           WHR   R13,R12                                    MAC24570
0022AC  34CC                2458           EXHR  R12,R12                                    MAC24580
0022AE  94CC                2459           EXBR  R12,R12                                    MAC24590
0022B0  98DC                2460           WHR   R13,R12                                    MAC24600
0022B2  DED0 251F           2461           OC    R13,NORM                                   MAC24610
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0022B6  030E              2462           BR    R14                                                    MAC24620
                          2463  *                                                                      MAC24630
                          2464  *                                                                      MAC24640
                          2465  *                                                                      MAC24650
                          2466  * ERROR ROUTINE  R1 = DATA   R13 = ADRS OF END OF MSG                 MAC24660
                          2467  *                 R4 = ADRS     R14 = ERROR NUMBER                     MAC24670
                          2468  *                                                                      MAC24680
0022B8  25E1              2469  ERROR1 LCS    R14,1                                                  MAC24690
0022BA  40E0 244A         2470         STH    R14,END                                                MAC24700
0022BE  2304              2471         BS     ERRORX                                                 MAC24710
0022C0  24E0              2472  ERROR  LIS    R14,0                                                  MAC24720
0022C2  40E0 244A         2473         STH    R14,END                                                MAC24730
0022C6  73EF 0000         2474  ERRORX LHL    R14,0(R15)          PICK UP ERROR NUMBER               MAC24740
0022CA  26F2              2475         AIS    R15,2                                                  MAC24750
0022CC  40E0 2430         2476         STH    R14,ERRNUM          STORE ERROR NUMBER IN MESSAGE      MAC24760
0022D0  48B0 2530         2477         LH     R11,ADDRESS         PICK UP DEVICE NUMBER              MAC24770
0022D4  24E0              2478         LIS    R14,0                                                  MAC24780
0022D6  50E0 2088         2479         ST     R14,FLAG            RESET MAC INTERRUPT FLAG           MAC24790
0022DA  24E1              2480         LIS    R14,1                                                  MAC24800
0022DC  51E0 253C         2481         AM     R14,TOTALERR                                           MAC24810
0022E0  238A              2482         BNCS   CONVRT                                                 MAC24820
0022E2  9DBA              2483         SSR    R11,R10                                                MAC24830
0022E4  2113              2484         BMS    ERRORXW             DU                                 MAC24840
0022E6  27AC              2485         SIS    R10,X'0C'                                              MAC24850
0022E8  2136              2486         BNZS   CONVRT                                                 MAC24860
0022EA  2571              2487  ERRORXW LCS   R7,1                R7 = 'FFFF'                        MAC24870
0022EC  41E0 22A0         2488         BAL    R14,WRITE                                              MAC24880
0022F0  C200 2578         2489         LPSW   ERRHALT                                                MAC24890


0022F4  9DBA              2491  CONVRT SSR    R11,R10                                                MAC24910
0022F6  C3A0 0020         2492         THI    R10,X'20'                                              MAC24920
0022FA  4230 2336         2493         BNZ    BRKWAIT                                                MAC24930
0022FE  41E0 235E         2494         BAL    R14,CONVERT                                            MAC24940
002302  001C              2495         DC     X'1C'                                                  MAC24950
002304  2456              2496         DC     Z(DATA)                                                MAC24960
002306  73E0 0B9C         2497         LHL    R14,SEGREG          LOAD START ADRS OF SEG REGISTERS   MAC24970
00230A  D31E 0043         2498         LB     R1,67(R14)          LOAD CONTENT  OF STATUS REGISTER   MAC24980
00230E  41E0 235E         2499         BAL    R14,CONVERT         CONVERT TO ASCII CHARACTERS        MAC24990
002312  0004              2500         DC     X'4'                                                   MAC25000
002314  243C              2501         DC     Z(STATUS)                                              MAC25010
002316  0814              2502         LR     R1,R4               LOAD MEMORY ADRS                   MAC25020
002318  41E0 235E         2503         BAL    R14,CONVERT         CONVERT TO ASCII CHARACTERS        MAC25030
00231C  001C              2504         DC     X'1C'                                                  MAC25040
00231E  244C              2505         DC     Z(ADRS)                                                MAC25050
002320  D310 252C         2506         LB     R1,CONFLD           LOAD CURRENT CONTROL FIELD VALUE   MAC25060
002324  41E0 235E         2507         BAL    R14,CONVERT         CONVERT TO ASCII CHARACTERS        MAC25070
002328  0000              2508         DC     X'0'                                                   MAC25080
00232A  2447              2509         DC     Z(CONTROL)                                             MAC25090
00232C  08EF              2510         LR     R14,R15                                                MAC25100
00232E  41F0 239C         2511         BAL    R15,PRINT                                              MAC25110
002332  2426              2512         DC     Z(ERRMSG)                                              MAC25120
002334  030E              2513         BR     R14                                                    MAC25130
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002336  73E0 2558          2515  BRKWAIT  LHL   R14,CRTFL6                                          MAC25150
00233A  233C               2516           BZS   BRKWAIT1                                         MAC25160
00233C  9DBA               2517           SSR   R11,R10                                          MAC25170
00233E  4280 235A          2518           BTC   8,RTN5              IF BUSY BRANCH TO RTN5        MAC25180
002342  DEB0 2528          2519           OC    R11,RDCMD                                         MAC25190
002346  9BBE               2520           RDR   R11,R14                                           MAC25200
002348  9DBA               2521           SSR   R11,R10                                           MAC25210
00234A  2281               2522           BFBS  8,1                 LOOP ON BUSY NOT TRUE         MAC25220
00234C  08EE               2523           LR    R14,R14             CHAR BRK ? (=0)               MAC25230
00234E  2336               2524           BZS   RTN5                                              MAC25240
002350  030F               2525           BR    R15                                               MAC25250
002352  9DBA               2526  BRKWAIT1 SSR   R11,R10                                           MAC25260
002354  C3A0 0020          2527           THI   R10,X'20'                                         MAC25270
002358  2033               2528           BTBS  3,3                 WAIT FOR BREAK TO GO AWAY     MAC25280
00235A  4300 20C0          2529  RTN5     B     TSTCHK                                            MAC25290
                           2530  *                                                               MAC25300
                           2531  *                                                               MAC25310
                           2532  *                                                               MAC25320
                           2533  * CONVERT ROUTINE   R1 = DATA TO BE CONVERTED TO ASCII          MAC25330
                           2534  *                   R10 = ADRS WHERE DATA IS TO BE STORED       MAC25340
                           2535  *                   R12 = SHIFT VALUE                           MAC25350
                           2536  *                                                               MAC25360
00235E  73CE 0000          2537  CONVERT  LHL   R12,0(R14)                                       MAC25370
002362  73AE 0002          2538           LHL   R10,2(R14)                                        MAC25380
002366  08B1               2539  CONVERT1 LR    R11,R1              LOAD DATA TO BE CONVERTED     MAC25390
002368  ECBC 0000          2540           SRL   R11,0(R12)          SHIFT HEX DIGIT TO BE CONVERTED MAC25400
00236C  C4B0 000F          2541           NHI   R11,X'F'            ISOLATE HEX DIGIT             MAC25410
002370  C6B0 0030          2542           OHI   R11,X'30'           CONVERT TO ASCII NUMBER       MAC25420
002374  C5B0 003A          2543           CLHI  R11,X'3A'           IS IT A VALID NUMBER ?        MAC25430
002378  2182               2544           BLS   CONT                YES, CONTINUE                 MAC25440
00237A  26B7               2545           AIS   R11,7               NO, CONVERT TO ASCII LETTER    MAC25450
00237C  D2BA 0000          2546  CONT     STB   R11,0(R10)          STORE ASCII BYTE IN MESSAGE   MAC25460
002380  08CC               2547           LR    R12,R12             HAS ENTIRE NUMBER BEEN CONVERTED ? MAC25470
002382  433E 0004          2548           BZ    4(R14)              YES, RETURN                   MAC25480
002386  27C4               2549           SIS   R12,4               NO, DECREMENT SHIFT INDEX     MAC25490
002388  26A1               2550           AIS   R10,1               INCREMENT STORAGE INDEX       MAC25500
00238A  4300 2366          2551           B     CONVERT1            REPEAT FOR NEXT HEX DIGIT     MAC25510
                           2552  *                                                               MAC25520
                           2553  *                                                               MAC25530
                           2554  *                                                               MAC25540
00238E  9DB0               2555  GETCHR   SSR   R11,R0              * READ CHAR ROUTINE           MAC25550
002390  021F               2556           BMR   R15                 EXIT IF TTY DU                MAC25560
002392  2082               2557           BCS   GETCHR              IF BUSY SENSE AGAIN           MAC25570
002394  9BB0               2558           RDR   R11,R0              READ A CHARACTER              MAC25580
002396  C400 007F          2559           NHI   R0,X'7F'            MASK OF PARITY BIT            MAC25590
00239A  030F               2560           BR    R15                 RETURN                        MAC25600
                           2561  *                                                               MAC25610
                           2562  *                                                               MAC25620
                           2563  *                                                               MAC25630
00239C  48B0 2530          2564  PRINT    LH    R11,ADDRESS = 10                                  MAC25640
0023A0  73CF 0000          2565           LHL   R12,0(R15)                                        MAC25650
0023A4  26F2               2566           AIS   R15,2                                             MAC25660
0023A6  73A0 2558          2567           LHL   R10,CRTFL6                                        MAC25670
0023AA  2332               2568           BZS   CMD                                               MAC25680
0023AC  26B1               2569           AIS   R11,1                                             MAC25690
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0023AE  DEB0 2527          2570  CMD       OC    R11,WRTCMD+A3                    MAC25700
0023B2  9DBA               2571  SENSE     SSR   R11,R10                          MAC25710
0023B4  2314               2572            BNMS  CONT12                           MAC25720
0023B6  D2B0 2523          2573            STB   R11,TTYFLG                       MAC25730
0023BA  030F               2574            BR    R15                              MAC25740
0023BC  2085               2575  CONT12    BCS   SENSE                            MAC25750
0023BE  D3AC 0000          2576            LB    R10,0(R12)       PICK UP CHARACTER TO OUTPUT  MAC25760
0023C2  9ABA               2577            WDR   R11,R10                          MAC25770
0023C4  26C1               2578            AIS   R12,1                            MAC25780
0023C6  C3A0 0080          2579            THI   R10,X'80'        DONE?           MAC25790
0023CA  4330 23B2          2580            BZ    SENSE            LOOP IF NO      MAC25800
0023CE  9DBA               2581            SSR   R11,R10          SENSE TTY STATUS  MAC25810
0023D0  2081               2582            BTBS  8,1              WAIT FOR BUSY = 0  MAC25820
0023D2  73A0 2558          2583            LHL   R10,CRTFLG                       MAC25830
0023D6  033F               2584            BZR   R15                              MAC25840
0023D8  07AA               2585            XR    R10,R10                          MAC25850
0023DA  9ABA               2586            WDR   R11,R10                          MAC25860
0023DC  9DBA               2587            SSR   R11,R10                          MAC25870
0023DE  2081               2588            BTBS  8,1                              MAC25880
0023E0  27B1               2589            SIS   R11,1                            MAC25890
0023E2  030F               2590            BR    R15                              MAC25900
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                                2592  *                M E S S A G E S                    *                MAC25920


0023E4  0D0A                    2594  TITLE    DC    X'0D0A',0,C'MACT 06-160F01R03',X'0D0A'                MAC25940
0023E6  0000 0000
0023EA  4D41 4354 2030 362D
0023F2  3136 3046 3031 5230
0023FA  3320
0023FC  0D0A
0023FE  FFFF                    2595           DCX   FFFF                                                   MAC25950
                                2596  *                                                                      MAC25960
                                2597  *                                                                      MAC25970
                                2598  *                                                                      MAC25980
002400  4156 4149 4C41 424C    2599  MEMSG    DC    C'AVAILABLE MEMORY',X'0D0A'                             MAC25990
002408  4520 4D45 4D4F 5259
002410  0D0A
002412  FFFF                    2600           DCX   FFFF                                                   MAC26000
002414  0000 0000               2601  MEMSG1   DC    0                                                     MAC26010
002418  0000                    2602           DC    X'0'                                                  MAC26020
00241A  2D20                    2603           DC    X'2D20'                                               MAC26030
00241C  0000 0000               2604  ENDVAL   DC    0                                                     MAC26040
002420  0000                    2605           DC    X'0'                                                  MAC26050
002422  0D0A                    2606           DCX   0D0A                                                  MAC26060
002424  FFFF                    2607           DCX   FFFF                                                  MAC26070
                                2608  *                                                                      MAC26080
                                2609  *                                                                      MAC26090
                                2610  *                                                                      MAC26100
                                2611  *                                                                      MAC26110
                                2612  *                                                                      MAC26120
                                2613  *                                                                      MAC26130
                                2614  * ERROR MESSAGE = ERROR TTEE  STATUS SS  CONFLD ZZ                     MAC26140
                                2615  *                 ADRS XXXXXXXX  DATA DDDDDDDD                         MAC26150
                                2616  *                                                                      MAC26160
                                2617  * TT = TEST NUMBER   EE = ERROR  NUMBER    SS = MAC STATUS            MAC26170
                                2618  * ZZ = CONTROL FIELD VALUE                                             MAC26180
                                2619  * XXXXXXXX = MEMORY ADRS WRITTEN TO   DDDDDDDD = DATA READ FROM ADRS  MAC26190
                                2620  *                                                                      MAC26200
002426  0D0A                    2621  ERRMSG   DC    X'0D0A'                                                 MAC26210
002428  4552 524F 5220          2622           DC    C'ERROR '                                               MAC26220
00242E  0000                    2623  TESTNUM  DC    X'0000'                                                 MAC26230
002430  0000                    2624  ERRNUM   DC    X'0000'                                                 MAC26240
002432  2020                    2625           DC    X'2020'                                                 MAC26250
002434  5354 4154 5553 2020     2626           DC    C'STATUS '                                              MAC26260
00243C  0000                    2627  STATUS   DC    X'0000'                                                 MAC26270
00243E  2020                    2628           DC    X'2020'                                                 MAC26280
002440  434F 4E46 4C44          2629           DC    C'CONFLD'                                               MAC26290
002446  20                      2630           DB    X'20'                                                   MAC26300
002447  00                      2631  CONTROL  DB    X'0'                                                    MAC26310
002448  0D0A                    2632           DC    X'0D0A'                                                 MAC26320
00244A  FFFF                    2633  END      DCX   FFFF                                                    MAC26330
00244C  0000 0000               2634  ADRS     DC    Y'00000000',0                                           MAC26340
002450  0000 0000
002454  2020                    2635           DC    X'2020'                                                 MAC26350
002456  0000 0000               2636  DATA     DC    Y'00000000',0                                           MAC26360
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00245A  0000 0000
00245E  0D0A                    2637            DC    X'0D0A'                                   MAC26370
002460  FFFF                    2638            DCX   FFFF                                      MAC26380
                                2639  *                                                         MAC26390
                                2640  *                                                         MAC26400
                                2641  *                                                         MAC26410
002462  0D0A                    2642  TESTMSG   DC    X'0D0A',C'TEST  '                          MAC26420
002464  5445 5354 2020
00246A  0000                    2643  VALUE     DC    X'0000'                                   MAC26430
00246C  FFFF                    2644            DCX   FFFF                                      MAC26440
                                2645  *                                                         MAC26450
                                2646  *                                                         MAC26460
                                2647  *                                                         MAC26470
00246E  0D0A                    2648  QMARK     DCX   0D0A,003F                                 MAC26480
002470  003F
002472  FFFF                    2649            DCX   FFFF                                      MAC26490
                                2650  *                                                         MAC26500
                                2651  *                                                         MAC26510
                                2652  *                                                         MAC26520
002474  0D0A                    2653  ASTERISK  DCX   0D0A,002A                                 MAC26530
002476  002A
002478  20A0                    2654            DCX   20A0                                      MAC26540
                                2655  *                                                         MAC26550
                                2656  *                                                         MAC26560
                                2657  *                                                         MAC26570
00247A  0D0A                    2658  TOTMSG    DC    X'0D0A'                                   MAC26580
00247C  0000 0000               2659  TOTALMSG  DC    0                                         MAC26590
002480  0000 0000               2660            DC    0                                         MAC26600
002484  2054 4F54 414C 2020     2661            DC    C' TOTAL '                                MAC26610
00248C  FFFF                    2662            DCX   FFFF                                      MAC26620
00248E  4552 524F 5253 2020     2663            DC    C'ERRORS ',X'0D0A'                        MAC26630
002496  0D0A
002498  FFFF                    2664            DCX   FFFF                                      MAC26640
                                2665  *                                                         MAC26650
                                2666  *                                                         MAC26660
                                2667  *                                                         MAC26670
00249A  0020                    2668  NOERR     DC    X'0020',C'NO ERROR'                       MAC26680
00249C  4E4F 2045 5252 4F52
0024A4  FFFF                    2669            DCX   FFFF                                      MAC26690
                                2670  *                                                         MAC26700
                                2671  *                                                         MAC26710
                                2672  *                                                         MAC26720
0024A6  0D0A                    2673  INTMSG1   DC    X'0D0A'                                   MAC26730
0024A8  0000                    2674  INTMSG    DC    X'0'                                      MAC26740
0024AA  4635                    2675            DC    C'F5'                                     MAC26750
0024AC  0D0A                    2676            DC    X'0D0A'                                   MAC26760
0024AE  0000 0000               2677  DEVADRS   DC    0                                         MAC26770
0024B2  0D0A                    2678            DC    X'0D0A'                                   MAC26780
0024B4  FFFF                    2679            DCX   FFFF                                      MAC26790
                                2680  *                                                         MAC26800
                                2681  *                                                         MAC26810
                                2682  *                                                         MAC26820
0024B6  0D0A                    2683  ILGMSG    DC    X'0D0A',C'ILLEGAL INSTRUCTION'            MAC26830
0024B8  494C 4C45 4741 4C20
0024C0  494E 5354 5255 4354
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0024C8   494F 4E20
0024CC   0D0A                  2684             DC    X'0D0A'                                  MAC26840
0024CE   0000 0000             2685  ADRS2      DC    0                                        MAC26850
0024D2   0000 0000             2686             DC    0                                        MAC26860
0024D6   2000                  2687             DC    X'2000'                                  MAC26870
0024D8   0000 0000             2688  ADRS1      DC    0                                        MAC26880
0024DC   0000 0000             2689             DC    0                                        MAC26890
0024E0   0D0A                  2690             DC    X'0D0A'                                  MAC26900
0024E2   FFFF                  2691             DCX   FFFF                                     MAC26910
                               2692  *                                                        MAC26920
                               2693  *                                                        MAC26930
                               2694  *                                                        MAC26940
0024E4   0D0A                  2695  MACHMAL    DC    X'0D0A',C'MACHINE MALFUNCTION'           MAC26950
0024E6   4D41 4348 494E 4520
0024EE   4D41 4C46 554E 4354
0024F6   494F 4E20
0024FA   0D0A                  2696             DC    X'0D0A'                                  MAC26960
0024FC   00                    2697  CCADRS     DB    0                                        MAC26970
0024FE   2020                  2698             DC    X'2020'                                  MAC26980
002500   0000 0000             2699  MMADRS     DC    0                                        MAC26990
002504   00                    2700             DB    0                                        MAC27000
002506   0D0A                  2701             DC    X'0D0A'                                  MAC27010
002508   FFFF                  2702             DCX   FFFF                                     MAC27020
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W. Williams
CRNX COMPUTER

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                                2704  *              M E M O R Y   T A B L E                 *                MAC27040


00250C                          2706                 ALIGN 4                                                    MAC27060
00250C  0000                    2707                 DC    X'0'                                                 MAC27070
00250E  80                      2708  KB0008         DB    X'80'      8-  16-  24-  32-  40-  48-  56-  64    MAC27080
00250F  00                      2709  KB0072         DB    0         72-  80-  88-  96- 104- 112- 120- 128    MAC27090
002510  00                      2710  KB0136         DB    0        136- 144- 152- 160- 168- 176- 184- 192    MAC27100
002511  00                      2711  KB0200         DB    0        200- 208- 216- 224- 232- 240- 248- 256    MAC27110
002512  00                      2712  KB0264         DB    0        264- 272- 280- 288- 296- 304- 312- 320    MAC27120
002513  00                      2713  KB0328         DB    0        328- 336- 344- 352- 360- 368- 376- 384    MAC27130
002514  00                      2714  KB0392         DB    0        392- 400- 408- 416- 424- 432- 440- 448    MAC27140
002515  00                      2715  KB0456         DB    0        456- 464- 472- 480- 488- 496- 504- 512    MAC27150
002516  00                      2716  KB0520         DB    0        520- 528- 536- 544- 552- 560- 568- 576    MAC27160
002517  00                      2717  KB0584         DB    0        584- 592- 600- 608- 616- 624- 632- 640    MAC27170
002518  00                      2718  KB0648         DB    0        648- 656- 664- 672- 680- 688- 696- 704    MAC27180
002519  00                      2719  KB0712         DB    0        712- 720- 728- 736- 744- 752- 760- 768    MAC27190
00251A  00                      2720  KB0776         DB    0        776- 784- 792- 800- 808- 816- 824- 832    MAC27200
00251B  00                      2721  KB0840         DB    0        840- 848- 856- 864- 872- 880- 888- 896    MAC27210
00251C  00                      2722  KB0904         DB    0        904- 912- 920- 928- 936- 944- 952- 960    MAC27220
00251D  00                      2723  KB0968         DB    0        968- 976- 984- 992-1000-1008-1016-1024    MAC27230
00251E  FF                      2724  KBEND          DB    X'FF'                                              MAC27240
                                2725  *                                                                       MAC27250
                                2726  *                                                                       MAC27260
                                2727  *                                                                       MAC27270
00251F  80                      2728  NORM           DB    X'80'                                              MAC27280
002520  40                      2729  INCRMT         DB    X'40'                                              MAC27290
002521  98                      2730  TTYWRT         DB    X'98'                                              MAC27300
002522  A4                      2731  TTYRD          DB    X'A4'                                              MAC27310
002523  00                      2732  TTYFLG         DB    0                                                  MAC27320
002524  F8                      2733  CRTCMD         DB    X'F8'                                              MAC27330
002525  A3                      2734  CRTWRT         DB    X'A3'                                              MAC27340
002526  B1                      2735  CRTRD          DB    X'B1'                                              MAC27350
002527  00                      2736  WRTCMD         DB    0                                                  MAC27360
002528  00                      2737  RDCMD          DB    0                                                  MAC27370
002529  00                      2738  SEGREGN        DB    0                                                  MAC27380
00252A  00                      2739  SUBTST         DB    0                                                  MAC27390
00252B  00                      2740  INSAVE         DB    0                                                  MAC27400
00252C  00                      2741  CONFLD         DB    0          CONTROL FIELD INDICATOR                 MAC27410
00252D  00                      2742  SAVE           DB    0                                                  MAC27420
00252E  00                      2743                 DB    0                                                  MAC27430
00252F  00                      2744                 DB    *                                                  MAC27440
002530  0000                    2745  ADDRESS        DCX   0                                                  MAC27450
002532  0030                    2746  THIRTY         DC    X'30'                                              MAC27460
002534                          2747                 ALIGN 4                                                  MAC27470
002534  0000 0000               2748  PSWMASK        DC    0          PSW MASK VALUE                          MAC27480
002538  0000 0000               2749  TOTAL          DC    0                                                  MAC27490
00253C  0000 0000               2750  TOTALERR       DC    0                                                  MAC27500
002540  0000 0000               2751  OPTSAV         DC    0                                                  MAC27510
002544  0000 0000               2752  LOCSAVE        DC    0                                                  MAC27520
002548  0000 0000               2753  MEMTOP         DC    Y'0'       TOP OF MEMORY                           MAC27530
00254C  0000 0000               2754  SAVE7          DC    Y'0'                                               MAC27540
002550  0000 0000               2755  CONVAL         DC    0                                                  MAC27550
002554  0000 FFFF               2756  DELAYVAL       DC    Y'FFFF'                                            MAC27560
```

EE61 W3
A3 A1

> EEA3

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002558   0000                2757  CRTFLG    DC    X'0'                          MAC27570
00255A   0000                2758  WRAPFLG   DC    X'0'                          MAC27580
00255C   0000                2759  MARCHCNT  DC    X'0'                          MAC27590
002560                       2760            ALIGN 8                             MAC27600
002560   0000 80F0           2761  SET1      DC    Y'80F0',DEVCHK                MAC27610
002564   0000 214E
002568   0000 20F0           2762  ENABLE    DC    Y'20F0',ENABLE2               MAC27620
00256C   0000 0BC8
002570   0000 A0F0           2763  HALT      DC    Y'A0F0',TTYIN                 MAC27630
002574   0000 0BD6
002578   0000 A0F0           2764  ERRHALT   DC    Y'A0F0',TTYCHK                MAC27640
00257C   0000 0E0E
002580   0000 24F0           2765  ENBMAC    DC    Y'24F0',BRANCH                MAC27650
002584   0000 150E
002588   0000 20F0           2766  DISMAC    DC    Y'20F0',INCR                  MAC27660
00258C   0000 1526
002590   0000 0000           2767  SAVE1     DC    Y'00000000'                   MAC27670
                             2768  *                                           MAC27680
                             2769  *                                           MAC27690
         0000 2593           2770  LNZB      EQU   *-1                         MAC27700
                             2771  *                                           MAC27710
002594                       2772  TABLE1    DS    12                          MAC27720
0025A0                       2773  PSWSAVE   DS    16                          MAC27730
0025B0                       2774  TTYBUF    DS    8                           MAC27740
0025B8                       2775  RSAVE     DS    128                         MAC27750
002638                       2776  REGSAVE   DS    40                          MAC27760
                             2777  *                                           MAC27770
                             2778  *                                           MAC27780
                             2779  *                                           MAC27790
                             2780  *                                           MAC27800
                             2781  *                                           MAC27810
```

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002660  2400            2783  $CHKSUM  LIS   R0,0          PUNCH M17 TAPE WITH CHECKSUM      MAC27830
002662  9510            2784           EPSR  R1,R0         SELECT REG,SET 0                  MAC27840
                        2785  *                                                              MAC27850
002664  E610 0A00       2786           LDAI  R1,ORIGIN1    START                             MAC27860
002668  2421            2787           LIS   R2,1          INCREMENT                         MAC27870
00266A  E630 2593       2788           LDAI  R3,LNZB       FINAL                             MAC27880
00266E  2440            2789           LIS   R4,0          CHECKSUM BYTE                     MAC27890
002670  D351 0000       2790  $GEN     LB    R5,0(R1)                                        MAC27900
002674  0745            2791           XAR   R4,R5                                           MAC27910
002676  C110 2670       2792           BXLE  R1,$GEN                                         MAC27920
00267A  D240 008D       2793           STB   R4,MN+3       CHECKSUM BYTE TO BOOT LOADER      MAC27930
                        2794  *                                                              MAC27940
00267E  C810 0080       2795  $TAPE    LHI   R1,X'0080'                                      MAC27950
002682  9E21            2796           OCR   R2,R1         DISPLAY TO NORMAL MODE            MAC27960
002684  9444            2797           EXBR  R4,R4                                           MAC27970
002686  9824            2798           WHR   R2,R4         SHOW CHECKSUM                     MAC27980
002688  9411            2799           EXBR  R1,R1                                           MAC27990
00268A  9501            2800           EPSR  R0,R1         HALT THE PROCESSOR                MAC28000


00268C  D360 007A       2802  $PUNCH   LB    R6,X'7A'      GET BOUTDV                        MAC28020
002690  DE60 007B       2803           OC    R6,X'7B'      START THE PUNCH                   MAC28030
002694  9D60            2804           SSR   R6,R0                                           MAC28040
002696  2081            2805           BTBS  8,1                                             MAC28050
002698  41F0 26DA       2806           BAL   R15,$TAPL     PUNCH LEADER                      MAC28060
00269C  9411            2807           EXBR  R1,R1         R1 = X'0080'                      MAC28070
00269E  C830 00CF       2808           LHI   R3,X'CF'                                        MAC28080
0026A2  DA61 0000       2809  $PNCH1   WD    R6,0(R1)      PUNCH BOOT LOADERE                MAC28090
0026A6  9D60            2810           SSR   R6,R0                                           MAC28100
0026A8  2081            2811           BTBS  8,1                                             MAC28110
0026AA  C110 26A2       2812           BXLE  R1,$PNCH1                                       MAC28120
0026AE  41F0 26E0       2813           BAL   R15,$TAPL1    PUNCH ONE-FOLD GAP                MAC28130
                        2814  *                                                              MAC28140
0026B2  D340 008D       2815           LB    R4,MN+3       GET CHECKSUM BYTE                 MAC28150
0026B6  E610 0A00       2816           LDAI  R1,ORIGIN1                                      MAC28160
0026BA  E630 2593       2817           LDAI  R3,LNZB                                         MAC28170
0026BE  D351 0000       2818  $PNCH2   LB    R5,0(R1)      PUNCH THE PROGRAM                 MAC28180
0026C2  0745            2819           XAR   R4,R5         CHECK CHECKSUM                    MAC28190
0026C4  9A65            2820           WDR   R6,R5         DISPLAY IT                        MAC28200
0026C6  9401            2821           EXBR  R0,R1                                           MAC28210
0026C8  9820            2822           WHR   R2,R0                                           MAC28220
0026CA  9D60            2823           SSR   R6,R0                                           MAC28230
0026CC  2081            2824           BTBS  8,1                                             MAC28240
0026CE  C110 26BE       2825           BXLE  R1,$PNCH2                                       MAC28250
0026D2  41F0 26DA       2826           BAL   R15,$TAPL     PUNCH RAILER                      MAC28260
0026D6  4300 267E       2827           B     $TAPE         SHOW CHECKSUM & HALT              MAC28270


0026DA  C800 0100       2829  $TAPL    LHI   R0,256       TO PUNCH BLANK LEADER             MAC28290
0026DE  2303            2830           BS    $TAPLP                                          MAC28300
0026E0  C800 0055       2831  $TAPL1   LHI   R0,85        TO PUNCH ONE FOLD                 MAC28310
0026E4  2701            2832  $TAPLP   SIS   R0,1                                           MAC28320
0026E6  032F            2833           BNPR  R15           RETURN                            MAC28330
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0026E8  2430          2834        LIS   R3,0                          MAC28340
0026EA  9A63          2835        WDR   R6,R3       PUNCH BLANK FRAME  MAC28350
0026EC  9D68          2836        SSR   R6,R8                         MAC28360
0026EE  2081          2837        BTBS  8,1                           MAC28370
0026F0  2206          2838        BS    $TAPLP                        MAC28380
0026F2                2839        END                                 MAC28390
```

ASSEMBLED BY CAL 03-066R05-01 (32-BIT)

START OPTIONS: SCR,CRO

NO CAL ERRORS
NO CAL WARNINGS
2 PASSES

$CHKSUM	0000	2660	2783*							
$GEN	0000	2670	2790*	2792						
$PNCH1	0000	26A2	2809*	2812						
$PNCH2	0000	26BE	2818*	2825						
$PUNCH	0000	26BC	2802*							
$TAPE	0000	267E	2795*	2827						
$TAPL	0000	26DA	2806	2826	2829*					
$TAPL1	0000	26E0	2813	2831*						
$TAPLP	0000	26E4	2830	2832*	2838					
AAA	0000	208C	1828	1862	2236*					
ABSTOP	0000	26F2								
ADC	0000	0004								
ADD	0000	2102	2284	2287*	2290					
ADD0	0000	14C4	1273*							
ADD1	0000	14C6	1274*	1279	1306					
ADD2	0000	14CC	1276*	1280						
ADDRESS	0000	2530	156	241	394	2328	2346	2477	2564	2745*
ADRS	0000	244C	2505	2634*						
ADRS1	0000	24D8	2401	2688*						
ADRS2	0000	24CE	2397	2685*						
AGNN	0000	1054	739*	740						
ALTPAT1	0000	1A30	1763	1769*						
ALTPAT2	0000	1994	1715	1721*						
ALTPAT3	0000	1B02	1827	1831*						
ALTPAT4	0000	186C	1861	1865*						
ARTFLT	0000	21BE	122	2359*						
ASTERISK	0000	2474	245	2653*						
BLKCHK	0000	20EE	669	680	1271	2279*				
BLKCHK1	0000	20FC	678	695	1278	2285*				
BR	0000	1F00	1896	2103*						
BR.TBL	0000	1FBC	1807	2154*						
BRANCH	0000	150E	1297*	2765						
BRKWAIT	0000	2336	2493	2515*						
BRKWAIT1	0000	2352	2516	2526*						
BRRX1END	0000	1D20	1948	1991*						
BRRX1T1	0000	18B2	1887*							
BRRX1T1A	0000	18D4	1895*	1985						
BRRX1T1B	0000	18B8	1889*	1990						
BRRX1T2	0000	18E2	1899*	1912	1941					
BRRX1T3	0000	18F0	1903*							
BRRX1T4	0000	1C14	1907	1914*						
BRRX1T5	0000	1C34	1919	1923*						
BRRX1T6	0000	1C3E	1922	1925*						
BRRX1T7	0000	1C78	1902	1913	1944*	1952	1957	1981		
BRRX1T8	0000	1CC0	1961	1965*						
BRRX1T9	0000	1CCA	1964	1967*						
BRRX1TA	0000	1D24	1936	1992*						

HEXASC	0000 0CB8	279	290	295	312*	315	
HEXLP	0000 0CC4	316*	333				
IEPROW	0000 16AC	1481*					
IEPROW1	0000 171A	1497	1516*				
IEPROW2	0000 16D6	1493*	1494				
ILGINT	0000 220C	116	1383	2394*			
ILGMSG	0000 24B6	2403	2683*				
ILGREG	0000 0F94	554	617*				
ILLADRS	0000 10DC	742	776*				
IMPTOP	0000 0000I						
INCR	0000 1526	1305*	2766				
INCRMT	0000 2520	2454	2729*				
INSAVE	0000 252B	2740*					
INTMSG	0000 24A8	2387	2674*				
INTMSG1	0000 24A6	2389	2673*				
INTRPT	0000 118C	825	871*				
INTRPT1	0000 13A2	1118	1128*				
IO	0000 0A10	105*	2320				
KB0008	0000 250E	190	205	214	2289	2708*	
KB0072	0000 250F	169	2709*				
KB0136	0000 2510	170	2710*				
KB0200	0000 2511	2711*					
KB0264	0000 2512	2712*					
KB0328	0000 2513	2713*					
KB0392	0000 2514	171	2714*				
KB0456	0000 2515	2715*					
KB0520	0000 2516	2716*					
KB0584	0000 2517	2717*					
KB0648	0000 2518	172	2718*				
KB0712	0000 2519	2719*					
KB0776	0000 251A	2720*					
KB0840	0000 251B	2721*					
KB0904	0000 251C	173	2722*				
KB0968	0000 251D	2723*					
KBEND	0000 251E	2724*					
LADC	0000 0002						
LDADRS	0000 0FE8	671*	679				
LDAGN	0000 14E8	1285*	1287				
LDAGN3	0000 11B0	882*	887				
LDAGN4	0000 11C6	889*	895				
LDNXT	0000 100E	682*	696	698			
LDREG	0000 1556	1349*	1351				
LEADER	0000 0096	79*	83				
LF	0000 0BEA	244*	292	308			
LF1	0000 0C7C	287	292*				
LNZB	0000 2593	75	2770*	2788	2817		
LOAD	0000 00A0	84*	90				
LOAD9	0000 0F24	576	580	582*	594		
LOADSUB	0000 14E2	1277	1282*				
LOC1	0000 167E	1457	1463*				
LOC1A	0000 1816	1591	1594*				
LOC1B	0000 1838	1603	1606*				
LOC1C	0000 1858	1615	1617*				
LOC1D	0000 1878	1626	1628*				
LOC2	0000 1884	1643	1648*				

