IDENTIFICATION

Product Code:	MAINDEC 9A-D1FA-D (D)
Product Name:	Extended Memory Address Test
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Maintainer:	Diagnostics Group
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1. Abstract

The PDP-9 Extended Memory Address Test tests all of memory not occupied by the program to make sure that each location can be uniquely addressed. This is performed by a series of five tests. The first three tests write the address and complement address of each memory location into itself, and then check each location to make sure each is correct. The fourth test slides a one through a word of zeroes in each bank, and test five writes and reads a pattern designed to detect adjacent bit positions shorted within the memory stack. Any one or a combination of, the five tests is selectable with ACS 3,4,5,6, and 7.

The program relocates automatically from bank to bank, and tests all of core memory from each bank.

2. Requirements

2.1 Equipment

A PDP-9 equipped with a minimum of 8K of core memory.

2.2 Storage

The program requires $4476_{(8)}$ locations of core memory. Locations 100 through 6ØØ7 are used.

3. Loading Procedure

3.1 Method

The tape supplied is punched in the HRI mode.

Place the tape in the reader.

Set the address switches to 100.

Press I/O RESET, and then READ-IN.

At the completion of loading, the program header will be printed, followed by a halt with the PC = 4477.

4. Starting Procedure

After the header has been printed, set ACS 14 through 17 to indicate the amount of memory to be tested, and press CONTINUE. The program will run until stopped by the operator with ACS 0 on a 1.

4.1 Control Switch Settings

Immediately after the program header, a halt occurs so the operator may signify the amount of core memory to be tested. This is done by placing the first bank to be tested in ACS 14 and 15, and the last bank in ACS 16 and 17. The values should equal bank numbers, i.e., bank 0 = 00; bank 1 = 01; bank 2 = 10; bank 3 = 11. Press CONTINUE after setting the test limits in ACS 14 - 17.The combinations recognized by the program are listed below.

			ACS			
Test	Memory Bank	to Memory Bank	14	15	16	17
(8K)	0	0	0	0	0	0
(16K)	0	1	0	0	0	1
(24K)	0	2	0	0	1	0
(32K)	0	3	0	0	1	1
(8K)	1	1	0	1	0	1
(16K)	1	2	0	1	1	0
(24K)	1	3	Ø	1	1	1
(8K)	2	2	1	Ø	1	Ø
(16K)	2	3	1	Ø	1	1
(8K)	3	3	1	1	1	1

Unless other than normal operation is desired, place all other ACS down.

The program recognizes ACS 14 and 15 as the lowest order 8K bank to be tested, and ACS 16 and 17 as the highest order 8K bank to be tested. The lower limit value must not exceed the higher limit value. When this occurs the message "L.L. EXCEEDS U.L." is printed, and a halt occurs with the PC = 2Ø64. To recover, correct the ACS settings and press CONTINUE.

The amount of core memory tested at one time when using a PDP-9 without extended memory is 4K. The program automatically relocates to test the area occupied by the program.

The amount of extended memory tested at one time equals the amount selected by ACS 14 through 17, minus 4K. If 32 K of core memory is to be tested the actual amount tested at one time is 28K. The 4K field occupied by the program is not tested until program relocation takes place.

4.2 Starting Address

The program may be restarted from location 100 of the memory bank containing the program (as indicated by extended program counter bits 3 and 4). If the program happens to be in the higher 4K field (as indicated by MB or PC bit 5 on a 1), the starting address is 10100.

4.3 Program Action

After setting the ACS and pressing CONTINUE, or after a restart, the program initializes various constants and then senses the ACS and checks for invalid switch settings. If all is in order the lower and upper limit addresses of memory are determined from ACS 14 through 17.

The program next performs the five tests, and then determines the next area to relocate to.

4.3.1 Program Relocation

Program relocation depends entirely upon the amount of core memory being tested. Under certain conditions the program will not relocate at all, but will remain in the current bank to perform all five tests (see below). For PDP-9s equipped with extended memory, the program normally first relocates to the highest order memory bank under test. From there it relocates to the next lower bank (after performing all five tests). The program keeps relocating to the next lower memory bank until it reaches the lowest order bank under test. The testing and relocation cycle is then repeated. This cycle continues until stopped by the operator with ACS 0. The program will always occupy the lower 4K field (00000 to 07777) of any memory bank.

The program will not relocate if any of the conditions described below exist.

a. A forced relocation has been made (section 8.2.7).

b. The program is currently located in an upper 4K field (10000 to 17777), and one or more banks other than the one containing the program is being tested.

d. An error was detected in all of the available lower 4K areas under test.

e. ACS 9 is on a one to inhibit relocation (section 8.2.5).

The EPC indicators will indicate the current bank containing the program.

If the program is testing a single 8K memory bank, which contains the program, the upper 4K field is first tested, and then the lower 4K field is tested after relocation to the upper 4K. The program relocates back to the lower 4K field after testing is completed. Bit 5 of the MB will glow brightly when the program is in the upper 4K.

The program will not relocate if any of these conditions exist:

a. A forced relocation has been made (section 8.2.7).

b. An error was detected in the opposite 4K field.

c. ACS 9 is on a 1 to inhibit relocation (section 8.2.5).

One complete pass of the program is defined as the execution of all five tests on all available memory from each memory bank or from each 4K field in the case of a single bank being tested.

The program will print "END" after all tests (or those selected) have been performed from one memory bank. If 16K is being tested, one complete pass would be indicated by END being printed twice, and four times if 32K is being tested.

If the program is to be run for lengthy periods, the operator may inhibit the message by placing a NOP instruction in locations 215 and 216. These locations ordinarily contain JMS CRLF and JMS PNXT, respectively.

5. Operating Procedure

5.1 Operational Switch Settings

See sections 4.1, and 8.2.

5.2 Operator Action

a. Load the program as described in section 3.1.

b. Specify the test limits in ACS 14 through 17 (section 4.1).

c. Press CONTINUE. The program will run until stopped by the operator.

The program should be stopped with ACS Ø rather than the STOP key, because the program may be performing a relocation when STOP is pressed, resulting in various constants and addresses being modified. Restarting the program would give unpredictable results.

The PC will = 2064 when halting with ACS Ø on a 1. To recover place ACS Ø down, and press CONTINUE. ACS changes may be made after the halt, in which case the program will execute the new functions specified. If no changes are made, the routine which was halted will be resumed. ACS Ø is sensed at the end of each test routine, and after each error print-out.

5.3 Subroutine Abstracts

The program executes a series of five tests on core memory. Each test writes a unique pattern, and checks each location for error.

Test 1 writes the value of each memory location into itself, from the lowest order to the highest order bank under test. The address pattern is then read, and checked for error, in the same direction, i.e., from the lowest to highest bank. The pattern is then read and checked for error in the reverse direction, i.e., from the highest bank to the lowest bank. This sequence is repeated twice before test 2 is initiated. Test 1 may be run by itself by placing ACS 3 on a 1.

Tests 2,3,4 and 5 write and read their patterns into one bank at a time. The rest of memory will contain an all 1's pattern. After each pattern is written and read, the rest of memory is checked to make sure that its pattern has not changed. After one bank has been tested the next higher bank in sequence will contain the pattern, and the rest of memory will equal all 1's. This is continued for one test until all banks have contained the test pattern. The next test in sequence will then be initialized. All of memory is set 1's before the next bank in sequence is tested.

Test 2 first writes 1's into all of memory and then writes the complement address of each memory location into itself. The only bits which are complemented are bits 5 through 17. Bits 3 and 4 are not complemented. Test 2 writes the pattern in one bank in the forward direction, and then reads and checks for error in the forward and reverse directions. The rest of memory is then read and checked for error (in the forward direction only). After each bank is tested in this manner, test 3 is initialized. Test 2 may be run alone by placing

ACS 4 on a 1.

Test 3 first writes 1's into all of memory, and then writes the complement value of each address into itself. It differs from test 2 in that all 18 bits are complemented. The pattern is written once in the forward direction in one bank. The rest of memory is then read and checked for error (in the forward direction). The bank with the address pattern is then read once in the forward and reverse directions, after which the rest of memory is again checked.

The same bank with the address pattern is then reset to all 1's, and the same address pattern is then written in the reverse direction. The rest of memory is then checked; the bank with the pattern is read in forward and reverse directions, and finally the rest of memory is again checked. The next higher bank in sequence will be tested in the same manner. After all banks have been tested in this manner, test 4 is initialized. Test 3 may be run alone by placing ACS 5 on a 1.

Test 4 first writes 1's into all of memory, and then writes a sliding 1 pattern into one bank. Each location of the bank will contain a word of all ∅'s except for one bit position. The bit set is rotated one place to the left for each memory location, starting with bit 17. The following test sequence is repeated 18 times, resulting in every bit in each memory location being set.

a. Write all 1's into all of memory.

b. Write a sliding one pattern into one bank.

c. Read and test rest of memory.

d. Read and test the bank with the pattern in the forward direction only.

e. Read and test rest of memory.

f. Repeat steps b through e 17 more times before testing the next sequential bank in the same manner.

After all banks have been tested with a sliding 1, test 5 is initialized. Test 4 may be run alone by placing ACS 6 on a 1.

Test 5 first writes ones into all of memory. A pattern consisting of 4 words of Ø's followed by 4 words of 1's is then written into one blank. The following sequence is then executed.

a. Write the pattern in one bank in the forward direction.

b. Read the bank with the pattern in the forward direction.

c. Read again in the reverse direction.

d. Read rest of memory.

e. Write the complement pattern in the forward direction, and repeat steps b, c and d, then do step f.

f. Write the pattern in the reverse direction, and do steps b, c and d, then do step g.

g. Write the complement pattern in the reverse direction, and do steps b,c and d, then setup to repeat a through g on the next higher bank in sequence.

After all banks have been tested, the program then relocates automatically and starts over with test 1. Test 5 may be run alone by placing ACS 7 on a 1.

6. Errors

6.1 Error Print-outs and Description

Immediately after program load the header shown below is printed.

```
TEST   OCTAL  ADR.  GOOD  BAD   BANK WITH PAT.
```

Where:

TEST = the current test which detected an error.

OCTAL ADR. = the memory location which contains the data in error.

GOOD = what the data should have been in that location.

BAD = the data as read from that location.

BANK WITH PAT. = the current bank under test which contains the pattern of the failing test. For test 1, this will equal "ALL", since test 1 writes an address pattern into all memory under test. For test 2,3,4 or 5, it will equal 0,1,2 or 3, depending on the amount of core memory available for test.