```
LOC2.1    0000 188A    1645  1650*
LOC2A     0000 18EA    1661  1666*
LOC2A.1   0000 18F0    1668  1668*
LOC2B     0000 1910    1676  1678*
LOC2C     0000 1930    1688  1690*
LOCSAVE   0000 2544    1299  1303  1342  1371  1377  2752*
LOKAGN    0000 0C6E     278   288*
LOOKUP    0000 0C24     264*  271
LOOP      0000 1650    1450* 1477
MAC.1     0000 207E    2224  2229*
MACHMAL   0000 24E4    2429  2695*
MACINT    0000 2182     133  2265  2353*
MACINT1   0000 2064    1415  1485  2220*
MALFTN    0000 2238     235  2412*
MALX      0000 1EE4    1895  1947  1984  2088*
MALX.TBL  0000 1F68    1806  2132*
MALXERNO  0000 1D8C    2001  2043*
MALXERR   0000 1D38    1841  1875  1992  1995  1999*
MALXERRM  0000 1DB2    2037  2041*
MALXRX16  0000 1B92    1874  1877*
MALXRX1A  0000 1AC6    1814* 1817
MALXRX1B  0000 1B0A    1830  1833*
MALXRX1C  0000 1AD0    1819* 1848  1884
MALXRX1D  0000 1B28    1840  1843*
MALXRX1E  0000 1B3A    1849* 1879
MALXRX1F  0000 1B74    1864  1867*
MALXTRX1  0000 1A72    1790*
MARCHCNT  0000 255C    1791  1881  1882  1888  1987  1988  2030  2759*
MATCH     0000 0C3C     273*
MBDA      0000 1E62    2021  2061*
MEMLIST   0000 0B28     183   187*
MEMSG     0000 2400     164  2599*
MEMSG1    0000 2414     195   203  2601*
MEMTOP    0000 2548     198  1900  1950  2753*
MMADRS    0000 2500    2427  2699*
MN        0000 008A      76* 2793  2815
MSGTST    0000 0DC4     400   402*
NEXT      0000 0CB2     267   309*
NEXT1     0000 0B6C     191   204   207   211*
NOERR     0000 249A    2274  2660*
NOMSG     0000 0B8C     222*  402  2271  2445
NORM      0000 251F    2461  2728*
NXTFLD    0000 1204     938*  986
NXTFLD1   0000 111C     829*  900
NXTFLD2   0000 148E    1259* 1281
OKIN      0000 0C1E     253   255   261*
OKIN2     0000 0C20     262*  310
OPTCHK    0000 0DAC     366   394*
OPTSAV    0000 2540     357   362   369  2751*
ORG       0000 0B80     217*  264   273   277   286   288   291   294   304   305
ORIGIN1   0000 0A00      73    97* 2786  2816
PARITY    0000 0BAC     226*
PASADR    0000 0A0A     102* 2345
PASSCNT   0000 1E9A    2033  2067*
PRESINT   0000 1448    1175  1207*
```

		2295	2370	2371	2372	2372	2381	2382	2386	2387	2394	2398	2412	2412
		2414	2418	2418	2424	2438	2442	2443	2498	2502	2506	2539	2784	2786
		2790	2792	2795	2796	2799	2799	2800	2807	2807	2809	2812	2816	2818
		2821	2825											
R10	0000 000A	65*	570	583	584	585	854	1413	1414	1419	1427	1428	1472	1475
		1476	1737	1738	1757	1766	1772	1780	1781	1837	1838	1871	1872	1933
		1934	1976	1977	2223	2404	2430	2483	2485	2491	2492	2517	2521	2526
		2527	2538	2546	2550	2567	2571	2576	2577	2579	2581	2583	2585	2585
		2586	2587											
R11	0000 000B	66*	152	153	154	156	157	235	236	237	238	239	240	241
		249	394	397	398	399	401	404	410	412	416	421	422	424
		571	855	1295	1445	1445	1458	1462	1710	1727	1730	1736	1737	1748
		1750	1784	1786	1787	1838	1839	1872	1873	1889	1891	1934	1935	1977
		1978	2255	2312	2312	2315	2404	2430	2477	2483	2491	2517	2519	2520
		2521	2526	2539	2540	2541	2542	2543	2545	2546	2555	2558	2564	2569
		2570	2571	2573	2577	2581	2586	2587	2589					
R12	0000 000C	67*	395	404	410	416	417	424	426	427	427	856	1825	1826
		1826	1859	1860	1860	1877	1878	1917	1918	1918	1959	1960	1960	2313
		2413	2414	2455	2456	2456	2457	2458	2458	2459	2459	2460	2537	2540
		2547	2547	2549	2565	2576	2578							
R13	0000 000D	68*	279	290	295	330	332	857	1459	1460	1916	1930	1958	1971
		2222	2225	2226	2303	2304	2307	2314	2453	2454	2457	2460	2461	
R14	0000 000E	69*	115	115	117	119	123	131	132	134	193	199	229	238
		242	244	409	430	436	676	686	858	1291	1451	1713	1761	1792
		1821	1834	1836	1854	1868	1870	1898	1915	1930	1932	1971	1975	2007
		2011	2015	2019	2023	2027	2031	2228	2301	2303	2305	2306	2364	2383
		2394	2395	2399	2407	2421	2425	2433	2439	2444	2446	2449	2462	2469
		2470	2472	2473	2474	2476	2478	2479	2480	2481	2488	2494	2497	2498
		2499	2503	2507	2510	2513	2515	2520	2523	2523	2537	2538	2548	
R15	0000 000F	70*	116	118	122	130	133	158	163	202	229	244	251	312
		328	419	422	433	439	472	483	508	553	592	619	626	659
		669	678	680	692	695	733	761	766	781	787	824	829	859
		863	865	877	885	891	898	932	938	954	968	973	977	983
		993	1024	1031	1051	1055	1067	1072	1078	1084	1117	1133	1138	1143
		1174	1180	1196	1200	1212	1217	1223	1256	1259	1271	1278	1301	1338
		1365	1373	1410	1470	1511	1535	1558	1599	1610	1622	1632	1648	1652
		1666	1670	1683	1695	1732	1778	1841	1875	1992	1995	2000	2002	2036
		2039	2227	2229	2273	2293	2296	2297	2302	2308	2316	2365	2367	2374
		2388	2398	2402	2428	2444	2445	2447	2474	2475	2510	2511	2525	2556
		2560	2565	2566	2574	2584	2590	2806	2813	2826	2833			
R2	0000 0002	57*	74	86	91	138	142	148	174	175	179	179	180	182
		196	208	215	335	335	336	337	338	339	355	356	356	357
		362	367	369	561	564	566	588	597	601	603	607	611	611
		670	671	673	681	682	684	752	755	778	783	784	834	840
		841	842	843	844	845	847	873	874	894	895	935	947	963
		970	979	980	1033	1041	1064	1069	1080	1081	1130	1135	1179	1189
		1209	1214	1219	1220	1272	1273	1276	1424	1428	1429	1434	1435	1437
		1439	1444	1460	1489	1493	1494	1547	1550	1580	1583	1584	1596	1597
		1608	1619	1620	1630	1680	1681	1692	1693	1711	1714	1714	1751	1752
		1759	1762	1762	1796	1807	1819	1844	1850	1855	1896	1909	1911	1925
		1938	1940	1945	1967	2010	2279	2279	2288	2364	2376	2382	2787	2796
		2798	2822											
R3	0000 0003	58*	75	139	143	149	175	262	262	266	269	270	298	301
		301	304	305	342	343	344	345	346	347	348	349	350	351
		352	353	354	377	378	503	505	587	589	617	618	687	689

			738	741	759	762	776	777	835	860	864	872	956	961	962
			990	1049	1052	1062	1063	1128	1129	1194	1197	1207	1208	1358	1362
			1364	1425	1436	1458	1461	1467	1468	1490	1555	1556	1581	1587	1588
			1596	1608	1693	1716	1718	1721	1723	1728	1753	1784	1797	1798	1808
			1823	1845	1851	1857	1894	1927	1969	1983	1984	2003	2264	2267	2268
			2365	2788	2808	2817	2834	2835							
R4	0000	0004	59*	77	78	79	81	87	89	136	140	146	150	176	263
			264	268	372	473	474	475	477	478	480	485	487	489	491
			492	497	499	500	504	506	510	558	558	562	564	565	575
			577	579	581	583	590	594	605	609	660	661	662	664	666
			668	671	674	674	675	677	682	685	688	690	694	735	735
			739	739	740	746	760	763	768	769	836	836	837	848	879
			882	887	889	893	940	947	948	949	957	966	985	991	1034
			1041	1042	1043	1050	1053	1086	1182	1189	1190	1192	1195	1198	1202
			1257	1258	1261	1263	1268	1270	1273	1275	1276	1284	1286	1288	1293
			1297	1299	1300	1303	1305	1339	1340	1341	1342	1343	1344	1345	1347
			1349	1351	1352	1352	1355	1355	1356	1359	1360	1361	1361	1363	1367
			1369	1370	1371	1372	1376	1377	1378	1379	1380	1426	1437	1438	1491
			1500	1501	1516	1518	1519	1520	1521	1522	1524	1533	1556	1564	1582
			1705	1717	1722	1731	1764	1766	1770	1772	1776	1809	1814	1816	1818
			1837	1846	1852	1853	1871	1897	1899	1910	1914	1933	1939	1946	1949
			1976	1980	2247	2255	2369	2370	2371	2502	2789	2791	2793	2797	2797
			2798	2815	2819										
R5	0000	0005	60*	79	81	82	82	84	85	87	89	177	188	205	213
			214	264	266	374	375	476	477	478	481	486	493	501	560
			663	672	683	736	747	849	880	941	950	1035	1044	1183	1191
			1192	1262	1293	1294	1346	1353	1446	1452	1503	1505	1531	1533	1541
			1542	1706	1712	1718	1723	1735	1740	1749	1750	1752	1754	1765	1771
			1814	1815	1819	1824	1855	1858	1899	1901	1904	1905	1925	1928	1949
			1951	1954	1955	1967	1970	1972	1973	1974	2018	2253	2380	2390	2790
			2791	2818	2819	2820									
R6	0000	0006	61*	76	85	86	91	178	178	192	208	280	282	284	286
			291	296	299	302	313	313	326	327	479	479	480	487	494
			502	559	606	610	664	673	684	737	748	770	850	881	888
			942	951	1036	1045	1184	1193	1263	1285	1286	1289	1290	1292	1294
			1347	1354	1408	1456	1465	1480	1482	1508	1521	1529	1540	1549	1553
			1572	1586	1590	1595	1602	1607	1614	1618	1625	1629	1642	1660	1673
			1679	1687	1691	1699	1717	1722	1726	1755	1766	1772	1811	1817	1822
			1823	1824	1828	1829	1831	1835	1839	1856	1857	1858	1862	1863	1865
			1869	1873	1880	1881	1882	1883	1900	1901	1920	1923	1924	1931	1935
			1950	1951	1962	1965	1966	1974	1978	1986	1987	1988	1989	2014	2381
			2802	2803	2804	2809	2810	2820	2823	2835	2836				
R7	0000	0007	62*	180	182	184	408	488	489	490	495	496	497	498	562
			563	564	568	572	582	585	586	595	596	665	666	667	675
			685	749	755	756	771	851	883	943	946	947	952	953	955
			955	975	975	1037	1040	1041	1046	1050	1141	1187	1188	1189	1264
			1267	1268	1269	1282	1282	1285	1286	1287	1288	1298	1348	1349	1350
			1411	1412	1418	1447	1450	1452	1475	1483	1484	1488	1489	1491	1496
			1506	1517	1518	1543	1544	1546	1573	1574	1577	1579	1580	1582	1636
			1637	1650	1657	1658	1668	1701	1702	1704	1707	1708	1712	1724	1725
			1746	1760	1765	1771	1773	1785	1786	1802	1803	1805	1812	1820	1853
			1903	1904	1906	1914	1926	1927	1928	1953	1954	1956	1968	1969	1970
			2221	2247	2250	2256	2258	2406	2432	2455	2487				
R8	0000	0008	63*	496	498	500	501	567	572	586	596	622	623	734	739
			750	852	963	964	970	971	971	979	980	981	981	1047	1047

```
SAVE7      0000 254C      1344   1369   1379   2754*
SEGDATA    0000 1E44      2013   2057*
SEGINIT    0000 1A8C      1799*  1800
SEGR.TBL   0000 2010      1808   2176*
SEGREG     0000 089C       224*   277    373    475    567    662    734    752    843    873    935   1033   1179
                          1261   1345   1411   1434   1447   1483   1517   1541   1573   1636   1657   1701   1749
                          1785   1794   1802   1822   1856   1890   1926   1968   2369   2497
SEGREGA    0000 1E20      2009   2054*
SEGREGN    0000 2529      2005   2738*
SEGRESTR   0000 1618      1427*  1429
SEGSETUP   0000 1634      1439*  1444
SEGTBL     0000 1EC6      1894   2072*
SELTST     0000 0D44       355*   413    418
SELTST1    0000 0CFA       274    335*
SENSE      0000 23B2      2571*  2575   2580
SENSE1     0000 0E0A       420    424*   425
SET1       0000 2560       344   2761*
SETADRS    0000 156E      1355*  1356
SETBIT     0000 0B5A       185    205*
SETBXLE    0000 0F20       578    581*
SHIFT      0000 0D6A       359    367*
SHIFTVAL   0000 0EE2       562*   565    612
START      0000 0A00        94     98*
STARTX     0000 00B8        92     94*
STATUS     0000 243C      2501   2627*
STFLG      0000 0B24       186*   217
STORE      0000 0E76       489*   491
STORE1     0000 0E96       497*   499
STORE2     0000 1098       754*   758
STORE3     0000 1410      1189*  1190
STORE5     0000 0F06       572*   573
STR1       0000 0C68       281    283    286*
STR4       0000 1138       837*   838
STRADRS    0000 0FF0       674*   677
STRAGN     0000 0FD2       666*   668
STRAGN1    0000 12F2      1041*  1042
STRAGN6    0000 1222       947*   948
STRAGNN    0000 14AE      1268*  1270
STRLOC     0000 20BC      2261*
SUBRTN     0000 2094      1285   2247*
SUBTRACT   0000 0F12       575*   600
SUBTST     0000 252A       363    370   2438   2739*
SVCERR     0000 21B8       136   2356*
SYSQ       0000 21C4       130   2362*
TABLE1     0000 2594       124   2772*
TEST       0000 0B84       221*   288    355
TEST0      0000 0E40       381    472*
TEST0.1    0000 0E68       482    485*
TEST1      0000 0EC4       382    553*
TEST2      0000 0FB8       383    659*
TEST3      0000 1042       384    733*
TEST4      0000 1108       385    824*
TEST5      0000 11EC       386    932*
TEST6      0000 12B2       387   1024*
TEST7      0000 1382       388   1117*
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TEST8     0000 13D8    389   1174*
TEST9     0000 1482    390   1256*
TESTA     0000 152C    391   1338*
TESTB     0000 15DE    392   1407*
TESTMSG   0000 2462   2448   2642*
TESTNUM   0000 242E   2386   2441   2442   2623*
TESTST    0000 0C80    289    293*
THIRTY    0000 2532   2746*
TITLE     0000 23E4    159   2594*
TOCS      0000 0AD6    163*
TOTAL     0000 2538    337    407    408    429   2749*
TOTALERR  0000 253C    338    435   2481   2750*
TOTALMSG  0000 247C    432    438    440   2659*
TOTMSG    0000 247A    434   2658*
TST       0000 0D94    372    380*
TST00     0000 0C86    295*   307
TST01     0000 0C92    299*   303
TST2      0000 0C9E    300    304*
TSTCHK    0000 20C0    511    602    700    772    830    939   1032   1181   1260   1385   1991   1994   1997
                      2231   2263*  2529
TSTNUM    0000 227C    472    553    659    733    824    932   1024   1117   1174   1256   1338   1410   2438*
TSTSEL    0000 0D52    360*  2270
TSTSEL2   0000 0D58    362*  2275
TTY       0000 215A   2323*
TTYBUF    0000 25B0    247    248    256    266   2774*
TTYCHK    0000 0E0E    415    423    426*  2764
TTYFLG    0000 2523    336    412    426   2573   2732*
TTYIN     0000 08D6    239*  2763
TTYRD     0000 2522   2325   2731*
TTYWRT    0000 2521   2323   2730*
VALUE     0000 246A   2443   2643*
WRAPFLG   0000 255A    168    186    211   2758*
WRITDAT   0000 1DC8   2017   2045*
WRITE     0000 22A0    409    676    686   1291   1451   1713   1761   1821   1854   1915   2407   2433   2453*
                     2488
WRTCMD    0000 2527    398    401   2324   2342   2570   2736*
WRTINT    0000 1336   1025   1062*
X9C       0000 0A8E    140*   141
XBC       0000 0A9C    144*   145
XCC       0000 0AB2    150*   151
```

PROG= MACF0203 ASSEMBLED BY CAL 03-066R05-00 (32-BIT)

```
                1  MACF0203 PROG  MEMORY ACCESS CONTROLLER TEST PART 2 06-160F02M91R03A13    MAC00010
                2           SCRAT                                                           MAC00020
                3           ERLST                                                           MAC00030
                4           CROSS                                                           MAC00040
                5           TARGT 32                                                        MAC00050
                6           SQUEZ                                                           MAC00060
                7           WIDTH 120                                                       MAC00070
                8           SQCHK                                                           MAC00080
                9  *                                COPYRIGHT INTERDATA INC. APR 1977       MAC00090


               11  * NINE SUBTESTS ARE PROVIDED:                          *                MAC00110
               12  *                                                      *                MAC00120
               13  * TEST 0 - CHECKS SEGMENTATION REGISTER SELECTION IN   *                MAC00130
               14  *          THE FULLWORD MODE.                         *                MAC00140
               15  *                                                      *                MAC00150
               16  * TEST 1 - EXERCISES THE RELOCATION FIELD.            *                MAC00160
               17  *                                                      *                MAC00170
               18  * TEST 2 - EXERCISES THE LIMIT FIELD AND CHECKS THE   *                MAC00180
               19  *          INVALID ADDRESS INTERRUPT.                 *                MAC00190
               20  *                                                      *                MAC00200
               21  * TEST 3 - CHECKS THE EXECUTE PROTECT FEATURES OF     *                MAC00210
               22  *          THE MAC.                                   *                MAC00220
               23  *                                                      *                MAC00230
               24  * TEST 4 - CHECKS THE WRITE PROTECT FEATURES OF THE   *                MAC00240
               25  *          MAC.                                       *                MAC00250
               26  *                                                      *                MAC00260
               27  * TEST 5 - CHECKS THE WRITE/INTERRUPT PROTECTION      *                MAC00270
               28  *              FEATURES OF THE MAC.                   *                MAC00280
               29  *                                                      *                MAC00290
               30  * TEST 6 - CHECKS THE OPERATION OF THE NON-PRESENT    *                MAC00300
               31  *          ADDRESS INTERRUPT OF THE MAC.              *                MAC00310
               32  *                                                      *                MAC00320
               33  * TEST 7 - RELOCATES AND EXECUTES A SMALL SUBROUTINE  *                MAC00330
               34  *          THROUGHOUT THE AVAILABLE MEMORY IN THE     *                MAC00340
               35  *          SYSTEM WITH THE MAC ENABLED.               *                MAC00350
               36  *                                                      *                MAC00360
               37  * TEST 8 - CHECKS SEGMENT BOUNDARY CROSSING LOGIC     *                MAC00370
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                        39  * THE PROCESSOR MUST BE EQUIPPED WITH A CONSOLE DEVICE.          MAC00390
                        40  * MAY BE SELECTED OR CHANGED WITHOUT RESTARTING THE TEST        MAC00400


0000 0000               42  R0      EQU   0                                                MAC00420
0000 0001               43  R1      EQU   1                                                MAC00430
0000 0002               44  R2      EQU   2                                                MAC00440
0000 0003               45  R3      EQU   3                                                MAC00450
0000 0004               46  R4      EQU   4                                                MAC00460
0000 0005               47  R5      EQU   5                                                MAC00470
0000 0006               48  R6      EQU   6                                                MAC00480
0000 0007               49  R7      EQU   7                                                MAC00490
0000 0008               50  R8      EQU   8                                                MAC00500
0000 0009               51  R9      EQU   9                                                MAC00510
0000 000A               52  R10     EQU   10                                               MAC00520
0000 000B               53  R11     EQU   11                                               MAC00530
0000 000C               54  R12     EQU   12                                               MAC00540
0000 000D               55  R13     EQU   13                                               MAC00550
0000 000E               56  R14     EQU   14                                               MAC00560
0000 000F               57  R15     EQU   15                                               MAC00570
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0000001                          59          ORG   X'80'                    MAC00590
000080   F810 0000 FFD0          60          LI    R1,ORIGIN1               MAC00600
000086   2421                    61          LIS   R2,1                     MAC00610
000088   F830 0001 1A54          62          LI    R3,LNZB                  MAC00620
00008E   C860 00FF               63  MN      LHI   R6,X'FF'                 MAC00630
000092   D340 0078               64          LB    R4,X'78'                 MAC00640
000096   DE40 0079               65          OC    R4,X'79'                 MAC00650
00009A   9D45                    66  STATUS1 SSR   R4,R5                    MAC00660
00009C   2091                    67          BTBS  9,1                      MAC00670
00009E   9545                    68          RDR   R4,R5                    MAC00680
0000A0   0855                    69          LR    R5,R5                    MAC00690
0000A2   2234                    70          BZS   STATUS1                  MAC00700
0000A4   D251 0000               71  STOREBYT STB  R5,0(R1)                 MAC00710
0000A8   0765                    72          XAR   R6,R5                    MAC00720
0000AA   9A26                    73          WDR   R2,R6                    MAC00730
0000AC   9D45                    74  STAT1   SSR   R4,R5                    MAC00740
0000AE   2091                    75          BTBS  9,1                      MAC00750
0000B0   9B45                    76          RDR   R4,R5                    MAC00760
0000B2   C110 00A4               77          BXLE  R1,STOREBYT              MAC00770
0000B6   9826                    78          WHR   R2,R6                    MAC00780
0000B8   C200 00C0               79          LPSW  LDWT                     MAC00790
0000C0                           80          ALIGN 8                        MAC00800
0000C0   0000 80F0               81  LDWT    DCW   80F0,10010               MAC00810
0000C4   0001 0010
```

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0000C8                          83          ORG   X'FFD0'                                    MAC00830
          0000 FFD0             84  ORIGIN1 EQU   *                                          MAC00840
          0000 FFD0             85  START   EQU   *                                          MAC00850
00FFD0    4300 9558 =01152C     86  SVCERR  B     SVCERR1                                    MAC00860
00FFD4    4300 958A =011562     87  EXTINT  B     EXTINT1                                    MAC00870


00FFD8                          89          ORG   Y'10010'                                  MAC00890
010010    4300 94AA =0114BE     90          B     DEVCHK                                     MAC00900
                                91  *                       RETURN FROM DEVCHK             MAC00910
010014    C800 00F0             92  EXEC    LHI   R0,X'F0'                                   MAC00920
010018    9510                  93          EPSR  R1,R0       DISABLE INTERRUPTS, SELECT SET F MAC00930
01001A    0700                  94          XR    R0,R0                                      MAC00940
01001C    5000 0000             95          ST    R0,0                                       MAC00950
010020    5000 0020             96          ST    R0,X'20'    MACHINE MALFUNCTION INTRPT.    MAC00960
010024    5000 0024             97          ST    R0,X'24'    OLD PSW                        MAC00970
010028    5000 0028             98          ST    R0,X'28'    RESERVED,MUST BE ZERO          MAC00980
01002C    5000 002C             99          ST    R0,X'2C'                                   MAC00990
010030    07EE                 100          XR    R14,R14                                    MAC01000
010032    E6F0 954E =011584    101          LA    R15,ILGINT  ILLEG.INTSTR. NEW PSW          MAC01010
010036    D0E0 0030            102          STM   R14,X'30'                                  MAC01020
01003A    E6F0 8116 =010154    103          LA    R15,ENABLE2 MACHINE MALFUNCTION PRESET     MAC01030
01003E    D0E0 0038            104          STM   R14,X'38'                                  MAC01040
010042    5000 0040            105          ST    R0,X'40'    RESERVED,MUST BE ZERO          MAC01050
010046    5000 0044            106          ST    R0,X'44'                                   MAC01060
01004A    E6F0 94E4 =011532    107          LA    R15,ARTFLT  ARITH.FAULT NEW PSW            MAC01070
01004E    D0E0 0048            108          STM   R14,X'48'                                  MAC01080
010052    E610 99FE =011A54    109          LA    R1,TABLE1   SYSTEM QUEUE POINTER           MAC01090
010056    5010 0080            110          ST    R1,X'80'                                   MAC01100
01005A    E610 0A00            111          LA    R1,PSWSAVE  CURRENT PSW SAVE POINTER       MAC01110
01005E    4010 0084            112          STH   R1,X'84'                                   MAC01120
010062    E610 0A10            113          LA    R1,RSAVE    REG.SAV POINTER (SET 1)        MAC01130
010066    4010 0086            114          STH   R1,X'86'                                   MAC01140
01006A    E6F0 94CA =011538    115          LA    R15,SYSQ    SYS.Q SERVICE INTRPT NEW PSW   MAC01150
01006E    D0E0 0088            116          STM   R14,X'88'                                  MAC01160
010072    C8E0 2000            117          LHI   R14,X'2000' MEMORY ACCESS CONTROLLER       MAC01170
010076    E6F0 94AC =011526    118          LA    R15,MACINT  INTERRUPT NEW PSW              MAC01180
01007A    D0E0 0090            119          STM   R14,X'90'                                  MAC01190
01007E    5000 0098            120          ST    R0,X'98'    SVC INTRPT,NEW PSW             MAC01200
010082    E640 FF4A =00FFD0    121          LA    R4,SVCERR                                  MAC01210
010086    C810 009C            122          LHI   R1,X'9C'                                   MAC01220
01008A    2422                 123          LIS   R2,2                                       MAC01230
01008C    C830 00BA            124          LHI   R3,X'BA'                                   MAC01240
010090    4041 0000            125  X9C     STH   R4,0(R1)    SVC CALL,ERR,TRAP            MAC01250
010094    C110 FFF8 =010090    126          BXLE  R1,X9C                                     MAC01260
010098    2424                 127          LIS   R2,4                                       MAC01270
01009A    C830 00CC            128          LHI   R3,X'CC'                                   MAC01280
01009E    5001 0000            129  XBC     ST    R0,0(R1)    RESERVED,MUST BE ZERO          MAC01290
0100A2    C110 FFF8 =01009E    130          BXLE  R1,XBC                                     MAC01300
0100A6    E640 FF2A =00FFD4    131          LA    R4,EXTINT                                  MAC01310
0100AA    C810 00D0            132          LHI   R1,X'D0'                                   MAC01320
0100AE    2422                 133          LIS   R2,2                                       MAC01330
0100B0    C830 02CC            134          LHI   R3,X'2CC'                                  MAC01340
0100B4    4041 0000            135  XCC     STH   R4,0(R1)                                   MAC01350
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0100B8  C110 FFF8 =010094    136           BXLE  R1,XCC                                                  MAC01360
                             137  *                                                                       MAC01370
                             138  *                                                                       MAC01380
                             139  *                                                                       MAC01390
                             140  *                                                                       MAC01400
                             141  *                                                                       MAC01410
                             142  *                                                                       MAC01420
0100BC  7380 9964 =011A24    143           LHL   R11,CRTFLG                                               MAC01430
0100C0  2365                 144           BZS   PRTTITLE                                                 MAC01440
0100C2  D380 992E =0119F4    145           LB    R11,ADDRESS                                              MAC01450
0100C6  DEB0 9924 =0119EE    146           OC    R11,CRTCMD                                               MAC01460
0100CA  41F0 9668 =011736    147  PRTTITLE BAL   R15,PRINT          PRINT "MACT 06-160F02R02"            MAC01470
0100CE  0001 18EC            148           DC    A(TITLE)          START ADDRESS OF MESSAGE             MAC01480
                             149  *                                                                       MAC01490
0100D2  0700                 150  TOCS     XR    R0,R0                                                    MAC01500
0100D4  5000 0000            151           ST    R0,0                                                     MAC01510
0100D8  F820 0001 2000       152           LI    R2,Y'12000'       START ADDRESS FOR SEARCH              MAC01520
0100DE  C830 2000            153           LHI   R3,X'2000'        INCREMENT VALUE                      MAC01530
0100E2  F840 000F E000       154           LI    R4,Y'FE000'                                              MAC01540
0100E8  5022 0000            155  REP      ST    R2,0(R2)          STORE ADDRESS AS DATA                MAC01550
0100EC  F870 AAAA AAAA       156           LI    R7,Y'AAAAAAAA'    CLEAR MEMORY DATA LINES              MAC01560
0100F2  5872 0000            157           L     R7,0(R2)          READ BACK THE TEST ADDRESS           MAC01570
0100F6  0527                 158           CLR   R2,R7             EQUALS THAT WRITTEN?                 MAC01580
0100F8  2136                 159           BNES  TOCS2             SKIP IF NO                           MAC01590
0100FA  5870 0000            160           L     R7,0              WRAP AROUND TO ZERO?                 MAC01600
0100FE  2133                 161           BNZS  TOCS2             DONE IF YES                          MAC01610
010100  C120 FFE4 =0100E8    162           BXLE  R2,REP            LOOP                                 MAC01620
010104  2721                 163  TOCS2    SIS   R2,1              MEMTOP = ADDRESS OF LAST BYTE        MAC01630
010106  5020 931A =011424    164           ST    R2,MEMTOP         IN THE FIRST CONTIGUOUS SEGMENT      MAC01640
                             165  *                                                                       MAC01650
                             166  *                                                                       MAC01660
01010A  4300 8042 =010150    167  ORG      B     ENABLE1                                                  MAC01670
                             168  *                                                                       MAC01680
                             169  *                                                                       MAC01690
                             170  *                                                                       MAC01700
01010E  FF80                 171  TEST     DC    X'FF80',C'TEST  '                                        MAC01710
010110  5445 5354 2020
010116  0000                 172  NOMSG    DC    X'0',C'NOMSG '                                           MAC01720
010118  4E4F 4D53 4720
01011E  0000                 173  CONTIN   DC    X'0',C'CONTIN'                                           MAC01730
010120  434F 4E54 494E
010126  0300                 174  SEGREG   DC    X'300',C'SEGREG'                                         MAC01740
010128  5345 4752 4547
01012E  0000                 175  HALT1    DC    X'0',C'HALT  '                                           MAC01750
010130  4841 4C54 2020
010136  0000                 176  FLAG,832 DC    X'0',C'CPU   '                                           MAC01760
010138  4350 5520 2020
01013E  0000                 177  RUN      DC    X'0',C'RUN   ',X'0',X'FFFF'                              MAC01770
010140  5255 4E20 2020
010146  0000
010148  FFFF
                             178  *                                                                       MAC01780
                             179  *                                                                       MAC01790
                             180  *                                                                       MAC01800
01014A  01FE                 181  QUESTN   BALR  R15,R14           OUTPUT A CR,LF,?,CR,LF                 MAC01810
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01014C   0001 194C              182          DC    A(QMARK)                                          MAC01820
                                183  *                                                               MAC01830
                                184  *                                                               MAC01840
                                185  *                                                               MAC01850
010150   C200 98DC =011A30      186  ENABLE1  LPSW  ENABLE          MALF ENABLE,SET F, GO TO TTYIN    MAC01860
010154   E6B0 9468 =0115C0      187  ENABLE2  LA    R11,MALFTN                                        MAC01870
010158   50B0 003C              188           ST    R11,X'3C'                                         MAC01880
01015C   58B0 98D0 =011A30      189           L     R11,ENABLE                                        MAC01890
010160   95EB                   190           EPSR  R14,R11                                           MAC01900
010162   E6E0 95D0 =011736      191  TTYIN    LA    R14,PRINT         SET UP R14 FOR PRINT ROUTINE    MAC01910
010166   E690 FFE0 =01014A      192           LA    R9,QUESTN         SET UP R9 FOR ERROR ROUTINE     MAC01920
01016A   01FE                  193  LF       BALR  R15,R14           OUTPUT AN * TO INDICATE         MAC01930
01016C   0001 1952              194           DC    A(ASTERISK)       WE ARE READY FOR INPUT          MAC01940
010170   F800 2020 2020        195           LI    R0,Y'20202020'    BLANK OUT TTY BUFFER            MAC01950
010176   5000 98E6 =011A60      196           ST    R0,TTYBUF         WHICH WILL CONTAIN OPTION NAME  MAC01960
01017A   4000 98E6 =011A64      197           STH   R0,TTYBUF+4                                       MAC01970
01017E   DEB0 9871 =0119F3      198           OC    R11,RDCMD         SET READ MODE                   MAC01980
010182   0711                   199           XR    R1,R1             CLEAR TTY INDEX                 MAC01990
010184   41F0 95A0 =011728      200  RDCHR    BAL   R15,GETCHR        GET A CHARACTER                 MAC02000
010188   C500 000D              201           CLHI  R0,X'0D'          IS IT A CR ?                    MAC02010
01018C   233A                   202           BES   OKIN              YES TRY TO MATCH IT TO TABLE    MAC02020
01018E   C500 0020              203           CLHI  R0,X'20'          IS IT A BLANK ?                 MAC02030
010192   2337                   204           BES   OKIN              YES, TRY A MATCH                MAC02040
010194   D201 98C8 =011A60      205           STB   R0,TTYBUF(R1)      NO, STORE THE CHAR              MAC02050
010198   2611                   206           AIS   R1,1               BUMP BUFFER INDEX               MAC02060
01019A   C510 0006              207           CLHI  R1,6              HAVE WE REACHED 6 CHARS ?       MAC02070
01019E   20DD                   208           BNES  RDCHR             NO, DO ANOTHER READ             MAC02080


0101A0   0711                   210  OKIN     XR    R1,R1             * MATCH ROUTINE - CLEAR TABLE INDEX  MAC02100
0101A2   0733                   211  OKIN2    XR    R3,R3             CLEAR TTYBUF INDEX              MAC02110
0101A4   0841                   212           LR    R4,R1             SET TABLE INDEX (NEW)           MAC02120
0101A6   4854 FF66 =010110      213  LOOKUP   LH    R5,ORG+6(R4)      GET HALFWORD FROM TABLE         MAC02130
0101AA   0219                   214           BMR   R9                IF MINUS, THEN NO MATCH ,I.E ERROR  MAC02140
0101AC   4553 9880 =011A60      215           CLH   R5,TTYBUF(R3)     COMPARE TO TTYBUF HALFWORD      MAC02150
0101B0   4230 8080 =010234      216           BNE   NEXT              NO MATCH, BUMP TO NEXT TABLE ENTRY  MAC02160
0101B4   2642                   217           AIS   R4,2               IF EQUAL, TRY NEXT HALFWORD     MAC02170
0101B6   2632                   218           AIS   R3,2                                              MAC02180
0101B8   C530 0006              219           CLHI  R3,6              HAVE WE FOUND 3 EQUAL HALFWORDS  MAC02190
0101BC   20E8                   220           BNES  LOOKUP            NO, LOOP                        MAC02200


0101BE   C510 0030              222  MATCH    CLHI  R1,RUN-ORG-4      * OPTION MATCH-CHECK IF RUN CMD  MAC02220
0101C2   4330 80B6 =01027C      223           BE    SELTST1           YES, SELECT TEST                MAC02230
0101C6   C500 000D              224           CLHI  R0,X'0D'          NO, CHECK IF CR FOLLOWS OPT     MAC02240
0101CA   0339                   225           BER   R9                                              MAC02250
0101CC   C510 0018              226  REGCHK   CLHI  R1,SEGREG-ORG-4                                 MAC02260
0101D0   4230 801C =0101F0      227           BNE   LOKAGN                                          MAC02270
0101D4   41D0 8062 =01023A      228           BAL   R13,HEXASC                                       MAC02280
0101D8   C560 0300              229           CLHI  R6,X'300'                                       MAC02290
0101DC   2337                   230           BES   STR1                                            MAC02300
0101DE   C560 0500              231           CLHI  R6,X'500'                                       MAC02310
0101E2   2334                   232           BES   STR1                                            MAC02320
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0101E4  C560 0900            233          CLHI  R6,X'900'                                    MAC02330
0101E8  0239                 234          BNER  R9                                           MAC02340
0101EA  4061 FF20 =01010E    235  STR1    STH   R6,ORG+4(R1)                                 MAC02350
0101EE  2308                 236          BS    LF1                                          MAC02360
0101F0  C510 0000            237  LOKAGN  CLHI  R1,TEST-ORG-4      CHECK IF TEST CMD       MAC02370
0101F4  2337                 238          BES   TESTST                                       MAC02380
0101F6  41D0 8040 =01023A    239          BAL   R13,HEXASC         GET HEX OPERAND           MAC02390
0101FA  4061 FF10 =01010E    240          STH   R6,ORG+4(R1)       STORE IN OPTION TABLE HALFWORD  MAC02400
0101FE  4300 FF68 =01016A    241  LF1     B     LF                 GO TO BEGINNING           MAC02410
010202  0700                 242  TESTST  XR    R0,R0              * TEST CMD                MAC02420
010204  4001 FF06 =01010E    243          STH   R0,ORG+4(R1)       CLEAR OPTION HALFWORD     MAC02430
010208  41D0 802E =01023A    244  TST00   BAL   R13,HEXASC         GET HEX OPERAND           MAC02440
01020C  C560 0009            245          CLHI  R6,9               9 OR GREATER?             MAC02450
010210  0389                 246          BNLR  R9                 YES, ERROR                MAC02460
010212  2431                 247          LIS   R3,1               CONVERT FROM BINARY TO    MAC02470
010214  C560 000F            248  TST01   CLHI  R6,15              UNARY BIT PATTERN LEFT    MAC02480
010218  2334                 249          BES   TST2                                         MAC02490
01021A  0A33                 250          AR    R3,R3                                        MAC02500
01021C  2661                 251          AIS   R6,1                                         MAC02510
01021E  2205                 252          BS    TST01                                        MAC02520
010220  4631 FEEA =01010E    253  TST2    OH    R3,ORG+4(R1)       OR BIT PATTERN INTO       MAC02530
010224  4031 FEE6 =01010E    254          STH   R3,ORG+4(R1)       OPTION HALFWORD           MAC02540
010228  C500 000D            255          CLHI  R0,X'0D'           WHERE WE TERMINATED BY CR ?  MAC02550
01022C  4230 FFD8 =010208    256          BNE   TST00              NO, LOOK FOR ANOTHER HEX OPERAND  MAC02560
010230  4300 FF36 =01016A    257          B     LF                 YES, GO TO BEGINNING      MAC02570
010234  2618                 258  NEXT    AIS   R1,8               BUMP TABLE INDEX TO NEXT ENTRY  MAC02580
010236  4300 FF68 =0101A2    259          B     OKIN2              RESUME LOOKUP             MAC02590


01023A  41F0 94EA =011728    261  HEXASC  BAL   R15,GETCHR        * HEX CONVERT ROUTINE     MAC02610
01023E  0766                 262          XR    R6,R6              CLEAR BUFFER REGISTER     MAC02620
010240  C500 0020            263          CLHI  R0,X'20'           SKIP LEADING SPACES       MAC02630
010244  2235                 264          BES   HEXASC                                        MAC02640
010246  C500 0030            265  HEXLP   CLHI  R0,C'0'           CHECK IF VALID HEX CHARACTER  MAC02650
01024A  0289                 266          BLR   R9                 NO, PRINT ?               MAC02660
01024C  C500 003A            267          CLHI  R0,X'3A'                                     MAC02670
010250  2188                 268          BLS   HEX                YES,                      MAC02680
010252  C500 0041            269          CLHI  R0,C'A'                                      MAC02690
010256  0289                 270          BLR   R9                 NO, PRINT ?               MAC02700
010258  C500 0047            271          CLHI  R0,X'47'                                     MAC02710
01025C  0389                 272          BNLR  R9                 NO, PRINT ?               MAC02720
01025E  2609                 273          AIS   R0,9               ADJUST A-F TO 10-15       MAC02730
010260  C400 000F            274  HEX     NHI   R0,15              ISOLATE 4 BITS            MAC02740
010264  1164                 275          SLLS  R6,4               SHIFT LEFT 4              MAC02750
010266  0660                 276          OR    R6,R0              OR IN NEW CHARACTER       MAC02760
010268  41F0 94BC =011728    277          BAL   R15,GETCHR         GET NEXT CHARACTER        MAC02770
01026C  C500 000D            278          CLHI  R0,X'0D'                                     MAC02780
010270  033D                 279          BER   R13                EXIT IF CR                MAC02790
010272  C500 002C            280          CLHI  R0,X'2C'                                     MAC02800
010276  033D                 281          BER   R13                OR COMMA                  MAC02810
010278  4300 FFCA =010246    282          B     HEXLP              LOOP TO PROCESS IT        MAC02820
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01027C  0722                 284  SELTST1  XR    R2,R2                                                    MAC02840
01027E  0220 976B =0119ED    285           STB   R2,TTYFLG                                                MAC02850
010282  5020 9782 =011AU8    286           ST    R2,TOTAL                                                 MAC02860
010286  5020 9782 =011AUC    287           ST    R2,TOTALERR                                              MAC02870
01028A  4020 968U =0119UE    288           STH   R2,ERRNUM                                                MAC02880
01028E  5800 976E =011AUU    289           L     R0,PSWMASK       LOAD PSW MASK                           MAC02890
U10292  C400 FBFF            290           NHI   R0,X'FBFF'       MASK OFF MAC BIT                        MAC02900
010296  F850 0000 A0F0       291           LI    R3,Y'A0F0'       LOAD STANDARD PSW VALUE                 MAC02910
01029C  0630                 292           OR    R3,R0            OR IN PSW MASK                          MAC02920
01029E  5030 9796 =011A38    293           ST    R3,HALT          STORE NEW PSW VALUE                     MAC02930
0102A2  5030 979A =011A4U    294           ST    R3,ERRHALT                                               MAC02940
0102A6  C830 24F0            295           LHI   R3,X'24F0'       LOAD STANDARD PSW VALUE                 MAC02950
0102AA  0630                 296           OR    R3,R0            OR IN PSW MASK                          MAC02960
0102AC  5030 9798 =011A48    297           ST    R3,ENBMAC        STORE NEW PSW VALUE                     MAC02970
0102B0  C830 20F0            298           LHI   R3,X'20F0'       LOAD STANDARD PSW VALUE                 MAC02980
0102B4  0630                 299           OR    R3,R0            OR IN PSW MASK                          MAC02990
U102B6  5030 9776 =011A3U    300           ST    R3,ENABLE        STORE NEW PSW VALUE                     MAC03000
U102BA  5030 978E =011A4C    301           ST    R3,DISMAC                                                MAC03010
0102BE  7320 FE4C =01U1UE    302  SELTST   LHL   R2,TEST          LOAD INITIAL TEST OPTION                MAC03020
0102C2  3422                 303           EXHR  R2,R2                                                    MAC03030
0102C4  0711                 304           XR    R1,R1                                                    MAC03040
0102C6  250D                 305           BS    SHIFT                                                    MAC03050
0102C8  0711                 306  TSTSEL   XR    R1,R1                                                    MAC03060
U102CA  4010 9640 =U119UE    307           STH   R1,ERRNUM        ZERO ERROR FLAG                         MAC03070
U102CE  5820 973E =011A1U    308  TSTSEL2  L     R2,UPTSAV        LOAD CURRENT TEST OPTION                MAC03080
0102D2  D310 971F =U119F5    309           LB    R1,SUBTST        LOAD PREVIOUS TEST NUMBER               MAC03090
0102D6  2611                 310  BUMP     AIS   R1,1             INCREMENT TEST NUMBER                   MAC03100
0102D8  C510 0009            311           CLHI  R1,9             HAVE WE REACHED MAX TEST NUMBER ?       MAC03110
0102DC  4380 8050 =010330    312           BNL   OPTCHK           YES,CHECK FOR CONTIN OPTION             MAC03120
0102E0  1121                 313  SHIFT    SLLS  R2,1             NO, IS NEXT TEST TO BE EXECUTED         MAC03130
0102E2  2286                 314           BNCS  BUMP             NO, INCREMENT TEST NUMBER               MAC03140
0102E4  5020 9728 =011A1U    315           ST    R2,OPTSAV        YES, SAVE CURRENT TEST OPTION           MAC03150
0102E8  D210 9709 =0119F5    316           STB   R1,SUBTST        SAVE CURRENT TEST NUMBER                MAC03160
0102EC  1112                 317           SLLS  R1,2             ESTABLISH BRANCH INDEX                  MAC03170
0102EE  5841 801A =01030C    318           L     R4,TST(R1)                                               MAC03180
0102F2  7310 FE30 =010126    319           LHL   R1,SEGREG                                                MAC03190
U102F6  F850 FFF1 0010       320           LI    R5,Y'FFF10010                                            MAC03200
0102FC  5051 0004            321           ST    R5,4(R1)                                                 MAC03210
U10300  5800 9744 =011A48    322           L     R0,ENBMAC                                                MAC03220
U10304  5830 9744 =011A4C    323           L     R3,DISMAC                                                MAC03230
010308  1803                 324           LPSWR R3               DISABLE MAC, SET F, GO TO TEST          MAC03240


01030C                       326           ALIGN 4                                                        MAC03260
01030C  0001 03CA            327  TST      DC    A(TEST0)                                                 MAC03270
010310  0001 0440            328           DC    A(TEST1)                                                 MAC03280
010314  0001 0524            329           DC    A(TEST2)                                                 MAC03290
010318  0001 05A6            330           DC    A(TEST3)                                                 MAC03300
01031C  0001 064C            331           DC    A(TEST4)                                                 MAC03310
010320  0001 06FA            332           DC    A(TEST5)                                                 MAC03320
010324  0001 0750            333           DC    A(TEST6)                                                 MAC03330
010328  0001 07DA            334           DC    A(TEST7)                                                 MAC03340
01032C  0001 0896            335           DC    A(TEST8)                                                 MAC03350
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010330  D3B0 96C0 =0119F4     337  OPTCHK   LB     R11,ADDRESS                                    MAC03370
010334  73C0 96EC =011A24     338           LHL    R12,CRTFLG                                     MAC03380
010338  2336                  339           BZS    CMD1                                           MAC03390
01033A  26B1                  340           AIS    R11,1                                          MAC03400
01033C  DEB0 96B2 =0119F2     341           OC     R11,WRTCMD                                     MAC03410
010340  27B1                  342           SIS    R11,1                                          MAC03420
010342  2303                  343           BS     MSGTST                                         MAC03430
010344  DEB0 96AA =0119F2     344  CMD1     OC     R11,WRTCMD                                     MAC03440
010348  7310 FDCA =010116     345  MSGTST   LHL    R1,NOMSG                                       MAC03450
01034C  2133                  346           BNZS   DISTOT                                         MAC03460
01034E  9DBC                  347           SSR    R11,R12        SENSE TTY STATUS                MAC03470
010350  231E                  348           BNMS   CONCHK                                         MAC03480
010352  2411                  349  DISTOT   LIS    R1,1                                           MAC03490
010354  5110 96B0 =011A08     350           AM     R1,TOTAL       INCREMENT TOTAL COUNT           MAC03500
010358  5870 96AC =011A08     351           L      R7,TOTAL                                       MAC03510
01035C  41E0 92D2 =011632     352           BAL    R14,WRITE      WRITE CURRENT COUNT ON DISPLAY  MAC03520
010360  9DBC                  353           SSR    R11,R12                                        MAC03530
010362  2315                  354           BNMS   CONCHK                                         MAC03540
010364  D2B0 9685 =0119ED     355           STB    R11,TTYFLG                                     MAC03550
010368  4300 FF52 =0102BE     356           B      SELTST                                         MAC03560
01036C  7310 FDAE =01011E     357  CONCHK   LHL    R1,CONTIN                                      MAC03570
010370  4330 801C =010390     358           BZ     TTYCHK         IF NOT SET CHECK TTY FLAG       MAC03580
010374  9DBC                  359           SSR    R11,R12        SENSE TTY STATUS                MAC03590
010376  C3C0 0020             360           THI    R12,X'20'      IS BREAK KEY SET ?              MAC03600
01037A  4330 FF40 =01028E     361           BZ     SELTST                                         MAC03610
01037E  73F0 96A2 =011A24     362           LHL    R15,CRTFLG                                     MAC03620
010382  2335                  363           BZS    SENSE1                                         MAC03630
010384  DEB0 966B =0119F3     364           OC     R11,RDCMD                                      MAC03640
010388  9BBF                  365           RDR    R11,R15                                        MAC03650
01038A  2303                  366           BS     TTYCHK                                         MAC03660
01038C  9DBC                  367  SENSE1   SSR    R11,R12        YES, WAIT FOR BREAK STATUS      MAC03670
01038E  2041                  368           BOS    SENSE1         TO GO AWAY                      MAC03680
010390  D3C0 9659 =0119ED     369  TTYCHK   LB     R12,TTYFLG     HAS TTY BEEN TURNED OFF ?       MAC03690
010394  08CC                  370           LR     R12,R12                                        MAC03700
010396  4330 FDB6 =010150     371           BZ     ENABLE1        NO, RETURN TO COMMAND MODE      MAC03710
01039A  5810 966A =011A08     372           L      R1,TOTAL                                       MAC03720
01039E  41E0 9350 =0116F2     373           BAL    R14,CONVERT                                    MAC03730
0103A2  001C                  374           DC     X'1C'          SHIFT INDEX                     MAC03740
0103A4  0001 195A             375           DC     A(TOTALMSG)                                    MAC03750
0103A8  41F0 938A =011736     376           BAL    R15,PRINT                                      MAC03760
0103AC  0001 1958             377           DC     A(TOTMSG)                                      MAC03770
0103B0  5810 9658 =011A0C     378           L      R1,TOTALERR                                    MAC03780
0103B4  41E0 933A =0116F2     379           BAL    R14,CONVERT                                    MAC03790
0103B8  001C                  380           DC     X'1C'                                          MAC03800
0103BA  0001 195A             381           DC     A(TOTALMSG)                                    MAC03810
0103BE  41F0 9374 =011736     382           BAL    R15,PRINT                                      MAC03820
0103C2  0001 195A             383           DC     A(TOTALMSG)                                    MAC03830
0103C6  4300 FD86 =010150     384           B      ENABLE1                                        MAC03840
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TEST0

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                                386  *                    T E S T 0                  *          MAC03860
                                387  *                                               *          MAC03870
                                388  * PURPOSE:                                      *          MAC03880
                                389  *  TO INSURE THAT THE CORRECT SEGMENTATION REGISTERS  *   MAC03890
                                390  *  ARE SELECTED IN THE FULLWORD MODE.            *          MAC03900
                                391  *                                               *          MAC03910
                                392  * ASSUMPTIONS:                                  *          MAC03920
                                393  *  THIS TEST ASSUMES THAT THE SERIES 32 PROCESSOR     *   MAC03930
                                394  *  TESTS AND THE SERIES 32 MEMORY TESTS HAVE RUN     *   MAC03940
                                395  *  WITHOUT DETECTING A FAILURE.                  *          MAC03950
                                396  *                                               *          MAC03960
                                397  * DESIGN SPECIFICATIONS:                        *          MAC03970
                                398  *  EACH SEGMENTATION REGISTER, STARTING WITH REGISTER *   MAC03980
                                399  *  0, IS LOADED WITH A RELOCATION FIELD OF 120, 100,  *   MAC03990
                                400  *  122, 123,...12F, LOCATIONS X'120001, X'12100',    *   MAC04000
                                401  *  X'12200',...X'12F00' ARE LOADED WITH VALUES OF    *   MAC04010
                                402  *  X'12345678', X'10000', X'20000',...X'F0000'. THE  *   MAC04020
                                403  *  MAC IS ENABLED AND ADDRESS 0 IS READ, IF REGISTER  *   MAC04030
                                404  *  0 IS SELECTED, X'12345678' SHOULD BE READ, IF     *   MAC04040
                                405  *  REGISTER 0 IS NOT SELECTED, THE DATA READ SHOULD  *   MAC04050
                                406  *  EQUAL THE ADDRESS OF THE LOCATION READ.       *          MAC04060
                                407  *                                               *          MAC04070
                                408  * HOW TO RUN THE TEST:                          *          MAC04080
                                409  *  ENTER TEST 0 AND ANY OTHER OPTION INFORMATION     *   MAC04090
                                410  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO      *          MAC04100
                                411  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND  *  MAC04110
                                412  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION     *          MAC04120
                                413  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *   MAC04130
                                414  *  ENTERING THE RUN COMMAND.                     *          MAC04140

0103CA  41F0 923C =0116UA       416  TEST0   BAL   R15,TSTNUM        PRINT TEST NUMBER          MAC04160
0103CE  2441                    417          LIS   R4,1                                          MAC04170
0103D0  D240 9623 =0119F7       418          STB   R4,CONFLD         STORE CONTROL FLD VALUE    MAC04180
0103D4  7340 FD4E =010126       419          LHL   R4,SEGREG         LOAD START ADRS OF SEG REGISTER  MAC04190
0103D8  2454                    420          LIS   R5,4              ESTABLISH INCREMENT VALUE  MAC04200
0103DA  C864 003C               421          LHI   R6,60(R4)         ESTABLISH BXLE LIMIT       MAC04210
0103DE  F870 0FF1 2010          422          LI    R7,Y'0FF12010'    LOAD VALUE FOR SEG REGISTER  MAC04220
0103E4  5074 0000               423  STORE   ST    R7,0(R4)          STORE DATA IN SEGMENTATION REG  MAC04230
0103E8  CA70 0100               424          AHI   R7,X'100'                                     MAC04240
0103EC  C140 FFF4 =0103E4       425          BXLE  R4,STORE          REPEAT UNTIL ALL SEG REGS LOADED  MAC04250
0103F0  7340 FD32 =010126       426          LHL   R4,SEGREG                                     MAC04260
0103F4  F870 0FF1 0010          427          LI    R7,Y'0FF10010'                                MAC04270
0103FA  5074 0004               428          ST    R7,4(R4)                                      MAC04280
0103FE  F840 0001 2000          429          LI    R4,Y'12000'       LOAD START ADRS OF BXLE    MAC04290
010404  C850 0100               430          LHI   R5,X'100'         LOAD INCREMENT VALUE       MAC04300
010408  F860 0001 2F00          431          LI    R6,Y'12F00'       LOAD BXLE LIMIT            MAC04310
01040E  F880 0001 0000          432          LI    R8,Y'10000'       LOAD DATA TO BE STORED IN MEMORY  MAC04320
010414  0777                    433          XR    R7,R7                                         MAC04330
010416  5074 0000               434  STORE1  ST    R7,0(R4)          STORE DATA IN MEMORY       MAC04340
01041A  0A78                    435          AR    R7,R8             INCREMENT DATA VALUE       MAC04350
01041C  C140 FFF6 =010416       436          BXLE  R4,STORE1         STORE NEXT VALUE           MAC04360
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TEST0

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010420   F840 1234 5678        437            LI    R4,Y'12345678'                                    MAC04370
010426   5040 9BD6 =012000     438            ST    R4,Y'12000'                                       MAC04380
01042A   9530                  439  EPSR      EPSR  R3,R0            ENABLE MAC                       MAC04390
01042C   5810 0000              440            L     R1,0                                              MAC04400
010430   9503                  441            EPSR  R0,R3            DISABLE MAC                      MAC04410
010432   0514                  442            CLR   R1,R4            IS DATA READ = CURRENT ADRS ?    MAC04420
010434   2334                  443            BES   CONT2            YES, CONTINUE WITH PROGRAM       MAC04430
010436   41F0 9218 =011652     444            BAL   R15,ERROR        NO, PRINT ERROR                  MAC04440
010438   3032                  445            DCX   3032             ERROR NUMBER          * 0002 *   MAC04450
01043C   4300 901C =01145C     446  CONT2     B     TSTCHK           CHECK FOR NEXT TEST              MAC04460
```

TEST 1

```
                                448  *                    T E S T 1                  *          MAC04480
                                449  *                                               *          MAC04490
                                450  * PURPOSE: TO EXERCISE THE RELOCATION FIELD.    *          MAC04500
                                451  *                                               *          MAC04510
                                452  * ASSUMPTIONS:                                  *          MAC04520
                                453  *  THIS TEST ASSUMES THAT TEST 0 HAS RUN WITHOUT *          MAC04530
                                454  *  DETECTING A FAILURE.                         *          MAC04540
                                455  *                                               *          MAC04550
                                456  * DESIGN SPECIFICATIONS:                        *          MAC04560
                                457  *  THE TEST LOADS SEGMENTATION REGISTER 0 WITH A KNOWN*     MAC04570
                                458  *  RELOCATION FIELD VALUE. THE VALUE OF THE RELOCATION*     MAC04580
                                459  *  FIELD IS THEN STORED IN A PREDETERMINED MEMORY *          MAC04590
                                460  *  LOCATION. THE MAC IS ENABLED AND A LOCATION IS READ*     MAC04600
                                461  *  IF THE MAC RELOCATES THE ADRS CORRECTLY THE VALUE *       MAC04610
                                462  *  READ WILL EQUAL THE VALUE IN THE RELOCATION FIELD. *      MAC04620
                                463  *  THE RELOCATION FIELD VALUE IS CHANGED AND THE TEST *     MAC04630
                                464  *  REPEATED UNTIL ALL THE VALUES LISTED BELOW HAVE *         MAC04640
                                465  *  BEEN TESTED.                                 *          MAC04650
                                466  *                                               *          MAC04660
                                467  *  REL FIELD VAL USED        MEM LOC READ       *          MAC04670
                                468  *    000 TO 0DF                 2000           *          MAC04680
                                469  *    F30 TO FFF                 F000           *          MAC04690
                                470  *    0E0 TO 0FF                 0000           *          MAC04700
                                471  *                                               *          MAC04710
                                472  *                                               *          MAC04720
                                473  *  RELOCATION VALUES OF F00 TO F2F ARE NOT TESTED. *        MAC04730
                                474  *                                               *          MAC04740
                                475  * HOW TO RUN THE TEST:                          *          MAC04750
                                476  *  ENTER TEST 1 AND ANY OTHER OPTION INFORMATION *          MAC04760
                                477  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO     *          MAC04770
                                478  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND *     MAC04780
                                479  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION     *          MAC04790
                                480  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *     MAC04800
                                481  *  ENTERING THE RUN COMMAND.                    *          MAC04810

010440  41F0 91C6 =0116DA     483  TEST1   BAL   R15,TSTNUM        PRINT TEST NUMBER                MAC04830
010444  E610 80BA =010502     484          LA    R1,ILGREG         LOAD ADRS OF INTERRUPT ROUTINE   MAC04840
010448  5010 0094             485          ST    R1,X'94'                                           MAC04850
01044C  2411                  486          LIS   R1,1                                               MAC04860
01044E  D210 95A5 =0119F7     487          STB   R1,CONFLD                                          MAC04870
010452  73B0 FCD0 =010126     488          LHL   R8,SEGREG         LOAD START ADRS OF SEG REGISTERS MAC04880
010456  C870 0010             489          LHI   R7,X'10'          LOAD SEG REGISTER VALUE          MAC04890
01045A  2498                  490          LIS   R9,8                                               MAC04900
01045C  24A4                  491          LIS   R10,4                                              MAC04910
01045E  C8B0 003C             492          LHI   R11,60                                             MAC04920
010462  5078 4900 0000        493  STORE5  ST    R7,0(R8,R9)                                        MAC04930
010468  C190 FFF6 =010462     494          BXLE  R9,STORE5                                          MAC04940
01046C  0744                  495          XR    R4,R4             SETUP FOR FIRST PATTERN  000-0DF MAC04950
01046E  C860 00DF             496          LHI   R6,X'DF'                                           MAC04960
010472  2451                  497          LIS   R5,1              LOAD INCREMENT VALUE             MAC04970
010474  C820 2000             498          LHI   R2,X'2000'        LOAD ADRS TO BE RELOCATED        MAC04980
```

TEST 1

```
010478  0874                    499  SHIFTVAL LR    R7,R4          LOAD RELOCATION FIELD VALUE                MAC04990
01047A  1178                    500           SLLS  R7,8          ESTABLISH INDEX                            MAC05000
01047C  5042 4700 0000          501           ST    R4,0(R2,R7)   STORE EXPECTED DATA IN MEMORY              MAC05010
010482  C140 FFF2 =010478       502           BXLE  R4,SHIFTVAL                                                MAC05020
010486  1048                    503  SUBTRACT SRLS  R4,8                                                       MAC05030
010488  2338                    504           BZS   LOAD9                                                      MAC05040
01048A  1041                    505           SRLS  R4,1                                                       MAC05050
01048C  2334                    506           BZS   SETBXLE                                                    MAC05060
01048E  C840 0F30               507           LHI   R4,X'F30'                                                  MAC05070
010492  2303                    508           BS    LOAD9                                                      MAC05080
010494  C840 00E0               509  SETBXLE  LHI   R4,X'E0'                                                  MAC05090
010498  F870 FFF0 0010          510  LOAD9    LI    R7,Y'FFF00010'  LOAD SEG REGISTER VALUE                   MAC05100
01049E  08A4                    511           LR    R10,R4                                                     MAC05110
0104A0  11A8                    512           SLLS  R10,8         ESTABLISH RELOCATION FIELD VALUE           MAC05120
0104A2  0A7A                    513           AR    R7,R10        ADD RELOCATION FIELD TO SEG REG VALUE      MAC05130
0104A4  5078 0000               514           ST    R7,0(R8)                                                   MAC05140
0104A8  9530                    515           EPSR  R3,R0         ENABLE MAC                                 MAC05150
0104AA  5812 0000               516           L     R1,0(R2)      READ DATA FROM MEMORY                      MAC05160
0104AE  9503                    517           EPSR  R0,R3         DISABLE MAC                                MAC05170
0104B0  0514                    518           CLR   R1,R4         IS DATA READ = DATA EXPECTED ?             MAC05180
0104B2  2334                    519           BES   CONT25        YES, CHECK NEXT RELOCATION FIELD VAL       MAC05190
0104B4  41F0 919A =011652       520           BAL   R15,ERROR     NO, PRINT ERROR                            MAC05200
0104B8  3033                    521           DCX   3033          ERROR NUMBER              * 0103 *         MAC05210
0104BA  C140 FFDA =010498       522  CONT25   BXLE  R4,LOAD9      REPEAT FOR EACH REL FIELD VALUE            MAC05220
0104BE  0822                    523           LR    R2,R2                                                      MAC05230
0104C0  4330 8024 =0104E8       524           BZ    EXTSET                                                     MAC05240
0104C4  C520 2000               525           CLHI  R2,X'2000'    HAS SECOND PATTERN BEEN TESTED ?           MAC05250
0104C8  2139                    526           BNES  CONT13        YES, SETUP FOR THIRD PATTERN 0E0-0FF       MAC05260
0104CA  C840 0F30               527           LHI   R4,X'F30'     NO, SETUP FOR SECOND PATTERN F30-FFF       MAC05270
0104CE  C860 0FFF               528           LHI   R6,X'FFF'                                                  MAC05280
0104D2  F820 0000 F000          529           LI    R2,Y'F000'    LOAD ADRS TO BE RELOCATED                  MAC05290
0104D8  2306                    530           BS    RTN           REPEAT TEST                                MAC05300
0104DA  C840 00E0               531  CONT13   LHI   R4,X'E0'     SETUP THIRD PATTERN  0E0-0FF               MAC05310
0104DE  C860 00FF               532           LHI   R6,X'FF'                                                   MAC05320
0104E2  0722                    533           XR    R2,R2         LOAD ADRS TO BE RELOCATED                  MAC05330
0104E4  4300 FF90 =010478       534  RTN      B     SHIFTVAL      REPEAT TEST                                MAC05340
0104E8  E640 FAE8 =00FFD4       535  EXTSET   LA    R4,EXTINT                                                  MAC05350
0104EC  C810 00E0               536           LHI   R1,X'E0'                                                   MAC05360
0104F0  2422                    537           LIS   R2,2                                                       MAC05370
0104F2  C830 00FE               538           LHI   R3,X'FE'                                                   MAC05380
0104F6  4041 0000               539  XDC      STH   R4,0(R1)                                                   MAC05390
0104FA  C110 FFF8 =0104F6       540           BXLE  R1,XDC                                                     MAC05400
0104FE  4300 8F5A =01145C       541           B     TSTCHK                                                     MAC05410
                                542  *                                                                        MAC05420
                                543  *                                                                        MAC05430
                                544  *                                                                        MAC05440
010502  5830 9546 =011A4C       545  ILGREG   L     R3,DISMAC                                                  MAC05450
010506  9503                    546           EPSR  R0,R3         SWITCH BACK TO SET F                       MAC05460
010508  41F0 9146 =011652       547           BAL   R15,ERROR     PRINT ERROR MESSAGE                        MAC05470
01050C  3032                    548           DCX   3032          ERROR NUMBER              * 0102 *         MAC05480
01050E  D218 0043               549           STB   R1,67(R8)                                                  MAC05490
010512  D318 0043               550           LB    R1,67(R8)                                                  MAC05500
010516  0811                    551           LR    R1,R1                                                      MAC05510
```

TEST 1

```
010518   2334                  552           BZS   RTN6                                          MAC05520
01051A   41F0 912C =01164A     553           BAL   R15,ERROR1                                    MAC05530
01051E   3034                  554           DCX   3034          ERROR NUMBER        * 0104 *  MAC05540
010520   4300 FF96 =01048A     555  RTN6     B     CONT25        RETURN TO TEST                  MAC05550
```

TEST 2

```
                                557  *                    T E S T 2                  *                MAC05570
                                558  *                                               *                MAC05580
                                559  * PURPOSE:                                      *                MAC05590
                                560  *  TO EXERCISE THE LIMIT FIELD AND CHECK THE INVALID  *          MAC05600
                                561  *  ADDRESS INTERRUPT.                           *                MAC05610
                                562  *                                               *                MAC05620
                                563  * ASSUMPTIONS:                                  *                MAC05630
                                564  *  THIS TEST ASSUMES THAT TESTS 0 AND 1         *                MAC05640
                                565  *  HAVE RUN WITHOUT DETECTING A FAILURE.        *                MAC05650
                                566  *                                               *                MAC05660
                                567  * DESIGN SPECIFICATIONS:                        *                MAC05670
                                568  *  SEGMENTATION REGISTER ZEROS LIMIT FIELD IS LOADED  *          MAC05680
                                569  *  WITH F00. AN ADRS EXCEEDING THAT LIMIT IS READ  *             MAC05690
                                570  *  FROM. AN INVALID ADRS INTERRUPT IS EXPECTED. IF  *            MAC05700
                                571  *  HTE INTERRUPT IS NOT GENERATED AN ERROR IS PRINTED.*          MAC05710
                                572  *  IF HTE INTERRUPT IS GENERATED THE MAC STATUS IS  *            MAC05720
                                573  *  TESTED TO INSURE THE CORRECT STATUS IS SET. THIS  *           MAC05730
                                574  *  SEQUENCE IS REPEATED FOR EACH LIMIT FIELD VALUE UP *         MAC05740
                                575  *  TO FFF.                                      *                MAC05750
                                576  *                                               *                MAC05760
                                577  * HOW TO RUN THE TEST:                          *                MAC05770
                                578  *  ENTER TEST 2 AND ANY OTHER OPTION INFORMATION  *              MAC05780
                                579  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO     *                MAC05790
                                580  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND  *         MAC05800
                                581  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION    *                MAC05810
                                582  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *          MAC05820
                                583  *  ENTERING THE RUN COMMAND.                    *                MAC05830

010524  41F0 90E2 =01160A     585  TEST2    BAL   R15,TSTNUM        PRINT TEST NUMBER                  MAC05850
010528  E610 804E =01057A     586           LA    R1,ILLADRS        LOAD ADRS OF INT ROUTINE           MAC05860
01052C  5010 0094             587           ST    R1,X'94'                                             MAC05870
010530  2411                  588           LIS   R1,1                                                 MAC05880
010532  D210 94C1 =0119F7     589           STB   R1,CONFLD                                            MAC05890
010536  C840 0100             590           LHI   R4,X'100'                                            MAC05900
01053A  F870 1000 0010        591           LI    R7,Y'10000010'                                       MAC05910
010540  F880 1010 0000        592           LI    R8,Y'10100000'                                       MAC05920
010546  F890 1FE0 0010        593           LI    R9,Y'1FE00010'                                       MAC05930
01054C  7320 F8D6 =010126     594  RESTART2 LHL   R2,SEGREG                                           MAC05940
010550  5072 0000             595           ST    R7,0(R2)                                             MAC05950
010554  9530                  596  EXCHANGE EPSR  R3,R0             ENABLE MAC                         MAC05960
010556  5814 0000             597           L     R1,0(R4)          GENERATE INVALID ADRS INT          MAC05970
01055A  41F0 8F52 =011480     598           BAL   R15,DELAY         WAIT FOR INTERRUPT                 MAC05980
01055E  9503                  599           EPSR  R0,R3             DISABLE MAC                        MAC05990
010560  0814                  600           LR    R1,R4             LOAD ADRS INDEX                    MAC06000
010562  C810 0100             601           SHI   R1,X'100'                                            MAC06010
010566  1018                  602           SRLS  R1,8                                                 MAC06020
010568  41F0 90E6 =011652     603           BAL   R15,ERROR         PRINT ERROR                        MAC06030
01056C  3035                  604           DCX   3035              ERROR NUMBER              * 0205 * MAC06040
01056E  CA40 0100             605  BXLE2    AHI   R4,X'100'                                            MAC06050
010572  C170 FFD6 =01054C     606           BXLE  R7,RESTART2                                          MAC06060
010576  4300 8EE2 =01145C     607           B     TSTCHK            FIND NEXT TEST                     MAC06070
```

TEST 2

```
                                608  *                                                                          MAC06080
                                609  *                                                                          MAC06090
                                610  *                                                                          MAC06100
01057A  5830 94CE =011A4C       611  ILLADRS  L      R3,DISMAC        INVALID ADDRESS INTERRUPT               MAC06110
01057E  9503                    612           EPSR   R0,R3            SWITCH BACK TO SET F                    MAC06120
010580  D312 0043               613           LB     R1,67(R2)                                                MAC06130
010584  C710 0010               614           XHI    R1,X'10'         IS CORRECT STATUS SET ?                 MAC06140
010588  2334                    615           BZS    CONT3                                                    MAC06150
01058A  41F0 90BC =01164A       616           BAL    R15,ERROR1                                               MAC06160
01058E  3036                    617           DCX    3036             ERROR NUMBER            * 0206 *        MAC06170
010590  D242 0043               618  CONT3    STB    R1,67(R2)                                                MAC06180
010594  D312 0043               619           LB     R1,67(R2)                                                MAC06190
010598  0811                    620           LR     R1,R1                                                    MAC06200
01059A  2334                    621           BZS    RTN7                                                     MAC06210
01059C  41F0 90AA =01164A       622           BAL    R15,ERROR1                                               MAC06220
0105A0  3034                    623           DCX    3034             ERROR NUMBER            * 0204 *        MAC06230
0105A2  4300 FFC8 =01056E       624  RTN7     B      BXLE2            YES, CONTINUE WITH TEST                 MAC06240
```

```
                                626  *                    T E S T 3                  *                MAC06260
                                627  *                                               *                MAC06270
                                628  * PURPOSE:                                      *                MAC06280
                                629  *  TO TEST THE EXECUTE PROTECT FEATURES OF THE MAC.  *           MAC06290
                                630  *                                               *                MAC06300
                                631  * ASSUMPTIONS:                                  *                MAC06310
                                632  *  THIS TEST ASSUMES THAT TEST 0, 1, AND 2 HAVE  *               MAC06320
                                633  *  RUN WITHOUT DETECTING A FAILURE.              *               MAC06330
                                634  *                                               *                MAC06340
                                635  * DESIGN SPECIFICATIONS:                        *                MAC06350
                                636  *  SEGMENTATION REGISTER 0 IS LOADED WITH X'FFF00090'.*           MAC06360
                                637  *  THE CODE FOR "LCS R7" AND "BR R15" IS STORED IN  *             MAC06370
                                638  *  LOCATION X'2000' AND X'2002'. THE MAC IS ENABLED  *           MAC06380
                                639  *  AND A BRANCH IS TAKEN THROUGH THE MAC TO LOCATION  *          MAC06390
                                640  *  X'2000'. AN EXECUTE PROTECT INTERRUPT SHOULD BE  *            MAC06400
                                641  *  GENERATED. THE CONTENTS OF R7 IS THEN CHECKED TO  *           MAC06410
                                642  *  INSURE THAT IT WAS NOT CHANGED EVEN THOUGH THE  *             MAC06420
                                643  *  INTERRUPT WAS GENERATED. THE TEST IS REPEATED WITH *          MAC06430
                                644  *  VALUES OF X'FFF000B0' AND X'FFF000F0' IN REGISTER0 *          MAC06440
                                645  *                                               *                MAC06450
                                646  * HOW TO RUN THE TEST:                          *                MAC06460
                                647  *  ENTER TEST 3 AND ANY OTHER OPTION INFORMATION  *              MAC06470
                                648  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO  *                   MAC06480
                                649  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND  *         MAC06490
                                650  *  INPUT STRUCTURE. AFTER DESIRED OPTION  *                      MAC06500
                                651  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *          MAC06510
                                652  *  ENTERING THE RUN COMMAND.                     *               MAC06520

0105A6  41F0 9060 =01160A       654  TEST3    BAL   R15,TSTNUM        PRINT TEST NUMBER                MAC06540
0105AA  E610 8042 =0105F0       655           LA    R1,EXPROINT       LOAD ADDRS OF INT ROUTINE        MAC06550
0105AE  5010 0094               656           ST    R1,X'94'                                           MAC06560
0105B2  7320 FB70 =010126       657           LHL   R2,SEGREG         LOAD START ADRS OF SEG REGISTER  MAC06570
0105B6  C810 0FB9               658           LHI   R1,X'0FB9'        LOAD CONTROL FIELD VALUES        MAC06580
0105BA  5010 945A =011A18       659           ST    R1,CONVAL         STORW CONTROL FIELD VALUES       MAC06590
0105BE  41F0 8ED4 =011496       660  NXTFLD   BAL   R15,ESTCON        EST CURRENT CONTROL FIELD VALUE  MAC06600
0105C2  4300 8E96 =01145C       661           B     TSTCHK            YES, CHECK FOR NEXT TEST         MAC06610
0105C6  F870 FFF1 0000          662           LI    R7,Y'FFF10000'    LOAD SEG REG VALUE               MAC06620
0105CC  D310 9427 =0119F7       663           LB    R1,CONFLD         LOAD CURRENT CONTROL FIELD VALUE MAC06630
0105D0  1114                    664           SLLS  R1,4              CHANGE 0X TO X0                  MAC06640
0105D2  0A71                    665           AR    R7,R1             ADD CURRENT VALUE TO SEG REG VALUE MAC06650
0105D4  5072 0000               666  STRAGN6  ST    R7,0(R2)          STORE VALUE IN SEG REGISTER      MAC06660
0105D8  C840 2000               667           LHI   R4,X'2000'        LOAD START ADRS (VIRTUAL)        MAC06670
0105DC  F870 2571 030F          668           LI    R7,Y'2571030F'    LCS R7 & BR R15                  MAC06680
0105E2  5070 9A1A =012000       669           ST    R7,Y'12000'       STORE INSTRUCTIONS IN MEMORY     MAC06690
0105E6  E6F0 8050 =01063A       670  REPEAT   LA    R15,ERROR7        LOAD BRANCH REG WITH ERROR ADRS  MAC06700
0105EA  0777                    671           XR    R7,R7             ZERO REGISTER R7                 MAC06710
0105EC  9530                    672           EPSR  R3,R0             ENABLE MAC                       MAC06720
0105EE  0304                    673           BR    R4                BRANCH TO X'2000'                MAC06730
                                674  *                                                                  MAC06740
                                675  *                                                                  MAC06750
                                676  *                                                                  MAC06760
```

TEST3

```
0105F0  5830 9458 =011A4C     677 EXPROINT L     R3,DISMAC          EXECUTE PROTECT INTERRUPT                MAC06770
0105F4  9503                  678          EPSR  R0,R3              SWITCH BACK TO SET F                     MAC06780
0105F6  0382 0043             679          LB    R8,67(R2)          LOAD STATUS REGISTER VALUE               MAC06790
0105FA  C780 0001             680          XHI   R8,1               IS CORRECT STATUS SET ?                  MAC06800
0105FE  2657                  681          BZS   CONT7              YES, CHECK FOR INSTRUCTION EXECUTION     MAC06810
010600  0814                  682          LR    R1,R4              LOAD VIRTUAL ADDRESS                     MAC06820
010602  EC10 0010             683          SRL   R1,16              SHIFT IT TO DETERMINE SEG REG NUM        MAC06830
010606  41F0 9040 =01164A     684          BAL   R15,ERROR1         PRINT ERROR MESSAGE                      MAC06840
01060A  3039                  685          DCX   3039               ERROR NUMBER                * 0309 *     MAC06850
01060C  0382 0043             686 CONT7    LB    R8,67(R2)                                                   MAC06860
010610  0888                  687          LR    R8,R8              WAS STATUS REG CLEARED ?                 MAC06870
010612  2194                  688          BNZS  CONT19             NO, CONTINUE TEST                        MAC06880
010614  41F0 9032 =01164A     689          BAL   R15,ERROR1         YES, PRINT ERROR MESSAGE                 MAC06890
010618  3130                  690          DCX   3130               ERROR NUMBER                * 0310 *     MAC06900
01061A  0877                  691 CONT19   LR    R7,R7              WAS INSTRUCTION EXECUTED ?               MAC06910
01061C  2334                  692          BZS   RETURN             NO, CONTINUE TEST                        MAC06920
01061E  41F0 9028 =01164A     693          BAL   R15,ERROR1         YES, PRINT ERROR MESSAGE                 MAC06930
010622  3131                  694          DCX   3131               ERROR NUMBER                * 0311 *     MAC06940
010624  0282 0043             695 RETURN   STB   R8,67(R2)          CLEAR STATUS REGISTER                    MAC06950
010628  0382 0043             696          LB    R8,67(R2)                                                   MAC06960
01062C  0888                  697          LR    R8,R8              WAS STATUS REG CLEARED ?                 MAC06970
01062E  2334                  698          BZS   BXLE4              YES, CONTINUE TEST                       MAC06980
010630  41F0 9016 =01164A     699          BAL   R15,ERROR1         NO, PRINT ERROR                          MAC06990
010634  3034                  700          DCX   3034               ERROR NUMBER                * 0304 *     MAC07000
010636  4300 FF84 =0105BE     701 BXLE4    B     NXTFLD             REPEAT TEST WITH NEXT CONTROL FLIED      MAC07010
                              702 *                                                                          MAC07020
                              703 *                                                                          MAC07030
                              704 *                                                                          MAC07040
01063A  9503                  705 ERROR7   EPSR  R0,R3              DISABLE MAC                              MAC07050
01063C  0814                  706          LR    R1,R4              LOAD VIRTUAL ADDRESS                     MAC07060
01063E  EC10 0010             707          SRL   R1,16              SHIFT IT TO DETERMINE SEG REG NUMBER     MAC07070
010642  41F0 900C =011652     708          BAL   R15,ERROR          PRINT ERROR MESSAGE                      MAC07080
010646  3132                  709          DCX   3132               ERROR NUMBER                * 0312 *     MAC07090
010648  4300 FFD8 =010624     710          B     RETURN             RETURN TO TEST NEXT SEG REGISTER         MAC07100
```