Example:

TEST	OCTAL ADR.	GOOD	BAD	BANK WITH PAT.
1	060100	060100	060000	ALL
2	060100	077677	076677	3
3	060100	777677	776677	3
4	023000	000002	000003	1
5	047777	777777	000000	2

TEST	OCTAL ADR.	GOOD	BAD	BANK WITH PAT.
5	047776	777777	000000	2
5	047775	777777	000000	2
5	017777	777777	000000	2

During test 1 address 100 in bank 3 was found to be in error. From the example, it can be seen that bit 11 was dropped. Bit 8 was dropped during test 2 in the same address, and also during test 3. Bit 17 was picked up at location 3000 in bank 1 during the sliding 1 test. Three consecutive addresses in bank 2 were in error during test 5. The test was reading in the reverse direction at the time, because the addresses are printed in descending order. Also, when checking rest of memory, location 17777 in bank 0 was found to be incorrect.

After each print-out the program continues with the next memory location to test.

ACS 0 may be raised, during an error print-out, to halt the program after print-out is completed. Press CONTINUE to resume the test in progress, or to execute new ACS settings made.

ACS 1 may be raised any time to inhibit all error print-outs (section 8.2.2).

ACS 2 on a 1 will cause the TTY BELL to ring on each error. Print-outs will be inhibited (section 8.2.3).

ACS 10 may be raised, during print-out, if the operator wishes to test selected areas of memory, or if certain addresses are to be suppressed. See section 8.2.6.

7. Restrictions

7.1 Starting Restrictions

Start from location 100 of the memory bank containing the program.

7.2 Operating Restrictions

Don't use the STOP key to halt the program. Place ACS 0 on a 1.

8. Miscellaneous

8.1 Execution Time

The time required to test one 8K bank with all 5 tests is approximately 2 1/2 minutes.

8.2 Applications

For operating convenience, and as an aid to trouble-shooting, each ACS is assigned a unique function. The ACS assignments and their effect on the program are described below. Please note that it is important that the program should be halted before changing the ACS, unless otherwise specified in the descriptions below. Otherwise, the program may be destroyed. Halting the program with ACS 0 is preferred, rather than with the STOP key. Using the STOP key may result in a halt while the program is in the process of relocating, which is disasterous.

8.2.1 Halt After Test or Error - ACS 0

Raising ACS 0 at any time while the program is running will cause a halt after the current test is completed. The PC will = 2064. ACS settings may then be changed if desired. Press CONTINUE to recover. If no ACS changes, the program will resume the test which was interrupted. If ACS changes were made, the new settings are stored, and executed.

Raising ACS 0 during an error type-out will cause a halt at the same location mentioned above. Proceed exactly as described in the above paragraph.

8.1.2 Inhibit Error Typeout - ACS 1

Raising ACS 1 causes all error typeouts to be inhibited. All other message typeouts are not inhibited. ACS 1 may be raised while the program is running.

8.1.3 Bell on Error - ACS 2

ACS 2 on a 1 causes the program to ring the TTY BELL whenever an error occurs. This is convenient when testing with power supply margins. ACS 2 has precedence over ACS 1 if both should happen to be up. ACS 2 may be raised while the program is running.

8.2.4 Test Selection - ACS 3 through 7

Any one, or any combination of tests may be executed by raising any one or any combination of ACS 3 though 7. ACS 3 specifies test 1; ACS 4, test 2; ACS 5, test 3; ACS 6, test 4; ACS 7, test 5. The test specified by the most significant ACS will be executed first.

If all five ACS are down, all five tests are executed in order starting with test 1.

Program relocation is not effected, regardless of the ACS settings.

ACS 3 through 7 should not be changed while the program is running.

8.2.5 Inhibit Program Relocation - ACS 9

The program normally relocates automatically as indicated by MB indicators 3,4 and 5. To retain the program in its current 4K field, raise ACS 9 at any time.

8.2.6 Request Keyboard Input - ACS 10

ACS 10, when up, indicates to the program that the operator wishes to select one test, along with one or more addresses to be suppressed, and that one or more blocks of addresses are to be tested, disregarding all other addresses. ACS 10 is recognized only immediately after an error print-out, restarting from 100, or after pressing CONTINUE after a halt with ACS 0.

The program will print the following information, waiting for input from the keyboard after each line:

```
TEST # -
SUPPRESS -
BLOCK #1 -
BLOCK #2 -
```

The program expects input information for each line. Typing only a carriage return indicates that the function represented by that line is not wanted. The next line will be printed. An explanation of each line follows.

TEST # - Type the test number desired (1 to 5). Any number less than 1 or greater than 5 is an error, and a ? will be printed, followed by TEST # - being printed again. If no particular test is wanted, type a carriage return only. The pattern used by the last test in progress will be used. In the case of no tests being previously run, test 1 will be used. TEST # is used only when one or more blocks are specified. If no blocks are selected, TEST # is ignored.

SUPPRESS - Error print-outs for one or more individual addresses, or a block of consecutive addresses may be suppressed. The addresses typed must be 5 digit octal numbers. Up to 256 addresses, individual or a block, may be suppressed. Any amount over 256 will be ignored by the program.

Suppression of individual addresses is indicated by separating each 5 digit address with a colon, terminating the line with a carriage return after the last address or colon. A block is indicated by typing the first address of the block, and the last address of the block, separating the two by a comma. An automatic carriage return is provided after the second address is typed. The individual or block of addresses do not have to be typed in numerical order.

Any input which differs from the above will result in a ? being printed, followed by SUPPRESS - being printed again. Typing a carriage return only indicates no addresses are to be suppressed.

BLOCK #1 and BLOCK #2 - Any length block of consecutive addresses to be tested may be indicated in either BLOCK #1 or BLOCK #2, or both. The block limits must not overlap the program or exceed the amount of memory available. If the limits of either block overlap the program a message will be printed giving the location of the program. The current line will be re-printed, and the operator must then specify new limits. Indicate the block to be tested by typing the first address and last address of the block, separating the two 5 digit addresses with a comma.

The program handles the blocks to be tested as if each were a separate memory bank. That is, if test 1 were selected, each address within either block would contain its own value. If any other test were selected, BLOCK 1 would contain the pattern, and BLOCK 2 would contain an all 1's pattern. The rest of memory outside of the block limits is ignored. Refer to section 5.2, Subroutine Abstracts, for a description of methods of testing, and patterns generated by each test.

When two blocks are selected, their limits should not overlap when tests 2, 3, 4 or 5 are selected. BLOCK 2 will always contain an all 1's pattern with these tests, and error print-outs will occur if both block limits overlap.

If only one block is selected, the pattern will be written in that block, and the rest of memory is ignored. A single block may be indicated after BLOCK 1 or BLOCK 2; one of the lines being left blank.

If no blocks are to be tested type a carriage return after BLOCK #1 and BLOCK #2. The program will start over with test 1, or the test selected in ACS 3-7.

If a block is selected, program relocation will not take place.

Press the RUBOUT key if a typing error was made. The routine will start over with "TEST # -".

If the pattern generated by test 5 is to be used, the operator may select one address, or a block of 2Ø$_{(8)}$ addresses with no restriction. Any amount over 2Ø$_{(8)}$ addresses must be in multiples of 2Ø$_{(8)}$. This is necessary due to the method of generating and reading the pattern. If a block of more than 2Ø addresses is not a multiple 2Ø, invalid error print-outs occur indicating an error at every fourth location within the block. This restriction applies to block #1 when two blocks are selected, or to a single block selected.

Examples:

Assume the program to be located in the lower 4K field of bank 1.

```
A.  TEST # - 5
    SUPPRESS -
    BLOCK #1 - ~~00077~~ 00100,01100
    BLOCK #2 -
```

The pattern generated by test 5 will be written and checked for error from ~~00077~~ 00100 to 01100 of bank 0. The rest of memory will contain an all 1's pattern, and will be ignored by the program since only one block is specified. All errors will be printed.

```
B.  TEST # - 5
    SUPPRESS -
    BLOCK #1 -
    BLOCK #2 - ~~00077~~ 00100,01100
```

The program will perform exactly as described in example A.

```
C.  TEST # - 3
    SUPPRESS
    BLOCK #1 - 3777,36000
    BLOCK #2 - 0000,16000
```

The pattern generated by test 3 will be written and checked for error in the first block from 36000 to 37777. An all 1's pattern will be written and checked for error in the second block from 00000 to 16000.

```
D.  TEST # -
    SUPPRESS - 377777:36100:35000
    BLOCK #1 - 00000,16000
    BLOCK #2 - 36000,37777
```

The pattern used by the last test in progress will be written in BLOCK 1, and an all 1's pattern in BLOCK 2 (note that the blocks are reversed from example C). Any error at the two addresses 36100 or 37777 will not be printed. Address 35000 is meaningless since it is located outside the test limits.

```
E.  TEST # - 4
    SUPPRESS - 36000,37777
    BLOCK #1 - 00000,16000
    BLOCK #2 - 36000,37777
```

All errors encountered in BLOCK 2 will not be printed.

```
F.  TEST # - 8
    ?
    TEST # - 1
    SUPPRESS - 036000
    ?
    SUPPRESS - 36000,37777
    BLOCK #1 - 40100,40100
    BLOCK #2 - 20000,30100
    BLOCK #2 - LIMITS OVERLAP PROGRAM
    PROGRAM IS LOCATED IN LOWER 4K FIELD OF BANK 1
    BLOCK #2 - 30000,30100
```

Example F indicates program response to format errors. The first, TEST #, is self-explanatory, since there are only 5 tests to choose from. The second, SUPPRESS, was in error becuase the number exceeds 5 digits. The program is assumed to be in the lower 4K of bank 1 for these examples, and the first address selected for BLOCK 2 is within this area. The example shows the error message printed for BLOCK 2, followed by the operator's correction.

```
G.  TEST # - 2
    SUPPRESS - 10000,10377
    BLOCK #1 -
    BLOCK #2 -
```

The program will not loop on test 2, but will restart with test 1, or the test specified in ACS 3-7. TEST # is used only when one or more blocks are specified. All of memory specified in ACS 14-17 will be tested.

Any errors detected within the block indicated after SUPPRESS will not be printed, regardless of which test is running.

To return to normal program operation type a carriage return after each of the four lines, or restart the program from 100.