TEST 4

```
                                712  *                    T E S T 4                    *                MAC07120
                                713  *                                                 *                MAC07130
                                714  * PURPOSE:                                       *                MAC07140
                                715  *  TO TEST THE WRITE PROTECT FEATURES OF THE MAC.  *                MAC07150
                                716  *                                                 *                MAC07160
                                717  * ASSUMPTIONS:                                   *                MAC07170
                                718  *  THIS TEST ASSUMES THAT TEST 0, 1 AND 2 HAVE    *                MAC07180
                                719  *  RUN WITHOUT DETECTING A FAILURE.               *                MAC07190
                                720  *                                                 *                MAC07200
                                721  * DESIGN SPECIFICATIONS:                          *                MAC07210
                                722  *  SEGMENTATION REGISTER 0 IS LOADED WITH X'FFF00030'.*                MAC07220
                                723  *  THE MAC IS ENABLED AND AN ATTEMPT IS MADE TO STORE *               MAC07230
                                724  *  DATA THROUGH THE MAC INTO LOCATION X'2000'. A WRITE*               MAC07240
                                725  *  PROTECT INTERRUPT SHOULD BE GENERATED. THE CONTENTS*               MAC07250
                                726  *  LOCATION X'2000' ARE THEN CHECKED TO INSURE IT WAS *               MAC07260
                                727  *  NOT CHANGED EVEN THOUGH THE INTERRUPT WAS GENERATED*               MAC07270
                                728  *                                                 *                MAC07280
                                729  * HOW TO RUN THE TEST:                            *                MAC07290
                                730  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO       *                MAC07300
                                731  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND  *             MAC07310
                                732  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION      *                MAC07320
                                733  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *             MAC07330
                                734  *  ENTERING THE RUN COMMAND.                      *                MAC07340

01064C  41F0 8FBA =0116UA       736  TEST4    BAL   R15,TSTNUM        PRINT TEST NUMBER                MAC07360
010650  E610 8060 =010684       737           LA    R1,WRTINT         LOAD ADRS OF WRITE PROTECT INT   MAC07370
010654  5010 0094               738           ST    R1,X'94'                                           MAC07380
010658  C810 3133               739           LHI   R1,X'3133'        ERROR NUMBER 0413                MAC07390
01065C  4010 804E =0106AE       740           STH   R1,ERRNUM1                                         MAC07400
010660  F810 0000 FB73          741           LI    R1,Y'FB73'        LOAD CONTROL FIELD VALUES        MAC07410
010666  5010 93AE =011A18       742           ST    R1,CONVAL         STORE CONTROL FIELD VALUES       MAC07420
01066A  41F0 8E28 =011496       743  RESTART1 BAL   R15,ESTCON        EST CURRENT CONTROL FIELD VALUE  MAC07430
01066E  4300 80EA =01145C       744           B     TSTCHK                                             MAC07440
010672  7320 FA80 =010126       745           LHL   R2,SEGREG                                          MAC07450
010676  F870 FFF0 0000          746           LI    R7,Y'FFF00000'    LOAD SEG REGISTER VALUE          MAC07460
01067C  D310 9377 =0119F7       747           LB    R1,CONFLD         LOAD CURRENT CONTROL FIELD VALUE MAC07470
010680  1114                   748           SLLS  R1,4                                               MAC07480
010682  0A71                   749           AR    R7,R1             ADD CONTROL FIELD TO REG VALUE   MAC07490
010684  5072 0000               750  STRAGN1  ST    R7,0(R2)          TORE VALUE IN SEG REGISTER       MAC07500
010688  C840 2000               751           LHI   R4,X'2000'                                         MAC07510
01068C  F870 A5A5 A5A5          752           LI    R7,Y'A5A5A5A5'    LOAD DATA PATTERN                MAC07520
010692  0788                   753           XR    R8,R8                                              MAC07530
010694  5080 2000               754  REPEAT1  ST    R8,X'2000'                                         MAC07540
010698  9530                   755  EXPSR    EPSR  R3,R0             ENABLE MAC                       MAC07550
01069A  5074 0000               756           ST    R7,0(R4)          STORE DATA IN MEMORY             MAC07560
01069E  41F0 8EUE =011480       757           BAL   R15,DELAY         WAIT FOR INTERRUPT               MAC07570
0106A2  9503                   758           EPSR  R0,R3             DISABLE MAC                      MAC07580
0106A4  0814                   759           LR    R1,R4                                              MAC07590
0106A6  EC10 0010               760           SRL   R1,16                                              MAC07600
0106AA  41F0 8FA4 =011652       761           BAL   R15,ERROR                                          MAC07610
0106AE  3133                   762  ERRNUM1  DCX   3133              ERROR NUMBER          * 0413 *   MAC07620
```

TEST 4

```
                                763  * OR                                ERROR NUMBER              * 0514 *   MAC07630
0106B0   4300 8030 =0106E4      764          B      CONT15                                                    MAC07640
                                765  *                                                                       MAC07650
                                766  *                                                                       MAC07660
                                767  *                                                                       MAC07670
0106B4   5830 9394 =011A4C      768  WRTINT  L      R3,DISMAC           WRITE PROTECT INTERRUPT               MAC07680
0106B8   9513                   769          EPSR   R1,R3               SWITCH BACK TO SET F                  MAC07690
0106BA   0312 0043              770          LB     R1,67(R2)           LOAD STATUS REGISTER VALUE            MAC07700
0106BE   C710 0004              771          XHI    R1,4                IS STATUS CORRECT ?                   MAC07710
0106C2   2334                  772          BZS    CONT8                                                     MAC07720
0106C4   41F0 8F82 =01164A     773          BAL    R15,ERROR1                                                MAC07730
0106C8   3135                  774          DCX    3135                ERROR NUMBER              * 0415 *   MAC07740
0106CA   0312 0043              775  CONT8   LB     R1,67(R2)                                                 MAC07750
0106CE   0811                   776          LR     R1,R1               DID READ CLEAR STATUS REG ?           MAC07760
0106D0   2134                  777          BNZS   CONT20              NO, CONTINUE TEST                     MAC07770
0106D2   41F0 8F74 =01164A     778          BAL    R15,ERROR1          YES, PRINT ERROR MESSAGE              MAC07780
0106D6   3130                  779          DCX    3130                ERROR NUMBER              * 0410 *   MAC07790
0106D8   5810 2000              780  CONT20  L      R1,X'2000'                                                MAC07800
0106DC   2334                  781          BZS    CONT15                                                    MAC07810
0106DE   41F0 8F68 =01164A     782          BAL    R15,ERROR1          PRINT ERROR MESSAGE                   MAC07820
0106E2   3136                  783          DCX    3136                ERROR NUMBER              * 0416 *   MAC07830
0106E4   0212 0043              784  CONT15  STB    R1,67(R2)                                                 MAC07840
0106E8   0312 0043              785          LB     R1,67(R2)           DID WRITE CLEAR STATUS REG ?          MAC07850
0106EC   0811                   786          LR     R1,R1                                                     MAC07860
0106EE   2334                  787          BZS    BXLE5               YES,CONTINUE TEST                     MAC07870
0106F0   41F0 8F56 =01164A     788          BAL    R15,ERROR1          NO, PRINT ERROR MESSAGE               MAC07880
0106F4   3034                  789          DCX    3034                ERROR NUMBER              * 0404 *   MAC07890
0106F6   4300 FF70 =01166A     790  BXLE5   B      RESTART1                                                  MAC07900
```

TEST 5

```
                                792  *                    T E S T 5                  *                MAC07920
                                793  *                                               *                MAC07930
                                794  * PURPOSE:                                     *                MAC07940
                                795  *  TO TEST THE WRITE/INTERRUPT PROTECTION FEATURES *             MAC07950
                                796  *  OF MAC.                                     *                MAC07960
                                797  *                                               *                MAC07970
                                798  * ASSUMPTIONS:                                *                MAC07980
                                799  *  THIS TEST ASSUMES THAT TEST 0, 1 AND 2 HAVE *                MAC07990
                                800  *  RUN WITHOUT DETECTING A FAILURE.            *                MAC08000
                                801  * DESIGN SPECIFICATIONS:                       *                MAC08010
                                802  *  SEGMENTATION REGISTER 0 IS LOADED WITH X'FFF00050'.*          MAC08020
                                803  *  THE MAC IS ENABLED AND DATA IS STORED THROUGH THE *           MAC08030
                                804  *  MAC INTO LOCATION X'2000'. A WRITE/INTERRUPT *                MAC08040
                                805  *  PROTECT INTERRUPT SHOULD BE GENERATED. WHEN THE *             MAC08050
                                806  *  INTERRUPT IS GENERATED LOCATION X'2000' IS CHECKED *          MAC08060
                                807  *  TO INSURE THE DATA WAS STORED. THE TEST IS THEN *             MAC08070
                                808  *  REPEATED WITH A VALUE OF X'FFF000D0' IN *                     MAC08080
                                809  *  SEGMENTATION REGISTER 0.                    *                MAC08090
                                810  *                                               *                MAC08100
                                811  *                                               *                MAC08110
                                812  * HOW TO RUN THE TEST:                         *                MAC08120
                                813  *  ENTER TEST 5 AND ANY OTHER OPTION INFORMATION *               MAC08130
                                814  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO *                    MAC08140
                                815  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND *          MAC08150
                                816  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION *                   MAC08160
                                817  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *          MAC08170
                                818  *  ENTERING THE RUN COMMAND.                   *                MAC08180

0106FA  41F0 8FUC =0116UA       820  TEST5   BAL   R15,TSTNUM      PRINT TEST NUMBER                MAC08200
0106FE  E610 8018 =01071A       821          LA    R1,INTRPT1      LOAD ADRS OF INTERRUPT ROUTINE   MAC08210
010702  5010 0094               822          ST    R1,X'94'                                         MAC08220
010706  C810 3134               823          LHI   R1,X'3134'      ERROR NUMBER 0514                MAC08230
01070A  4010 FFA0 =0106AE       824          STH   R1,ERRNUM1                                       MAC08240
01070E  C810 0005               825          LHI   R1,X'0005'      LOAD CONTROL FIELD VALUES        MAC08250
010712  5010 9302 =011A18       826          ST    R1,CONVAL       STORE CURRENT CONTROL FIELD VALUES MAC08260
010716  4300 FF50 =01066A       827          B     RESTART1                                         MAC08270
                                828  *                                                             MAC08280
                                829  *                                                             MAC08290
                                830  *                                                             MAC08300
01071A  5830 932E =011A4C       831  INTRPT1 L     R3,DISMAC                                        MAC08310
01071E  9513                    832          EPSR  R1,R3           SWITCH BACK TO SET F             MAC08320
010720  D312 0043               833          LB    R1,67(R2)       LOAD CONTENTS OF STATUS REGISTER MAC08330
010724  C710 0002               834          XHI   R1,2            IS CORRECT STATUS SET ?          MAC08340
010728  2334                    835          BZS   CONT9                                            MAC08350
01072A  41F0 8F1C =01164A       836          BAL   R15,ERROR1      PRINT ERROR MESSAGE              MAC08360
01072E  3137                    837          DCX   3137            ERROR NUMBER          * 0517 *   MAC08370
010730  D312 0043               838  CONT9   LB    R1,67(R2)                                        MAC08380
010734  0811                    839          LR    R1,R1           DID READ CLEAR STATUS REG ?      MAC08390
010736  2134                    840          BNZS  CONT21          NO, CONTINUE TEST                MAC08400
010738  41F0 8FUE =01164A       841          BAL   R15,ERROR1      PRINT ERROR MESSAGE              MAC08410
01073C  3130                    842          DCX   3130            ERROR NUMBER          * 0510 *   MAC08420
```

TEST 5

```
01073E   5810 2000              843  CONT21   L      R1,X'2000'                                    MAC08430
010742   0517                   844           CLR    R1,R7          AS CORRECT DATA STORED IN MEMORY ?  MAC08440
010744   2334                   845           BES    RTN9                                          MAC08450
010746   41F0 8F00 =01164A      846           BAL    R15,ERROR1     PRINT ERROR MESSAGE                 MAC08460
01074A   3138                   847           DCX    3138           ERROR NUMBER          * 0518 *      MAC08470
01074C   4300 FF94 =0106E4      848  RTN9     B      CONT15                                             MAC08480
```

TEST 6

```
                                850  *                    T E S T 6                    *                MAC08500
                                851  *                                                 *                MAC08510
                                852  * PURPOSE:                                       *                MAC08520
                                853  *  TO INSURE THE OPERATION OF THE NON PRESENT    *                MAC08530
                                854  *  ADDRESS INTERRUPT OF THE MAC.                 *                MAC08540
                                855  *                                                 *                MAC08550
                                856  * ASSUMPTIONS:                                   *                MAC08560
                                857  *  THIS TEST ASSUMES THAT TEST 0, 1 AND 2 HAVE   *                MAC08570
                                858  *  RUN WITHOUT DETECTING A FAILURE.              *                MAC08580
                                859  *                                                 *                MAC08590
                                860  * DESIGN SPECIFICATIONS:                         *                MAC08600
                                861  *  SEGMENTATION REGISTER 0 IS LOADED WITH X'FFF00000',*             MAC08610
                                862  *  THE MAC IS ENABLED AND AN ATTEMPT IS MADE TO ACCESS*             MAC08620
                                863  *  MEMORY CONTROLLED BY SEGMENTATION REGISTER 0. THIS *             MAC08630
                                864  *  TEST IS REPEATED WITH SEGMENTATION REGISTER VALUES *             MAC08640
                                865  *  OF X'FFF00020', X'FFF00040', X'FFF00060',      *                MAC08650
                                866  *  X'FFF00080', X'FFF000A0', X'FFF000C0', X'FFF000E0',*            MAC08660
                                867  *                                                 *                MAC08670
                                868  * HOW TO RUN THE TEST:                           *                MAC08680
                                869  *  ENTER TEST 6 AND ANY OTHER OPTION INFORMATION *                MAC08690
                                870  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO      *                MAC08700
                                871  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND *            MAC08710
                                872  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION     *                MAC08720
                                873  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *           MAC08730
                                874  *  ENTERING THE RUN COMMAND.                     *                MAC08740

010750  41F0 8EB6 =0116BA     876  TEST6    BAL   R15,TSTNUM        PRINT TEST NUMBER                  MAC08760
010754  E610 8048 =0107A0     877           LA    R1,PRESINT        LOAD ADRS OF INT ROUTINE           MAC08770
010758  5010 0094             878           ST    R1,X'94'                                             MAC08780
01075C  F810 ECA8 6420        879           LI    R1,Y'ECA86420'    LOAD CURRENT CONTROL FIELD VALUES  MAC08790
010762  5010 92B2 =011A18     880           ST    R1,CONVAL         STORE CURRENT CONTROL FIELD VALUES MAC08800
010766  7320 F9BC =010126     881           LHL   R2,SEGREG                                            MAC08810
01076A  41F0 8D28 =011496     882  RESTART6 BAL   R15,ESTCON                                         MAC08820
01076E  4300 8CEA =01145C     883           B     TSTCHK            CHECK FOR NEXT TEST                MAC08830
010772  F870 FFF0 0000        884           LI    R7,Y'FFF00000'    LOAD SEG REGISTER VALUES           MAC08840
010778  D310 927B =0119F7     885           LB    R1,CONFLD                                            MAC08850
01077C  1114                  886           SLLS  R1,4                                                 MAC08860
01077E  0A71                  887           AR    R7,R1             ADD CONTROL FIELD TO REG VALUE     MAC08870
010780  5072 0000             888  STORE3   ST    R7,0(R2)                                             MAC08880
010784  9530                  889  EXPSR1   EPSR  R3,R0             ENABLE MAC                         MAC08890
010786  5810 0000             890           L     R1,0              GENERATE PRESENT  INTERRUPT        MAC08900
01078A  41F0 8D22 =011480     891           BAL   R15,DELAY         WAIT FOR INTERRUPT                 MAC08910
01078E  9503                  892           EPSR  R0,R3             DISABLE MAC                        MAC08920
010790  0814                  893           LR    R1,R4                                                MAC08930
010792  EC10 0010             894           SRL   R1,16                                                MAC08940
010796  41F0 8EB8 =011652     895           BAL   R15,ERROR         PRINT ERROR                        MAC08950
01079A  3139                  896           DCX   3139              ERROR NUMBER          * 0619 *     MAC08960
01079C  4300 FFCA =01076A     897  BXLE3    B     RESTART3                                             MAC08970
                              898  *                                                                    MAC08980
                              899  *                                                                    MAC08990
                              900  *                                                                    MAC09000
```

TEST 6

```
0107A0   5830 92A8 =011A4C     901  PRESINT  L     R3,DISMAC          NON PRESENT INTERRUPT                    MAC09010
0107A4   9513                  902             EPSR  R1,R3           SWITCH BACK TO SET F                     MAC09020
0107A6   D312 0043             903             LB    R1,67(R2)      LOAD STATUS                              MAC09030
0107AA   C710 0008             904             XHI   R1,8           IS CORRECT STATUS SET ?                  MAC09040
0107AE   2304                  905             BZS   CONT26         YES, CONTINUE WITH TEST                  MAC09050
0107B0   41F0 8E96 =01164A     906             BAL   R15,ERROR1     NO, PRINT ERROR                          MAC09060
0107B4   3230                  907             DCX   3230           ERROR NUMBER              * 0620 *       MAC09070
0107B6   D312 0043             908  CONT26    LB    R1,67(R2)                                               MAC09080
0107BA   0811                  909             LR    R1,R1                                                   MAC09090
0107BC   2104                  910             BNZS  CONT22                                                  MAC09100
0107BE   41F0 8E88 =01164A     911             BAL   R15,ERROR1                                              MAC09110
0107C2   3130                  912             DCX   3130           ERROR NUMBER              * 0610 *       MAC09120
0107C4   D212 0043             913  CONT22    STB   R1,67(R2)                                               MAC09130
0107C8   D312 0043             914             LB    R1,67(R2)                                               MAC09140
0107CC   0811                  915             LR    R1,R1                                                   MAC09150
0107CE   2304                  916             BZS   RTNA                                                    MAC09160
0107D0   41F0 8E76 =01164A     917             BAL   R15,ERROR1                                              MAC09170
0107D4   3034                  918             DCX   3034           ERROR NUMBER              * 0604 *       MAC09180
0107D6   4300 FFC2 =01079C     919  RTNA      B     BXLE3                                                   MAC09190
```

TEST 7

```
                                921  *                    T E S T 7                  *                MAC09210
                                922  *                                               *                MAC09220
                                923  * PURPOSE:                                      *                MAC09230
                                924  *  TO ENSURE THAT A PROGRAM CAN BE RELOCATED THROUGH  *          MAC09240
                                925  *  MEMORY AND EXECUTED WITH THE MAC ENABLED.     *                MAC09250
                                926  *                                               *                MAC09260
                                927  * ASSUMPTIONS:                                  *                MAC09270
                                928  *  THIS TEST ASSUMES THAT TEST 0, 1 AND 2 HAVE RUN  *           MAC09280
                                929  *  WITHOUT DETECTING A FAILURE.                 *                MAC09290
                                930  *                                               *                MAC09300
                                931  * DESIGN SPECIFICATION:                         *                MAC09310
                                932  *  SEGMENTATION REGISTER 0 IS SET UP FOR        *                MAC09320
                                933  *  NO-TRANSLATION. A SUBROUTINE IS THEN STORED INTO  *           MAC09330
                                934  *  MEMORY STARTING AT LOCATION X'2000'. THE MAC IS  *            MAC09340
                                935  *  ENABLED AND THE SUBROUTINE EXECUTED. THE MAC IS  *            MAC09350
                                936  *  DISABLED AND THE SUBROUTINE IS MOVED UP ONE WORD  *           MAC09360
                                937  *  IN MEMORY. THE MAC IS AGAIN ENABLED AND THE  *               MAC09370
                                938  *  SUBROUTINE EXECUTED. THIS ROUTINE IS REPEATED  *             MAC09380
                                939  *  UNTIL ALL AVAILABLE MEMORY UP TO X'10000' HAS BEEN *         MAC09390
                                940  *  TESTED.                                      *               MAC09400
                                941  *                                               *                MAC09410
                                942  * HOW TO RUN THE TEST:                          *                MAC09420
                                943  *  ENTER TEST 7 AND ANY OTHER OPTION INFORMATION  *              MAC09430
                                944  *  DESIRED VIA THE CONSOLE DEVICE. REFER TO     *                MAC09440
                                945  *  06-160F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND  *         MAC09450
                                946  *  INPUT STRUCTURE. AFTER THE DESIRED OPTION     *               MAC09460
                                947  *  INFORMATION IS ESTABLISHED THE TEST IS EXECUTED BY *          MAC09470
                                948  *  ENTERING THE RUN COMMAND.                     *               MAC09480

0107DA  41F0 8E2C =0116UA       950  TEST7    BAL   R15,TSTNUM        PRINT TEST NUMBER                MAC09500
0107DE  C840 0571               951           LHI   R4,X'571'                                          MAC09510
0107E2  5040 9232 =011A18       952           ST    R4,CONVAL                                          MAC09520
0107E6  41F0 8CAC =011496       953  NXTFLD2  BAL   R15,ESTCON                                        MAC09530
0107EA  4300 8C6E =01145C       954           B     TSTCHK                                             MAC09540
0107EE  7340 F934 =010126       955           LHL   R4,SEGREG         LOAD START ADRS OF SEG REGISTERS MAC09550
0107F2  F870 0FF0 0000          956           LI    R7,Y'0FF00000'    ESTABLISH VALUE FOR 1ST REGISTER MAC09560
0107F8  D380 91FB =0119F7       957           LB    R8,CONFLD                                          MAC09570
0107FC  1184                    958           SLLS  R8,4                                               MAC09580
0107FE  0A78                    959           AR    R7,R8                                              MAC09590
010800  5074 0000               960  STRAGNN  ST    R7,0(R4)          STORE DATA IN SEGMENTATION REGISTER MAC09600
010804  C820 2000               961           LHI   R2,X'2000'        START ADDRESS FOR TEST           MAC09610
010808  0842                    962  ADD1     LR    R4,R2             LOAD START ADRS OF BLOCK         MAC09620
01080A  C890 0032               963           LHI   R9,X'32'          LOAD SUBROUTINE SIZE             MAC09630
01080E  0A49                    964           AR    R4,R9             ESTABLISH END ADRS OF SUBROUTINE MAC09640
010810  F540 0001 0000          965           CLI   R4,Y'10000'       IS END ADDRESS BELOW 10000?      MAC09650
010816  2183                    966           BLS   LOADSUB           YES, LOAD SUBROUTINE INTO MEMORY MAC09660
010818  4300 FFCA =0107E6       967           B     NXTFLD2                                            MAC09670
01081C  0777                    968  LOADSUB  XR    R7,R7             SETUP BXLE REGISTERS             MAC09680
01081E  2482                    969           LIS   R8,2                                               MAC09690
                                970  *        R9    = X'32'                                          MAC09700
010820  0842                    971           LR    R4,R2             DESTINATION ADDRESS              MAC09710
```

TEST 7

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010822  4867 803E =010864     972  LOAGN   LH    R6,SUBRTN(R7)       LOAD PATTERN FROM IMAGE                    MAC09720
010826  4064 4700 0000         973           STH   R6,0(R4,R7)        STORE IN MEMORY                            MAC09730
01082C  C170 FFF2 =010822     974           BXLE  R7,LOAGN            REPEAT UNTIL SUBRTN STORED IN MEMORY       MAC09740
010830  0874                  975           LR    R7,R4                                                        MAC09750
010832  41E0 80FC =011632     976           BAL   R14,WRITE           WRITE SUBRTN ADRS TO DISPLAY               MAC09760
010836  0869                  977           LR    R6,R9               SETUP REGISTERS FOR SUBROUTINE             MAC09770
010838  0854                  978           LR    R5,R4                                                        MAC09780
01083A  0A56                  979           AR    R5,R6                                                        MAC09790
01083C  24B2                  980           LIS   R11,2                                                        MAC09800
01083E  5830 9206 =011A48     981           L     R3,ENBMAC                                                    MAC09810
010842  1803                  982           LPSWR R3                  BRANCH TO SUBROUTINE                       MAC09820
010844  0817                  983  ERR      LR    R1,R7               SETUP REGISTERS FOR ERROR MESSAGE          MAC09830
010846  5020 91CA =011A14     984           ST    R2,LOCSAVE                                                   MAC09840
01084A  0848                  985           LR    R4,R8                                                        MAC09850
01084C  41F0 8EU2 =011652     986           BAL   R15,ERROR           PRINT ERROR MESSAGE                        MAC09860
010850  3231                  987           DCX   3231                ERROR NUMBER              * 0721 *         MAC09870
010852  5820 91BE =011A14     988           L     R2,LOCSAVE                                                   MAC09880
010856  C200 91F2 =011A4C     989  RTN4     LPSW  DISMAC                                                       MAC09890
01085A  2624                  990  INCR     AIS   R2,4                INCREMENT SUBROUTINE START ADRS            MAC09900
01085C  4300 FFA8 =010808     991           B     ADD1                REPEAT TEST FOR NEXT LOCATION              MAC09910


                              994  *              S U B R O U T I N E                  *                      MAC09940
                              995  *                                                   *                      MAC09950
010860  0000 0000             996           DC    0                                                            MAC09960
010864  E674                  997  SUBRTN   DCX   E674,002A          LA   R7,42(R4)     RX1 FORMAT             MAC09970
010866  002A
010868  E680                  998           DCX   E680,8026           LA   R8,STRLOC     RX2 FORMAT,+D2         MAC09980
01086A  8026
01086C  0A78                  999           DCX   0A78                AR   R7,R8                                MAC09990
01086E  E686                 1000           DCX   E686,FFEE           LA   R8,SUBRTN-4(R6)RX2 FORMAT,-D2     MAC10000
010870  FFEE
010872  E695                 1001           DCX   E695,40FF,FFFC      LA   R9,-4(R5)     RX3 FORMAT             MAC10010
010874  40FF
010876  FFFC
010878  0A89                 1002           DCX   0A89                AR   R8,R9                                MAC10020
01087A  E694                 1003           DCX   E694,4B00,0028      LA   R9,40(R4,R11) RX3 FORMAT             MAC10030
01087C  4B00
01087E  0028
010880  0B79                 1004           SR    R7,R9                                                        MAC10040
010882  0B87                 1005           SR    R8,R7                                                        MAC10050
010884  0578                 1006           CLR   R7,R8               ARE ALL ADRS EQUAL ?                       MAC10060
? 010886  4230 4001 0844     1007           BNE   ERR(0,0)            NO, PRINT ERROR                            MAC10070
? 01088C  4300 4001 0856     1008           B     RTN4(0,0)           YES, RETURN TO MAIN PROGRAM                MAC10080
  010892  0000 0000          1009  STRLOC   DC    0                                                            MAC10090
```

TEST 8

```
                        1011  *                    T E S T   8                          *                MAC10110
                        1012  *                                                         *                MAC10120
                        1013  * PURPOSE:                                               *                MAC10130
                        1014  *  TO TEST SEGMENT BOUNDARY CROSSING LOGIC               *                MAC10140
                        1015  *                                                         *                MAC10150
                        1016  * ASSUMPTIONS:                                          *                MAC10160
                        1017  *  THIS TEST ASSUMES THAT TESTS 0 THRU 8 HAVE BEEN      *                MAC10170
                        1018  *  RUN WITHOUT DETECTING AN ERROR.                      *                MAC10180
                        1019  *                                                         *                MAC10190
                        1020  * DESIGN SPECIFICATIONS:                                 *                MAC10200
                        1021  *  TEST 8 CONSISTS OF A NUMBER OF SECTIONS              *                MAC10210
                        1022  *  1) MALXM1    MALX MARCHING ONES TEST                 *                MAC10220
                        1023  *  3) BRM1      MARCHING ONES TEST, REGISTERS 0 & 2:F   *                MAC10230
                        1024  *  4) BRM0      MARCHING ZEROS TEST, REGISTERS 0 & 2:F  $                MAC10240
                        1025  *  5) RX2P4T1   RX2 FORMAT INSTRUCTION TEST             *                MAC10250
                        1026  *  6) IEPROW    INSTRUCTION EXEC,PROT READ OR WRITE     *                MAC10260
                        1027  *  7) RX1P4T    RX1 FORMAT INSTRUCTION TEST             *                MAC10270
                        1028  *  8) RX3P4T    RX3 FORMAT INSTRUCTION TEST             *                MAC10280
                        1029  *  9) R12MLCOV  R2 LIMIT CHECK                          *                MAC10290
                        1030  * 10) RI1MLCOV  RI1 LIMIT CHECK                        *                MAC10300
                        1031  *                                                         *                MAC10310
                        1032  * HOW TO RUN THE TEST:                                  *                MAC10320
                        1033  *  ENTER TEST 8 AND ANY OTHER OPTION INFORMATION       *                MAC10330
                        1034  *  DESIRED VIA THE CONSOLE DEVICE.  REFER TO 05-160    *                MAC10340
                        1035  *  F02R02A15 APPENDIX 3 FOR THE OPTION/COMMAND INPUT   *                MAC10350
                        1036  *  STRUCTURE.  AFTER THE DESIRED OPTION INFORMATION    *                MAC10360
                        1037  *  IS ESTABLISHED, ENTER THE RUN COMMAND.              *                MAC10370

010896  2400            1039  TEST8   LIS   R0,0                                      MAC10390
010898  9560            1040          EPSR  R6,R0              SET PSW STATUS = 0     MAC10400
01089A  0700            1041          XR    R0,R0                                     MAC10410
01089C  41F0 8D6A =01160A 1042        BAL   R15,ISTNUM                                MAC10420
0108A0  F810 0001 1430  1043          LI    R1,MACINT1                                MAC10430
0108A6  5010 0094       1044          ST    R1,X'94'           MACINT NEW PSW LOC     MAC10440
0108AA  5000 9172 =011A20 1045        ST    R0,FLAG            NO MAC INTERRUPT EXPECTED NOW.  MAC10450
0108AE  F800 0FF0 0010  1046          LI    R0,Y'0FF00010'     NO TRANSLATION         MAC10460
0108B4  F810 0FF1 0010  1047          LI    R1,Y'0FF10010'                            MAC10470
0108BA  F820 0001 0010  1048          LI    R2,Y'00010010'     SLF=0, TRANSLATE TO 10000  MAC10480
0108C0  C630 0010       1049          LHI   R3,X'10'           SLF=0, TRANSLATE TO 00000  MAC10490
0108C4  2440            1050          LIS   R4,0               NON PRESENT            MAC10500
0108C6  2450            1051          LIS   R5,0                                      MAC10510
0108C8  2460            1052          LIS   R6,0                                      MAC10520
0108CA  2470            1053          LIS   R7,0                                      MAC10530
0108CC  2480            1054          LIS   R8,0                                      MAC10540
0108CE  2490            1055          LIS   R9,0                                      MAC10550
0108D0  24A0            1056          LIS   R10,0                                     MAC10560
0108D2  24B0            1057          LIS   R11,0                                     MAC10570
0108D4  24C0            1058          LIS   R12,0                                     MAC10580
0108D6  24D0            1059          LIS   R13,0                                     MAC10590
0108D8  24E0            1060          LIS   R14,0                                     MAC10600
0108DA  73F0 F848 =010126 1061        LHL   R15,SEGREG                                MAC10610
```

TEST 8

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0108DE   D00F 0000            1062           STM   R0,0(R15)          SET MAC REGISTERS 0:14                  MAC10620
0108E2   50EF 003C            1063           ST    R14,X'3C'(R15)     SET MAC REGISTER 15                     MAC10630
0108E6   50EF 0040            1064           ST    R14,X'40'(R15)     CLEAR ISR                               MAC10640



0108EA   C800 0400            1066  RX2P4T1  LHI   R0,X'400'                                                   MAC10660
0108EE   5010 97DE =012000    1067           ST    R1,Y'12000'        INITIALIZE TEST CELL                    MAC10670
*0108F2  C810 F604            1068           LI    R1,X'FEFC'-LOC1                                            MAC10680
0108F6   9560                 1069           EPSR  R6,R0              ENABLE MAC                              MAC10690
0108F8   5011                 1070  LOC1     DCX   5011,A100          ST   R1,A100(R1)                        MAC10700
0108FA   A100
                              1071  *                                  RX2 FORWARD STORE SHOULD SELECT         MAC10710
                              1072  *                                  SEG REG 1, LOGICAL ADDRESS '2000'       MAC10720
                              1073  *                                  PHYSICAL ADDRESS 12000.                 MAC10730
                              1074  *                                  NO INTERRUPT EXPECTED                   MAC10740
0108FC   2400                 1075           LIS   R0,0                                                       MAC10750
0108FE   9560                 1076           EPSR  R6,R0              DISABLE MAC                             MAC10760
010900   5510 96FC =012000    1077           CL    R1,Y'12000'        CHECK DATA                              MAC10770
010904   2336                 1078           BES   RX2P4T2                                                    MAC10780
010906   41F0 8D40 =01164A    1079           BAL   R15,ERROR1                                                 MAC10790
01090A   3233                 1080           DCX   3233               ERROR NUMBER              * 0823 *      MAC10800
01090C   4300 884C =01145C    1081           B     TSTCHK                                                     MAC10810
                              1082  *                                                                        MAC10820
010910   C800 0400            1083  RX2P4T2  LHI   R0,X'400'                                                 MAC10830
010914   9560                 1084           EPSR  R6,R0              ENABLE MAC                              MAC10840
*010916  C810 F5E2            1085           LI    R1,X'FEFC'-LOC1B                                           MAC10850
01091A   5831                 1086  LOC1B    DCX   5831,A100          L    R3,A100(R1)                        MAC10860
01091C   A100
01091E   2400                 1087           LIS   R0,0                                                       MAC10870
010920   9560                 1088           EPSR  R6,R0              DISABLE MAC                             MAC10880
010922   5530 96DA =012000    1089           CL    R3,Y'12000'        CHECK DATA                              MAC10890
010926   2336                 1090           BES   RX2P4T3                                                    MAC10900
010928   41F0 8D1E =01164A    1091           BAL   R15,ERROR1                                                 MAC10910
01092C   3234                 1092           DCX   3234               ERROR NUMBER              * 0824 *      MAC10920
01092E   4300 882A =01145C    1093           B     TSTCHK                                                     MAC10930
                              1094  *                                                                        MAC10940
010932   C800 0400            1095  RX2P4T3  LHI   R0,X'400'                                                 MAC10950
010936   4000 0000            1096           STH   R0,0               INITIALIZE CELL                         MAC10960
01093A   9560                 1097           EPSR  R6,R0              ENABLE MAC                              MAC10970
01093C   F810 FFEE F7BA       1098           LI    R1,0-LOC1C-Y'FFF00'                                        MAC10980
010942   5011                 1099           DCX   5011,FF00                                                  MAC10990
010944   FF00
                              1100  *                                  RX2 BACKWARD STORE SHOULD SELECT        MAC11000
                              1101  *                                  SEG REG 0, LOGICAL/PHYSICAL ADRS        MAC11010
                              1102  *                                  '00000', NO INTERRUPT EXPECTED.         MAC11020
010946   2400                 1103  LOC1C    LIS   R0,0                                                       MAC11030
010948   9560                 1104           EPSR  R6,R0              DISABLE MAC                             MAC11040
01094A   5820 0000            1105           L     R2,0               GET DATA                                MAC11050
01094E   0512                 1106           CLR   R1,R2              COMPARE DATA STORED/READ                MAC11060
010950   2336                 1107           BES   RX2P4T4                                                    MAC11070
010952   41F0 8CF4 =01164A    1108           BAL   R15,ERROR1                                                 MAC11080
010956   3235                 1109           DCX   3235               ERROR NUMBER              * 0825 *      MAC11090
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TEST 8

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010958  4300 8800 =01145C  1110            B     TSTCHK                                                  MAC11100
                           1111  *                                                                        MAC11110
                           1112  *                                                                        MAC11120
01095C  C800 0400          1113  RX2P4T4   LHI   R0,X'400'                                              MAC11130
010960  9560               1114            EPSR  R6,R0             ENABLE MAC                          MAC11140
010962  F810 FFFE F694     1115            LI    R1,0-LOC1D                                              MAC11150
010968  5821               1116            DCX   5821,8000         L    R2,0(R1)                       MAC11160
01096A  8000
01096C  2400               1117  LOC1D     LIS   R0,0                                                    MAC11170
01096E  9560               1118            EPSR  R6,R0             DISABLE MAC                         MAC11180
010970  5520 0000          1119            CL    R2,0              SAME AS WRITTEN?                    MAC11190
010974  2336               1120            BES   RX2SLT1           SKIP I YES                          MAC11200
010976  41F0 8CD0 =01164A  1121            BAL   R15,ERROR1                                              MAC11210
01097A  3236               1122            DCX   3236              ERROR NUMBER          * 0826 *      MAC11220
01097C  4300 8ADC =01145C  1123            B     TSTCHK                                                  MAC11230
                           1124  *                                                                        MAC11240
                           1125  *                                                                        MAC11250
010980  F820 0001 0010     1126  RX2SLT1   LI    R2,Y'00010010'                                          MAC11260
010986  7330 F79C =010126  1127            LHL   R3,SEGREG                                               MAC11270
01098A  5023 0008          1128            ST    R2,8(R3)          SET SEG REG 2                       MAC11280
01098E  C800 0400          1129            LHI   R0,X'400'                                               MAC11290
010992  F810 0000 F756     1130            LI    R1,Y'200FC'-LOC2                                        MAC11300
010998  5010 9084 =011A20  1131            ST    R1,FLAG           SET INTERRUPT EXPECTED FLAG           MAC11310
01099C  E630 8010 =0109B0  1132            LA    R3,LOC2,1                                               MAC11320
0109A0  5030 8A84 =011428  1133            ST    R3,RETURN1                                              MAC11330
0109A4  9560               1134            EPSR  R6,R0             ENABLE MAC                          MAC11340
0109A6  5001               1135  LOC2      DCX   5001,8000         ST R0,0(R1)                         MAC11350
0109A8  8000
                           1136  *                               RX2 FORWARD STORE, EFFECTIVE          MAC11360
                           1137  *                               ADDRESS IS '20100', EXCEEDING         MAC11370
                           1138  *                               SEGMENT LIMIT FIELD OF SEG REG 2,     MAC11380
                           1139  *                               AN INTERRUPT SHOULD OCCUR             MAC11390
                           1140  *                                                                     MAC11400
0109AA  41F0 8C9C =01164A  1141            BAL   R15,ERROR1                                              MAC11410
0109AE  3237               1142            DCX   3237              ERROR NUMBER          * 0827 *      MAC11420
0109B0  5870 9050 =011A04  1143  LOC2,1    L     R7,MACSTAT                                              MAC11430
0109B4  C370 0010          1144            THI   R7,X'10'          SEGMENT LIMIT VIOLATION?            MAC11440
0109B8  2136               1145            BNZS  RX2SLT2           SKIP IF YES                         MAC11450
0109BA  41F0 8C8C =01164A  1146            BAL   R15,ERROR1                                              MAC11460
0109BE  3036               1147            DCX   3036              ERROR NUMBER          * 0806 *      MAC11470
0109C0  4300 8A98 =01145C  1148            B     TSTCHK                                                  MAC11480
                           1149  *                                                                        MAC11490
                           1150  *                                                                        MAC11500
                           1151  * SEGMENT LIMIT TEST                                                    MAC11510
                           1152  *                                                                        MAC11520
0109C4  7350 F75E =010126  1153  RX2SLT2   LHL   R5,SEGREG                                               MAC11530
0109C8  5875 0040          1154            L     R7,X'40'(R5)      FETCH MAC ISR                       MAC11540
0109CC  C800 0400          1155            LHI   R0,X'400'                                               MAC11550
0109D0  E630 801A =0109EE  1156            LA    R3,LOC2A,1                                              MAC11560
0109D4  5030 8A50 =011428  1157            ST    R3,RETURN1                                              MAC11570
0109D8  9560               1158            EPSR  R6,R0             ENABLE MAC                          MAC11580
0109DA  F810 0000 F718     1159            LI    R1,Y'200FC'-LOC2A                                       MAC11590
0109E0  5010 903C =011A20  1160            ST    R1,FLAG           SET INTERRUPT EXPECTED FALG           MAC11600
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TEST 8

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0109E4  5811                1161  LOC2A   DCX   5811,8000          L R1,0(R1)                              MAC11610
0109E6  8000
                            1162  *                                                                        MAC11620
                            1163  *                                RX2 FORWARD STORE AT '20100'            MAC11630
                            1164  *                                SHOULD GENERATE INTERRUPT               MAC11640
0109E8  41F0 8C5E =01164A   1165        BAL   R15,ERROR1                                                   MAC11650
0109EC  3238                1166        DCX   3238               ERROR NUMBER              * 0828 *      MAC11660
                            1167  *                                                                        MAC11670
0109EE  5870 9012 =011A04   1168  LOC2A.1 L     R7,MACSTAT                                                 MAC11680
0109F2  C370 0010           1169        THI   R7,X'10'           SEGMENT LIMIT VIOLATION?                MAC11690
0109F6  2156                1170        BNZS  RX2SLT3            SKIP IF YES                             MAC11700
0109F8  41F0 8C4E =01164A   1171        BAL   R15,ERROR1                                                   MAC11710
0109FC  3036                1172        DCX   3036               ERROR NUMBER              * 0806 *      MAC11720
0109FE  4300 8A5A =01145C   1173        B     TSTCHK                                                       MAC11730
                            1174  *                                                                        MAC11740
                            1175  *                                                                        MAC11750
010A02  241A                1176  RX2SLT3 LIS   R1,X'A'                                                    MAC11760
010A04  7350 F71E =010126   1177        LHL   R5,SEGREG                                                    MAC11770
010A08  5015 0038           1178        ST    R1,X'38'(R5)                                                 MAC11780
010A0C  C800 0400           1179        LHI   R0,X'400'                                                    MAC11790
010A10  9560                1180        EPSR  R6,R0              ENABLE MAC                              MAC11800
010A12  F810 000E F5E4      1181        LI    R1,Y'FFFFF'-LOC2B+1                                          MAC11810
010A18  5011                1182        DCX   5011,8000          ST   R0,0(R1)                           MAC11820
010A1A  8000
                            1183  *                                RX2 FORWARD STORE TO '00000'            MAC11830
010A1C  2400                1184  LOC2B   LIS   R0,0                                                       MAC11840
010A1E  9560                1185        EPSR  R6,R0              DISABLE MAC                             MAC11850
010A20  5820 0000           1186        L     R2,0               READ LOCATION 0                         MAC11860
010A24  0521                1187        CLR   R2,R1              COMPARE DATA READ WITH DATA             MAC11870
                            1188  *                                    WRITTEN.                          MAC11880
010A26  2356                1189        BES   RX2SLT4                                                      MAC11890
010A28  41F0 8C1E =01164A   1190        BAL   R15,ERROR1                                                   MAC11900
010A2C  3239                1191        DCX   3239               ERROR NUMBER              * 0829 *      MAC11910
010A2E  4300 8A2A =01145C   1192        B     TSTCHK                                                       MAC11920
                            1193  *                                                                        MAC11930
                            1194  *                                                                        MAC11940
010A32  C800 0400           1195  RX2SLT4 LHI   R0,X'400'                                                  MAC11950
010A36  9560                1196        EPSR  R6,R0              ENABLE MAC                              MAC11960
010A38  F810 000E F58E      1197        LI    R1,Y'FFFFF'-LOC2C+1                                          MAC11970
010A3E  5831                1198        DCX   5831,8000          L    R3,0(R1)                           MAC11980
010A40  8000
010A42  2400                1199  LOC2C   LIS   R0,0                                                       MAC11990
010A44  9560                1200        EPSR  R6,R0              DISABLE MAC                             MAC12000
010A46  5820 0000           1201        L     R2,0               READ LOCATION 0                         MAC12010
010A4A  0523                1202        CLR   R2,R3              COMPARE DATA READ WITH DATA             MAC12020
                            1203  *                                    WRITTEN.                          MAC12030
010A4C  2356                1204        BES   IEPROW                                                       MAC12040
010A4E  41F0 8BF8 =01164A   1205        BAL   R15,ERROR1                                                   MAC12050
010A52  3330                1206        DCX   3330               ERROR NUMBER              * 0830 *      MAC12060
010A54  4300 8A04 =01145C   1207        B     TSTCHK                                                       MAC12070
                            1208  *                                                                        MAC12080
010A58  2410                1209  IEPROW  LIS   R1,0               INSTRUCTION EXECUTE PROTECT             MAC12090
010A5A  9561                1210        EPSR  R6,R1              READ OR WRITE.                          MAC12100
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TEST 8

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010A5C  7350 F6C6 =010126   1211           LHL   R5,SEGREG                                          MAC12110
010A60  5015 0040           1212           ST    R1,X'40'(R5)       INITIALZIE MAC                  MAC12120
010A64  E610 89C8 =011430   1213           LA    R1,MACINT1                                         MAC12130
010A68  5010 0094           1214           ST    R1,X'94'           SET UP VECTOR FOR MAC INTERRUPT MAC12140
010A6C  F810 0FF1 0010      1215           LI    R1,Y'0FF10010'     SET UP VECTOR FOR MAC INTERRUPT MAC12150
010A72  5015 0004           1216           ST    R1,4(R5)           SET SEG REG 1                   MAC12160
010A76  C825 000C           1217           LHI   R2,X'C'(R5)                                        MAC12170
010A7A  2434                1218           LIS   R3,4                                               MAC12180
010A7C  C845 0040           1219           LHI   R4,X'40'(R5)                                       MAC12190
010A80  2400                1220           LIS   R0,0                                               MAC12200
010A82  5002 0000           1221  IEPROW2  ST    R0,0(R2)           INIT SEG REGS 3 THRU15.         MAC12210
010A86  C120 FFF8 =010A82   1222           BXLE  R2,IEPROW2                                         MAC12220
010A8A  F800 0001 4090      1223           LI    R0,Y'00014090'     SRF = 000 SLF = 140 E = 1       MAC12230
010A90  5005 0008           1224           ST    R0,8(R5)                                           MAC12240
010A94  E600 8036 =010ACE   1225           LA    R0,IEPROW1                                         MAC12250
010A98  5000 898C =011428   1226           ST    R0,RETURN1                                         MAC12260
010A9C  244F                1227           LIS   R4,15                                              MAC12270
010A9E  5040 8F7E =011A20   1228           ST    R4,FLAG                                            MAC12280
010AA2  C850 0307           1229           LHI   R5,X'0307'         = BR R7                         MAC12290
010AA6  F810 0001 4000      1230           LI    R1,Y'14000'                                        MAC12300
010AAC  4051 0000           1231           STH   R5,0(R1)           STORE BR R7 AT 14000            MAC12310
010AB0  F870 0001 0AC4      1232           LI    R7,ERROR9          R7 POINTS TO ERROR9.            MAC12320
010AB6  C810 0400           1233           LHI   R1,X'400'                                          MAC12330
010ABA  9561                1234           EPSR  R6,R1              ENABLE MAC                      MAC12340
010ABC  F880 0002 4000      1235           LI    R8,Y'24000'        BRANCH TO LOCATION 14000 THRU   MAC12350
010AC2  0308                1236           BR    R8                 SEG REG 2.                      MAC12360
010AC4  41F0 8882 =01164A   1237  ERROR9   BAL   R15,ERROR1         NO EXECUTE PROTECT INTERRUPT    MAC12370
010AC8  3132                1238           DCX   3132               ERROR NUMBER          * 0812 *  MAC12380
010ACA  4300 898E =01145C   1239           B     TSTCHK                                             MAC12390
                            1240  *                                                                 MAC12400
                            1241  *                                                                 MAC12410
                            1242  *                                                                 MAC12420
010ACE  2440                1243  IEPROW1  LIS   R4,0                                               MAC12430
010AD0  7350 F652 =010126   1244           LHL   R5,SEGREG                                          MAC12440
010AD4  5045 0040           1245           ST    R4,X'40'(R5)       CLEAR MAC ISR                   MAC12450
010AD8  5040 8F44 =011A20   1246           ST    R4,FLAG            CLEAR INTERRUPT EXPECTED FLAG   MAC12460
010ADC  C840 0400           1247           LHI   R4,X'400'                                          MAC12470
010AE0  9564                1248           EPSR  R6,R4              ENABLE MAC                      MAC12480
010AE2  F840 AAAA AAAA      1249           LI    R4,Y'AAAAAAAA'                                     MAC12490
010AE8  F810 0002 0000      1250           LI    R1,Y'20000'                                        MAC12500
010AEE  5041 0000           1251           ST    R4,0(R1)           STORE TEST PATTERN AT LOC 14000 MAC12510
010AF2  2400                1252           LIS   R0,0                                               MAC12520
010AF4  9560                1253           EPSR  R6,R0              DISABLE MAC                     MAC12530
010AF6  5850 B506 =014000   1254           L     R5,Y'14000'        READ LOCATION 14000             MAC12540
010AFA  0545                1255           CLR   R4,R5              DATA SAME AS WRITTEN ?          MAC12550
010AFC  2336                1256           BES   RX1P4T                                             MAC12560
010AFE  41F0 8850 =011652   1257           BAL   R15,ERROR                                          MAC12570
010B02  3332                1258           DCX   3332               ERROR NUMBER          * 0832 *  MAC12580
010B04  4300 8954 =01145C   1259           B     TSTCHK                                             MAC12590


010B08  7350 F61A =010126   1261  RX1P4T   LHL   R5,SEGREG                                          MAC12610
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TEST 8

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010B0C  2400                    1262           LIS   R0,0                SEG REG 0 IS SET UP TO RELOCATE      MAC12620
010B0E  9560                    1263           EPSR  R6,R0               TO A00 WITH A LIMIT FIELD OF 0.      MAC12630
010B10  F810 0FF0 0A10          1264           LI    R1,Y'0FF00A10'      AN ALTERNATING DATA PATTERN IS       MAC12640
010B16  5015 0000               1265           ST    R1,0(R5)            WRITTEN AT LOCATION A00:AFF          MAC12650
010B1A  F810 0FF1 0010          1266           LI    R1,Y'0FF10010'      THESE LOCATIONS ARE VERIFIED         MAC12660
010B20  5015 0004               1267           ST    R1,4(R5)            THEN THE PROCESS IS REPEATED         MAC12670
010B24  C840 0400               1268           LHI   R4,X'400'           FOR ALL LOCATIONS UP TO FEFF.        MAC12680
010B28  2450                    1269           LIS   R5,0                                                     MAC12690
010B2A  C8B0 0A00               1270           LHI   R11,X'A00'                                               MAC12700
010B2E  247F                    1271           LIS   R7,15                                                    MAC12710
010B30  D270 88FA =01142E       1272           STB   R7,FLOP                                                  MAC12720
010B34  C880 0100               1273           LHI   R8,X'100'                                                MAC12730
010B38  D320 88F2 =01142E       1274  RX1P4T1  LB    R2,FLOP             TEST ALT DATA FLIP - FLOP            MAC12740
010B3C  0822                    1275           LR    R2,R2               IF SET DATA PATTERN IS ALL A'S       MAC12750
010B3E  233A                    1276           BZS   ALTPAT2             IF RESET, DATA PATTERN IS 5'S        MAC12760
010B40  F830 AAAA AAAA          1277           LI    R3,Y'AAAAAAAA'                                           MAC12770
010B46  9564                    1278           EPSR  R6,R4               ENABLE MAC                           MAC12780
010B48  5035 0000               1279           ST    R3,0(R5)            WRITE PATTERN TO TEST LOCATION       MAC12790
010B4C  D2D0 88DE =01142E       1280           STB   R0,FLOP                                                  MAC12800
010B50  2309                    1281           BS    RX1P4T1A                                                 MAC12810
010B52  F830 5555 5555          1282  ALTPAT2  LI    R3,Y'55555555'                                           MAC12820
010B58  9564                    1283           EPSR  R6,R4               ENABLE MAC                           MAC12830
010B5A  5035 0000               1284           ST    R3,0(R5)            WRITE PATTERN TO TEST LOCATION       MAC12840
010B5E  D270 88CC =01142E       1285           STB   R7,FLOP                                                  MAC12850
010B62  9560                    1286  RX1P4T1A EPSR  R6,R0               DISABLE MAC                          MAC12860
010B64  589B 0000               1287           L     R9,0(R11)           READ DATA FROM TEST LOCATION         MAC12870
010B68  0593                    1288           CLR   R9,R3               COMPARE DATA WRITTEN AND DATA        MAC12880
010B6A  2336                    1289           BES   RX1P4T2             READ.                                MAC12890
010B6C  41F0 8ADA =01164A       1290           BAL   R15,ERROR1                                               MAC12900
010B70  3337                    1291           DCX   3337                ERROR NUMBER              * 0837 *   MAC12910
010B72  4300 88E6 =01145C       1292           B     TSTCHK                                                   MAC12920
010B76  2654                    1293  RX1P4T2  AIS   R5,4                INCREMENT MEMORY BLOCK DISPL.        MAC12930
010B78  26B4                    1294           AIS   R11,4               INCREMENT TEST LOCATION ADDR.        MAC12940
010B7A  08AB                    1295           LR    R10,R11                                                  MAC12950
010B7C  C4A0 00FF               1296           NHI   R10,X'00FF'                                              MAC12960
010B80  42D0 FFB4 =010B38       1297           BNZ   RX1P4T1                                                  MAC12970
010B84  0755                    1298           XR    R5,R5                                                    MAC12980
010B86  73F0 F59C =010126       1299           LHL   R15,SEGREG                                               MAC12990
010B8A  0A18                    1300           AR    R1,R8               AND BUMP SRF UP BY 1 AND CONT        MAC13000
010B8C  501F 0000               1301           ST    R1,0(R15)           TEST, ADJUST SEG REG 0 TO NEW        MAC13010
010B90  F510 0FF0 FF10          1302           CLI   R1,Y'0FF0FF10'      SRF VALUE                            MAC13020
010B96  4280 FF9E =010B38       1303           BL    RX1P4T1                                                  MAC13030


010B9A  2400                    1305  RX3P4T   LIS   R0,0                                                     MAC13050
010B9C  73F0 F586 =010126       1306           LHL   R15,SEGREG                                               MAC13060
010BA0  9570                    1307           EPSR  R7,R0                                                    MAC13070
010BA2  C810 0A00               1308           LHI   R1,X'A00'                                                MAC13080
010BA6  F8B0 0FF1 0010          1309           LI    R11,Y'0FF10010'                                          MAC13090
010BAC  50BF 0004               1310           ST    R11,4(R15)          SETUP SEG REG 1                      MAC13100
010BB0  F8B0 0FF0 0A10          1311           LI    R11,Y'0FF00A10'                                          MAC13110
010BB6  50BF 0000               1312           ST    R11,0(R15)          SETUP SEG REG 0                      MAC13120
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TEST 8

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010BBA   C850 0100            1513           LHI   R3,X'100'                                    MAC13130
010BBE   C850 0400            1514           LHI   R5,X'400'                                    MAC13140
010BC2   2460                 1515           LIS   R6,0              FIRST INDEX VALUE          MAC13150
010BC4   248F                 1516           LIS   R8,15                                        MAC13160
010BC6   24A0                 1517           LIS   R10,0             SECOND INDEX VALUE         MAC13170
010BC8   D200 8862 =01142E    1518           STB   R0,FLOP                                      MAC13180
010BCC   D320 885E =01142E    1519  RX3P4T1  LB    R2,FLOP                                      MAC13190
010BD0   0822                 1520           LR    R2,R2                                        MAC13200
010BD2   233B                 1521           BZS   ALTPAT1                                      MAC13210
010BD4   F840 AAAA AAAA       1522           LI    R4,Y'AAAAAAAA'                               MAC13220
010BDA   9575                 1523           EPSR  R7,R5                                        MAC13230
010BDC   5046 4A00 0000       1524           ST    R4,0(R6,R10)                                 MAC13240
010BE2   D200 8848 =01142E    1525           STB   R0,FLOP                                      MAC13250
010BE6   230A                 1526           BS    RX3P4T1A                                     MAC13260
010BE8   D280 8842 =01142E    1527  ALTPAT1  STB   R8,FLOP                                      MAC13270
010BEC   F840 5555 5555       1528           LI    R4,Y'55555555'                               MAC13280
010BF2   9575                 1529           EPSR  R7,R5                                        MAC13290
010BF4   5046 4A00 0000       1530           ST    R4,0(R6,R10)                                 MAC13300
010BFA   9570                 1531  RX3P4T1A EPSR  R7,R0                                        MAC13310
010BFC   5891 0000            1532           L     R9,0(R1)                                     MAC13320
010C00   2614                 1533           AIS   R1,4                                         MAC13330
010C02   0594                 1534           CLR   R9,R4                                        MAC13340
*010C04  2336                 1535           BE    RX3P4T1B                                     MAC13350
 010C06  41F0 8A48 =011652    1536           BAL   R15,ERROR                                    MAC13360
 010C0A  3333                 1537           DCX   3333              ERROR NUMBER       * 0833 * MAC13370
 010C0C  4300 884C =01145C    1538           B     TSTCHK                                       MAC13380
 010C10  26A4                 1539  RX3P4T1B AIS   R10,4                                        MAC13390
 010C12  087A                 1540           LR    R7,R10                                       MAC13400
 010C14  C470 00FF            1541           NHI   R7,X'00FF'                                   MAC13410
 010C18  4230 FFB0 =010BCC    1542           BNZ   RX3P4T1                                      MAC13420
 010C1C  07AA                 1543           XR    R10,R10                                      MAC13430
 010C1E  0AB3                 1544           AR    R11,R3                                       MAC13440
 010C20  50BF 0000            1545           ST    R11,0(R15)                                   MAC13450
 010C24  F5B0 0FF0 FF10       1546           CLI   R11,Y'0FF0FF10'                              MAC13460
 010C2A  4280 FF9E =010BCC    1547           BL    RX3P4T1                                      MAC13470


 010C2E  2400                 1549  RX2MLC0V LIS   R0,0              RX2 INCREMENTING LOC CAUSES NEW  MAC13490
 010C30  73F0 F4F2 =011126    1550           LHL   R15,SEGREG        SEG REG SELECTION, LOOKING FOR   MAC13500
 010C34  500F 0040            1551           ST    R0,X'40'(R15)     EXECUTE PROTECT VIOLATION.       MAC13510
 010C38  95D0                 1552           EPSR  R13,R0                                       MAC13520
 010C3A  F810 0FF0 0010       1553           LI    R1,Y'0FF00010'    SEG REG 0; SLF=FF, SRF=00        MAC13530
 010C40  501F 0000            1554           ST    R1,0(R15)         WP AND E = 0, P = 1              MAC13540
 010C44  F810 0FF1 0090       1555           LI    R1,Y'0FF10090'    EXEC PROT IN SEG REG 1           MAC13550
 010C4A  501F 0004            1556           ST    R1,4(R15)         WP = 0,E = 1,P = 1               MAC13560
 010C4E  E610 87DE =011430    1557           LA    R1,MACINT1                                       MAC13570
 010C52  5010 0094            1558           ST    R1,X'94'                                         MAC13580
 010C56  E610 8052 =010CAC    1559           LA    R1,RX2MLC7                                       MAC13590
 010C5A  5010 87CA =011428    1560           ST    R1,RETURN1        SET UP RETURN ADDRESS            MAC13600
 010C5E  2511                 1561           LCS   R1,1                                             MAC13610
 010C60  5010 8DBC =011A20    1562           ST    R1,FLAG           SET INTERRUPT EXPECTED FLAG      MAC13620
 010C64  E620 801E =010C86    1563           LA    R2,RX2MLC2        SUBROUTINE START ADDRESS         MAC13630
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010C68  E640 803E =010CAA  1364            LA    R4,RX2MLC3          SUBROUTINE END ADDRESS                  MAC13640
010C6C  F850 0000 FFE6     1365            LI    R5,Y'0FFE6'         DESTINATION ADDRESS                     MAC13650
                           1366  *                                                                            MAC13660
                           1367  * COMMON ROUTINE COPIES SUBROUTINE TO MEMORY THEN BRANCHES TO IT            MAC13670
                           1368  *                                                                            MAC13680
010C72  2452               1369  COPY      LIS   R3,2                                                       MAC13690
010C74  0885               1370            LR    R8,R5               SAVE START ADDRESS                      MAC13700
010C76  4862 0000          1371  COPYLOOP  LH    R6,0(R2)                                                    MAC13710
010C7A  4065 0000          1372            STH   R6,0(R5)                                                    MAC13720
010C7E  2652               1373            AIS   R5,2                                                        MAC13730
010C80  C120 FFF2 =010C76  1374            BXLE  R2,COPYLOOP                                                 MAC13740
010C84  0308               1375            BR    R8                  GO TO SUBROUTINE                        MAC13750
                           1376  *                                                                            MAC13760
010C86  2400               1377  RX2MLC2   DCX   2400                0FFE6     LIS  R0,0                     MAC13770
010C88  9590               1378            DCX   9590                0FFE8     EPSR R9,R0                    MAC13780
010C8A  F810               1379            DCX   F810,A5A5,A5A5      0FFEA     LI   R1,Y'A5A5A5A5'           MAC13790
010C8C  A5A5
010C8E  A5A5
010C90  5010               1380            DCX   5010,4001,000C      0FFF0     ST   R1,Y'100C'               MAC13800
010C92  4001
010C94  000C
010C96  C870               1381            DCX   C870,0400           0FFF6     LHI  R7,X'0400'               MAC13810
010C98  0400
010C9A  9597               1382            DCX   9597                0FFFA     EPSR R9,R7                    MAC13820
010C9C  2428               1383            DCX   2428                0FFFC     LIS  R2,8                     MAC13830
010C9E  5020               1384            DCX   5020,800A           0FFFE     ST   R2,Y'100C'  **RX2**     MAC13840
010CA0  800A
010CA2  9590               1385            DCX   9590                10002     EPSR R9,R0                    MAC13850
010CA4  F800 0001 0CBA     1386            LI    R0,RX2MLC10         10004     LI   R0,RX2MLC10              MAC13860
010CAA  0300               1387  RX2MLC3   DCX   0300                1000A     BR   R0                       MAC13870
                           1388  *                                                                            MAC13880
010CAC  4810 F486 =010136  1389  RX2MLC7   LH    R1,FLAG,832         TEST IF 7/32 OR 8/32                    MAC13890
010CB0  233A               1390            BZS   RX2MLC8             SKIP IF 7/32                            MAC13900
010CB2  F5F0 0000 FFFE     1391            CLI   R15,Y'0FFFE'                                                MAC13910
010CB8  233A               1392            BES   RX2MLC9                                                     MAC13920
010CBA  41F0 898C =01164A  1393  RX2MLC10  BAL   R15,ERROR1                                                  MAC13930
010CBE  3338               1394            DCX   3338                ERROR NUMBER              * 0838 *    MAC13940
010CC0  4300 8798 =01145C  1395            B     TSTCHK                                                      MAC13950
010CC4  F5F0 0001 0002     1396  RX2MLC8   CLI   R15,Y'10002'                                                MAC13960
010CCA  2038               1397            BNES  RX2MLC10                                                    MAC13970
010CCC  2411               1398  RX2MLC9   LIS   R1,1                                                       MAC13980
010CCE  5410 8D32 =011A04  1399            N     R1,MACSTAT                                                  MAC13990
010CD2  223C               1400            BZS   RX2MLC10                                                    MAC14000


010CD4  2400               1402  RX3MLCOV  LIS   R0,0                 RX3 INCREMENTING LOC                    MAC14020
010CD6  73F0 F44C =010126  1403            LHL   R15,SEGREG          SEG REG SELECTED TEST                   MAC14030
010CDA  500F 0040          1404            ST    R0,X'40'(R15)                                               MAC14040
010CDE  95D0               1405            EPSR  R13,R0                                                      MAC14050
010CE0  F810 0FF0 0010     1406            LI    R1,Y'0FF00010'                                              MAC14060
010CE6  501F 0000          1407            ST    R1,0(R15)                                                   MAC14070
010CEA  F810 0FF1 0090     1408            LI    R1,Y'0FF10090'                                              MAC14080
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010CF0   501F 0004            1409           ST    R1,4(R15)                                          MAC14090
010CF4   E610 8738 =011430    1410           LA    R1,MACINT1                                         MAC14100
010CF8   5010 0094            1411           ST    R1,X'94'                                           MAC14110
010CFC   E610 803C =010D3C    1412           LA    R1,RX3MLC7                                         MAC14120
010D00   5010 8724 =011428    1413           ST    R1,RETURN1                                         MAC14130
010D04   241F                 1414           LIS   R1,15                                              MAC14140
010D06   5010 8D16 =011A20    1415           ST    R1,FLAG                                            MAC14150
010D0A   E620 800E =010D1C    1416           LA    R2,RX3MLC2                                         MAC14160
010D0E   E640 801E =010D30    1417           LA    R4,RX3MLC3                                         MAC14170
010D12   F850 0000 FFF6       1418           LI    R5,Y'0FFF6'      DESTINATION ADDRESS               MAC14180
010D18   4300 FF56 =010C72    1419           B     COPY                                               MAC14190
                              1420   *                                                                 MAC14200
010D1C   C810                 1421   RX3MLC2 DCX   C810,0400        0FFF6     LHI  R1,X'400'           MAC14210
010D1E   0400
010D20   9591                 1422           DCX   9591             0FFFA     EPSR R9,R1               MAC14220
010D22   0711                 1423           DCX   0711             0FFFC     XR   R1,R1               MAC14230
010D24   5810                 1424           DCX   5810,4001,000C   0FFFE     L    R1,Y'1000C'  **RX3**  MAC14240
010D26   4001
010D28   000C
010D2A   F800 0001 0D32       1425           LI    R0,RX3MLC5       10004     LI   R0,RX3MLC5          MAC14250
010D30   0300                 1426   RX3MLC3 DCX   0300             1000A     BR   R0                  MAC14260
                              1427   *                                                                 MAC14270
010D32   41F0 8914 =01164A    1428   RX3MLC5 BAL   R15,ERROR1                                         MAC14280
010D36   3339                 1429           DCX   3339             ERROR NUMBER          * 0839 *   MAC14290
010D38   4300 8720 =01145C    1430           B     TSTCHK                                             MAC14300
010D3C   4810 F3F6 =010136    1431   RX3MLC7 LH    R1,FLAG,832      TEST IF 7/32 OR 8/32              MAC14310
010D40   2336                 1432           BZS   RX3MLC8          SKIP IF 7/32                      MAC14320
010D42   F5F0 0000 FFFE       1433           CLI   R15,Y'0FFFE'                                       MAC14330
010D48   2338                 1434           BES   RX3MLC9                                            MAC14340
010D4A   220C                 1435           BS    RX3MLC5                                            MAC14350
010D4C   F5F0 0001 0004       1436   RX3MLC8 CLI   R15,Y'10004'                                      MAC14360
010D52   2333                 1437           BES   RX3MLC9                                            MAC14370
010D54   4300 FFDA =010D32    1438           B     RX3MLC5                                            MAC14380
010D58   2411                 1439   RX3MLC9 LIS   R1,1                                               MAC14390
010D5A   5410 8CA6 =011A04    1440           N     R1,MACSTAT                                         MAC14400
010D5E   4330 FFD0 =010D32    1441           BZ    RX3MLC5                                            MAC14410


010D62   2400                 1443   RI2MLCOV LIS  R0,0             RI2 INCREMENTING LOC              MAC14430
010D64   73F0 F3BE =010126    1444           LHL   R15,SEGREG                                         MAC14440
010D68   500F 0040            1445           ST    R0,X'40'(R15)                                      MAC14450
010D6C   9590                 1446           EPSR  R9,R0                                              MAC14460
010D6E   F810 0FF0 0010       1447           LI    R1,Y'0FF00010'                                     MAC14470
010D74   501F 0000            1448           ST    R1,0(R15)                                          MAC14480
010D78   F810 0FF1 0090       1449           LI    R1,Y'0FF10090'                                     MAC14490
010D7E   501F 0004            1450           ST    R1,4(R15)                                          MAC14500
010D82   E610 86AA =011430    1451           LA    R1,MACINT1                                         MAC14510
010D86   5010 0094            1452           ST    R1,X'94'                                           MAC14520
010D8A   E610 803C =010DCA    1453           LA    R1,RI2MLC6                                         MAC14530
010D8E   5010 8696 =011428    1454           ST    R1,RETURN1                                         MAC14540
010D92   2511                 1455           LCS   R1,1                                               MAC14550
010D94   5010 8C88 =011A20    1456           ST    R1,FLAG                                            MAC14560
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010D98  E620 800E =010DAA   1457            LA    R2,RI2MLC2                                          MAC14570
010D9C  E640 801E =010D8E   1458            LA    R4,RI2MLC3                                          MAC14580
010DA0  F850 0000 FFF6      1459            LI    R5,Y'FFF6'          DESTINATION ADDRESS             MAC14590
010DA6  4300 FEC8 =010C72   1460            B     COPY                                                MAC14600
                            1461  *                                                                   MAC14610
010DAA  C810                1462  RI2MLC2   DCX   C810,0400           0FFF6     LHI  R1,X'400'        MAC14620
010DAC  0400
010DAE  9591                1463            DCX   9591                0FFFA     EPSR R9,R1            MAC14630
010DB0  0711                1464            DCX   0711                0FFFC     XR   R1,R1            MAC14640
010DB2  F810                1465            DCX   F810,5A5A,5A5A      0FFFE     LI   R1,Y'5A5A5A5A' RI2** MAC14650
010DB4  5A5A
010DB6  5A5A
010DB8  F800 0001 0DC0      1466            LI    R0,RI2MLC5          10004     LI   R0,RI2MLC5       MAC14660
010DBE  0300                1467  RI2MLC4   DCX   0300                10000     BR   R0               MAC14670
010DC0  41F0 8886 =01164A   1468  RI2MLC5   BAL   R15,ERROR1                                          MAC14680
010DC4  3430                1469            DCX   3430                ERROR NUMBER          * 0840 * MAC14690
010DC6  4300 8692 =01145C   1470            B     TSTCHK                                              MAC14700
010DCA  4810 F368 =010136   1471  RI2MLC6   LH    R1,FLAG,832         TEST IF 7/32 OR 8/32            MAC14710
010DCE  233B                1472            BZS   RI2MLC7             SKIP IF 7/32                    MAC14720
010DD0  F5F0 0000 FFFE      1473            CLI   R15,Y'0FFFE'                                        MAC14730
010DD6  203B                1474            BNES  RI2MLC5                                             MAC14740
010DD8  2411                1475  RI2MLC8   LIS   R1,1                                                MAC14750
010DDA  5410 8C26 =011A04   1476            N     R1,MACSTAT                                          MAC14760
010DDE  2139                1477            BNZS  RI1MLCOV                                            MAC14770
010DE0  4300 FFDC =010DC0   1478            B     RI2MLC5                                             MAC14780
010DE4  F5F0 0001 0004      1479  RI2MLC7   CLI   R15,Y'10004'                                        MAC14790
010DEA  2239                1480            BES   RI2MLC8                                             MAC14800
010DEC  4300 FFD0 =010DC0   1481            B     RI2MLC5                                             MAC14810


010DF0  2400                1483  RI1MLCOV  LIS   R0,0               RI1 INCREMENTING LOC            MAC14830
010DF2  73F0 F330 =010126   1484            LHL   R15,SEGREG                                          MAC14840
010DF6  F810 0FF0 0010      1485            LI    R1,Y'0FF00010'                                      MAC14850
010DFC  501F 0000           1486            ST    R1,0(R15)                                           MAC14860
010E00  F810 0FF1 0090      1487            LI    R1,Y'0FF10090'                                      MAC14870
010E06  501F 0004           1488            ST    R1,4(R15)                                           MAC14880
010E0A  E610 8622 =011430   1489            LA    R1,MACINT1                                          MAC14890
010E0E  5010 0094           1490            ST    R1,X'94'                                            MAC14900
010E12  E610 8030 =010E46   1491            LA    R1,RI1MLC6                                          MAC14910
010E16  5010 860E =011428   1492            ST    R1,RETURN1                                          MAC14920
010E1A  2511                1493            LCS   R1,1                                                MAC14930
010E1C  5010 8C00 =011A20   1494            ST    R1,FLAG                                             MAC14940
010E20  E620 800E =010E32   1495            LA    R2,RI1MLC2                                          MAC14950
010E24  E640 801C =010E44   1496            LA    R4,RI1MLC3                                          MAC14960
010E28  F850 0000 FFF6      1497            LI    R5,Y'0FFF6'         DESTINATION ADDRESS             MAC14970
010E2E  4300 FE40 =010C72   1498            B     COPY                                                MAC14980
                            1499  *                                                                   MAC14990
010E32  C810                1500  RI1MLC2   DCX   C810,0400           0FFF6     LHI  R1,X'400'        MAC15000
010E34  0400
010E36  9591                1501            DCX   9591                0FFFA     EPSR R9,R1            MAC15010
010E38  0711                1502            DCX   0711                0FFFC     XR   R1,R1            MAC15020
010E3A  C810                1503            DCX   C810,5A5A           0FFFE     LHI  R1,X'5A5A'   **RI1** MAC15030
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010E3C  5A5A
010E3E  F800 0001 0E66      1504          LI    R0,RI1MLC5          10002     LI   R0,RI1MLC5              MAC15040
010E44  0300                1505  RI1MLC3 DCX   0300                10008     BR   R0                      MAC15050
010E46  4810 F2EC =010136   1506  RI1MLC6 LH    R1,FLAG,832                                               MAC15060
010E4A  233A                1507          BZS   RI1MLC7                                                   MAC15070
010E4C  F5F0 0000 FFFE      1508          CLI   R15,Y'0FFFE'                                              MAC15080
010E52  213A                1509          BNES  RI1MLC5                                                   MAC15090
010E54  2411                1510  RI1MLC8 LIS   R1,1                                                      MAC15100
010E56  5410 8BAA =011A04   1511          N     R1,MACSTAT                                                MAC15110
010E5A  213B                1512          BNZS  RX1MLCOV                                                  MAC15120
010E5C  2305                1513          BS    RI1MLC5                                                   MAC15130
010E5E  F5F0 0001 0002      1514  RI1MLC7 CLI   R15,Y'10002'                                             MAC15140
010E64  2238                1515          BES   RI1MLC8                                                   MAC15150
010E66  41F0 87E0 =01164A   1516  RI1MLC5 BAL   R15,ERROR1                                                MAC15160
010E6A  3431                1517          DCX   3431                ERROR NUMBER              * 0841 *  MAC15170
010E6C  4300 85EC =01145C   1518          B     TSTCHK                                                    MAC15180

010E70  2400                1520  RX1MLCOV LIS  R0,0                RX1 INCREMENTING LOC CAUSES NEW         MAC15200
010E72  73F0 F2B0 =010126   1521          LHL   R15,SEGREG          SEG REG SELECTED TEST                   MAC15210
010E76  500F 0040           1522          ST    R0,X'40'(R15)                                             MAC15220
010E7A  9590                1523          EPSR  R9,R0                                                     MAC15230
010E7C  F810 0FF0 0010      1524          LI    R1,Y'0FF00010'                                            MAC15240
010E82  501F 0000           1525          ST    R1,0(R15)                                                 MAC15250
010E86  F810 0FF1 0090      1526          LI    R1,Y'0FF10090'                                            MAC15260
010E8C  501F 0004           1527          ST    R1,4(R15)                                                 MAC15270
010E90  2410                1528          LIS   R1,0                                                      MAC15280
010E92  5010 3F00           1529          ST    R1,X'3F00'                                                MAC15290
010E96  E610 8596 =011430   1530          LA    R1,MACINT1                                                MAC15300
010E9A  5010 0094           1531          ST    R1,X'94'                                                  MAC15310
010E9E  E610 8036 =010ED8   1532          LA    R1,RX1MLC6                                                MAC15320
010EA2  5010 8582 =011428   1533          ST    R1,RETURN1                                                MAC15330
010EA6  2511                1534          LCS   R1,1                                                      MAC15340
010EA8  5040 8B74 =011A20   1535          ST    R1,FLAG                                                   MAC15350
010EAC  E620 800E =010EBE   1536          LA    R2,RX1MLC2          START ADDRESS                         MAC15360
010EB0  E640 8022 =010ED6   1537          LA    R4,RX1MLC3          END ADDRESS                           MAC15370
010EB4  F850 0000 FFF0      1538          LI    R5,Y'0FFF0'         DESTINATION ADDRESS                   MAC15380
010EBA  4300 FDB4 =010C72   1539          B     COPY                                                      MAC15390
                            1540  *                                                                       MAC15400
010EBE  C810                1541  RX1MLC2 DCX   C810,0400           0FFF0     LHI  R1,X'400'              MAC15410
010EC0  0400
010EC2  9591                1542          DCX   9591                0FFF4     EPSR R9,R1                  MAC15420
010EC4  0711                1543          DCX   0711                0FFF6                 XR   R1,R1      MAC15430
010EC6  F810                1544          DCX   F810,5A5A,5A5A      0FFF8     LI   R1,Y'5A5A5A5A'         MAC15440
010EC8  5A5A
010ECA  5A5A
010ECC  5010                1545          DCX   5010,3F00           0FFFE     ST   R1,Y'03F00'  **RX1**   MAC15450
010ECE  3F00
010ED0  F800 0001 0EF8      1546          LI    R0,RX1MLC5          10002     LI   R0,RX1MLC5             MAC15460
010ED6  0300                1547  RX1MLC3 BR    R0                                                        MAC15470
                            1548  *                                                                       MAC15480
010ED8  4810 F25A =010136   1549  RX1MLC6 LH    R1,FLAG,832                                               MAC15490
```