8.2.7 Program Relocation - ACS 11 and 12

The operator may relocate the program to any 4K field in any memory bank by specifying the desired bank in ACS 16 and 17, and the 4K field in ACS 11. Use the following procedure.

a. Halt the program with ACS 0

b. Place ACS 12 up to indicate a program relocation.

c. Place ACS 11 up if an upper 4K field is wanted (10000 to 17777), or down for a lower 4K field (00000 to 07777).

d. Place in ACS 16 and 17 the desired memory bank (00=bank 0; 01=bank1; 10=bank 2; 11=bank 3).

e. Press CONTINUE. The program will relocate to the specified area, and a halt will occur in the present area with the PC = .

f. Place ACS 11 and 12 down, and reset ACS 14 - 17 to the desired value. Any other ACS may be changed at this time.

g. Press CONTINUE to execute the program in the new 4K area.

The program will not automatically relocate again until it is restarted from address 100.

Before the relocation takes place the new area to be occupied is first checked to see if errors have been previously detected. If an error was detected the message "ERROR IN SELECTED 4K" is printed. A halt then occurs with the PC = 2064. The operator may then change the destination, or press CONTINUE to ignore the warning, and relocate to that area.

8.2.8 Upper and Lower Core Memory Testing Limits - ACS 14 - 17

ACS 14 and 15 specify to the program the first (or lowest order) memory bank to test, and ACS 16 and 17 the last (or highest order) bank. A single bank may be tested by setting ACS 14 and 15 to equal ACS 16 and 17.

If the 8K bank under test does not contain the program relocation will not take place. However, testing more than 8K allows relocation to take place.

9. Program Description

The Extended Memory Address test is intended for use with PDP9's equipped with the extended memory option, but may be used on basic 8K PDP-9's as well. A total of five tests are executed by the program. Each test writes a unique pattern into core memory and then checks for error. The first test writes the value of each memory address into that address, with all available banks containing the pattern. The remaining four tests write their patterns into one 8K bank at a time, with rest of memory containing an "all ones" pattern. The patterns were chosen so as to detect word and digit driver errors, as well as shorted wires within any bank (see section 5.2).

Control of the program is given to the operator by means of the ACS. The operator may halt the program, inhibit error print-outs, substitute the TTY BELL for error indication, halt after print-out, select any one or group of tests, inhibit program relocation, specify any single address or group of addresses to be suppressed, any single address or up to two blocks of addresses for testing, relocate the program to any 4K area, and vary the number of 8K banks to test. See section 8.2 for the ACS designations for the above functions.

The program automatically relocates after performing all specified tests on the amount of core memory selected.