TEST 8

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010EDC   233A             1550           BZS   RX1MLC7            SKIP IF 7/32                          MAC15500
010EDE   F5F0 0000 FFFE   1551           CLI   R15,Y'0FFFE'                                             MAC15510
010EE4   213A             1552           BNES  RX1MLC5                                                   MAC15520
010EE6   2411             1553 RX1MLC8   LIS   R1,1                                                     MAC15530
010EE8   5410 8818 =011A04 1554          N     R1,MACSTAT                                                MAC15540
010EEC   2336             1555           BZS   RX1MLC5                                                   MAC15550
*010EEE  230A             1556           B     MALXTRX1                                                  MAC15560
010EF0   F5F0 0001 0002   1557 RX1MLC7   CLI   R15,Y'10002'                                             MAC15570
010EF6   2238             1558           BES   RX1MLC8                                                   MAC15580
010EF8   41F0 874E =01164A 1559 RX1MLC5  BAL   R15,ERROR1                                               MAC15590
010EFC   3432             1560           DCX   3432               ERROR NUMBER          * 0842 *       MAC15600
010EFE   4300 855A =01145C 1561          B     TSTCHK                                                    MAC15610
                          1562 *                                                                         MAC15620


                          1564 * IN THIS ROUTINE, A MARCHING 1'S PATTERN (0000 THRU FFFF)                MAC15640
                          1565 * IS APPLIED TO THE PROGRAM ADDRESS BUS.                                  MAC15650
                          1566 *                                                                         MAC15660
010F02   2400             1567 MALXTRX1 LIS   R0,0                MALX MARCHING 1'S TEST                MAC15670
010F04   4000 8522 =01142A 1568          STH   R0,MARCHCNT                                               MAC15680
010F08   95E0             1569          EPSR  R14,R0                                                    MAC15690
010F0A   C890 0400         1570          LHI   R9,X'400'                                                 MAC15700
010F0E   7310 F214 =010126 1571          LHL   R1,SEGREG                                                 MAC15710
010F12   2424             1572          LIS   R2,4                                                      MAC15720
010F14   C831 0036         1573          LHI   R3,X'36'(R1)                                              MAC15730
010F18   5001 0008         1574 SEGINIT  ST    R0,8(R1)              INITIALIZE SEG REGS                   MAC15740
010F1C   C110 FFF8 =010F18 1575          BXLE  R1,SEGINIT                                                MAC15750
010F20   7370 F202 =010126 1576          LHL   R7,SEGREG                                                 MAC15760
010F24   F810 0FF1 0010    1577          LI    R1,Y'0FF10010'                                            MAC15770
010F2A   5017 0004         1578          ST    R1,4(R7)              SET SEG REG 1                       MAC15780
010F2E   F810 0FF0 0010    1579          LI    R1,Y'0FF00010'                                            MAC15790
010F34   5017 0020         1580          ST    R1,X'20'(R7)          SET SEG REG 8                       MAC15800
010F38   F810 0001 128C   1581          LI    R1,MALX,TBL           GET MALX,TBL POINTER                MAC15810
010F3E   F820 0001 1310    1582          LI    R2,BR,TBL             GET BR,TBL POINTER                  MAC15820
010F44   F830 0001 1364    1583          LI    R3,SEGR,TBL           GET SEG REG TBL POINTER             MAC15830
010F4A   F840 0001 1390    1584          LI    R4,PROG,TBL           GET PROG ADDRESS TABLE POINTER      MAC15840
010F50   D200 84DA =01142E 1585          STB   R0,FLOP                                                   MAC15850
010F54   2461             1586          LIS   R6,1                                                      MAC15860
010F56   2471             1587          LIS   R7,1                                                      MAC15870
010F58   C880 0015         1588          LHI   R8,X'15'                                                  MAC15880
010F5C   5854 0000         1589 MALXRX1A L     R5,0(R4)                                                  MAC15890
010F60   D205 0000         1590          STB   R0,0(R5)                                                  MAC15900
010F64   2644             1591          AIS   R4,4                                                      MAC15910
010F66   C160 FFF2 =010F5C 1592          BXLE  R6,MALXRX1A           INITIALIZE TEST LOCATIONS           MAC15920
010F6A   F840 0001 1390    1593          LI    R4,PROG,TBL                                               MAC15930
010F70   5852 0000         1594 MALXRX1C L     R5,0(R2)                                                  MAC15940
010F74   5871 0000         1595          L     R7,0(R1)                                                  MAC15950
010F78   41E0 86B6 =011632 1596          BAL   R14,WRITE             SHOW PROGRAM ADDRESS                MAC15960
010F7C   7360 F1A6 =010126 1597          LHL   R6,SEGREG                                                 MAC15970
010F80   4A63 0000         1598          AH    R6,0(R3)              ADRS OF SEG REG X                   MAC15980
010F84   5056 0000         1599          ST    R5,0(R6)              BASE REGISTER SETUP                 MAC15990
010F88   D350 84A2 =01142E 1600          LB    R5,FLOP                                                   MAC16000
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TEST 8

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010F8C  0855              1601          LR    R5,R5       TEST ALT DATA FLIP - FLOP                MAC16010
010F8E  2136              1602          BNZS  ALTPAT3                                              MAC16020
010F90  D360 8498 =01142C 1603          LB    R6,AAA                                               MAC16030
010F94  D260 8496 =01142E 1604          STB   R6,FLOP     SET ALT DATA FLOP                        MAC16040
010F98  2305              1605          BS    MALXRX1B                                             MAC16050
010F9A  D360 848F =01142D 1606  ALTPAT3 LB    R6,FIVES                                             MAC16060
010F9E  D2D0 848C =01142E 1607          STB   R0,FLOP     RESET ALT PATTERN FLIP - FLOP            MAC16070
010FA2  5881 0000         1608  MALXRX1B L     R8,0(R1)                                             MAC16080
010FA6  95E9              1609          EPSR  R14,R9      ENABLE MAC                               MAC16090
010FA8  D268 0000         1610          STB   R6,0(R8)    WRITE TO TEST LOCATION                   MAC16100
010FAC  95E0              1611          EPSR  R14,R0      DISABLE MAC                              MAC16110
010FAE  58A4 0000         1612          L     R10,0(R4)                                            MAC16120
010FB2  D3BA 0000         1613          LB    R11,0(R10)  READ TEST LOCATION                       MAC16130
010FB6  056B              1614          CLR   R6,R11                                               MAC16140
010FB8  2334              1615          BES   MALXRX1D                                             MAC16150
010FBA  41F0 868C =01164A 1616          BAL   R15,ERROR1                                           MAC16160
010FBE  3433              1617          DCX   3433        ERROR NUMBER              * 0843 *       MAC16170
010FC0  2614              1618  MALXRX1D AIS  R1,4                                                 MAC16180
010FC2  2624              1619          AIS   R2,4                                                 MAC16190
010FC4  2632              1620          AIS   R3,2                                                 MAC16200
010FC6  2644              1621          AIS   R4,4                                                 MAC16210
010FC8  F510 0001 1310    1622          CLI   R1,BR.TBL   END OF TABLES?                           MAC16220
010FCE  4280 FF9E =010F70 1623          BL    MALXRX1C                                             MAC16230


010FD2  2714              1625  MALXRX1E SIS  R1,4        MALX MARCHING 0'S TEST                   MAC16250
010FD4  2724              1626          SIS   R2,4        DECREMENT MALX,BR AND PROG.TBL           MAC16260
010FD6  2732              1627          SIS   R3,2                                                 MAC16270
010FD8  2744              1628          SIS   R4,4                                                 MAC16280
010FDA  5874 0000         1629          L     R7,0(R4)                                             MAC16290
010FDE  41E0 8650 =011632 1630          BAL   R14,WRITE   SHOW PROGRAM ADDRESS                     MAC16300
010FE2  5852 0000         1631          L     R5,0(R2)                                             MAC16310
010FE6  7360 F13C =010126 1632          LHL   R6,SEGREG                                            MAC16320
010FEA  4A63 0000         1633          AH    R6,0(R3)    ADRS OF SEG REG                          MAC16330
010FEE  5056 0000         1634          ST    R5,0(R6)                                             MAC16340
010FF2  D350 8438 =01142E 1635          LB    R5,FLOP     TEST ALT PATTERN FLIP - FLOP             MAC16350
010FF6  0855              1636          LR    R5,R5                                                MAC16360
010FF8  2136              1637          BNZS  ALTPAT4                                              MAC16370
010FFA  D360 842E =01142C 1638          LB    R6,AAA                                               MAC16380
010FFE  D260 842C =01142E 1639          STB   R6,FLOP     SET FLOP                                 MAC16390
011002  2305              1640          BS    MALXRX1F                                             MAC16400
011004  D360 8425 =01142D 1641  ALTPAT4 LB    R6,FIVES                                             MAC16410
011008  D2D0 8422 =01142E 1642          STB   R0,FLOP                                              MAC16420
01100C  5881 0000         1643  MALXRX1F L     R8,0(R1)                                             MAC16430
011010  95E9              1644          EPSR  R14,R9                                               MAC16440
011012  D268 0000         1645          STB   R6,0(R8)                                             MAC16450
011016  95E0              1646          EPSR  R14,R0                                               MAC16460
011018  58A4 0000         1647          L     R10,0(R4)                                            MAC16470
01101C  D3BA 0000         1648          LB    R11,0(R10)                                           MAC16480
011020  056B              1649          CLR   R6,R11                                               MAC16490
011022  2334              1650          BES   MALXRX1G                                             MAC16500
011024  41F0 8622 =01164A 1651          BAL   R15,ERROR1                                           MAC16510
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TEST 8

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011028  3434                    1652            DCX   3434              ERROR NUMBER                * 0844 *  MAC16520
01102A  F510 0001 12BC          1653  MALXRX1G  CLI   R1,MALX.TBL       BACK AT START?                         MAC16530
011030  2333                    1654            BES   MALXRX1H          YES                                    MAC16540
011032  4380 FF9C =010FD2       1655            BNL   MALXRX1E          NO                                     MAC16550
011036  2461                    1656  MALXRX1H  LIS   R6,1                                                      MAC16560
011038  6160 83EE =01142A       1657            AHM   R6,MARCHCNT                                               MAC16570
01103C  4860 83EA =01142A       1658            LH    R6,MARCHCNT                                              MAC16580
011040  C560 0064               1659            CLHI  R6,100                                                   MAC16590
011044  4280 FF28 =01UF70       1660            BL    MALXRX1C                                                 MAC16600


                                1662  * MARCHING 1'S TEST FOR SEGMENTATION REGISTERS 0 AND 2 THRU F            MAC16620
                                1663  *                                                                        MAC16630
011048  2400                    1664  BRRX1T1   LIS   R0,0                                                     MAC16640
01104A  9560                    1665            EPSR  R6,R0               DISABLE MAC                        MAC16650
01104C  4000 83DA =01142A       1666            STH   R0,MARCHCNT                                              MAC16660
011050  F870 0FF0 0010          1667  BRRX1T1B  LI    R7,Y'0FF00010'                                           MAC16670
011056  E630 820E =011268       1668            LA    R3,SEGR             GET SEGMENTATION REG NUMBER          MAC16680
01105A  73F0 F0C8 =010126       1669            LHL   R15,SEGREG                                               MAC16690
01105E  4AF3 0000               1670            AH    R15,0(R3)                                                MAC16700
011062  507F 0000               1671            ST    R7,0(R15)           SET UP SEG REG 0                     MAC16710
011066  D200 83C4 =01142E       1672            STB   R0,FLOP                                                  MAC16720
01106A  24CF                    1673            LIS   R12,15                                                   MAC16730
01106C  F890 0002 0000          1674            LI    R9,Y'20000'                                              MAC16740
011072  E610 81A2 =011218       1675  BRRX1TA  LA    R1,MALX             GET TABLE ADDRESSES                  MAC16750
011076  E620 81BA =011234       1676            LA    R2,BR                                                    MAC16760
01107A  E640 820A =011288       1677            LA    R4,PROADD                                                MAC16770
                                1678  *                                                                        MAC16780
01107E  4881 0000               1679  BRRX1T2   LH    R8,0(R1)            GET MALX VALUE                       MAC16790
011082  5874 0000               1680            L     R7,0(R4)                                                 MAC16800
011086  41E0 85A8 =011632       1681            BAL   R14,WRITE           SHOW MALX VALUE                      MAC16810
01108A  5852 0000               1682            L     R5,0(R2)            GET SEGMENTATION REGISTER DATA       MAC16820
01108E  73F0 F094 =010126       1683            LHL   R15,SEGREG                                               MAC16830
011092  4AF3 0000               1684            AH    R15,0(R3)                                                MAC16840
011096  505F 0000               1685            ST    R5,0(R15)           SET UP SEGMENTATION REGISTER         MAC16850
01109A  F860 A5A5 A5A5          1686            LI    R6,Y'A5A5A5A5'      GET DATA PATTERN                     MAC16860
0110A0  C850 0400               1687            LHI   R5,X'400'                                                MAC16870
0110A4  95D5                    1688            EPSR  R13,R5              ENABLE MAC                           MAC16880
0110A6  5068 0000               1689            ST    R6,0(R8)            WRITE PATTERN TO TEST LOCATION       MAC16890
0110AA  95D0                    1690            EPSR  R13,R0              DISABLE MAC                          MAC16900
0110AC  58A4 0000               1691            L     R10,0(R4)           GET PROADD TABLE ENTRY               MAC16910
0110B0  58BA 0000               1692            L     R11,0(R10)          READ DATA BACK                       MAC16920
0110B4  05B6                    1693            CLR   R11,R6                                                   MAC16930
0110B6  2334                    1694            BES   SEGOTST2            OK                                   MAC16940
0110B8  41F0 86C6 =011782       1695            BAL   R15,MALXERR                                              MAC16950
0110BC  3433                    1696            DCX   3433                ERROR NUMBER                * 0843 *  MAC16960
0110BE  2612                    1697  SEGOTST2  AIS   R1,2               INCREMENT TABLE POINTERS             MAC16970
0110C0  2624                    1698            AIS   R2,4                                                     MAC16980
0110C2  2644                    1699            AIS   R4,4                                                     MAC16990
0110C4  F520 0001 1268          1700            CLI   R2,SEGR                                                  MAC17000
0110CA  2337                    1701            BES   BRRX2T1A                                                 MAC17010
0110CC  5864 0000               1702            L     R6,0(R4)            TOP OF MEMORY OR END OF TABLES?      MAC17020
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TEST 8

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0110D0  5560 8350 =011424   1703            CL    R6,MEMTOP                                    MAC17030
0110D4  4280 FFA6 =01107E   1704            BL    BRRX1T2                                      MAC17040
                            1705  *                                                            MAC17050
                            1706  *                                                            MAC17060
                            1707  *                                                            MAC17070
0110D8  E610 813C =011218   1708  BRRX2T1A  LA    R1,MALX          SET UP TABLE POINTERS       MAC17080
0110DC  E620 8154 =011234   1709            LA    R2,BR                                        MAC17090
0110E0  E640 81A4 =011288   1710            LA    R4,PROADD                                    MAC17100
0110E4  2632                1711            AIS   R3,2                                         MAC17110
0110E6  48A3 0000           1712            LH    R10,0(R3)                                    MAC17120
0110EA  C5A0 0040           1713            CLHI  R10,X'40'                                    MAC17130
0110EE  4380 8122 =011214   1714            BNL   BRRX1END         DONE                        MAC17140
0110F2  D200 8338 =01142E   1715            STB   R0,FLOP                                      MAC17150
0110F6  58A4 0000           1716  BRRX2T2   L     R10,0(R4)        GET CURRENT PROGRAM ADDRESS MAC17160
0110FA  087A                1717            LR    R7,R10                                       MAC17170
0110FC  41E0 8532 =011632   1718            BAL   R14,WRITE                                    MAC17180
011100  F850 A5A5 A5A5      1719  BRRX2T3   LI    R5,Y'A5A5A5A5'   CHECK TO SEE IF ANY MEMORY MAC17190
011106  505A 0000           1720            ST    R5,0(R10)        IN THIS 64KB BLOCK          MAC17200
01110A  588A 0000           1721            L     R8,0(R10)                                    MAC17210
01110E  0585                1722            CLR   R8,R5                                        MAC17220
011110  2336                1723            BES   BRRX2T4                                      MAC17230
011112  2612                1724            AIS   R1,2              NO MEMORY FOUND IN THIS 64 KB MAC17240
011114  2624                1725            AIS   R2,4              BLOCK.  CHECK NEXT ONE      MAC17250
011116  2644                1726            AIS   R4,4                                         MAC17260
011118  4300 FFDA =0110F6   1727            B     BRRX2T2                                      MAC17270
01111C  D3C0 830E =01142E   1728  BRRX2T4   LB    R12,FLOP                                     MAC17280
011120  08CC                1729            LR    R12,R12                                      MAC17290
011122  2337                1730            BZS   BRRX2T5                                      MAC17300
011124  F860 AAAA AAAA      1731            LI    R6,Y'AAAAAAAA'                               MAC17310
01112A  D200 8300 =01142E   1732            STB   R0,FLOP          RESET ALT DATA FLOP         MAC17320
01112E  2306                1733            BS    BRRX2T6                                      MAC17330
011130  F860 5555 5555      1734  BRRX2T5   LI    R6,Y'55555555'                               MAC17340
011136  D260 82F4 =01142E   1735            STB   R6,FLOP          SET ALT DATA FLOP           MAC17350
01113A  5852 0000           1736  BRRX2T6   L     R5,0(R2)                                     MAC17360
01113E  73F0 EFE4 =010126   1737            LHL   R15,SEGREG                                   MAC17370
011142  4AF3 0000           1738            AH    R15,0(R3)                                    MAC17380
011146  505F 0000           1739            ST    R5,0(R15)        SET UP SEGMENTATION REGISTER MAC17390
01114A  4861 0000           1740            LH    R8,0(R1)                                     MAC17400
01114E  C870 0400           1741            LHI   R7,X'400'                                    MAC17410
011152  95C7                1742            EPSR  R12,R7                                       MAC17420
011154  5069 4800 0000      1743            ST    R6,0(R9,R8)      WRITE PATTERN TO TEST LOC   MAC17430
01115A  95D0                1744            EPSR  R13,R0           DISABLE MAC                 MAC17440
01115C  58A4 0000           1745            L     R10,0(R4)                                    MAC17450
011160  58BA 0000           1746            L     R11,0(R10)       READ DATA                   MAC17460
011164  05B6                1747            CLR   R11,R6           COMPARE                     MAC17470
011166  2334                1748            BES   BRRX2TA                                      MAC17480
011168  41F0 8616 =011782   1749            BAL   R15,MALXERR                                  MAC17490
01116C  3434                1750            DCX   3434             ERROR NUMBER          * 0844 * MAC17500
01116E  2612                1751  BRRX2TA   AIS   R1,2              INCREMENT TABLE POINTERS    MAC17510
011170  2624                1752            AIS   R2,4                                         MAC17520
011172  2644                1753            AIS   R4,4                                         MAC17530
011174  5864 0000           1754            L     R6,0(R4)                                     MAC17540
011178  5560 82A8 =011424   1755            CL    R6,MEMTOP                                    MAC17550
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TEST 8

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011178   2386                  1756            BNLS  BRRX1T7             SKIP IF OUT OF MEMORY                    MAC17560
01117E   F520 0001 1268        1757            CLI   R2,SEGR                                                      MAC17570
011184   4280 FF6E =0110F6     1758            BL    BRRX2T2                                                      MAC17580
                               1759  *                                                                            MAC17590
                               1760  *                                                                            MAC17600
                               1761  * MARCHING ZEROS TEST FOR SEGMENT REGISTERS 0 AND 2 THRU F                   MAC17610
                               1762  *                                                                            MAC17620
011188   2712                  1763  BRRX1T7   SIS   R1,2               DECREMENT POINTERS                       MAC17630
01118A   2724                  1764            SIS   R2,4                                                         MAC17640
01118C   2744                  1765            SIS   R4,4                                                         MAC17650
01118E   D3C0 829C =01142E     1766            LB    R12,FLOP                                                     MAC17660
011192   08CC                  1767            LR    R12,R12             TEST ALT DATA FLIP - FLOP                MAC17670
011194   2337                  1768            BZS   BRRX1T8                                                      MAC17680
011196   F860 AAAA AAAA        1769            LI    R6,Y'AAAAAAAA'                                               MAC17690
01119C   D2D0 828E =01142E     1770            STB   R0,FLOP             RESET ALT DATA FLIP - FLOP               MAC17700
0111A0   2306                  1771            BS    BRRX1T9                                                      MAC17710
0111A2   F860 5555 5555        1772  BRRX1T8   LI    R6,Y'55555555'      GET DATA PATTERN ALL 5'S                 MAC17720
0111A8   D260 8282 =01142E     1773            STB   R6,FLOP                                                      MAC17730
0111AC   5874 0000             1774  BRRX1T9   L     R7,0(R4)                                                     MAC17740
0111B0   41E0 847E =011632     1775            BAL   R14,WRITE                                                    MAC17750
0111B4   73F0 EF6E =010126     1776            LHL   R15,SEGREG                                                   MAC17760
0111B8   4AF3 0000             1777            AH    R15,0(R3)                                                    MAC17770
0111BC   5872 0000             1778            L     R7,0(R2)            SEG REG VALUE                            MAC17780
0111C0   507F 0000             1779            ST    R7,0(R15)           SET UP SEGMENTATION REGISTER             MAC17790
0111C4   7381 0000             1780            LHL   R8,0(R1)            GET MALX VALUE                           MAC17800
0111C8   C870 0400             1781            LHI   R7,X'400'                                                    MAC17810
0111CC   95D7                  1782            EPSR  R13,R7              ENABLE MAC                               MAC17820
0111CE   5068 4900 0000        1783            ST    R6,0(R8,R9)         WRITE PATTERN TO TEST LOCATION           MAC17830
0111D4   95D0                  1784            EPSR  R13,R0              DISABLE MAC                              MAC17840
0111D6   58A4 0000             1785            L     R10,0(R4)                                                    MAC17850
0111DA   58BA 0000             1786            L     R11,0(R10)          READ DATA                                MAC17860
0111DE   0586                  1787            CLR   R11,R6                                                       MAC17870
0111E0   2334                  1788            BES   BRRX2TB                                                      MAC17880
0111E2   41F0 859C =011782     1789            BAL   R15,MALXERR                                                  MAC17890
0111E6   3433                  1790            DCX   3433                ERROR NUMBER              * 0843 *       MAC17900
0111E8   F520 0001 1234        1791  BRRX2TB   CLI   R2,BR              BACK AT START OF TABLE?                   MAC17910
0111EE   4220 FF96 =011188     1792            BP    BRRX1T7             LOOP IF NO                               MAC17920
0111F2   FA90 0001 0000        1793            AI    R9,Y'10000'         INCREMENT OFF-SET                        MAC17930
0111F8   F590 0010 0000        1794            CLI   R9,Y'100000'                                                 MAC17940
0111FE   4230 FED6 =0110D8     1795            BNE   BRRX2T1A                                                     MAC17950
011202   2461                  1796            LIS   R6,1                                                         MAC17960
011204   6160 8222 =01142A     1797            AHM   R6,MARCHCNT                                                  MAC17970
011208   4860 821E =01142A     1798            LH    R6,MARCHCNT                                                  MAC17980
01120C   C560 0100             1799            CLHI  R6,X'100'                                                    MAC17990
011210   4280 FE3C =011050     1800            BL    BRRX1T1B                                                     MAC18000
011214   4300 8244 =01145C     1801  BRRX1END B     TSTCHK                                                       MAC18010
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TEST 8

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011218  3F00            1803  MALX      DC    X'3F00'                                  MAC18030
01121A  3E00            1804            DC    X'3E00'                                  MAC18040
01121C  3C00            1805            DC    X'3C00'                                  MAC18050
01121E  3800            1806            DC    X'3800'                                  MAC18060
011220  3000            1807            DC    X'3000'                                  MAC18070
011222  2000            1808            DC    X'2000'                                  MAC18080
011224  0000            1809            DC    X'0'                                     MAC18090
011226  0000            1810            DC    X'0'                                     MAC18100
011228  0000            1811            DC    X'0'                                     MAC18110
01122A  0000            1812            DC    X'0'                                     MAC18120
01122C  0000            1813            DC    X'0'                                     MAC18130
01122E  0000            1814            DC    X'0'                                     MAC18140
011230  4000            1815            DC    X'4000'                                  MAC18150
011234                  1816            ALIGN 4                                        MAC18160
011234  03F0 0010       1817  BR        DC    Y'03F00010'                              MAC18170
011238  03F0 0110       1818            DC    Y'03F00110'                              MAC18180
01123C  03F0 0310       1819            DC    Y'03F00310'                              MAC18190
011240  03F0 0710       1820            DC    Y'03F00710'                              MAC18200
011244  03F0 0F10       1821            DC    Y'03F00F10'                              MAC18210
011248  0200 1F10       1822            DC    Y'02001F10'                              MAC18220
01124C  0000 3F10       1823            DC    Y'00003F10'                              MAC18230
011250  0000 7F10       1824            DC    Y'00007F10'                              MAC18240
011254  0000 FF10       1825            DC    Y'0000FF10'                              MAC18250
011258  0001 FF10       1826            DC    Y'0001FF10'                              MAC18260
01125C  0003 FF10       1827            DC    Y'0003FF10'                              MAC18270
011260  0007 FF10       1828            DC    Y'0007FF10'                              MAC18280
011264  0FFF FF10       1829            DC    Y'0FFFFF10'                              MAC18290
011268  0000            1830  SEGR      DCX   0,8,C,10,14,18,1C                        MAC18300
01126A  0008
01126C  000C
01126E  0010
011270  0014
011272  0018
011274  001C
011276  0020            1831            DCX   20,24,28,2C,30,34,38,3C,40               MAC18310
011278  0024
01127A  0028
01127C  002C
01127E  0030
011280  0034
011282  0038
011284  003C
011286  0040
011288                  1832            ALIGN 4                                        MAC18320
011288  0000 3F00       1833  PROADD    DC    Y'3F00'                                  MAC18330
01128C  0000 3F00       1834            DC    Y'3F00'                                  MAC18340
011290  0000 3F00       1835            DC    Y'3F00'                                  MAC18350
011294  0000 3F00       1836            DC    Y'3F00'                                  MAC18360
011298  0000 3F00       1837            DC    Y'3F00'                                  MAC18370
01129C  0000 3F00       1838            DC    Y'3F00'                                  MAC18380
0112A0  0000 3F00       1839            DC    Y'3F00'                                  MAC18390
0112A4  0000 7F00       1840            DC    Y'7F00'                                  MAC18400
0112A8  0000 FF00       1841            DC    Y'FF00'                                  MAC18410
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TEST 8

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0112AC   0001 FF00          1842          DC    Y'1FF00'                    MAC18420
0112B0   0003 FF00          1843          DC    Y'3FF00'                    MAC18430
0112B4   0007 FF00          1844          DC    Y'7FF00'                    MAC18440
0112B8   0000 3F00          1845          DC    Y'3F00'                     MAC18450
```

TEST 8

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011218  3F00            1803  MALX    DC    X'3F00'                          MAC18030
01121A  3E00            1804          DC    X'3E00'                          MAC18040
01121C  3C00            1805          DC    X'3C00'                          MAC18050
01121E  3800            1806          DC    X'3800'                          MAC18060
011220  3000            1807          DC    X'3000'                          MAC18070
011222  2000            1808          DC    X'2000'                          MAC18080
011224  0000            1809          DC    X'0'                             MAC18090
011226  0000            1810          DC    X'0'                             MAC18100
011228  0000            1811          DC    X'0'                             MAC18110
01122A  0000            1812          DC    X'0'                             MAC18120
01122C  0000            1813          DC    X'0'                             MAC18130
01122E  0000            1814          DC    X'0'                             MAC18140
011230  4000            1815          DC    X'4000'                          MAC18150
011234                  1816          ALIGN 4                                MAC18160
011234  03F0 0010       1817  BR      DC    Y'03F00010'                      MAC18170
011238  03F0 0110       1818          DC    Y'03F00110'                      MAC18180
01123C  03F0 0310       1819          DC    Y'03F00310'                      MAC18190
011240  03F0 0710       1820          DC    Y'03F00710'                      MAC18200
011244  03F0 0F10       1821          DC    Y'03F00F10'                      MAC18210
011248  0200 1F10       1822          DC    Y'02001F10'                      MAC18220
01124C  0000 3F10       1823          DC    Y'00003F10'                      MAC18230
011250  0000 7F10       1824          DC    Y'00007F10'                      MAC18240
011254  0000 FF10       1825          DC    Y'0000FF10'                      MAC18250
011258  0001 FF10       1826          DC    Y'0001FF10'                      MAC18260
01125C  0003 FF10       1827          DC    Y'0003FF10'                      MAC18270
011260  0007 FF10       1828          DC    Y'0007FF10'                      MAC18280
011264  0FFF FF10       1829          DC    Y'0FFFFF10'                      MAC18290
011268  0000            1830  SEGR    DCX   0,8,C,10,14,18,1C                MAC18300
01126A  0008
01126C  000C
01126E  0010
011270  0014
011272  0018
011274  001C
011276  0020            1831          DCX   20,24,28,2C,30,34,38,3C,40       MAC18310
011278  0024
01127A  0028
01127C  002C
01127E  0030
011280  0034
011282  0038
011284  003C
011286  0040
011288                  1832          ALIGN 4                                MAC18320
011288  0000 3F00       1833  PROADD  DC    Y'3F00'                          MAC18330
01128C  0000 3F00       1834          DC    Y'3F00'                          MAC18340
011290  0000 3F00       1835          DC    Y'3F00'                          MAC18350
011294  0000 3F00       1836          DC    Y'3F00'                          MAC18360
011298  0000 3F00       1837          DC    Y'3F00'                          MAC18370
01129C  0000 3F00       1838          DC    Y'3F00'                          MAC18380
0112A0  0000 3F00       1839          DC    Y'3F00'                          MAC18390
0112A4  0000 7F00       1840          DC    Y'7F00'                          MAC18400
0112A8  0000 FF00       1841          DC    Y'FF00'                          MAC18410
```