10. Listing

```
                                     /IOT DEFINITIONS TO KEEP MACRO-9 HAPPY
                                     /
                                     /
                    700001           CLSF=700001
                    700004           CLOF=700004
                    700044           CLON=700044
                                     /
                    700101           RSF=700101
                    700102           RCF=700102
                    700112           RRB=700112
                    700104           RSA=700104
                    700144           RSB=700144
                                     /
                    700201           PSF=700201
                    700202           PCF=700202
                    700204           PSA=700204
                    700244           PSB=700244
                                     /
                    700301           KSF=700301
                    700312           KRB=700312
                                     /
                    700401           TSF=700401
                    700402           TCF=700402
                    700406           TLS=700406
                                     /

                                             .TITLE XMADR9
                                     /PDP-9 EXTENDED MEMORY ADDRESS TEST.  HRI LOAD ADDRESS
                                     /=100. PLACE LOWEST BANK # TO TEST IN ACS 14-15; HIGHEST
                                     /BANK # TO TEST IN ACS 16-17.
                                             .FULL
     00100                                   .LOC 100
                                     /
     00100      700002               BEGIN   IOF
     00101      700004                       CLOF
     00102      204550                       LAC DLMT
     00103      045511                       DAC KEND+402         /752525 IS AT END OF TABLE
     00104      144756                       DZM FLAGS            /CLEAR PROGRAM FLAGS
     00105      100106                       JMS .+1              /STORE EPC
     00106      000000                       0
     00107      200106                       LAC .-1
     00110      505076                       AND K60K             /MASK BITS 3 AND 4
     00111      044770                       DAC FLOAD            /BANK WHICH 1ST HAS PROGRAM
     00112      044771                       DAC FLOADA           /CURRENT BANK WITH PROGRAM
     00113      760000                       LAW
     00114      044760                       DAC ERWRD+1
     00115      045022                       DAC LAST
     00116      045012                       DAC BLOC1
     00117      045014                       DAC BLOC3
                                     /
     00120      202310                       LAC ERTBL
     00121      044757                       DAC ERWRD            /SETUP POINTERS
     00122      202536                       LAC STBL
     00123      042537                       DAC SUPTBL                     /SUPPRESSION TABLE
     00124      707704                       LEM
     00125      760000                       LAW
     00126      062537                       DAC* SUPTBL
```

```
                                /
                                /RETURN TO STOVER AFTER ANY ACS CHANGES DURING
                                /RUNNING.
                                /
ØØ127     75ØØØ4                STOVER   LAS                /READ ACS
ØØ13Ø     Ø44773                         DAC MCWA           /PROGRAM CONTROL WORD - CHANGES -
ØØ131     5Ø5Ø47                         AND K4Ø            /MASK BIT 12
ØØ132     7442ØØ                         SZA!CLL            /DO A FORCED MOVE IF NO SKIP
ØØ133     6Ø3354                         JMP FCDMV          /RELOCATE
                                /
                                         .EJECT
```

```
                              /
                              /NOW DETERMINE TEST LIMITS AND TESTS
                              /
ØØ134    7Ø77Ø4                      LEM
ØØ135    2Ø4773                      LAC MCWA          /CONTROL WORD C(ACS)
ØØ136    5Ø5Ø44                      AND K3            /MASK 16 AND 17
ØØ137    Ø44774                      DAC ULBNK         /C(ULBNK) = HIGHEST BANK #
ØØ14Ø    2Ø4773                      LAC MCWA
ØØ141    5Ø5Ø45                      AND K14           /MASK 14 AND 15
ØØ142    742Ø2Ø                      RTR
ØØ143    74ØØØ1                      CMA
ØØ144    345Ø43                      TAD K1            /2'S COMPLEMENT
ØØ145    344774                      TAD ULBNK         /SUBTRACT LOW BANK # FROM HIGH #
ØØ146    7411ØØ                      SPA               /LOWER BETTER BE LESS THAN HIGHER
ØØ147    6Ø3567                      JMP HEXED         /IT IS NOT. PRINT ERROR MESSAGE
ØØ15Ø    2Ø4773                      LAC MCWA          /CONTROL WORD
ØØ151    5Ø5Ø46                      AND K17           /MASK L.L. AND U.L.
ØØ152    34Ø32Ø                      TAD BASE          /ADD BASE & LIMITS AND JMP* ON
                                                       /THE SUM
ØØ153    Ø4Ø224                      DAC LOCN
ØØ154    7Ø77Ø4                      LEM               /EXTEND OFF
ØØ155    62Ø224                      JMP* LOCN         /DETERMINE ADDRESS TEST LIMITS
                              /
                                     .EJECT
```

```
                                        /
                                        /RETURN HERE AFTER SETTING UP ADDRESS LIMITS
                                        /
00156      204773            EXTST      LAC MCWA            /CONTROL WORD
00157      505051                       AND K200            /MASK BIT 10
00160      740200                       SZA                 /KEYBOARD INPUT IF NO SKIP
00161      602312                       JMP KYBRD           /GO ACCEPT INPUT
00162      204773                       LAC MCWA            /PROGRAM CONTROL WORD (ACS)
00163      505077                       AND K76K            /K76K = 076000
00164      741200                       SNA                 /NO SKIP = NO INDIVIDUAL TESTS
00165      600314                       JMP DOALL           /SETUP TO RUN ALL TESTS
00166      205075            EXAM1      LAC K40K            /K40K = 040000
00167      504773                       AND MCWA
00170      740200                       SZA                 /NO SKIP = DO TEST 1
00171      600321                       JMP TST1
00172      205073            EXAM2      LAC K20K
00173      504773                       AND MCWA
00174      740200                       SZA                 /NO SKIP = DO TEST 2
00175      600461                       JMP TST2
00176      205072            EXAM3      LAC K10K
00177      504773                       AND MCWA
00200      740200                       SZA                 /NO SKIP = DO TEST 3
00201      600730                       JMP TST3
00202      205071            EXAM4      LAC K4K             /K4K = 004000
00203      504773                       AND MCWA
00204      740200                       SZA                 /NO SKIP = DO TEST 4
00205      601151                       JMP TST4
00206      205070            EXAM5      LAC K2K
00207      504773                       AND MCWA
00210      740200                       SZA                 /NO SKIP = DO TEST 5
00211      601323                       JMP TST5
00212      204474                       LAC END             /END=PEND
00213      045032                       DAC PRNT
00214      707704                       LEM
00215      104537                       JMS CRLF            /CR,LF
00216      103010                       JMS PNXT            /PRINT END
00217      750004                       LAS
00220      505065                       AND K400
00221      740200                       SZA
00222      600127                       JMP STOVER
00223      603031                       JMP CMOVE           /DONE ALL TESTS, NOW GO DETERMINE
                                                            /DEST'N FOR RELOCATING PROGRAM
                                        /
                                                .EJECT
```

```
   ØØ224      ØØØØØØ       LOCN      Ø
   ØØ225      6ØØ245                 JMP ADØ1        /TEST BANK Ø TO Ø
   ØØ226      6ØØ251                 JMP ADØ2        /TEST BANK Ø TO 1
   ØØ227      6ØØ253                 JMP ADØ3        /TEST BANK Ø TO 2
   ØØ23Ø      6ØØ255                 JMP ADØ4        /TEST BANK Ø TO 3
   ØØ231      74ØØ4Ø                 HLT             /SHOULD NEVER GET HERE
   ØØ232      6ØØ257                 JMP ADØ5        /TEST BANK 1 TO 1
   ØØ233      6ØØ263                 JMP ADØ6        /TEST BANK 1 TO 2
   ØØ234      6ØØ265                 JMP ADØ7        /TEST BANK 1 TO 3
   ØØ235      74ØØ4Ø                 HLT             /SHOULD NEVER GET TO HERE,
   ØØ236      74ØØ4Ø                 HLT             /OR HERE.
   ØØ237      6ØØ267                 JMP ADØ8        /TEST BANK 2 TO 2
   ØØ24Ø      6ØØ273                 JMP ADØ9        /TEST BANK 2 TO 3
   ØØ241      74ØØ4Ø                 HLT             /SHOULD NEVER GET HERE,
   ØØ242      74ØØ4Ø                 HLT             /OR HERE
   ØØ243      74ØØ4Ø                 HLT             /OR HERE
   ØØ244      6ØØ275                 JMP AD1Ø        /TEST BANK 3 TO 3
                           /
   ØØ245      2Ø51Ø3       ADØ1      LAC K17S        /K17S = 17777
   ØØ246      Ø44775                 DAC LAST1       /U.L. FOR BANK Ø
   ØØ247      Ø44776                 DAC LAST2
   ØØ25Ø      6ØØ3Ø2                 JMP LOWA        /SETUP L.L. TO = BANK Ø
                                     .EJECT
```

```
                                /
ØØ251       2Ø51Ø4              ADØ2       LAC K37S            /K37S = 37777; U.L. FOR BANK 1
ØØ252       6ØØ246                         JMP ADØ1+1
                                /
ØØ253       2Ø51Ø5              ADØ3       LAC K57S            /K57S = 57777; U.L. FOR BANK 2
ØØ254       6ØØ246                         JMP ADØ1+1
                                /
ØØ255       2Ø51Ø6              ADØ4       LAC K77S            /K77S = 77777; U.L. FOR BANK 3
ØØ256       6ØØ246                         JMP ADØ1+1
                                /
ØØ257       2Ø51Ø4              ADØ5       LAC K37S            /K37S = 37777; U.L. FOR BANK 1
ØØ26Ø       Ø44775                         DAC LAST1           /U.L. (UPPER LIMIT) TO TEST
ØØ261       Ø44776                         DAC LAST2
ØØ262       6ØØ31Ø                         JMP LOWB            /SETUP L.L. TO = BANK 1
                                /
ØØ263       2Ø51Ø5              ADØ6       LAC K57S            /K57S = 57777; U.L. FOR BANK 2
ØØ264       6ØØ26Ø                         JMP ADØ5+1
                                /
ØØ265       2Ø51Ø6              ADØ7       LAC K77S            /K77S = 77777; U.L. FOR BANK 3
ØØ266       6ØØ26Ø                         JMP ADØ5+1
                                /
ØØ267       2Ø51Ø5              ADØ8       LAC K57S            /K57S = 57777; U.L. FOR BANK 2
ØØ27Ø       Ø44775                         DAC LAST1           /U.L. TO TEST
ØØ271       Ø44776                         DAC LAST2
ØØ272       6ØØ312                         JMP LOWC            /SETUP L.L. TO = BANK 2
                                /
ØØ273       2Ø51Ø6              ADØ9       LAC K77S            /K77S = 77777; U.L. FOR BANK 3
ØØ274       6ØØ27Ø                         JMP ADØ8+1
                                /
ØØ275       2Ø51Ø6              AD1Ø       LAC K77S            /K77S = 77777; U.L. FOR BANK 3
ØØ276       Ø44775                         DAC LAST1
ØØ277       Ø44776                         DAC LAST2
ØØ3ØØ       2Ø5Ø76                         LAC K6ØK            /L.L. = BANK 3 ALSO
ØØ3Ø1       6ØØ3Ø3                         JMP LOWA+1          /STORE AND EXIT
                                /
ØØ3Ø2       2Ø5Ø42              LOWA       LAC KØ              /BANK Ø
ØØ3Ø3       Ø45ØØ1                         DAC FIRST1
ØØ3Ø4       Ø45ØØ2                         DAC FIRST2
ØØ3Ø5       3451Ø3                         TAD K17S            /ADD 17777
ØØ3Ø6       Ø44777                         DAC LSTLOC
ØØ3Ø7       6ØØ156                         JMP EXTST           /EXIT AND START TESTING
                                /
ØØ31Ø       2Ø5Ø73              LOWB       LAC K2ØK            /BANK1
ØØ311       6ØØ3Ø3                         JMP LOWA+1
                                /
ØØ312       2Ø5Ø75              LOWC       LAC K4ØK            /BANK 2
ØØ313       6ØØ3Ø3                         JMP LOWA+1
                                /
                                           .EJECT
                                /
                                /SETUP TO RUN ALL TESTS
                                /
  00314      204773             DOALL     LAC MCWA          /CONTROL WORD (ACS)
  00315      245077                       XOR K76K          /SET ALL TEST SWITCHES
  00316      044773                       DAC MCWA
  00317      600321                       JMP TST1          /START TEST 1
                                /
  00320      000225             BASE      LOCN+1
                                /
                                /TEST 1. EACH LOCATION WILL CONTAIN ITS OWN
                                /VALUE. ALL OF MEMORY SPECIFIED WILL CONTAIN
                                /THE PATTERN.
                                /
  00321      102035             TST1      JMS WRT1S         /WRITE 1'S INTO ALL OF MEMORY
  00322      760261                       LAW 261
  00323      045003                       DAC TNUM          /TEST NUMBER
  00324      205001                       LAC FIRST1        /FIRST1 = C(ACS 14,15)
  00325      045000                       DAC MEMADR        /ADR. COUNTER
  00326      101674                       JMS CBANK         /SEE IF TESTED BANK HAS PROGRAM
  00327      777776             WBLK1     LAW -2
  00330      045004                       DAC RPETE         /DELAY COUNTER
  00331      777775                       LAW -3
  00332      045005                       DAC WRCNT         /COUNTS 3 TIMES FOR EACH ADDRESS
  00333      707702                       EEM               /EXTEND ON
  00334      205000             WLOP1     LAC MEMADR
  00335      065000                       DAC* MEMADR       /WRITE C(MEMADR) INTO SAME ADDRESS
  00336      445004                       ISZ RPETE         /DELAY 6 US
  00337      600336                       JMP .-1
  00340      777776                       LAW -2            /RESTORE COUNT
  00341      045004                       DAC RPETE
  00342      445005                       ISZ WRCNT
  00343      600334                       JMP WLOP1         /TOTAL 17 US BETWEEN WRITES
  00344      205000                       LAC MEMADR        /
  00345      544777                       SAD LSTLOC        /LSTLOC = LAST LOC. OF ONE BANK
  00346      600351                       JMP .+3
  00347      445000                       ISZ MEMADR        /INCREMENT ADDRESS COUNT
  00350      600331                       JMP WLOP1-3       /WRITE IN NEXT
  00351      760000                       LAW
  00352      545012                       SAD BLOC1         /NO BLOCK IF = LAW
  00353      741000                       SKP
  00354      603775                       JMP BLKA1         /SETUP FOR BLOCK 2
  00355      445000                       ISZ MEMADR        /INCREMENT ADDRESS COUNT
  00356      101636                       JMS NXTBNK        /SETUP FOR NEXT BANK
  00357      101674                       JMS CBANK
  00360      600331                       JMP WLOP1-3
                              /
                                          .EJECT
```

```
                                        /
                                        /READ AND CHECK FOR ERROR.  READ FROM LO BANK
                                        /TO HI BANK AND THEN DECREMENT FROM HI TO LO.
                                        /REPEAT THE SEQUENCE TWICE BEFORE FINISHING.
                                        /
ØØ361       777776                      READ1       LAW -2
ØØ362       Ø45ØØ6                                  DAC LOOPT           /COUNT # OF TIMES READ BACKWARD
ØØ363       2Ø5ØØ1                                  LAC FIRST1          /FIRST 1 = C(ACS 14,15)
ØØ364       Ø45ØØØ                                  DAC MEMADR          /ADDRESS COUNTER
ØØ365       1Ø1674                                  JMS CBANK           /SEE IF TESTED BANK HAS PROGRAM
ØØ366       777754                      RLOP1       LAW -24
ØØ367       Ø45ØØ4                                  DAC RPETE           /LOOP 5 TIMES ON EACH READ
ØØ37Ø       7Ø77Ø2                                  EEM                 /EXTEND ON
ØØ371       2Ø5ØØØ                                  LAC MEMADR
ØØ372       Ø45ØØ7                                  DAC PATR
ØØ373       225ØØØ                                  LAC* MEMADR
ØØ374       545ØØØ                                  SAD MEMADR          /CHECK FOR ERROR
ØØ375       741ØØØ                                  SKP                 /O.K.
ØØ376       1Ø21ØØ                                  JMS ERROR           /PRINT INFO
ØØ377       445ØØ4                                  ISZ RPETE           /LOOP 5 TIMES ON EACH ADDRESS
ØØ4ØØ       6ØØ373                                  JMP RLOP1+5                 /READ SAME ONE AGAIN

ØØ4Ø1       2Ø5ØØØ                                  LAC MEMADR
ØØ4Ø2       544777                                  SAD LSTLOC          /LSTLOC = LAST ADR. OF TESTED BANK
ØØ4Ø3       6ØØ4Ø6                                  JMP .+3
ØØ4Ø4       445ØØØ                                  ISZ MEMADR          /SETUP FOR NEXT BANK
ØØ4Ø5       6ØØ366                                  JMP RLOP1
ØØ4Ø6       76ØØØØ                                  LAW
ØØ4Ø7       545Ø12                                  SAD BLOC1           /NO BLOCKS IF = LAW
ØØ41Ø       741ØØØ                                  SKP
ØØ411       6Ø4Ø16                                  JMP BLKB1           /SETUP FOR BLOCK 2
ØØ412       445ØØØ                                  ISZ MEMADR          /INCREMENT ADR. COUNTER
ØØ413       1Ø1636                                  JMS NXTBNK
ØØ414       1Ø1674                                  JMS CBANK
ØØ415       6ØØ366                                  JMP RLOP1
ØØ416       6ØØ422                                  JMP RBAK1           /NOW READ FROM LAST TO FIRST
ØØ417       445ØØ6                      LOOP1       ISZ LOOPT           /DONE IF Ø
ØØ42Ø       6ØØ363                                  JMP READ1+2         /READ FORWARD ONCE MORE
ØØ421       6ØØ172                                  JMP EXAM2           /ALL DONE.  SEE IF TEST 2 HAS
                                                                        /BEEN SELECTED.
                                        /
                                                    .EJECT
```

```
                                /
                                /READ ALL OF MEMORY FROM HI BANK TO LO BANK
                                /
    00422      204775           RBAK1      LAC LAST1             /VERY LAST LOC. IN HIGH BANK
    00423      044777                      DAC LSTLOC            /ADDRESS COUNT
    00424      505076                      AND K60K
    00425      045000                      DAC MEMADR            /FIRST LOC. IS LAST TESTED
    00426      101744                      JMS CKBAK             /SEE IF BANK CONTAINS PROGRAM
    00427      707702                      EEM                   /EXTEND ON
    00430      777754           BAK1       LAW -24
    00431      045004                      DAC RPETE             /COUNTS 20 TIMES
    00432      204777                      LAC LSTLOC
    00433      045007                      DAC PATR
    00434      224777                      LAC* LSTLOC           /READ ONE
    00435      544777                      SAD LSTLOC            /COMPARE
    00436      741000                      SKP                   /O.K.
    00437      102070                      JMS ERRORA            /PRINT INFO
    00440      445004           ERR1A      ISZ RPETE             /SKIP AFTER 20 READS
    00441      600434                      JMP BAK1+4
    00442      204777                      LAC LSTLOC            /COUNT
    00443      545000                      SAD MEMADR            /DONE ONE BANK IF EQUAL
    00444      600451                      JMP .+5
    00445      777777                      LAW -1
    00446      344777                      TAD LSTLOC            /DECREMENT ADDRESS COUNT
    00447      044777                      DAC LSTLOC
    00450      600430                      JMP BAK1              /READ IN DESCENDING ORDER
    00451      760000                      LAW
    00452      545012                      SAD BLOC1             /NO BLOCKS IF = LAW
    00453      741000                      SKP
    00454      604043                      JMP BLKC1             /SETUP FOR BLOCK 2
    00455      102012                      JMS NXBAK             /SETUP FOR NEXT BANK
    00456      101744                      JMS CKBAK             /SEE IF NEXT HAS PROGRAM
    00457      600430                      JMP BAK1              /READ
    00460      600417                      JMP LOOP1             /READ FORWARDS AGAIN
                                /
                                           .EJECT
```

```
                                  /
                                  /TEST 2.  REVERSE THE CONTENTS OF EACH ADDRESS.
                                  /LOC. Ø WILL = 17777; LOC. 1 = 17776, ETC. WRITE
                                  /AND READ THE PATTERN IN ONE BANK AT A TIME.
                                  /AFTER TESTING ONE BANK MAKE SURE REST OF
                                  /MEMORY HAS NOT CHANGED.
                                  /
ØØ461      1Ø2Ø35                 TST2        JMS WRT1S            /WRITE 1'S INTO AL OF MEMORY
ØØ462      2Ø5ØØ1                             LAC FIRST1           /FIRST1 = FIRST BANK
ØØ463      Ø45ØØØ                             DAC MEMADR           /ADDRESS COUNTER
ØØ464      Ø45Ø1Ø                             DAC PATBNK           /PATBNK = BANK THAT HAS PATTERN
ØØ465      3451Ø3                             TAD K17S             /K17S = Ø17777
ØØ466      Ø45ØØ7                 LOP2        DAC PATR             /CONTAINS DATA TO BE WRIITEN
ØØ467      1Ø1674                             JMS CBANK            /SEE IF TESTED BANK HAS PROGRAM
ØØ47Ø      777776                             LAW -2
ØØ471      Ø45ØØ4                             DAC RPETE            /DELAY COUNTER
ØØ472      777775                             LAW -3
ØØ473      Ø45ØØ5                             DAC WRCNT            /COUNTS 3 TIMES FOR EACH ADDRESS
ØØ474      7Ø77Ø2                             EEM                  /EXTEND ON
ØØ475      2Ø5ØØ7                 WLOP2       LAC PATR
ØØ476      Ø65ØØØ                             DAC* MEMADR          /WRITE C(PATR)
ØØ477      445ØØ4                             ISZ RPETE            /DELAY 6 US
ØØ5ØØ      6ØØ477                             JMP .-1
ØØ5Ø1      777776                             LAW -2
ØØ5Ø2      Ø45ØØ4                             DAC RPETE            /RESTORE COUNT
ØØ5Ø3      445ØØ5                             ISZ WRCNT
ØØ5Ø4      6ØØ475                             JMP WLOP2            /17 US TOTAL BETWEEN WRITES
ØØ5Ø5      2Ø5ØØØ                             LAC MEMADR
ØØ5Ø6      544777                             SAD LSTLOC           /LSTLOC = LAST LOC. OF ONE BANK
ØØ5Ø7      6ØØ515                             JMP CKBA             /GO READ ANN CHECK THIS BANK
                                                                   /FROM LO TO HI
ØØ51Ø      445ØØØ                             ISZ MEMADR           /INCREMENT ADDRESS
ØØ511      777777                             LAW -1               /-1
ØØ512      345ØØ7                             TAD PATR             /DECREMENT COUNT PATTERN
ØØ513      Ø45ØØ7                             DAC PATR
ØØ514      6ØØ472                             JMP WLOP2-3          /DO NEXT IN SEQUENCE
                                  /
ØØ515      76ØØØØ                 CKBA        LAW
ØØ516      545Ø12                             SAD BLOC1            /NO BLOCKS IF = LAW
ØØ517      6ØØ534                             JMP RDFWD            /NONE.  READ FORWARD
ØØ52Ø      2Ø5Ø12                             LAC BLOC1
ØØ521      Ø45ØØØ                             DAC MEMADR                     /1ST OF BLOCK 1
ØØ522      74ØØØ1                             CMA
ØØ523      5Ø51Ø3                             AND K17S             /CLEAR BITS Ø-4
ØØ524      Ø45ØØ7                             DAC PATR             /COMPARE WORD
ØØ525      2Ø5Ø12                             LAC BLOC1
ØØ526      5Ø5Ø76                             AND K6ØK
ØØ527      245ØØ7                             XOR PATR             /PUT BANK # ON PATR
ØØ53Ø      Ø45ØØ7                             DAC PATR
ØØ531      2Ø5Ø13                             LAC BLOC2            /LAST OF BLOCK 1
ØØ532      Ø44777                             DAC LSTLOC
ØØ533      6ØØ543                             JMP RBLK2            /READ BLOCK 1 FORWARD
                                  /
                                              .EJECT
```

```
                                /
                                /READ THE BANK WITH THE PATTERN FROM O
                                /TO HI THEN HI TO LO, THEN REST OF MEMORY
                                /
    00534      760262           RDFWD      LAW 262
    00535      045003                      DAC TNUM
    00536      205010                      LAC PATBNK          /PATBNK = BANK WITH PATTERN
    00537      045000                      DAC MEMADR          /ADDRESS COUNTER