TEST 8

```
0112AC   0001 FF00          1842          DC    Y'1FF00'                    MAC18420
0112B0   0003 FF00          1843          DC    Y'3FF00'                    MAC18430
0112B4   0007 FF00          1844          DC    Y'7FF00'                    MAC18440
0112B8   0000 3F00          1845          DC    Y'3F00'                     MAC18450
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TEST 8

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0112BC                          1847            ALIGN 4                                 MAC18470
0112BC   0008 0000              1848  MALX.TBL  DC    Y'80000'                          MAC18480
0112C0   0008 0001              1849            DC    Y'80001'                          MAC18490
0112C4   0008 0003              1850            DC    Y'80003'                          MAC18500
0112C8   0008 0007              1851            DC    Y'80007'                          MAC18510
0112CC   0008 000F              1852            DC    Y'8000F'                          MAC18520
0112D0   0008 001F              1853            DC    Y'8001F'                          MAC18530
0112D4   0008 003F              1854            DC    Y'8003F'                          MAC18540
0112D8   0008 007F              1855            DC    Y'8007F'                          MAC18550
0112DC   0008 00FF              1856            DC    Y'800FF'                          MAC18560
0112E0   0008 01FF              1857            DC    Y'801FF'                          MAC18570
0112E4   0008 03FF              1858            DC    Y'803FF'                          MAC18580
0112E8   0008 07FF              1859            DC    Y'807FF'                          MAC18590
0112EC   0008 0FFF              1860            DC    Y'80FFF'                          MAC18600
0112F0   0008 1FFF              1861            DC    Y'81FFF'                          MAC18610
0112F4   0008 3FFF              1862            DC    Y'83FFF'                          MAC18620
0112F8   0008 7FFF              1863            DC    Y'87FFF'                          MAC18630
0112FC   0008 FFFF              1864            DC    Y'8FFFF'                          MAC18640
011300   0001 FFFF              1865            DC    Y'1FFFF'                          MAC18650
011304   0003 FFFF              1866            DC    Y'3FFFF'                          MAC18660
011308   0007 FFFF              1867            DC    Y'7FFFF'                          MAC18670
01130C   000F FFFF              1868            DC    Y'FFFFF'                          MAC18680
011310   0FF0 0A10              1869  BR.TBL    DC    Y'0FF00A10'                       MAC18690
011314   0FF0 0A10              1870            DC    Y'0FF00A10'                       MAC18700
011318   0FF0 0A10              1871            DC    Y'0FF00A10'                       MAC18710
01131C   0FF0 0A10              1872            DC    Y'0FF00A10'                       MAC18720
011320   0FF0 0A10              1873            DC    Y'0FF00A10'                       MAC18730
011324   0FF0 0A10              1874            DC    Y'0FF00A10'                       MAC18740
011328   0FF0 0A10              1875            DC    Y'0FF00A10'                       MAC18750
01132C   0FF0 0A10              1876            DC    Y'0FF00A10'                       MAC18760
011330   0FF0 0A10              1877            DC    Y'0FF00A10'                       MAC18770
011334   0FF0 0A10              1878            DC    Y'0FF00A10'                       MAC18780
011338   0FF0 0A10              1879            DC    Y'0FF00A10'                       MAC18790
01133C   0FF0 0A10              1880            DC    Y'0FF00A10'                       MAC18800
011340   0FF0 0A10              1881            DC    Y'0FF00A10'                       MAC18810
011344   0FF0 0A10              1882            DC    Y'0FF00A10'                       MAC18820
011348   0FF0 0A10              1883            DC    Y'0FF00A10'                       MAC18830
01134C   0FF0 0010              1884            DC    Y'0FF00010'                       MAC18840
011350   0FF1 0010              1885            DC    Y'0FF10010'                       MAC18850
011354   0FF1 0010              1886            DC    Y'0FF10010'                       MAC18860
011358   0FF1 0010              1887            DC    Y'0FF10010'                       MAC18870
01135C   0FF1 0010              1888            DC    Y'0FF10010'                       MAC18880
011360   0FF1 0010              1889            DC    Y'0FF10010'                       MAC18890
011364   0020                   1890  SEGR.TBL  DCX   20,20,20,20                      MAC18900
011366   0020
011368   0020
01136A   0020
01136C   0020                   1891            DCX   20,20,20,20                      MAC18910
01136E   0020
011370   0020
011372   0020
011374   0020                   1892            DCX   20,20,20,20                      MAC18920
011376   0020
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TEST 8

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011378   0020
01137A   0020
01137C   0020              1893          DCX   20,2V,20,20                          MAC18930
01137E   0020
011380   0020
011382   0020
011384   0020              1894          DCX   20,08,0C,1C                          MAC18940
011386   0008
011388   000C
01138A   001C
01138C   003C              1895          DCX   3C                                   MAC18950
011390                     1896          ALIGN 4                                    MAC18960
011390   0000 0A00         1897  PROG,TBL DCY   00A00,00A01,00A03,00A07              MAC18970
011394   0000 0A01
011398   0000 0A03
01139C   0000 0A07
0113A0   0000 0A0F         1898          DCY   00A0F,00A1F,00A3F,00A7F               MAC18980
0113A4   0000 0A1F
0113A8   0000 0A3F
0113AC   0000 0A7F
0113B0   0000 0AFF         1899          DCY   00AFF,00BFF,00DFF,011FF               MAC18990
0113B4   0000 0BFF
0113B8   0000 0DFF
0113BC   0000 11FF
0113C0   0000 19FF         1900          DCY   019FF,029FF,049FF,07FFF               MAC19000
0113C4   0000 29FF
0113C8   0000 49FF
0113CC   0000 7FFF
0113D0   0001 FFFF         1901          DCY   1FFFF,1FFFF,1FFFF,1FFFF               MAC19010
0113D4   0001 FFFF
0113D8   0001 FFFF
0113DC   0001 FFFF
0113E0   0001 FFFF         1902          DCY   1FFFF                                MAC19020
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0113E4                          1904           ALIGN 4                                                    MAC19040
0113E4                          1905  REGSAVE  DSF   16                                                   MAC19050
011424   0000 0000              1906  MEMTOP   DC    Y'0'                                                 MAC19060
011428   0000                   1907  RETURN1  DC    X'0000'                                              MAC19070
01142A   0000                   1908  MARCHCNT DC    X'0'                                                 MAC19080
01142C   AA                     1909  AAA      DB    X'AA'                                                MAC19090
01142D   55                     1910  FIVES    DB    X'55'                                                MAC19100
01142E   00                     1911  FLOP     DB    0                                                    MAC19110
01142F   00                     1912           DB    *                                                    MAC19120


                                1914  *                        *** MAC INTERRUPT ***                     MAC19140
                                1915  *                                                                    MAC19150
                                1916  * ROUTINE MACINT IS ENTERED WHEN THE MAC INTERRUPTS.                 MAC19160
                                1917  * IF LOCATION FLAG IS NON ZERO, THE INTERRUPT WAS EXPECTED.          MAC19170
                                1918  * R13 IS LOADED WITH THE RETURN ADDRESS AND A RETURN IS MADE         MAC19180
                                1919  * TO THE INTERRUPTING MODULE.  IF FLAG IS ZERO, THE INTERRUPT        MAC19190
                                1920  * WAS NOT EXPECTED.                                                 MAC19200
                                1921  *                                                                    MAC19210
011430   7370 ECF2 =010126      1922  MACINT1  LHL   R7,SEGREG          MAC INTERRUPT HANDLER             MAC19220
011434   5877 0040              1923           L     R7,X'40'(R7)       FETCH MAC ISR                     MAC19230
011438   5070 85C8 =011A04      1924           ST    R7,MACSTAT                                           MAC19240
01143C   24D0                   1925           LIS   R13,0                                                MAC19250
01143E   58A0 85DE =011A20      1926           L     R10,FLAG           WAS INTERRUPT EXPECTED ?          MAC19260
011442   233A                   1927           BZS   MAC.1              BRANCH IF NO                      MAC19270
011444   73A0 ECDE =010126      1928           LHL   R10,SEGREG                                            MAC19280
011448   50DA 0040              1929           ST    R13,X'40'(R10)     CLEAR MAC ISR                     MAC19290
01144C   50D0 85D0 =011A20      1930           ST    R13,FLAG           RESET FLAG                        MAC19300
011450   58D0 FFD4 =011428      1931           L     R13,RETURN1        GET RETURN ADDRESS                MAC19310
011454   06DD                   1932           BR    R13                                                  MAC19320
011456   41F0 81F8 =011652      1933  MAC.1    BAL   R15,ERROR                                            MAC19330
01145A   4630                   1934           DC    C'F0'              ERROR NUMBER          * NNF0 *    MAC19340
                                1935  *                                                                    MAC19350
                                1936  *                                                                    MAC19360
                                1937  *                                                                    MAC19370
01145C   5810 85EC =011A4C      1938  TSTCHK   L     R1,DISMAC                                            MAC19380
011460   9531                   1939           EPSR  R3,R1                                                MAC19390
011462   E610 80C0 =011526      1940           LA    R1,MACINT                                            MAC19400
011466   5010 0094              1941           ST    R1,X'94'                                             MAC19410
01146A   C830 2000              1942           LHI   R3,X'2000'                                           MAC19420
01146E   F810 4300 896A         1943           LI    R1,Y'4300896A'                                       MAC19430
011474   5010 EB58 =00FFD0      1944           ST    R1,SVCERR                                            MAC19440
011478   5030 0090              1945           ST    R3,X'90'                                             MAC19450
01147C   7310 848E =01190E      1946           LHL   R1,ERRNUM          IS ERROR FLAG SET ?               MAC19460
011480   4230 EE44 =0102C8      1947           BNZ   TSTSEL             NO, CHECK FOR NEXT TEST           MAC19470
011484   7310 EC8E =010116      1948           LHL   R1,NOMSG                                             MAC19480
011488   2135                   1949           BNZS  RTN1                                                 MAC19490
01148A   41F0 82A8 =011736      1950           BAL   R15,PRINT          PRINT 'NO ERROR'                  MAC19500
01148E   0001 1978              1951           DC    A(NOERR)                                             MAC19510
011492   4300 EE38 =0102CE      1952  RTN1     B     TSTSEL2            CHECK FOR NEXT TEST               MAC19520
                                1953  *                                                                    MAC19530
                                1954  *                                                                    MAC19540
                                1955  *                                                                    MAC19550
                                1956  *                                                                    MAC19560
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                                1957  *                                                                                  MAC19570
                                1958  *                                                                                  MAC19580
011496   58E0 857E =011A18      1959  ESTCON   L      R14,CONVAL          LOAD CONTROL FIELD VALUES                     MAC19590
01149A   033F                  1960           BZR    R15                 IF ZERO TAKE RETURN                           MAC19600
01149C   93DE                  1961           LBR    R13,R14                                                           MAC19610
01149E   C4D0 000F              1962           NHI    R13,X'F'            ISOLATE CURRENT CONTROL FIELD VALUE           MAC19620
0114A2   10E4                  1963           SRLS   R14,4                 REMOVE CURRENT VALUE FROM LIST                MAC19630
0114A4   50E0 8570 =011A18     1964           ST     R14,CONVAL          STORE VALUE FOR NEXT PASS                     MAC19640
0114A8   D2D0 854B =0119F7     1965           STB    R13,CONFLD          STORE CURRENT VALUE                           MAC19650
0114AC   430F 0004             1966           B      4(R15)              RETURN TO TEST                                MAC19660
                                1967  *                                                                                  MAC19670
                                1968  *                                                                                  MAC19680
                                1969  *                                                                                  MAC19690
0114B0   07BB                  1970  DELAY    XR     R11,R11                                                           MAC19700
0114B2   24C1                  1971           LIS    R12,1                                                             MAC19710
0114B4   58D0 8564 =011A1C     1972           L      R13,DELAYVAL                                                      MAC19720
0114B8   C1B0 FFFC =0114B8     1973           BXLE   R11,*                                                             MAC19730
0114BC   030F                  1974           BR     R15                                                               MAC19740
                                1975  *                                                                                  MAC19750
                                1976  *                                                                                  MAC19760
                                1977  *                                                                                  MAC19770
0114BE   D300 8566 =011A28     1978  DEVCHK   LB     R0,IO                                                             MAC19780
0114C2   C500 0002             1979           CLHI   R0,2                IS IT A DEVICE ON A CURRENT LOOP              MAC19790
0114C6   4230 8022 =0114EC     1980           BNE    CRTORCAR            NO                                            MAC19800
0114CA   D300 851C =0119EA     1981  TTY      LB     R0,TTYWRT                                                         MAC19810
0114CE   D200 8520 =0119F2     1982           STB    R0,WRTCMD                                                         MAC19820
0114D2   D300 8515 =0119E8     1983           LB     R0,TTYRD                                                          MAC19830
0114D6   D200 8519 =0119F3     1984           STB    R0,RDCMD                                                          MAC19840
0114DA   D300 854C =011A2A     1985           LB     R0,CONADR                                                         MAC19850
0114DE   D200 8512 =0119F4     1986           STB    R0,ADDRESS                                                        MAC19860
0114E2   0700                  1987           XR     R0,R0                                                             MAC19870
0114E4   4000 853C =011A24     1988           STH    R0,CRTFLG                                                         MAC19880
0114E8   4300 EB28 =010014     1989           B      EXEC                                                              MAC19890
                                1990  *                                                                                  MAC19900
                                1991  *                                                                                  MAC19910
                                1992  *                                                                                  MAC19920
0114EC   C500 0004             1993  CRTORCAR CLHI   R0,4                 IS IT CAROUSEL 300                            MAC19930
0114F0   2136                  1994           BNES   CRT1                NO THEN CRT                                   MAC19940
0114F2   C800 00F0             1995           LHI    R0,X'F0'            SET UP OUTPUT COM                             MAC19950
0114F6   D200 84F4 =0119EE     1996           STB    R0,CRTCMD                                                         MAC19960
0114FA   2305                  1997           BS     CRT                 GO THROUGH CRT DRIVER                         MAC19970
0114FC   C800 00F8             1998  CRT1     LHI    R0,X'F8'            SET UP FOR OUTPUT COM                         MAC19980
011500   D200 84EA =0119EE     1999           STB    R0,CRTCMD                                                         MAC19990
011504   D300 84E7 =0119EF     2000  CRT      LB     R0,CRTWRT                                                         MAC20000
011508   D200 84E6 =0119F2     2001           STB    R0,WRTCMD                                                         MAC20010
01150C   D300 84E0 =0119F0     2002           LB     R0,CRTRD                                                          MAC20020
011510   D200 84DF =0119F3     2003           STB    R0,RDCMD                                                          MAC20030
011514   D300 8514 =011A2C     2004           LB     R0,PASADR                                                         MAC20040
011518   D200 84D8 =0119F4     2005           STB    R0,ADDRESS                                                        MAC20050
01151C   2401                  2006           LIS    R0,1                                                              MAC20060
01151E   4000 8502 =011A24     2007           STH    R0,CRTFLG                                                         MAC20070
011522   4300 EAEE =010014     2008           B      EXEC                                                              MAC20080
                                2009  *                                                                                  MAC20090
                                2010  *                                                                                  MAC20100
                                2011  *                                                                                  MAC20110
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0113E4                          1904          ALIGN 4                                                    MAC19040
0113E4                          1905  REGSAVE DSF   16                                                   MAC19050
011424   0000 0000              1906  MEMTOP  DC    Y'0'                                                 MAC19060
011428   0000                   1907  RETURN1 DC    X'0000'                                              MAC19070
01142A   0000                   1908  MARCHCNT DC   X'0'                                                 MAC19080
01142C   AA                     1909  AAA     DB    X'AA'                                                MAC19090
01142D   55                     1910  FIVES   DB    X'55'                                                MAC19100
01142E   00                     1911  FLOP    DB    0                                                    MAC19110
01142F   00                     1912          DB    *                                                    MAC19120

                                1914  *                       *** MAC INTERRUPT ***                      MAC19140
                                1915  *                                                                  MAC19150
                                1916  * ROUTINE MACINT IS ENTERED WHEN THE MAC INTERRUPTS.               MAC19160
                                1917  * IF LOCATION FLAG IS NON ZERO, THE INTERRUPT WAS EXPECTED.        MAC19170
                                1918  * R13 IS LOADED WITH THE RETURN ADDRESS AND A RETURN IS MADE       MAC19180
                                1919  * TO THE INTERRUPTING MODULE.  IF FLAG IS ZERO, THE INTERRUPT      MAC19190
                                1920  * WAS NOT EXPECTED.                                               MAC19200
                                1921  *                                                                  MAC19210
011430   7370 ECF2 =010126      1922  MACINT1 LHL   R7,SEGREG          MAC INTERRUPT HANDLER             MAC19220
011434   5877 0040              1923          L     R7,X'40'(R7)       FETCH MAC ISR                     MAC19230
011438   5070 85C8 =011A04      1924          ST    R7,MACSTAT                                           MAC19240
01143C   24D0                   1925          LIS   R13,0                                                MAC19250
01143E   58A0 85DE =011A20      1926          L     R10,FLAG           WAS INTERRUPT EXPECTED ?          MAC19260
011442   233A                   1927          BZS   MAC.1              BRANCH IF NO                      MAC19270
011444   73A0 ECDE =010126      1928          LHL   R10,SEGREG                                           MAC19280
011448   50DA 0040              1929          ST    R13,X'40'(R10)     CLEAR MAC ISR                     MAC19290
01144C   50D0 85D0 =011A20      1930          ST    R13,FLAG           RESET FLAG                        MAC19300
011450   58D0 FFD4 =011428      1931          L     R13,RETURN1        GET RETURN ADDRESS                MAC19310
011454   06DD                   1932          BR    R13                                                  MAC19320
011456   41F0 81F8 =011652      1933  MAC.1   BAL   R15,ERROR                                            MAC19330
01145A   4630                   1934          DC    C'F0'              ERROR NUMBER          * NNF0 *    MAC19340
                                1935  *                                                                  MAC19350
                                1936  *                                                                  MAC19360
                                1937  *                                                                  MAC19370
01145C   5810 85EC =011A4C      1938  TSTCHK  L     R1,DISMAC                                            MAC19380
011460   9531                   1939          EPSR  R3,R1                                                MAC19390
011462   E610 80C0 =011526      1940          LA    R1,MACINT                                            MAC19400
011466   5010 0094              1941          ST    R1,X'94'                                             MAC19410
01146A   C830 2000              1942          LHI   R3,X'2000'                                           MAC19420
01146E   F810 4300 896A         1943          LI    R1,Y'4300896A'                                       MAC19430
011474   5010 E858 =00FFD0      1944          ST    R1,SVCERR                                            MAC19440
011478   5030 0090              1945          ST    R3,X'90'                                             MAC19450
01147C   7310 848E =01190E      1946          LHL   R1,ERRNUM          IS ERROR FLAG SET ?               MAC19460
011480   4260 EE44 =0102C8      1947          BNZ   TSTSEL             NO, CHECK FOR NEXT TEST           MAC19470
011484   7310 EC8E =010116      1948          LHL   R1,NOMSG                                             MAC19480
011488   2135                   1949          BNZS  RTN1                                                 MAC19490
01148A   41F0 82A8 =011736      1950          BAL   R15,PRINT          PRINT 'NO ERROR'                  MAC19500
01148E   0001 1978              1951          DC    A(NOERR)                                             MAC19510
011492   4300 EE38 =0102CE      1952  RTN1    B     TSTSEL2            CHECK FOR NEXT TEST               MAC19520
                                1953  *                                                                  MAC19530
                                1954  *                                                                  MAC19540
                                1955  *                                                                  MAC19550
                                1956  *                                                                  MAC19560
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                                1957  *                                                                                  MAC19570
                                1958  *                                                                                  MAC19580
011496   58E0 857E =011A18      1959  ESTCON   L      R14,CONVAL          LOAD CONTROL FIELD VALUES                     MAC19590
01149A   033F                  1960           BZR    R15                 IF ZERO TAKE RETURN                           MAC19600
01149C   93DE                  1961           LBR    R13,R14                                                           MAC19610
01149E   C4D0 000F              1962           NHI    R13,X'F'            ISOLATE CURRENT CONTROL FIELD VALUE           MAC19620
0114A2   10E4                  1963           SRLS   R14,4                 REMOVE CURRENT VALUE FROM LIST                MAC19630
0114A4   50E0 8570 =011A18     1964           ST     R14,CONVAL          STORE VALUE FOR NEXT PASS                     MAC19640
0114A8   D2D0 854B =0119F7     1965           STB    R13,CONFLD          STORE CURRENT VALUE                           MAC19650
0114AC   430F 0004             1966           B      4(R15)              RETURN TO TEST                                MAC19660
                                1967  *                                                                                  MAC19670
                                1968  *                                                                                  MAC19680
                                1969  *                                                                                  MAC19690
0114B0   07BB                  1970  DELAY    XR     R11,R11                                                           MAC19700
0114B2   24C1                  1971           LIS    R12,1                                                             MAC19710
0114B4   58D0 8564 =011A1C     1972           L      R13,DELAYVAL                                                      MAC19720
0114B8   C1B0 FFFC =0114B8     1973           BXLE   R11,*                                                             MAC19730
0114BC   030F                  1974           BR     R15                                                               MAC19740
                                1975  *                                                                                  MAC19750
                                1976  *                                                                                  MAC19760
                                1977  *                                                                                  MAC19770
0114BE   D300 8566 =011A28     1978  DEVCHK   LB     R0,IO                                                             MAC19780
0114C2   C500 0002             1979           CLHI   R0,2                IS IT A DEVICE ON A CURRENT LOOP              MAC19790
0114C6   4230 8022 =0114EC     1980           BNE    CRTORCAR            NO                                            MAC19800
0114CA   D300 851C =0119EA     1981  TTY      LB     R0,TTYWRT                                                         MAC19810
0114CE   D200 8520 =0119F2     1982           STB    R0,WRTCMD                                                         MAC19820
0114D2   D300 8515 =0119EB     1983           LB     R0,TTYRD                                                          MAC19830
0114D6   D200 8519 =0119F3     1984           STB    R0,RDCMD                                                          MAC19840
0114DA   D300 854C =011A2A     1985           LB     R0,CONADR                                                         MAC19850
0114DE   D200 8512 =0119F4     1986           STB    R0,ADDRESS                                                        MAC19860
0114E2   0700                  1987           XR     R0,R0                                                             MAC19870
0114E4   4000 853C =011A24     1988           STH    R0,CRTFLG                                                         MAC19880
0114E8   4300 E828 =010014     1989           B      EXEC                                                              MAC19890
                                1990  *                                                                                  MAC19900
                                1991  *                                                                                  MAC19910
                                1992  *                                                                                  MAC19920
0114EC   C500 0004             1993  CRTORCAR CLHI   R0,4                 IS IT CAROUSEL 300                            MAC19930
0114F0   2136                  1994           BNES   CRT1                NO THEN CRT                                   MAC19940
0114F2   C800 00F0             1995           LHI    R0,X'F0'            SET UP OUTPUT COM                             MAC19950
0114F6   D200 84F4 =0119EE     1996           STB    R0,CRTCMD                                                         MAC19960
0114FA   2305                  1997           BS     CRT                 GO THROUGH CRT DRIVER                         MAC19970
0114FC   C800 00F8             1998  CRT1     LHI    R0,X'F8'            SET UP FOR OUTPUT COM                         MAC19980
011500   D200 84EA =0119EE     1999           STB    R0,CRTCMD                                                         MAC19990
011504   D300 84E7 =0119EF     2000  CRT      LB     R0,CRTWRT                                                         MAC20000
011508   D200 84E6 =0119F2     2001           STB    R0,WRTCMD                                                         MAC20010
01150C   D300 84E0 =0119F0     2002           LB     R0,CRTRD                                                          MAC20020
011510   D200 84DF =0119F3     2003           STB    R0,RDCMD                                                          MAC20030
011514   D300 8514 =011A2C     2004           LB     R0,PASADR                                                         MAC20040
011518   D200 84D8 =0119F4     2005           STB    R0,ADDRESS                                                        MAC20050
01151C   2401                  2006           LIS    R0,1                                                              MAC20060
01151E   4000 8502 =011A24     2007           STH    R0,CRTFLG                                                         MAC20070
011522   4300 EAEE =010014     2008           B      EXEC                                                              MAC20080
                                2009  *                                                                                  MAC20090
                                2010  *                                                                                  MAC20100
                                2011  *                                                                                  MAC20110
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011526  C800 4631            2012  MACINT  LHI   R0,C'F1'                                          MAC20120
01152A  2309                 2013        BS    COMRTN                                            MAC20130
                             2014  *                                                               MAC20140
01152C  C800 4632            2015  SVCERR1 LHI   R0,C'F2'                                          MAC20150
011530  2306                 2016        BS    COMRTN                                            MAC20160
                             2017  *                                                               MAC20170
011532  C800 4633            2018  ARTFLT  LHI   R0,C'F3'                                          MAC20180
011536  2303                 2019        BS    COMRTN                                            MAC20190
                             2020  *                                                               MAC20200
011538  C800 4634            2021  SYSQ    LHI   R0,C'F4'                                          MAC20210
                             2022  *                                                               MAC20220
01153C  082E                 2023  COMRTN  LR    R2,R14                                            MAC20230
01153E  083F                 2024        LR    R3,R15                                            MAC20240
011540  4000 8004 =011548   2025        STH   R0,UC                                             MAC20250
011544  41F0 8102 =01164A   2026        BAL   R15,ERROR1                                        MAC20260
011548  0000                 2027  DC      DC    X'0000'                                           MAC20270
01154A  7340 EBD8 =010126    2028        LHL   R4,SEGREG                                         MAC20280
01154E  D214 0043            2029        STB   R1,67(R4)                                         MAC20290
011552  D314 0043            2030        LB    R1,67(R4)                                         MAC20300
011556  0811                 2031        LR    R1,R1                                             MAC20310
011558  2334                 2032        BZS   RTNB                                              MAC20320
01155A  41F0 80EC =01164A    2033        BAL   R15,ERROR1                                        MAC20330
01155E  3034                 2034        DCX   3034                ERROR NUMBER          * NN04 * MAC20340
011560  1802                 2035  RTNB    LPSWR R2                                              MAC20350
                             2036  *                                                               MAC20360
                             2037  *                                                               MAC20370
                             2038  *                                                               MAC20380
011562  0850                 2039  EXTINT1 LR    R5,R0                                             MAC20390
011564  0861                 2040        LR    R6,R1                                             MAC20400
011566  0812                 2041        LR    R1,R2                                             MAC20410
011568  41E0 8186 =0116F2    2042        BAL   R14,CONVERT                                       MAC20420
01156C  0008                 2043        DC    X'8'                                              MAC20430
01156E  0001 198C            2044        DC    A(DEVADRS)                                        MAC20440
011572  7310 8396 =01190C    2045        LHL   R1,TESTNUM                                        MAC20450
011576  4010 840C =011986    2046        STH   R1,INTMSG                                         MAC20460
01157A  41F0 81B8 =011736    2047        BAL   R15,PRINT                                         MAC20470
01157E  0001 1984            2048        DC    A(INTMSG1)                                        MAC20480
011582  1805                 2049        LPSWR R5                                                MAC20490
                             2050  *                                                               MAC20500
                             2051  *                                                               MAC20510
                             2052  *                                                               MAC20520
011584  081E                 2053  ILGINT  LR    R1,R14              LOAD DATA TO BE CONVERTED   MAC20530
011586  41E0 8168 =0116F2    2054        BAL   R14,CONVERT         CONVERT TO ASCII CHARACTERS   MAC20540
01158A  001C                 2055        DC    X'1C'                                             MAC20550
01158C  0001 19AC            2056        DC    A(ADRS2)                                          MAC20560
011590  081F                 2057        LR    R1,R15              LOAD DATA TO BE CONVERTED   MAC20570
011592  41E0 815C =0116F2    2058        BAL   R14,CONVERT         CONVERT TO ASCII CHARACTERS   MAC20580
011596  001C                 2059        DC    X'1C'                                             MAC20590
011598  0001 1986            2060        DC    A(ADRS1)                                          MAC20600
01159C  41F0 8196 =011736    2061        BAL   R15,PRINT           PRINT ILLEGAL INSTRUCTION MESSAGE MAC20610
0115A0  0001 1994            2062        DC    A(ILGMSG)                                         MAC20620
0115A4  90BA                 2063        SSR   R11,R10             IS TTY OFF ?                MAC20630
0115A6  231B                 2064        BNMS  CONT14              NO, LOAD NEW PSW            MAC20640
0115A8  F870 5555 5555       2065        LI    R7,Y'55555555'      YES, WRITE TO DISPLAY PANEL MAC20650
0115AE  41E0 8080 =011632    2066        BAL   R14,WRITE                                         MAC20660
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0115B2   94CC                          EXBR  R12,R12                                        MAC20670
0115B4   98DC                          WHR   R13,R12                                        MAC20680
0115B6   DED0 842E =0119E8             OC    R13,NORM                                       MAC20690
0115BA   030E                          BR    R14                                            MAC20700
0115BC   C200 8478 =011A38    CONT14   LPSW  HALT             LOAS NEW PSW AND HALT         MAC20710
                              *                                                             MAC20720
                              *                                                             MAC20730
                              *                                                             MAC20740
0115C0   9511                 MALFTN   EPSR  R1,R1                                          MAC20750
0115C2   24C1                          LIS   R12,1                                          MAC20760
0115C4   04C1                          NR    R12,R1                                         MAC20770
0115C6   2335                          BZS   CONT4                                          MAC20780
0115C8   5890 0024                     L     R9,X'24'                                       MAC20790
0115CC   4300 8036 =011606             B     CONT16                                         MAC20800
0115D0   0811                 CONT4    LR    R1,R1                                          MAC20810
0115D2   2133                          BNZS  CONT17                                         MAC20820
0115D4   5090 0024                     ST    R9,X'24'                                       MAC20830
0115D8   41E0 8116 =0116F2    CONT17   BAL   R14,CONVERT                                    MAC20840
0115DC   0000                          DC    X'0'                                           MAC20850
0115DE   0001 19DA                     DC    A(CCADRS)                                      MAC20860
0115E2   5810 0024                     L     R1,X'24'                                       MAC20870
0115E6   41E0 8108 =0116F2             BAL   R14,CONVERT                                    MAC20880
0115EA   0010                          DC    X'10'                                          MAC20890
0115EC   0001 19DE                     DC    A(MMADRS)                                      MAC20900
0115F0   41F0 8142 =011736             BAL   R15,PRINT                                      MAC20910
0115F4   0001 19C2                     DC    A(MACHMAL)                                     MAC20920
0115F8   9DBA                          SSR   R11,R10                                        MAC20930
0115FA   2316                          BNMS  CONT16                                         MAC20940
0115FC   F870 AAAA AAAA                LI    R7,Y'AAAAAAAA'                                 MAC20950
011602   41E0 802C =011632             BAL   R14,WRITE                                      MAC20960
011606   C200 842E =011A38    CONT16   LPSW  HALT                                           MAC20970
                              *                                                             MAC20980
                              *                                                             MAC20990
                              *                                                             MAC21000
01160A   D310 83E7 =0119F5    TSTNUM   LB    R1,SUBTST                                      MAC21010
01160E   41E0 80E0 =0116F2             BAL   R14,CONVERT                                    MAC21020
011612   0004                          DC    X'4'                                           MAC21030
011614   0001 190C                     DC    A(TESTNUM)                                     MAC21040
011618   4810 82F0 =01190C             LH    R1,TESTNUM                                     MAC21050
01161C   4010 8328 =011948             STH   R1,VALUE                                       MAC21060
011620   08EF                          LR    R14,R15                                        MAC21070
011622   73F0 EAF0 =010116             LHL   R15,NOMSG                                      MAC21080
011626   023E                          BNZR  R14                                            MAC21090
011628   41F0 810A =011736             BAL   R15,PRINT                                      MAC21100
01162C   0001 1940                     DC    A(TESTMSG)                                     MAC21110
011630   030E                          BR    R14                                            MAC21120
                              *                                                             MAC21130
                              *                                                             MAC21140
                              *                                                             MAC21150
011632   24D1                 WRITE    LIS   R13,1            PUT DISPLAY IN INCREMENTAL MODE   MAC21160
011634   DED0 83B1 =0119E9             OC    R13,INCRMT       LOAD CONTENTS OF R7 INTO R12 AND  MAC21170
011638   08C7                          LR    R12,R7           WRITE VALUE ON DISPLAY PANEL      MAC21180
01163A   94CC                          EXBR  R12,R12                                        MAC21190
01163C   98DC                          WHR   R13,R12                                        MAC21200
01163E   34CC                          EXHR  R12,R12                                        MAC21210
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011640   94CC                  2122          EXBR  R12,R12                    MAC21220
011642   98UC                  2123          WHR   R13,R12                    MAC21230
011644   DED0 83A0 =0119E8     2124          OC    R13,NORM                   MAC21240
011648   030E                  2125          BR    R14                        MAC21250
                               2126  *                                        MAC21260
                               2127  *                                        MAC21270
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                                2129  * ERROR ROUTINE  R1 = DATA   R13 = ADRS OF END OF MSG                    MAC21290
                                2130  *                 R4 = ADRS     R14 = ERROR NUMBER                     MAC21300
                                2131  *                                                                      MAC21310
011164A  25E1                   2132  ERROR1   LCS   R14,1                                                   MAC21320
011164C  40E0 82D8 =011928      2133           STH   R14,END                                                 MAC21330
011650  2304                    2134           BS    ERRORX                                                  MAC21340
011652  24E0                    2135  ERROR    LIS   R14,0                                                   MAC21350
011654  40E0 82D0 =011928      2136           STH   R14,END                                                 MAC21360
011658  73EF 0000               2137  ERRORX   LHL   R14,0(R15)                                             MAC21370
01165C  40E0 82AE =01190E      2138           STH   R14,ERRNUM        STORE ERROR NUMBER IN MESSAGE         MAC21380
011660  26F2                    2139           AIS   R15,2                                                   MAC21390
011662  D3B0 838E =0119F4      2140           LB    R11,ADDRESS                                             MAC21400
011666  24E1                    2141           LIS   R14,1                                                   MAC21410
011668  51E0 83A0 =011A0C      2142           AM    R14,TOTALERR                                            MAC21420
01166C  238A                    2143           BNCS  CONVRT                                                  MAC21430
01166E  9DBA                    2144           SSR   R11,R10                                                 MAC21440
011670  2113                    2145           BMS   ERRORXW           DU                                    MAC21450
011672  27AC                    2146           SIS   R10,X'0C'                                              MAC21460
011674  2136                    2147           BNZS  CONVRT                                                  MAC21470
011676  2571                    2148  ERRORXW  LCS   R7,1                                                    MAC21480
011678  41E0 FFB6 =011632      2149           BAL   R14,WRITE                                               MAC21490
01167C  C200 83C0 =011A40      2150           LPSW  ERRHALT                                                 MAC21500


011680  9DBA                    2152  CONVRT   SSR   R11,R10                                                 MAC21520
011682  C3A0 0020               2153           THI   R10,X'20'                                               MAC21530
011686  4230 8042 =0116CC      2154           BNZ   BRKWAIT                                                 MAC21540
01168A  41E0 8064 =0116F2      2155           BAL   R14,CONVERT                                             MAC21550
01168E  001C                    2156           DC    X'1C'                                                   MAC21560
011690  0001 1934               2157           DC    A(DATA)                                                 MAC21570
011694  73E0 EA8E =010126      2158           LHL   R14,SEGREG        LOAD START ADRS OF SEG REGISTERS        MAC21580
011698  D31E 0043               2159           LB    R1,67(R14)      LOAD CONTENT  OF STATUS REGISTER        MAC21590
01169C  41E0 8052 =0116F2      2160           BAL   R14,CONVERT     CONVERT TO ASCII CHARACTERS             MAC21600
0116A0  0004                    2161           DC    X'4'                                                    MAC21610
0116A2  0001 191A               2162           DC    A(STATUS)                                               MAC21620
0116A6  0814                    2163           LR    R1,R4           LOAD MEMORY ADRS                        MAC21630
0116A8  41E0 8046 =0116F2      2164           BAL   R14,CONVERT     CONVERT TO ASCII CHARACTERS             MAC21640
0116AC  001C                    2165           DC    X'1C'                                                   MAC21650
0116AE  0001 192A               2166           DC    A(ADRS)                                                 MAC21660
0116B2  D310 8341 =0119F7      2167           LB    R1,CONFLD       LOAD CURRENT CONTROL FIELD VALUE        MAC21670
0116B6  41E0 8038 =0116F2      2168           BAL   R14,CONVERT     CONVERT TO ASCII CHARACTERS             MAC21680
0116BA  0000                    2169           DC    X'0'                                                    MAC21690
0116BC  0001 1925               2170           DC    A(CONTROL)                                              MAC21700
0116C0  08EF                    2171           LR    R14,R15                                                 MAC21710
0116C2  41F0 8070 =011736      2172           BAL   R15,PRINT                                               MAC21720
0116C6  0001 1904               2173           DC    A(ERRMSG)                                               MAC21730
0116CA  030E                    2174           BR    R14                                                     MAC21740
0116CC  73E0 8354 =011A24      2175  BRKWAIT  LHL   R14,CRTFLG                                             MAC21750
0116D0  233B                    2176           BZS   BRKWAIT1                                                MAC21760
0116D2  9DBA                    2177           SSR   R11,R10                                                 MAC21770
*0116D4  218D                   2178           BTC   8,RTN5          BRANCH IF BUSY                          MAC21780
0116D6  DEB0 8319 =0119F3      2179           OC    R11,RDCMD                                               MAC21790
0116DA  9BBE                    2180           RDR   R11,R14                                                 MAC21800
0116DC  9DBA                    2181           SSR   R11,R10                                                 MAC21810
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0116DE  2281                2182          BFBS  8,1                                                  MAC21820
0116E0  08EE                2183          LR    R14,R14            CHARACTER = 0?                    MAC21830
0116E2  2136                2184          BNZS  RTN5                                                  MAC21840
0116E4  030F                2185          BR    R15                                                   MAC21850
0116E6  9DBA                2186  BRKWAIT1 SSR  R11,R10                                               MAC21860
0116E8  C3A0 0020           2187          THI   R10,X'20'                                             MAC21870
0116EC  2033                2188          BNZS  BRKWAIT1                                              MAC21880
0116EE  4300 FD6A =01145C   2189  RTN5    B     TSTCHK                                                MAC21890
                            2190  *                                                                   MAC21900
                            2191  *                                                                   MAC21910
                            2192  *                                                                   MAC21920
                            2193  * CONVERT ROUTINE   R1 = DATA TO BE CONVERTED TO ASCII              MAC21930
                            2194  *                   R10 = ADRS WHERE DATA IS TO BE STORED          MAC21940
                            2195  *                   R12 = SHIFT VALUE                             MAC21950
                            2196  *                                                                   MAC21960
0116F2  73CE 0000           2197  CONVERT LHL   R12,0(R14)                                            MAC21970
0116F6  73AE 0002           2198          LHL   R10,2(R14)                                            MAC21980
0116FA  34AA                2199          EXHR  R10,R10                                               MAC21990
0116FC  46AE 0004           2200          OH    R10,4(R14)                                            MAC22000
011700  08B1                2201  CONVERT1 LR   R11,R1             LOAD DATA TO BE CONVERTED          MAC22010
011702  ECBC 0000           2202          SRL   R11,0(R12)         SHIFT HEX DIGIT TO BE CONVERTED    MAC22020
011706  C4B0 000F           2203          NHI   R11,X'F'           ISOLATE HEX DIGIT                  MAC22030
01170A  C6B0 0030           2204          OHI   R11,X'30'          CONVERT TO ASCII NUMBER            MAC22040
01170E  C5B0 003A           2205          CLHI  R11,X'3A'          IS IT A VALID NUMBER ?             MAC22050
011712  2182                2206          BLS   CONT               YES, CONTINUE                      MAC22060
011714  26B7                2207          AIS   R11,7              NO, CONVERT TO ASCII LETTER        MAC22070
011716  D2BA 0000           2208  CONT    STB   R11,0(R10)         STORE ASCII BYTE IN MESSAGE        MAC22080
01171A  08CC                2209          LR    R12,R12            HAS ENTIRE NUMBER BEEN CONVERTED ? MAC22090
01171C  433E 0006           2210          BZ    6(R14)             YES, RETURN                        MAC22100
011720  27C4                2211          SIS   R12,4              NO, DECREMENT SHIFT INDEX          MAC22110
011722  26A1                2212          AIS   R10,1              INCREMENT STORAGE INDEX            MAC22120
011724  4300 FFD8 =011700   2213          B     CONVERT1           REPEAT FOR NEXT HEX DIGIT          MAC22130
                            2214  *                                                                   MAC22140
                            2215  *                                                                   MAC22150
                            2216  *                                                                   MAC22160
011728  9DB0                2217  GETCHR  SSR   R11,R0             * READ CHAR ROUTINE                MAC22170
01172A  021F                2218          BMR   R15                EXIT IF TTY DU                     MAC22180
01172C  2082                2219          BCS   GETCHR             IF BUSY SENSE AGAIN                MAC22190
01172E  9BB0                2220          RDR   R11,R0             READ A CHARACTER                   MAC22200
011730  C400 007F           2221          NHI   R0,X'7F'           MASK OF PARITY BIT                 MAC22210
011734  030F                2222          BR    R15                RETURN                             MAC22220
                            2223  *                                                                   MAC22230
                            2224  *                                                                   MAC22240
                            2225  *                                                                   MAC22250
011736  03B0 82BA =0119F4   2226  PRINT   LB    R11,ADDRESS                                           MAC22260
01173A  73A0 82E6 =011A24   2227          LHL   R10,CRTFLG                                            MAC22270
01173E  2332                2228          BZS   CMD                                                   MAC22280
011740  26B1                2229          AIS   R11,1                                                 MAC22290
011742  DEB0 82AC =0119F2   2230  CMD     OC    R11,WRTCMD                                            MAC22300
011746  9DBA                2231  SENSE   SSR   R11,R10                                               MAC22310
011748  2315                2232          BNMS  CONT12                                                MAC22320
01174A  D2B0 829F =0119ED   2233          STB   R11,TTYFLG                                            MAC22330
01174E  430F 0004           2234          B     4(R15)                                                MAC22340
011752  73CF 0000           2235  CONT12  LHL   R12,0(R15)                                            MAC22350
011756  34CC                2236          EXHR  R12,R12                                               MAC22360
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011758   46CF 0002            2237           OH     R12,2(R15)                                  MAC22370
01175C   26F4                 2238           AIS    R15,4                                       MAC22380
01175E   D3DC 0000            2239  LOOP     LB     R13,0(R12)                                  MAC22390
011762   9DBA                 2240           SSR    R11,R10                                     MAC22400
011764   2081                 2241           BTBS   8,1                 WAIT FOR BUSY = 0        MAC22410
011766   9ABD                 2242           WDR    R11,R13                                     MAC22420
011768   26C1                 2243           AIS    R12,1                                       MAC22430
01176A   C5D0 00FF            2244           CLHI   R13,X'FF'                                   MAC22440
01176E   2038                 2245           BNES   LOOP                                        MAC22450
011770   73A0 8280 =011A24    2246           LHL    R10,CRTFLG                                  MAC22460
011774   035F                 2247           BZR    R15                                         MAC22470
011776   07AA                 2248           XR     R10,R10                                     MAC22480
011778   9ABA                 2249           WDR    R11,R10                                     MAC22490
01177A   9DBA                 2250           SSR    R11,R10                                     MAC22500
01177C   2081                 2251           BTBS   8,1                                         MAC22510
01177E   27B1                 2252           SIS    R11,1                                       MAC22520
011780   030F                 2253           BR     R15                                         MAC22530
                              2254  *                                                           MAC22540
                              2255  *                                                           MAC22550
                              2256  *                                                           MAC22560
                              2257  *                                                    *      MAC22570
011782   D000 FC5E =0113E4    2258  MALXERR  STM    R0,REGSAVE          SAVE ALL REGISTERS       MAC22580
011786   481F 0000            2259           LH     R1,0(R15)                                   MAC22590
01178A   4010 8082 =011810    2260           STH    R1,MALXERNO         SAVE ERROR NUMBER        MAC22600
01178E   26F2                 2261           AIS    R15,2                                       MAC22610
011790   4813 0000            2262           LH     R1,0(R3)                                    MAC22620
011794   1012                 2263           SRLS   R1,2                SEGMENTATION REGISTER NUMBER MAC22630
011796   41F0 FF58 =0116F2    2264           BAL    R15,CONVERT         CONVERT TO ASCII         MAC22640
01179A   000C                 2265           DCX    C                                           MAC22650
01179C   0001 1874            2266           DC     SEGREGA                                     MAC22660
0117A0   5812 0000            2267           L      R1,0(R2)            GET CONTENTS OF SEG REG  MAC22670
0117A4   41E0 FF4A =0116F2    2268           BAL    R14,CONVERT         CONVERT TO ASCII         MAC22680
0117A8   001C                 2269           DCX    1C                                          MAC22690
0117AA   0001 1898            2270           DC     SEGDATA                                     MAC22700
0117AE   0816                 2271           LR     R1,R6               DATA WRITTEN             MAC22710
0117B0   41E0 FF3E =0116F2    2272           BAL    R14,CONVERT         CONVERT TO ASCII         MAC22720
0117B4   0004                 2273           DCX    4                                           MAC22730
0117B6   0001 181C            2274           DC     WRITDAT                                     MAC22740
0117BA   0815                 2275           LR     R1,R5               PROGRAM ADDRESS          MAC22750
0117BC   41E0 FF32 =0116F2    2276           BAL    R14,CONVERT         CONVERT TO ASCII         MAC22760
0117C0   001C                 2277           DCX    1C                                          MAC22770
0117C2   0001 18B6            2278           DC     MBDA                                        MAC22780
0117C6   5810 FC42 =0114DC    2279           L      R1,REGSAVE+40       R10 = ACTUAL ADDRESS     MAC22790
0117CA   41E0 FF24 =0116F2    2280           BAL    R14,CONVERT         CONVERT TO ASCII         MAC22800
0117CE   001C                 2281           DCX    1C                                          MAC22810
0117D0   0001 1838            2282           DC     RELADDR                                     MAC22820
0117D4   5810 FC38 =011410    2283           L      R1,REGSAVE+44       R11 = DATA READ          MAC22830
0117D8   41E0 FF16 =0116F2    2284           BAL    R14,CONVERT         CONVERT TO ASCII         MAC22840
0117DC   0004                 2285           DCX    4                                           MAC22850
0117DE   0001 1850            2286           DC     DATRED                                      MAC22860
0117E2   4810 FC44 =01142A    2287           LH     R1,MARCHCNT         NUMBER OF PASSES         MAC22870
0117E6   41E0 FF08 =0116F2    2288           BAL    R14,CONVERT         CONVERT TO ASCII         MAC22880
0117EA   0004                 2289           DCX    4                                           MAC22890
0117EC   0001 18C0            2290           DC     PASSCNT                                     MAC22900
*0117F0  2511                 2291           LHI    R1,X'FFFF'                                  MAC22910
```

```
0117F2   4010 8118 =01190E    2292          STH   R1,ERRNUM          SET ERROR FLAG                MAC22920
0117F6   41F0 FF3C =011736    2293          BAL   R15,PRINT                                      MAC22930
0117FA   0001 1806            2294          DC    MALXERRM           PRINT MESSAGE              MAC22940
0117FE   D100 FBE2 =0113E4    2295          LM    R0,REGSAVE                                    MAC22950
011802   430F 0002            2296          B     2(R15)                                        MAC22960
```

```
011806  0D0A                    2298  MALXERRM DCX   0D0A                                          MAC22980
011808  4552 524F 5220 3038     2299           DC    C'ERROR 08'                                   MAC22990
011810  0000                    2300  MALXERNO DC    X'0000',X'0D0A',X'0000'                       MAC23000
011812  0D0A
011814  0000
011816  4441 5441 2020          2301           DC    C'DATA '                                      MAC23010
01181C  0000                    2302  WRITDAT  DC    X'0000'                                       MAC23020
01181E  2057 4153 2057 5249     2303           DC    C' WAS WRITTEN TO LOCATION '                  MAC23030
011826  5454 454E 2054 4F20
01182E  4C4F 4341 5449 4F4E
011836  2020
011838  0000 0000               2304  RELADDR  DC    Y'00000000'                                   MAC23040
01183C  0000                    2305           DCX   0,0,0D0A                                      MAC23050
01183E  0000
011840  0D0A
011842  4441 5441 2052 4541     2306           DC    C'DATA READ WAS'                              MAC23060
01184A  4420 5741 5320
011850  0000                    2307  DATRED   DC    X'0000',X'0D0A'                               MAC23070
011852  0D0A
011854  5345 474D 454E 5441     2308           DC    C'SEGMENTATION REGISTER USED WAS '            MAC23080
01185C  5449 4F4E 2052 4547
011864  4953 5445 5220 5553
01186C  4544 2057 4153 2020
011874  0000                    2309  SEGREGA  DC    X'0000',X'0D0A'                               MAC23090
011876  0D0A
011878  5345 474D 454E 5441     2310           DC    C'SEGMENTATION REGISTER DATA WAS '            MAC23100
011880  5449 4F4E 2052 4547
011888  4953 5445 5220 4441
011890  5441 2057 4153 2020
011898  0000                    2311  SEGDATA  DCX   0,0,0,0,0D0A                                  MAC23110
01189A  0000
01189C  0000
01189E  0000
0118A0  0D0A
0118A2  5052 4F47 5241 4D20     2312           DC    C'PROGRAM ADDRESS WAS '                       MAC23120
0118AA  4144 4452 4553 5320
0118B2  5741 5320
0118B6  0000                    2313  MBDA     DCX   0,0,0,0,0D0A                                  MAC23130
0118B8  0000
0118BA  0000
0118BC  0000
0118BE  0D0A
0118C0  0000                    2314  PASSCNT  DC    X'0000'                                       MAC23140
0118C2  2050 4153 5345 5320     2315           DC    C' PASSES WERE COMPLETED BEFORE FAILURE'      MAC23150
0118CA  5745 5245 2043 4F4D
0118D2  504C 4554 4544 2042
0118DA  4546 4F52 4520 4641
0118E2  494C 5552 4520
0118E8  0D0A                    2316           DC    X'0D0A'                                       MAC23160
0118EA  FFFF                    2317           DC    X'FFFF'                                       MAC23170
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                                2319  *                  M E S S A G E S                    *                MAC23190
0118EC  0D0A                    2320  TITLE    DC    X'0D0A',C'MACT 06-160F02R03',X'0D0A'                    MAC23200
0118EE  4D41 4354 2030 362D
0118F6  3136 3046 3032 5230
0118FE  3320
011900  0D0A
011902  FFFF                    2321           DCX   FFFF                                                    MAC23210
                                2322  *                                                                      MAC23220
                                2323  *                                                                      MAC23230
                                2324  *                                                                      MAC23240
                                2325  *                                                                      MAC23250
                                2326  * ERROR MESSAGE = ERROR TTEE  STATUS SS  CONFLD ZZ                     MAC23260
                                2327  *                   ADRS XXXXXXXX  DATA DDDDDDDD                       MAC23270
                                2328  *                                                                      MAC23280
                                2329  * TT = TEST NUMBER   EE = ERROR  NUMBER    SS = MAC STATUS             MAC23290
                                2330  * ZZ = CONTROL FIELD VALUE                                             MAC23300
                                2331  * XXXXXXXX = MEMORY ADRS WRITTEN TO   DDDDDDDD = DATA READ FROM ADRS   MAC23310
                                2332  *                                                                      MAC23320
011904  0D0A                    2333  ERRMSG   DC    X'0D0A'                                                 MAC23330
011906  4552 524F 5220          2334           DC    C'ERROR '                                               MAC23340
01190C  0000                    2335  TESTNUM  DC    X'0000'                                                 MAC23350
01190E  0000                    2336  ERRNUM   DC    X'0000'                                                 MAC23360
011910  2020                    2337           DC    X'2020'                                                 MAC23370
011912  5354 4154 5553 2020     2338           DC    C'STATUS '                                              MAC23380
01191A  0000                    2339  STATUS   DC    X'0000'                                                 MAC23390
01191C  2020                    2340           DC    X'2020'                                                 MAC23400
01191E  434F 4E46 4C44          2341           DC    C'CONFLD'                                               MAC23410
011924  20                      2342           DB    X'20'                                                   MAC23420
011925  00                      2343  CONTROL  DB    X'0'                                                    MAC23430
011926  0D0A                    2344           DC    X'0D0A'                                                 MAC23440
011928  FFFF                    2345  END      DCX   FFFF                                                    MAC23450
01192A  0000 0000               2346  ADRS     DC    Y'00000000',0                                           MAC23460
01192E  0000 0000
011932  2020                    2347           DC    X'2020'                                                 MAC23470
011934  0000 0000               2348  DATA     DC    Y'00000000',0                                           MAC23480
011938  0000 0000
01193C  0D0A                    2349           DC    X'0D0A'                                                 MAC23490
01193E  FFFF                    2350           DCX   FFFF                                                    MAC23500
                                2351  *                                                                      MAC23510
                                2352  *                                                                      MAC23520
                                2353  *                                                                      MAC23530
011940  0D0A                    2354  TESTMSG  DC    X'0D0A',C'TEST  '                                       MAC23540
011942  5445 5354 2020
011948  0000                    2355  VALUE    DC    X'0000'                                                 MAC23550
01194A  FFFF                    2356           DCX   FFFF                                                    MAC23560
                                2357  *                                                                      MAC23570
                                2358  *                                                                      MAC23580
                                2359  *                                                                      MAC23590
01194C  0D0A                    2360  QMARK    DCX   0D0A,003F                                               MAC23600
01194E  003F
011950  FFFF                    2361           DCX   FFFF                                                    MAC23610
                                2362  *                                                                      MAC23620
                                2363  *                                                                      MAC23630
                                2364  *                                                                      MAC23640
011952  0D0A                    2365  ASTERISK DCX   0D0A,002A                                               MAC23650
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011954  002A
011956  20FF                    2366            DCX   20FF                                MAC23660
                                2367  *                                                   MAC23670
                                2368  *                                                   MAC23680
                                2369  *                                                   MAC23690
011958  0D0A                    2370  TOTMSG    DC    X'0D0A'                             MAC23700
01195A  0000 0000               2371  TOTALMSG  DC    0                                   MAC23710
01195E  0000 0000               2372            DC    0                                   MAC23720
011962  2054 4F54 414C 2020     2373            DC    C' TOTAL '                          MAC23730
01196A  FFFF                    2374            DCX   FFFF                                MAC23740
01196C  4552 524F 5253 2020     2375            DC    C'ERRORS ',X'0D0A'                  MAC23750
011974  0D0A
011976  FFFF                    2376            DCX   FFFF                                MAC23760
                                2377  *                                                   MAC23770
                                2378  *                                                   MAC23780
                                2379  *                                                   MAC23790
011978  0020                    2380  NOERR     DC    X'0020',C'NO ERROR',X'FFFF'         MAC23800
01197A  4E4F 2045 5252 4F52
011982  FFFF
                                2381  *                                                   MAC23810
                                2382  *                                                   MAC23820
                                2383  *                                                   MAC23830
011984  0D0A                    2384  INTMSG1   DC    X'0D0A'                             MAC23840
011986  0000                    2385  INTMSG    DC    X'0'                                MAC23850
011988  4635                    2386            DC    C'F5'                               MAC23860
01198A  0D0A                    2387            DC    X'0D0A'                             MAC23870
01198C  0000 0000               2388  DEVADRS   DC    0                                   MAC23880
011990  0D0A                    2389            DC    X'0D0A'                             MAC23890
011992  FFFF                    2390            DCX   FFFF                                MAC23900
                                2391  *                                                   MAC23910
                                2392  *                                                   MAC23920
                                2393  *                                                   MAC23930
011994  0D0A                    2394  ILGMSG    DC    X'0D0A',C'ILLEGAL INSTRUCTION'      MAC23940
011996  494C 4C45 4741 4C20
01199E  494E 5354 5255 4354
0119A6  494F 4E20
0119AA  0D0A                    2395            DC    X'0D0A'                             MAC23950
0119AC  0000 0000               2396  ADRS2     DC    0                                   MAC23960
0119B0  0000 0000               2397            DC    0                                   MAC23970
0119B4  2000                    2398            DC    X'2000'                             MAC23980
0119B6  0000 0000               2399  ADRS1     DC    0                                   MAC23990
0119BA  0000 0000               2400            DC    0                                   MAC24000
0119BE  0D0A                    2401            DC    X'0D0A'                             MAC24010
0119C0  FFFF                    2402            DCX   FFFF                                MAC24020
                                2403  *                                                   MAC24030
                                2404  *                                                   MAC24040
                                2405  *                                                   MAC24050
0119C2  0D0A                    2406  MACHMAL   DC    X'0D0A',C'MACHINE MALFUNCTION'      MAC24060
0119C4  4D41 4348 494E 4520
0119CC  4D41 4C46 554E 4354
0119D4  494F 4E20
0119D8  0D0A                    2407            DC    X'0D0A'                             MAC24070
0119DA  00                      2408  CCADRS    DB    0                                   MAC24080
0119DC  2020                    2409            DC    X'2020'                             MAC24090
0119DE  0000 0000               2410  MMADRS    DC    0                                   MAC24100
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0119E2  00                  2411            DB    0                                                  MAC24110
0119E4  0D0A                2412            DC    X'0D0A'                                            MAC24120
0119E6  FFFF                2413            DCX   FFFF                                               MAC24130
                            2414  *                                                                  MAC24140
                            2415  *                                                                  MAC24150
0119E8  80                  2416  NORM      DB    X'80'                                              MAC24160
0119E9  40                  2417  INCRMT    DB    X'40'                                              MAC24170
0119EA  98                  2418  TTYWRT    DB    X'98'                                              MAC24180
0119EB  A4                  2419  TTYRD     DB    X'A4'                                              MAC24190
0119EC  02                  2420  TTYADR    DB    2                                                  MAC24200
0119ED  00                  2421  TTYFLG    DB    0                                                  MAC24210
0119EE  F8                  2422  CRTCMD    DB    X'F8'                                              MAC24220
0119EF  A3                  2423  CRTWRT    DB    X'A3'                                              MAC24230
0119F0  B1                  2424  CRTRD     DB    X'B1'                                              MAC24240
0119F1  10                  2425  CRTADR    DB    X'10'                                              MAC24250
0119F2  00                  2426  WRTCMD    DB    0                                                  MAC24260
0119F3  00                  2427  RDCMD     DB    0                                                  MAC24270
0119F4  00                  2428  ADDRESS   DB    0                                                  MAC24280
0119F5  00                  2429  SUBTST    DB    0                                                  MAC24290
0119F6  00                  2430  INSAVE    DB    0                                                  MAC24300
0119F7  00                  2431  CONFLD    DB    0                  CONTROL FIELD INDICATOR         MAC24310
0119F8                      2432            DB    *                                                  MAC24320
0119F8  0030                2433  THIRTY    DC    X'30'                                              MAC24330
0119FC                      2434            ALIGN 4                                                  MAC24340
0119FC  0000 0000           2435  FAILADDR  DCY   0                                                  MAC24350
011A00  0000 0000           2436  PSWMASK   DC    0                  PSW MASK VALUE                  MAC24360
011A04  0000 0000           2437  MACSTAT   DC    0                                                  MAC24370
011A08  0000 0000           2438  TOTAL     DC    0                                                  MAC24380
011A0C  0000 0000           2439  TOTALERR  DC    0                                                  MAC24390
011A10  0000 0000           2440  OPTSAV    DC    0                                                  MAC24400
011A14  0000 0000           2441  LOCSAVE   DC    0                                                  MAC24410
011A18  0000 0000           2442  CONVAL    DC    0                                                  MAC24420
011A1C  0000 FFFF           2443  DELAYVAL  DC    Y'FFFF'                                            MAC24430
011A20  0000 0000           2444  FLAG      DC    Y'0'                                               MAC24440
011A24  0000                2445  CRTFLG    DC    X'0'                                               MAC24450
011A26  0000                2446  WRAPFLG   DC    X'0'                                               MAC24460
011A28  0202                2447  IO        DCX   0202                                               MAC24470
011A2A  0202                2448  CONADR    DCX   0202               TELETYPE/CAROUSEL 15,30         MAC24480
011A2C  1011                2449  PASADR    DCX   1011               PASLA ADDRESS SEND/RECEIVE      MAC24490
011A30                      2450            ALIGN 8                                                  MAC24500
011A30  0000 20F0           2451  ENABLE    DC    Y'20F0',ENABLE2                                    MAC24510
011A34  0001 0154
011A38  0000 A0F0           2452  HALT      DC    Y'A0F0',TTYIN                                      MAC24520
011A3C  0001 0162
011A40  0000 A0F0           2453  ERRHALT   DC    Y'A0F0',TTYCHK                                     MAC24530
011A44  0001 0390
011A48  0000 24F0           2454  ENBMAC    DCY   24F0                                               MAC24540
011A4C  0000 20F0           2455  DISMAC    DC    Y'20F0',INCR                                       MAC24550
011A50  0001 085A
        0001 1A54           2456  LNZB      EQU   *                                                  MAC24560
                            2457  *                                                                  MAC24570
                            2458  *                                                                  MAC24580
                            2459  *                                                                  MAC24590
011A54                      2460  TABLE1    DS    12                                                 MAC24600
011A60                      2461  TTYBUF    DS    6                                                  MAC24610
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011A66                  2462            ORG   X'A00'                      MAC24620
000A00                  2463  PSWSAVE   DS    16                          MAC24630
000A10                  2464  RSAVE     DS    128                         MAC24640
                        2465  *                                           MAC24650
                        2466  *                                           MAC24660
```

```
000A90  2400            2468  $CHKSUM  LIS   R0,0          PUNCH M17 TAPE WITH CHECKSUM      MAC24680
000A92  9510            2469           EPSR  R1,R0         SELECT REG.SET 0                  MAC24690
                        2470  *                                                              MAC24700
000A94  E610 4000 FFD0  2471           LOAI  R1,ORIGIN1    START                             MAC24710
000A9A  2421            2472           LIS   R2,1          INCREMENT                         MAC24720
000A9C  E630 4001 1A54  2473           LOAI  R3,LNZB       FINAL                             MAC24730
000AA2  2440            2474           LIS   R4,0          CHECKSUM BYTE                     MAC24740
000AA4  D351 0000       2475  $GEN     LB    R5,0(R1)                                        MAC24750
000AA8  0745            2476           XAR   R4,R5                                           MAC24760
000AAA  C110 0AA4       2477           BXLE  R1,$GEN                                         MAC24770
000AAE  D240 0091       2478           STB   R4,MN+3       CHECKSUM BYTE TO BOOT LOADER      MAC24780
                        2479  *                                                              MAC24790
000AB2  C810 0080       2480  $TAPE    LHI   R1,X'0080'                                      MAC24800
000AB6  9E21            2481           OCR   R2,R1         DISPLAY TO NORMAL MODE            MAC24810
000AB8  9444            2482           EXBR  R4,R4                                           MAC24820
000ABA  9824            2483           WHR   R2,R4         SHOW CHECKSUM                     MAC24830
000ABC  9411            2484           EXBR  R1,R1                                           MAC24840
000ABE  9501            2485           EPSR  R0,R1         HALT THE PROCESSOR                MAC24850


000AC0  D360 007A       2487  $PUNCH   LB    R6,X'7A'      GET BOUTDV                        MAC24870
000AC4  DE60 007B       2488           OC    R6,X'7B'      START THE PUNCH                   MAC24880
000AC8  9D60            2489           SSR   R6,R0                                           MAC24890
000ACA  2081            2490           BTBS  8,1                                             MAC24900
000ACC  41F0 0B12       2491           BAL   R15,$TAPL     PUNCH LEADER                      MAC24910
000AD0  9411            2492           EXBR  R1,R1         R1 = X'0080'                      MAC24920
000AD2  C830 00CF       2493           LHI   R3,X'CF'                                        MAC24930
000AD6  DA61 0000       2494  $PNCH1   WD    R6,0(R1)      PUNCH BOOT LOADERE                MAC24940
000ADA  9D60            2495           SSR   R6,R0                                           MAC24950
000ADC  2081            2496           BTBS  8,1                                             MAC24960
000ADE  C110 0AD6       2497           BXLE  R1,$PNCH1                                       MAC24970
000AE2  41F0 0B18       2498           BAL   R15,$TAPL1    PUNCH ONE-FOLD GAP                MAC24980
                        2499  *                                                              MAC24990
000AE6  D340 0091       2500           LB    R4,MN+3       GET CHECKSUM BYTE                 MAC25000
000AEA  E610 4000 FFD0  2501           LOAI  R1,ORIGIN1                                      MAC25010
000AF0  E630 4001 1A54  2502           LOAI  R3,LNZB                                         MAC25020
000AF6  D351 0000       2503  $PNCH2   LB    R5,0(R1)      PUNCH THE PROGRAM                 MAC25030
000AFA  0745            2504           XAR   R4,R5         CHECK CHECKSUM                    MAC25040
000AFC  9A65            2505           WDR   R6,R5         DISPLAY IT                        MAC25050
000AFE  9401            2506           EXBR  R0,R1                                           MAC25060
000B00  9820            2507           WHR   R2,R0                                           MAC25070
000B02  9D60            2508           SSR   R6,R0                                           MAC25080
000B04  2081            2509           BTBS  8,1                                             MAC25090
000B06  C110 0AF6       2510           BXLE  R1,$PNCH2                                       MAC25100
000B0A  41F0 0B12       2511           BAL   R15,$TAPL     PUNCH RAILER                      MAC25110
000B0E  4300 0AB2       2512           B     $TAPE         SHOW CHECKSUM & HALT              MAC25120


000B12  C800 0100       2514  $TAPL    LHI   R0,256        TO PUNCH BLANK LEADER             MAC25140
000B16  2303            2515           BS    $TAPLP                                          MAC25150
000B18  C800 0055       2516  $TAPL1   LHI   R0,85         TO PUNCH ONE FOLD                 MAC25160
000B1C  2701            2517  $TAPLP   SIS   R0,1                                           MAC25170
000B1E  032F            2518           BNPR  R15           RETURN                            MAC25180
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000B20  2430            2519        LIS   R3,0                                MAC25190
000B22  9A63            2520        WDR   R6,R3          PUNCH BLANK FRAME      MAC25200
000B24  9D68            2521        SSR   R6,R8                                 MAC25210
000B26  2081            2522        BTBS  8,1                                   MAC25220
000B28  2206            2523        BS    $TAPLP         CONTINUE               MAC25230
000B2A                  2524        END                                         MAC25240
```