    00540      345103                      TAD K17S            /K17S = 017777
    00541      045007                      DAC PATR            /PATR = DATA FOR COMPARISON
    00542      101674                      JMS CBANK           /SEE IF TESTED BANK HAS PROGRAM
    00543      777776           RBLK2      LAW -2
    00544      045004                      DAC RPETE           /DELAY COUNTER
    00545      777775                      LAW -3
    00546      045005                      DAC WRCNT           /COUNTS 3 TIMES FOR EACH ADR.
    00547      707702                      EEM                 /EXTEND ON
    00550      225000           FWD2       LAC* MEMADR         /READ
    00551      545007                      SAD PATR            /COMPARE
    00552      741000                      SKP                 /O.K.
    00553      102100                      JMS ERROR           /PRINT INFO
    00554      445004                      ISZ RPETE           /DELAY 6 US
    00555      600554                      JMP .-1

    00556      777776                      LAW -2
    00557      045004                      DAC RPETE           /RESTORE COUNT
    00560      445005                      ISZ WRCNT           /17 US TOTAL
    00561      600550                      JMP FWD2
    00562      205000                      LAC MEMADR
    00563      544777                      SAD LSTLOC          /LSTLOC = LAST LOC. IN TESTED BANK
    00564      600572                      JMP CKBB            /READ THIS BANK HI TO LO
    00565      445000                      ISZ MEMADR          /INCREMENT ADDRESS
    00566      777777                      LAW -1
    00567      345007                      TAD PATR            /DERCREMENT COUNT PATTERN
    00570      045007                      DAC PATR
    00571      600545                      JMP FWD2-3          /DO NEXT IN SEQUENCE
                                /
                                           .EJECT
    ØØ572    76ØØØØ        CKRB      LAW
    ØØ573    545Ø12                  SAD BLOC1          /NO BLOCK IF = LAW
    ØØ574    6ØØ611                  JMP RDBAK          /READ HI TO LO
    ØØ575    205Ø12                  LAC BLOC1
    ØØ576    Ø45ØØØ                  DAC MEMADR                   /1ST OF BLOCK 1
    ØØ577    2Ø5Ø13                  LAC BLOC2
    ØØ6ØØ    Ø44777                  DAC LSTLOC                   /LAST OF BLOCK 1
    ØØ6Ø1    74ØØØ1                  CMA
    ØØ6Ø2    5Ø51Ø3                  AND K17S           /CLEAR BITS Ø-4
    ØØ6Ø3    Ø45ØØ7                  DAC PATR
    ØØ6Ø4    2Ø5Ø13                  LAC BLOC2
    ØØ6Ø5    5Ø5Ø76                  AND K6ØK
    ØØ6Ø6    245ØØ7                  XOR PATR           /PUT BANK # ON PATR
    ØØ6Ø7    Ø45ØØ7                  DAC PATR
    ØØ61Ø    6ØØ615                  JMP BAK2-1                   /READ BLOCK 1 BACKWARD
                           /
                                     .EJECT
```

```
                                  /
                                  /READ THE BANK WITH THE PATTERN FROM HI TO LO
                                  /AND THEN READ REST OF MEMRY.
                                  /
    00611      205010             RDBAK      LAC PATBNK
    00612      045007                        DAC PATR             /PATR = DATA FOR COMPARISON
    00613      045000                        DAC MEMADR           /MEMADR = LAST LOC. TO TEST
    00614      101744                        JMS CKBAK            /SEE IF TEST BANK HAS PROGRAM
    00615      707702                        FEM                  /EXTEND ON
    00616      777754             BAK2       LAW -24
    00617      045004                        DAC RPETE
    00620      224777                        LAC* LSTLOC                   /READ
    00621      545007                        SAD PATR             /COMPARE
    00622      741000                        SKP                  /O.K.
    00623      102070                        JMS ERRORA           /PRINT INFO
    00624      445004                        ISZ RPETE
    00625      600620                        JMP .-5
    00626      204777                        LAC LSTLOC
    00627      545000                        SAD MEMADR           /DONE IF LSTLOC = LOWEST ADR.
    00630      600636                        JMP CKBC             /READ & TEST REST OF MEMORY
    00631      445007                        ISZ PATR             /INCREMENT COUNT PATTERN
    00632      777777                        LAW -1
    00633      344777                        TAD LSTLOC           /DECREMENT ADDRESS COUNT
    00634      044777                        DAC LSTLOC
    00635      600616                        JMP BAK2             /READ NEXT IN DESCENDING ORDER
                                  /
    00636      760000             CKBC       LAW
    00637      545012                        SAD BLOC1
    00640      600642                        JMP REST
    00641      604073                        JMP BLKA2
                                             .EJECT
```

```
                                /
                                /NOW READ REST OF MEMORY AND MAKE SURE IT
                                /EQUALS 777777, THEN WRITE THE ADDRESS PATTERN
                                /IN NEXT SEQUENTIAL BANK.
                                /
00642      204775               REST       LAC LAST1         /SEE IF MORE THAN 1 BANK SELECTED
00643      505076                          AND K60K          /MASK BITS 3 AND 4
00644      545001                          SAD FIRST1        /ONLY 1 SELECTED IF EQUAL
00645      600176                          JMP EXAM3         /SEE IF TEST 3 IS SELECTED
00646      205001                          LAC FIRST1        /FIRST1 = 1ST LOCATION TO TEST
00647      045000               REST1      DAC MEMADR        /ADDRESS COUNTER
00650      345103                          TAD K17S          /K17S = 017777
00651      044777                          DAC LSTLOC        /LAST ADDRESS IN FIRST BANK
00652      201146                          LAC KNXPT         /KNXPT = LOCATION NXTPAT
00653      045011                          DAC EXIT          /(EXIT) = NXTPAT
00654      205000                          LAC MEMADR
00655      505076                          AND K60K          /MASK BITS 3 AND 4
00656      545010                          SAD PATBNK        /SEE IF BANK HAS ADDRESS PATTERN
00657      600662                          JMP .+3
00660      100670                          JMS REST2         /READ REST OF MEMORY
00661      600654                          JMP .-5
00662      204777                          LAC LSTLOC
00663      544776                          SAD LAST2         /IS THE BANK THE HIGHEST SELECTED
00664      600176                          JMP EXAM3         /YES.  SEE IF TEST 3 IS SELECTED
00665      205010                          LAC PATBNK        /EQUALS BANK WITH ADDRESS PATTERN
00666      345073                          TAD K20K          /ADD 8K TO ADDRESS
00667      600647                          JMP REST1
                                /
                                           .EJECT
```

```
                                  /
                                  /READ ALL OF MEMORY EXCEPT BANK WITH ADDRESS PATTERN
                                  /
    00670      000000             REST2     0
    00671      101674                       JMS CBANK            /SEE IF TESTED BANK HAS PROGRAM
    00672      777777                       LAW -1               /777777
    00673      045007                       DAC PATR             /COMPARE CONSTANT
    00674      707702                       EEM
    00675      225000             ALL1      LAC* MEMADR          /READ ONE
    00676      545007                       SAD PATR             /MUST = 777777
    00677      741000                       SKP                  /O.K.
    00700      102100                       JMS ERROR            /PRINT INFO
    00701      205000                       LAC MEMADR
    00702      544777                       SAD LSTLOC           /SEE IF READ ONE BANK
    00703      600706                       JMP .+3              /YES
    00704      445000                       ISZ MEMADR           /INCREMENT ADDRESS COUNT
    00705      600675                       JMP ALL1
    00706      760000                       LAW
    00707      545012                       SAD BLOC1            /NO BLOCKS IF = LAW
    00710      741000                       SKP
    00711      600716                       JMP .+5              /EXIT
    00712      445000                       ISZ MEMADR           /INCREMENT ADDRESS
    00713      101636                       JMS NXTBNK           /SETUP FOR NEXT BANK IN SEQUENCE
    00714      740000                       NOP
    00715      620670                       JMP* REST2
    00716      707704                       LEM                  /EXTEND OFF.
    00717      625011                       JMP* EXIT            /EXIT TO NXTPAT, RTN3, RTN4, OR RTN5
                                  /
                                  /SETUP TO WRITE PATTERN IN NEXT BANK
                                  /
    00720      102035             NXTPAT    JMS WRT1S            /WRITE 1'S INTO ALL OF MEMORY
    00721      205010                       LAC PATBNK           /CURRENT BANK WITH ADDRESS PATTERN
    00722      345073                       TAD K20K             /ADD 8K TO IT
    00723      045010                       DAC PATBNK
    00724      045000                       DAC MEMADR           /ADDRESS COUNTER
    00725      345103                       TAD K17S             /K17S = 017777
    00726      044777                       DAC LSTLOC           /LAST LOCATION OF NEXT BANK
    00727      600466                       JMP LOP2             /JMP BACK AND WRITE THE
                                                                 /ADDRESS PATTERN IN NEXT BANK
                                  /
                                            .EJECT
```

```
                                        /
                                        /TEST 3.  WRITE COMPLEMENT ADDRESSES INTO ONE
                                        /BANK AND 777777 IN ALL OTHER BANKS.  WRIE
                                        /IN BOTH DIRECTIONS (LO TO HI AND HI TO LO).  AND
                                        /READ IN BOTH DIRECTIONS BEFORE READING REST
                                        /OF MEMORY
                                        /
00730       102035                      TST3      JMS WRT1S         /WRITE 1'S INTO ALL OF MEMORY
00731       205001                                LAC FIRST1        /FIRST BANK TO TEST
00732       045000                                DAC MEMADR        /ADDRESS COUNTER
00733       045010                                DAC PATBNK        /EQUALS BANK WITH ADDRESS PATTERN
00734       345103                                TAD K17S          /AND 017777
00735       044777                                DAC LSTLOC        /LSTLOC = LAST LOC. OF TESTED BANK
00736       101674                      LOP3      JMS CBANK         /SEE IF TESTED BANK HAS PROGRAM
00737       777776                                LAW -2
00740       045004                                DAC RPETE         /DELAY COUNTER
00741       777775                                LAW -3
00742       045005                                DAC WRCNT         /COUNTS 3 TIMES FOR EACH ADDRESS
00743       707702                                EEM               /EXTEND ON
00744       205000                      WLOP3     LAC MEMADR
00745       740001                                CMA               /COMPLEMENT ADDRESS
00746       065000                                DAC* MEMADR       /WRITE INTO SAME ADDRESS
00747       445004                                ISZ RPETE
00750       600747                                JMP .-1           /DELAY 6 US

00751       777776                                LAW -2
00752       045004                                DAC RPETE
00753       445005                                ISZ WRCNT
00754       600744                                JMP WLOP3         /18 US TOTAL BETWEEN WRITES
00755       205000                                LAC MEMADR
00756       544777                                SAD LSTLOC        /LSTLOC = LAST LOC. OF TESTED BANK
00757       600762                                JMP .+3
00760       445000                                ISZ MEMADR        /INCREMENT ADDRESS COUNT
00761       600741                                JMP WLOP3-3       /WRITE IN NEXT
00762       760000                                LAW
00763       545012                                SAD BLOC1         /NO BLOCK IF = LAW
00764       741000                                SKP
00765       604124                                JMP BLKA3
00766       100772                                JMS REST3         /READ REST OF MEMORY
00767       101023                                JMS RFWD3         /READ LO TO HI FROM TESTED BANK
00770       100772                                JMS REST3         /READ REST OF MEMORY AGAIN
00771       601104                                JMP TST3A         /WRITE HI TO LO IN TESTED BANK
                                        /
                                                  .EJECT
```

```
                            /
                            /SETUP TO READ REST OF MEMORY, THEN READ AND
                            /TEST THE BANK WITH ADDRESS PATTERN
                            /
      00772      000000     REST3     0
      00773      760263               LAW 263
      00774      045003               DAC TNUM                 /TEST NUMBER
      00775      204775               LAC LAST1                /SEE IF MORE THAN 1 BANK SELECTED
      00776      505076               AND K60K                 /MASK BITS 3 AND 4
      00777      545001               SAD FIRST1               /ONLY 1 SELECTED IF EQUAL
      01000      620772     RTN3      JMP* REST3               /NO MORE TO READ
      01001      205001               LAC FIRST1               /FIRST1 = 1ST LOCATION TO TEST
      01002      045000     REST3A    DAC MEMADR               /ADDRESS COUNTER
      01003      345103               TAD K17S                 /K17S = 017777
      01004      044777               DAC LSTLOC               /LAST ADDRESS IN FIRST BANK
      01005      201147               LAC KRTN3                /KRTN3 = LOCATION RTN3
      01006      045011               DAC EXIT                 /(EXIT) = RTN3
      01007      205000               LAC MEMADR
      01010      505076               AND K60K                 /MASK BITS 3 AND 4
      01011      545010               SAD PATBNK               /SEE IF BANK HAS ADDRESS PATTERN
      01012      601015               JMP .+3                  /YES
      01013      100670               JMS REST2                /NO, READ REST OF MEMORY
      01014      601007               JMP .-5
      01015      204777               LAC LSTLOC
      01016      544776               SAD LAST2                /IS THE BANK THE HIGHEST SELECTED
      01017      620772               JMP* REST3               /YES.  EXIT
      01020      205010               LAC PATBNK
      01021      345073               TAD K20K                 /ADD 8K TO ADDRESS
      01022      601002               JMP REST3A
                            /
                                      .EJECT
```

```
                                        /NOW READ THE BANK WITH ADDRESS PATTERN FROM
                                        /LO T HI, THEN HI TO LO AND THEN RECHECK REST
                                        /OF MEMORY.
                                        /
 Ø1Ø23       ØØØØØØ                     REWD3      Ø
 Ø1Ø24       2Ø5Ø1Ø                                LAC PATBNK          /BANK WITH ADDRESS PATTERN
 Ø1Ø25       Ø45ØØØ                                DAC MEMADR          /ADDRESS COUNTER
 Ø1Ø26       3451Ø3                                TAD K17S            /AKD Ø17777
 Ø1Ø27       Ø44777                                DAC LSTLOC          /LAST LOCATION TO TEST
 Ø1Ø3Ø       1Ø1674                                JMS CBANK           /SEE IF THE BANK HAS PROGRAM
 Ø1Ø31       7077Ø2                                FEM                 /EXTEND ON
 Ø1Ø32       2Ø5ØØØ                     FWD3       LAC MEMADR
 Ø1Ø33       74ØØØ1                                CMA
 Ø1Ø34       Ø45ØØ7                                DAC PATR            /DATA FOR COMPARISON
 Ø1Ø35       225ØØØ                                LAC* MEMADR         /READ ONE
 Ø1Ø36       545ØØ7                                SAD PATR            /COMPARE
 Ø1Ø37       741ØØØ                                SKP                 /O.K.
 Ø1Ø4Ø       1Ø21ØØ                                JMS ERROR           /PRINT INFO

 Ø1Ø41       2Ø5ØØØ                                LAC MEMADR
 Ø1Ø42       544777                                SAD LSTLOC          /SEE IF DONE ONE BANK
 Ø1Ø43       6Ø1Ø46                                JMP .+3             /READ BACKWARD
 Ø1Ø44       445ØØØ                                ISZ MEMADR          /INCREMENT ADDRESS COUNT
 Ø1Ø45       6Ø1Ø32                                JMP FWD3            /READ NEXT IN SEQUENCE
 Ø1Ø46       76ØØØØ                                LAW
 Ø1Ø47       545Ø12                                SAD BLOC1           /NO BLOCK IF = LAW
 Ø1Ø5Ø       6Ø1Ø52                                JMP RBAK3           /READ BACKWARD
 Ø1Ø51       6Ø4145                                JMP BLKC3
                                        /
                                                   .EJECT
```

```
                         /
                         /NOW READ SAME BANK FROM HI TO LO, AND THEN
                         /RECHECK REST OF MEMORY
                         /
01052     205010         RBAK3     LAC PATBNK         /CURRENT BANK WITH ADDRESS PATTERN
01053     045000                   DAC MEMADR         /MEMADR = LAST LOC. TO *FST
01054     101744                   JMS CKBAK          /SEE IF TESTED BANK HAS PROGRAM
01055     707702                   FEM                /EXTEND ON
01056     777770         BAK3      LAW -10
01057     045004                   DAC RPFTE
01060     204777                   LAC LSTLOC                      /ADDRESS COUNT
01061     740001                   CMA
01062     045007                   DAC PATR           /DATA FOR COMPARISON
01063     224777                   LAC* LSTLOC
01064     545007                   SAD PATR           /COMPARE
01065     741000                   SKP                /O.K.
01066     102070                   JMS ERRORA         /PRINT INFO
01067     445004                   ISZ RPFTE
01070     601063                   JMP .-5
01071     204777                   LAC LSTLOC
01072     545000                   SAD MEMADR         /DONE IF LOWEST ADDRESS
01073     601100                   JMP .+5
01074     777777                   LAW -1
01075     344777                   TAD LSTLOC         /DECREMENT ADDRESS COUNT
01076     044777                   DAC LSTLOC
01077     601056                   JMP BAK3           /READ NEXT IN DESCENDING ORDER
01100     760000                   LAW
01101     545012                   SAD BLOC1          /NO BLOCK IF = LAW
01102     621023                   JMP* RFWD3                /EXIT AND RECHECK REST OF MEMOR
01103     604152                   JMP BLKD3
                         /
                                   .EJECT
```

```
                                     /
                                     /TEST 3A.  WRITE SAME PATTERN IN SAME BANK
                                     /FROM HI TO LO.
                                     /
01104      102035                    TST3A       JMS WRT1S          /WRITE 1'S INTO ALL OF MEMORY
01105      205010                                LAC PATBNK         /CURRENT BANK WITH ADDRESS PATTERN
01106      045000                                DAC MEMADR         /MEMADR = LAST LOC. TO TEST
01107      101744                                JMS CKBAK          /SEE IF TESTED BANK HAS PROGRAM
01110      707702                                EEM
01111      204777                    BAK3A       LAC LSTLOC         /DATA TO BE WRITTEN
01112      740001                                CMA                /COMPLEMENT
01113      064777                                DAC* LSTLOC        /PUT IN SAME ADDRESS
01114      204777                                LAC LSTLOC
01115      545000                                SAD MEMADR         /DONE IF = LOWEST ADDRESS
01116      601123                                JMP .+5
01117      777777                                LAW -1
01120      344777                                TAD LSTLOC         /DECREMENT ADDRESS COUNT
01121      044777                                DAC LSTLOC
01122      601111                                JMP BAK3A          /WRITE NEXT IN DESCENDING ORDER
01123      760000                                LAW
01124      545012                                SAD BLOC1          /NO BLOCK IF = LAW
01125      741000                                SKP
01126      604124                                JMP BLKA3
01127      100772                                JMS REST3          /SETUP TO CHECK REST OF MEMORY
01130      101023                                JMS REWD3          /GO READ LO TO HI; HI TO LO
01131      100772                                JMS REST3          /RECHECK REST OF MEMORY THEN
                                                                    /SETUP TO WRITE THE PATTERN IN
                                                                    /NEXT SEQUENTIAL BANK

                                     /
                                     /SETUP FOR NEXT
                                     /
01132      205010                    NXPT3       LAC PATBNK         /CURRENT BANK
01133      345103                                TAD K17S           /ADD 17777
01134      544775                                SAD LAST1          /CHECK FOR LAST
01135      600202                                JMP EXAM4          /ALL DONE.  SEE IF TEST 4 SELECTED
01136      102035                                JMS WRT1S          /WRITE 1'S INTO ALL OF MEMORY
01137      205010                                LAC PATBNK
01140      345073                                TAD K20K           /ADD 8K TO CURRENT ADDRESS
01141      045010                                DAC PATBNK         /BANK WITH ADR. PATTERN
01142      045000                                DAC MEMADR         /ADDRESS COUNTER
01143      345103                                TAD K17S           /K17S = 017777
01144      044777                                DAC LSTLOC         /LAST LOC. TO WRITE
01145      600736                                JMP LOP3           /START NEW BANK
                                     /
01146      000720                    KNXPT       NXTPAT
01147      001000                    KRTN3       RTN3
01150      001215                    KRTN4       RTN4
                                     /

                                     /XMADR9 - TAPE 2
                                     /
                                     /TEST 4. SLIDE A 1 THRU ONE BANK.  REPEAT
                                     /18 TIMES PER BANK TO CHECK EACH BIT POSITION.
                                     /REST OF MEMORY WILL CONTAIN ALL 1'S. CHECK
                                     /REST OF MEMORY AFTER EACH WRITE AND READ
                                     /IN THE BANK BEING TESTED.
```

```
                                /
    01151      760264           TST4      LAW 264
    01152      045003                     DAC TNUM          /TEST NUMBER
    01153      102035                     JMS WRT1S         /WRITE 1'S INTO ALL OF MEMORY
    01154      205001                     LAC FIRST1        /1ST LOCATION TO TEST
    01155      045000                     DAC MEMADR        /ADDRESS COUNTER
    01156      045010                     DAC PATBNK        /BANK WITH BIT PATTERN
    01157      345103                     TAD K17S          /ADD 017777
    01160      044777                     DAC LSTLOC        /LAST LOC. OF TESTED BANK
    01161      101674           LOP4      JMS CBANK         /SEE IF TESTED BANK HAS PROGRAM
    01162      205043                     LAC K1            /K1=1
    01163      045033                     DAC BITN
    01164      205033                     LAC BITN          /BITN SAVES CURRENT STARTING BIT POSITION
    01165      045007                     DAC PATR
    01166      744000                     CLL
    01167      707702                     EEM
    01170      205007           WLOP4     LAC PATR
    01171      065000                     DAC* MEMADR       /WRITE THE BIT
    01172      740010                     RAL               /ROTATE TO NEXT BIT POSITION
    01173      045007                     DAC PATR
    01174      205000                     LAC MEMADR
    01175      544777                     SAD LSTLOC        /DONE ONE BANK IF EQUAL
    01176      601201                     JMP .+3
    01177      445000                     ISZ MEMADR        /INCREMENT ADDRESS COUNT
    01200      601170                     JMP WLOP4         /WRITE IN NEXT IN SEQUENCE
    01201      760000                     LAW
    01202      545012                     SAD BLOC1         /NO BLOCK IF=LAW
    01203      741000                     SKP
    01204      604206                     JMP BLKA4
    01205      101211                     JMS REST4         /SETUP TO READ REST OF MEMORY
    01206      101240                     JMS RFWD4         /READ LO TO HI FROM TESTED BANK
    01207      101211                     JMS REST4         /READ REST OF MEMORY AGAIN