ASSEMBLED BY CAL 03-066R05-00 (32-BIT)

START OPTIONS: SCR+CRO+T=32

NO CAL ERRORS
2 CAL WARNINGS PREVIOUS WARNING ON PAGE 26
6 PASSES

$CHKSUM	0000 0A90	2468*						
$GEN	0000 0AA4	2475*	2477					
$PNCH1	0000 0AD6	2494*	2497					
$PNCH2	0000 0AF6	2503*	2510					
$PUNCH	0000 0AC0	2487*						
$TAPE	0000 0AB2	2480*	2512					
$TAPL	0000 0B12	2491	2511	2514*				
$TAPL1	0000 0B18	2498	2516*					
$TAPLP	0000 0B1C	2515	2517*	2523				
AAA	0001 142C	1603	1638	1909*				
ABSTOP	0001 1A66							
ADC	0000 0004							
ADD1	0001 0808	962*	991					
ADDRESS	0001 19F4	145	337	1986	2005	2140	2226	2428*
ADRS	0001 192A	2166	2346*					
ADRS1	0001 19B6	2060	2399*					
ADRS2	0001 19AC	2056	2396*					
ALTPAT1	0001 0BE8	1321	1327*					
ALTPAT2	0001 0B52	1276	1282*					
ALTPAT3	0001 0F9A	1602	1606*					
ALTPAT4	0001 1004	1637	1641*					
ARTFLT	0001 1532	107	2018*					
ASTERISK	0001 1952	194	2365*					
BR	0001 1234	1676	1709	1791	1817*			
BR.TBL	0001 1310	1582	1622	1869*				
BRKWAIT	0001 16CC	2154	2175*					
BRKWAIT1	0001 16E6	2176	2186*	2188				
BRRX1END	0001 1214	1714	1801*					
BRRX1T1	0001 1048	1664*						
BRRX1T1B	0001 1050	1667*	1800					
BRRX1T2	0001 107E	1679*	1704					
BRRX1T7	0001 1188	1756	1763*	1792				
BRRX1T8	0001 11A2	1768	1772*					
BRRX1T9	0001 11AC	1771	1774*					
BRRX1TA	0001 1072	1675*						
BRRX2T1A	0001 10D8	1701	1708*	1795				
BRRX2T2	0001 10F6	1716*	1727	1758				
BRRX2T3	0001 1100	1719*						
BRRX2T4	0001 111C	1723	1728*					
BRRX2T5	0001 1130	1730	1734*					
BRRX2T6	0001 113A	1733	1736*					
BRRX2TA	0001 116E	1748	1751*					
BRRX2TB	0001 11E8	1788	1791*					
BUMP	0001 02D6	310*	314					
BXLE2	0001 056E	605*	624					
BXLE3	0001 079C	897*	919					
BXLE4	0001 0636	698	701*					

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ENABLE2   0001 0154   103   187*  2451
ENBMAC    0001 1A48   297   322   981   2454*
END       0001 1928  2133  2136  2345*
EPSR      0001 042A   439*
ERR       0001 0844   983*  1007
ERRHALT   0001 1A40   294  2150  2453*
ERRMSG    0001 1904  2173  2333*
ERRNUM    0001 190E   288   307  1946  2138  2292  2336*
ERRNUM1   0001 06AE   740   762*  824
ERROR     0001 1652   444   520   547   603   708   761   895   986  1257  1336  1933  2135*
ERROR1    0001 164A   553   616   622   684   689   693   699   773   778   782   788   836   841
                      846   906   911   917  1079  1091  1108  1121  1141  1146  1165  1171  1190
                     1205  1237  1290  1393  1428  1468  1516  1559  1616  1651  2026  2033  2132*
ERROR7    0001 063A   670   705*
ERROR9    0001 0AC4  1232  1237*
ERRORX    0001 1658  2134  2137*
ERRORXW   0001 1676  2145  2148*
ESTCON    0001 1496   660   743   882   953  1959*
EXCHANGE  0001 0554   596*
EXEC      0001 0014    92*  1989  2008
EXPROINT  0001 05F0   655   677*
EXPSR     0001 0698   755*
EXPSR1    0001 0784   889*
EXTINT    0000 FFD4    87*   131   535
EXTINT1   0001 1562    87  2039*
EXTSET    0001 04E8   524   535*
FAILADDR  0001 19FC  2435*
FIVES     0001 142D  1606  1641  1910*
FLAG      0001 1A20  1045  1131  1160  1228  1246  1362  1415  1456  1494  1535  1926  1930  2444*
FLAG.832  0001 0136   176*  1389  1431  1471  1506  1549
FLOP      0001 142E  1272  1274  1280  1285  1318  1319  1325  1327  1585  1600  1604  1607  1635
                     1639  1642  1672  1715  1728  1732  1735  1766  1770  1774  1911*
GETCHR    0001 1728   200   261   277  2217*  2219
HALT      0001 1A38   293  2071  2097  2452*
HALT1     0001 012E   175*
HEX       0001 0260   268   274*
HEXASC    0001 023A   228   239   244   261*  264
HEXLP     0001 0246   265*  282
IEPROW    0001 0A58  1204  1209*
IEPROW1   0001 0ACE  1225  1243*
IEPROW2   0001 0A82  1221*  1222
ILGINT    0001 1584   101  2053*
ILGMSG    0001 1994  2062  2394*
ILGREG    0001 05U2   484   545*
ILLADRS   0001 057A   586   611*
IMPTOP    0000 0000I
INCR      0001 085A   990*  2455
INCRMT    0001 19E9  2117  2417*
INSAVE    0001 19F6  2430*
INTMSG    0001 1986  2046  2385*
INTMSG1   0001 1984  2048  2384*
INTRPT1   0001 071A   821   831*
IO        0001 1A28  1978  2447*
LADC      0000 0002
LOAGN     0001 0822   972*   974
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			2041	2045	2046	2053	2057	2075	2075	2077	2081	2081	2087	2101	2105
			2106	2159	2163	2167	2201	2259	2260	2262	2263	2267	2271	2275	2279
			2283	2287	2291	2292	2469	2471	2475	2477	2480	2481	2484	2484	2485
			2492	2492	2494	2497	2501	2503	2506	2510					
R10	0000 000A		52*	491	511	512	513	1056	1295	1296	1317	1324	1330	1339	1340
			1343	1343	1612	1613	1647	1648	1691	1692	1712	1713	1716	1717	1720
			1721	1745	1746	1785	1786	1926	1928	1929	2063	2093	2144	2146	2152
			2153	2177	2181	2186	2187	2198	2199	2199	2200	2208	2212	2227	2231
			2240	2246	2248	2248	2249	2250							
R11	0000 000B		53*	143	145	146	187	188	189	190	198	337	340	341	342
			344	347	353	355	359	364	365	367	492	980	1057	1270	1287
			1294	1295	1309	1310	1311	1312	1344	1345	1346	1613	1614	1648	1649
			1692	1693	1746	1747	1786	1787	1970	1970	1973	2063	2093	2140	2144
			2152	2177	2179	2180	2181	2186	2201	2202	2203	2204	2205	2207	2208
			2217	2220	2226	2229	2230	2231	2233	2240	2242	2249	2250	2252	
R12	0000 000C		54*	338	347	353	359	360	367	369	370	370	1058	1673	1728
			1729	1729	1742	1766	1767	1767	1971	2067	2067	2068	2076	2077	2118
			2119	2119	2120	2121	2121	2122	2122	2123	2197	2206	2209	2209	2211
			2235	2236	2236	2237	2239	2243							
R13	0000 000D		55*	228	239	244	279	281	1059	1352	1405	1688	1690	1744	1782
			1784	1925	1929	1930	1931	1932	1961	1962	1965	1972	2068	2069	2116
			2117	2120	2123	2124	2239	2242	2244						
R14	0000 000E		56*	100	100	102	104	108	116	117	119	181	190	191	193
			352	373	379	976	1060	1063	1064	1569	1596	1609	1611	1630	1644
			1646	1681	1718	1775	1959	1961	1963	1964	2023	2042	2053	2054	2058
			2066	2070	2084	2088	2096	2102	2107	2109	2112	2125	2132	2133	2135
			2136	2137	2138	2141	2142	2149	2155	2158	2159	2160	2164	2168	2171
			2174	2175	2180	2183	2183	2197	2198	2200	2210	2268	2272	2276	2280
			2284	2288											
R15	0000 000F		57*	101	103	107	115	118	147	181	193	200	261	277	362
			365	376	382	416	444	483	520	547	553	585	598	603	616
			622	654	660	670	684	689	693	699	708	736	743	757	761
			773	778	782	788	820	836	841	846	876	882	891	895	906
			911	917	950	953	986	1042	1061	1062	1063	1064	1079	1091	1108
			1121	1141	1146	1165	1171	119	1205	1237	1257	1290	1299	1301	1306
			1310	1312	1936	1345	1350	1351	1354	1356	1391	1399	1396	1403	1404
			1407	1409	1428	1433	1436	1444	1445	1448	1450	1468	1473	1479	1484
			1486	1488	1508	1514	1516	1521	1522	1525	1527	1551	1557	1559	1616
			1651	1669	1670	1671	1683	1684	1685	1695	1737	1738	1739	1749	1776
			1777	1779	1789	1933	1950	1960	1966	1974	2024	2026	2033	2047	2057
			2061	2091	2107	2108	2110	2137	2139	2171	2172	2185	2218	2222	2234
			2235	2237	2238	2247	2253	2259	2261	2264	2293	2296	2491	2498	2511
			2518												
R2	0000 0002		44*	61	73	78	123	127	133	152	155	155	157	158	162
			163	164	284	284	285	286	287	288	302	303	303	308	313
			315	498	501	516	523	523	525	529	533	533	537	594	595
			613	618	619	657	666	679	686	695	696	745	750	770	775
			784	785	833	838	881	888	903	908	913	914	961	962	971
			984	988	990	1048	1105	1106	1119	1126	1128	1186	1187	1201	1202
			1217	1221	1222	1274	1275	1275	1319	1320	1320	1363	1371	1374	1416
			1457	1495	1536	1572	1582	1594	1619	1626	1631	1676	1682	1698	1700
			1709	1725	1736	1752	1757	1764	1778	1791	2023	2035	2041	2267	2472
			2481	2483	2507										
R3	0000 0003		45*	62	124	128	134	153	211	211	215	218	219	247	250
			250	253	254	291	292	293	294	295	296	297	298	299	300

			301	323	324	439	441	515	517	538	545	546	596	599	611
			612	672	677	678	705	755	758	768	769	831	832	889	892
			901	902	981	982	1049	1089	1127	1128	1132	1134	1156	1157	1202
			1218	1277	1279	1282	1284	1288	1313	1344	1369	1575	1583	1598	1620
			1627	1633	1668	1670	1684	1711	1712	1738	1777	1939	1942	1945	2024
			2262	2473	2493	2502	2519	2520							
R4	0000	0004	46*	64	65	66	68	74	76	121	125	131	135	154	212
			213	217	318	417	418	419	421	423	425	426	428	429	434
			436	437	438	442	495	496	499	501	502	503	505	507	509
			511	518	522	527	531	535	539	590	597	600	605	667	673
			682	706	751	756	759	893	951	952	955	960	962	964	965
			971	973	975	978	985	1050	1219	1227	1228	1245	1245	1246	1247
			1248	1249	1251	1255	1268	1278	1283	1322	1324	1328	1330	1334	1364
			1417	1458	1496	1537	1584	1589	1591	1593	1612	1621	1628	1629	1647
			1677	1680	1691	1699	1702	1710	1716	1726	1745	1753	1754	1765	1774
			1785	2028	2029	2030	2163	2474	2476	2478	2482	2482	2483	2500	2504
R5	0000	0005	47*	66	68	69	69	71	72	74	76	213	215	320	321
			420	430	497	978	979	1051	1153	1154	1177	1178	1211	1212	1216
			1217	1219	1224	1229	1231	1244	1245	1254	1255	1261	1265	1267	1269
			1279	1284	1293	1298	1298	1314	1323	1329	1365	1370	1372	1373	1418
			1459	1497	1538	1589	1590	1594	1599	1600	1601	1601	1631	1634	1635
			1636	1636	1682	1685	1687	1688	1719	1720	1722	1736	1739	2039	2049
			2275	2475	2476	2503	2504	2505							
R6	0000	0006	48*	63	72	73	78	229	231	233	235	240	245	248	251
			262	262	275	276	421	431	496	528	532	972	973	977	979
			1040	1052	1069	1076	1084	1088	1097	1104	1114	1118	1134	1158	1180
			1185	1196	1200	1210	1234	1248	1253	1263	1278	1283	1286	1315	1324
			1330	1371	1372	1586	1592	1597	1598	1599	1603	1604	1606	1610	1614
			1632	1633	1634	1638	1639	1641	1645	1649	1656	1657	1658	1659	1665
			1686	1689	1693	1702	1703	1731	1734	1735	1743	1747	1754	1755	1769
			1772	1773	1783	1787	1796	1797	1798	1799	2040	2271	2487	2488	2489
			2494	2495	2505	2508	2520	2521							
R7	0000	0007	49*	156	157	158	160	351	422	423	424	427	428	433	433
			434	435	489	493	499	500	501	510	513	514	591	595	606
			662	665	666	668	669	671	671	691	691	746	749	750	752
			756	844	884	887	888	956	959	960	968	968	972	973	974
			975	983	1004	1005	1006	1053	1143	1144	1154	1168	1169	1232	1271
			1272	1285	1307	1323	1329	1331	1340	1341	1576	1578	1580	1587	1595
			1629	1667	1671	1680	1717	1741	1742	1774	1778	1779	1781	1782	1922
			1923	1923	1924	2065	2095	2118	2148						
R8	0000	0008	50*	432	435	488	493	514	549	550	592	679	680	686	687
			687	695	696	697	697	753	753	754	957	958	959	969	985
			1005	1006	1054	1235	1236	1273	1300	1316	1327	1370	1375	1588	1608
			1610	1643	1645	1679	1689	1721	1722	1740	1743	1780	1783	2521	
R9	0000	0009	51*	192	214	225	234	246	266	270	272	490	493	494	593
			963	964	977	1004	1055	1287	1288	1332	1334	1446	1523	1570	1609
			1644	1674	1743	1783	1793	1794	2079	2083					
RDCHR	0001	0184	200*	208											
RDCMD	0001	19F3	198	364	1984	2003	2179	2427*							
REGCHK	0001	01CC	226*												
REGSAVE	0001	13E4	1905*	2258	2279	2283	2295								
RELADDR	0001	1838	2282	2304*											
REP	0001	00E8	155*	162											
REPEAT	0001	05E6	670*												
REPEAT1	0001	0694	754*												

RESTART1	0001	066A	743*	790	827							
RESTART2	0001	054C	594*	606								
RESTART3	0001	076A	882*	897								
RETURN	0001	0624	692	695*	710							
RETURN1	0001	1428	1133	1157	1226	1360	1413	1454	1492	1533	1907*	1931
RI1MLC2	0001	0E32	1495	1500*								
RI1MLC3	0001	0E44	1496	1505*								
RI1MLC5	0001	0E66	1504	1509	1513	1516*						
RI1MLC6	0001	0E46	1491	1506*								
RI1MLC7	0001	0E5E	1507	1514*								
RI1MLC8	0001	0E54	1510*	1515								
RI1MLCOV	0001	0DF0	1477	1483*								
RI2MLC2	0001	0DAA	1457	1462*								
RI2MLC3	0001	0DBE	1458	1467*								
RI2MLC5	0001	0DC0	1466	1468*	1474	1478	1481					
RI2MLC6	0001	0DCA	1453	1471*								
RI2MLC7	0001	0DE4	1472	1479*								
RI2MLC8	0001	0DD8	1475*	1480								
RI2MLCOV	0001	0D62	1443*									
RSAVE	0000	0A10	113	2464*								
RTN	0001	04E4	530	534*								
RTN1	0001	1492	1949	1952*								
RTN4	0001	0856	989*	1008								
RTN5	0001	16EE	2178	2184	2189*							
RTN6	0001	0520	552	555*								
RTN7	0001	05A2	621	624*								
RTN9	0001	074C	845	848*								
RTNA	0001	07D6	916	919*								
RTNB	0001	156U	2032	2035*								
RUN	0001	013E	177*	222								
RX1MLC2	0001	0EBE	1536	1541*								
RX1MLC3	0001	0ED6	1537	1547*								
RX1MLC5	0001	0EF8	1546	1552	1555	1559*						
RX1MLC6	0001	0ED8	1532	1549*								
RX1MLC7	0001	0EF0	1550	1557*								
RX1MLC8	0001	0EE6	1553*	1558								
RX1MLCOV	0001	0E70	1512	1520*								
RX1P4T	0001	0B08	1256	1261*								
RX1P4T1	0001	0B38	1274*	1297	1303							
RX1P4T1A	0001	0B62	1281	1286*								
RX1P4T2	0001	0B76	1289	1293*								
RX2MLC10	0001	0CBA	1386	1393*	1397	1400						
RX2MLC2	0001	0C86	1363	1377*								
RX2MLC3	0001	0CAA	1364	1387*								
RX2MLC7	0001	0CAC	1359	1389*								
RX2MLC8	0001	0CC4	1390	1396*								
RX2MLC9	0001	0CCC	1392	1398*								
RX2MLCOV	0001	0C2E	1349*									
RX2P4T1	0001	08EA	1066*									
RX2P4T2	0001	0910	1078	1083*								
RX2P4T3	0001	0932	1090	1095*								
RX2P4T4	0001	095C	1107	1113*								
RX2SLT1	0001	0980	1120	1126*								
RX2SLT2	0001	09C4	1145	1153*								
RX2SLT3	0001	0A02	1170	1176*								

ERROR & WARNING SUMMARY :

? @ LINE 1007
? @ LINE 1008