    01210      601274                     JMP CK18B         /SEE IF ALL 18 BITS HAVE BEEN TESTED
                                                            /GO ON TO NEXT BANK IF SO.
                                /
                                          .EJECT
                                /
                                /SETUP TO READ REST FOR MEMRY, THEN READ AND TEST
                                /THE BANK WITH BIT PATTERN.
                                /
Ø1211       ØØØØØØ              REST4     Ø
Ø1212       204775                        LAC LAST1            /LAST LOC. TO TEST IN HI BANK
Ø1213       5Ø5Ø76                        AND K6ØK             /MASK BITS 3 AND 4
Ø1214       5450Ø1                        SAD FIRST1           /ONLY ONE BANK SELECTED IF EQUAL
Ø1215       621211              RTN4      JMP* REST4           /NO MORE TO READ
Ø1216       2Ø5ØØ1                        LAC FIRST1                   /1ST LOCATION TO TEST
Ø1217       Ø45ØØØ              REST4A    DAC MEMADR           /ADDRESS COUNTER
Ø122Ø       3451Ø3                        TAD K17S             /ADD Ø17777
Ø1221       Ø44777                        DAC LSTLOC           /LAST LOC. TO TEST
Ø1222       2Ø115Ø                        LAC KRTN4            /KRTN4 = LOCATION RTN4
Ø1223       Ø45Ø11                        DAC EXIT             /(EXIT) = RTN4
Ø1224       2Ø5ØØØ                        LAC MEMADR
Ø1225       5Ø5Ø76                        AND K6ØK             /MASK BITS 3 AND 4
Ø1226       545Ø1Ø                        SAD PATBNK           /SEE IF BANK HAS BIT PATTERN
Ø1227       6Ø1232                        JMP .+3              /YES
Ø123Ø       1ØØ67Ø                        JMS REST2            /READ REST OF MEMORY
Ø1231       6Ø1224                        JMP .-5
Ø1232       2Ø4777                        LAC LSTLOC
Ø1233       544776                        SAD LAST2            /IS THE BANK THE HIGHEST SELECTED
Ø1234       621211                        JMP* REST4           /YES. EXIT
Ø1235       2Ø5Ø1Ø                        LAC PATBNK
Ø1236       345Ø73                        TAD K2ØK             /ADD 8K TO ADDRESS
Ø1237       6Ø1217                        JMP REST4A
                                /
                                          .EJECT
```

```
                                      /NOW READ THE BANK WITH BIT PATTERN FROM
                                      /LO TO HI, THEN RECHECK REST OF MEMORY

                                      /
     01240      000000                RFWD4      0
     01241      205010                           LAC PATBNK         /BANK WITH BIT PATTERN
     01242      045000                           DAC MEMADR         /ADDRESS COUNTER
     01243      345103                           TAD K17S           /ADD 017777
     01244      044777                           DAC LSTLOC         /LAST LOCATION TO TEST
     01245      101674                           JMS CBANK          /SEE IF THE BANK HAS PROGRAM
     01246      205033                           LAC BITN           /FIRST BIT POSITION
     01247      045007                           DAC PATR
     01250      744000                           CLL
     01251      707702                           EEM
     01252      225000                FWD4       LAC* MEMADR        /READ ONE
     01253      545007                           SAD PATR           /COMPARE
     01254      741000                           SKP                /O.K.
     01255      102100                           JMS ERROR          /PRINT INFO
     01256      205007                           LAC PATR
     01257      741200                           SNA                /RESTORE LINK IF AC=0
     01260      744002                           STL
     01261      740010                           RAL                /ROTATE TO NEXT BIT POSITION
     01262      045007                           DAC PATR
     01263      205000                           LAC MEMADR
     01264      544777                           SAD LSTLOC         /DONE ONE BANK IF EQUAL
     01265      601270                           JMP .+3
     01266      445000                           ISZ MEMADR         /INCREMENT ADDRESS
     01267      601252                           JMP FWD4           /READ NEXT IN SEQUENCE
     01270      760000                           LAW
     01271      545012                           SAD BLOC1          /NO BLOCK IF = LAW
     01272      621240                           JMP* RFWD4
     01273      604227                           JMP BLKC4
                                      /
                                                 .EJECT
```

```
                                   /
                                   /SEE IF EACH BIT POSITION HAS BEEN TESTED
                                   /
     Ø1274      2Ø5Ø33             CK18B      LAC BITN
     Ø1275      5451ØØ                        SAD K4ØØK                /DONE 18 IF = 4ØØØØØ
     Ø1276      6Ø13Ø7                        JMP NXPT4                /SETUP FOR NEXT BANK
     Ø1277      744Ø1Ø                        RCL                      /SETUP FOR NEXT POSITION
     Ø13ØØ      Ø45Ø33                        DAC BITN
     Ø13Ø1      2Ø5Ø1Ø                        LAC PATBNK               /BANK WITH BIT PATTERN
     Ø13Ø2      Ø45ØØØ                        DAC MEMADR               /ADR. COUNT
     Ø13Ø3      3451Ø3                        TAD K17S
     Ø13Ø4      Ø44777                        DAC LSTLOC               /LAST LOCATION TO TEST
     Ø13Ø5      1Ø1674                        JMS CBANK                /SEE IF IT HAS PROGRAN
     Ø13Ø6      6Ø1164                        JMP WLOP4-4                       /START SAME BANK WITH NEW BIT
                                   /
                                   /SETUP FOR NEXT BANK WITH BIT PATTERN
     Ø13Ø7      2Ø5Ø1Ø             NXPT4      LAC PATBNK               /CURRENT BANK
     Ø131Ø      3451Ø3                        TAD K17S                 /ADD Ø17777
     Ø1311      544775                        SAD LAST1                /ALL BANK HAD BIT PATTERN IF EQUAL
     Ø1312      6ØØ2Ø6                        JMP EXAM5                /ALL DONE SEE IF TEST 5 SELECTED
     Ø1313      1Ø2Ø35                        JMS WRT1S                /WRITE 1'S INTO ALL OF MEMORY
     Ø1314      2Ø5Ø1Ø                        LAC PATBNK               /BANK JUST FINISHED
     Ø1315      345Ø73                        TAD K2ØK                 /ADD 8K TO IT
     Ø1316      Ø45Ø1Ø                        DAC PATBNK
     Ø1317      Ø45ØØØ                        DAC MEMADR               /ADDRESS COUNTER
     Ø132Ø      3451Ø3                        TAD K17S                 /ADD Ø17777
     Ø1321      Ø44777                        DAC LSTLOC               /LAST LOC. TO TEST
     Ø1322      6Ø1161                        JMP LOP4                 /START NEW BANK
                                   /
                                              .EJECT
```

```
                                /
                                /TEST 5. WRITE A PATTERN CONSISTING OF 4 WORDS
                                /OF 0'S FOLLOWED BY 4 WORDS OF 1'S, FROM LO TO HI,
                                /AND THEN HI TO LO IN EACH BANK. READ THE PAT-
                                /TERN THE SAME WAY. CHECK REST OF MEMORY AFTER
                                /EACH WRITE OR READ SEQUENCE. COMPLEMENT THE
                                /PATTERN AND REPEAT THE SEQUENCE.
                                /
   01323      102035            TST5       JMS WRT1S            /WRITE I'S INTO ALL OF MEMORY
   01324      760265                       LAW 265
   01325      045003                       DAC TNUM             /TEST NUMBER
   01326      205001                       LAC FIRST1           /1ST TO TEST
   01327      045000                       DAC MEMADR           /ADDRESS COUNTER
   01330      045010                       DAC PATBNK           /BANK WITH PATTERN
   01331      205034                       LAC PCW              /PATTERN CONTROL WORD = 036074
   01332      045036                       DAC CNTRL            /SAVE
   01333      101674            LOP5       JMS CBANK            /SEE IF BANK HAS PATTERN
   01334      707702                       EEM
   01335      205036                       LAC CNTRL            /CNTRL=036074 OR 741700
   01336      045007                       DAC PATR
   01337      777760                       LAW -20
   01340      045006                       DAC LOOPT            /COUNT 16 SHIFTS
   01341      777774            WLOP5      LAW -4
   01342      045004                       DAC RPETE            /COUNTS 4 WRITES
   01343      205007                       LAC PATR
   01344      744010                       RCL
   01345      045007                       DAC PATR
   01346      751400                       SZL!CLA              /WRITE 0'S IF LINK =0
   01347      740001                       CMA                  /WRITE 1'S
   01350      065000                       DAC* MEMADR          /WRITE
   01351      445004                       ISZ RPETE
   01352      601350                       JMP .-2              /WRITE 4 TIMES BEFORE SKIP
   01353      205000                       LAC MEMADR
   01354      544777                       SAD LSTLOC           /DONE WRITING 1 BANK IF EQUAL
   01355      601362                       JMP .+5              /DONE
   01356      445000                       ISZ MEMADR           /INCREMENT ADDRESS
   01357      445006                       ISZ LOOPT            /16 SHIFTS IF SKIP
   01360      601341                       JMP WLOP5
   01361      601335                       JMP LOP5+2                     /RESTORE LOOPT AND PATR
   01362      760000                       LAW
   01363      545012                       SAD BLOC1            /NO BLOCK IF = LAW
   01364      741000                       SKP
   01365      604266                       JMP BLKA5
   01366      101431                       JMS RFWD5            /READ LO TO HI FROM TESTED BANK
   01367      101402                       JMS REST5            /READ REST OF MEMORY AGAIN
                                /
                                           .EJECT
                                /NOW WRITE COMPLEMENT. (4 WORDS = 1'S, 4 WORDS = Ø)
                                /
 Ø137Ø      2Ø5Ø35                        LAC PCWA
 Ø1371      545Ø36                        SAD CNTRL            /PCWA = 7417ØØ
 Ø1372      6Ø1542                        JMP TST5A            /ALREADY DONE COMPLEMENT
 Ø1373      Ø45Ø36                        DAC CNTRL
 Ø1374      2Ø5Ø1Ø                        LAC PATBNK                        /BANK WITH PATTERN
 Ø1375      Ø45ØØØ                        DAC MEMADR
 Ø1376      3451Ø3                        TAD K17S
 Ø1377      Ø44777                        DAC LSTLOC
 Ø14ØØ      6Ø1333                        JMP LOP5             /WRITE COMPLEMENT
                                /
 Ø14Ø1      ØØ14Ø6              KRTN5     RTN5
                                /
                                /
                                /READ REST OF MEMORY
                                /
 Ø14Ø2      ØØØØØØ              REST5     Ø
 Ø14Ø3      204775                        LAC LAST1            /LAST LOC. IN HIGHEST BANK
 Ø14Ø4      5Ø5Ø76                        AND K6ØK             /MASK 4 AND 4
 Ø14Ø5      545ØØ1                        SAD FIRST1           /ONLY 1 BANK SELECTED IF EQUAL
 Ø14Ø6      6214Ø2              RTN5      JMP* REST5           /NONE TO READ
 Ø14Ø7      2Ø5ØØ1                        LAC FIRST1           /FIRST TO TEST
 Ø141Ø      Ø45ØØØ              REST5A    DAC MEMADR                   /ADDRESS COUNTER
 Ø1411      3451Ø3                        TAD K17S             /ADD Ø17777
 Ø1412      Ø44777                        DAC LSTLOC           /LAST LOC. TO TEST
 Ø1413      2Ø14Ø1                        LAC KRTN5            /KRTN5 = LOCATION RTN5
 Ø1414      Ø45Ø11                        DAC EXIT
 Ø1415      2Ø5ØØØ                        LAC MEMADR
 Ø1416      5Ø5Ø76                        AND K6ØK
 Ø1417      545Ø1Ø                        SAD PATBNK           /SEE IF BANK HAS PATTERN
 Ø142Ø      6Ø1423                        JMP .+3              /YES
 Ø1421      1ØØ67Ø                        JMS REST2            /READ REST OF MEMORY
 Ø1422      6Ø1415                        JMP .-5
 Ø1423      2Ø4777                        LAC LSTLOC
 Ø1424      544776                        SAD LAST2            /IS THE BANK THE HIGHEST SELECTED
 Ø1425      6214Ø2                        JMP* REST5           /YES.  EXIT
 Ø1426      2Ø5Ø1Ø                        LAC PATBNK
 Ø1427      345Ø73                        TAD K2ØK             /ADD 8K TO ADDRESS
 Ø143Ø      6Ø141Ø                        JMP REST5A           /AND SETUP FOR ANOTHER BANK
                                /
                                          .EJECT
```

```
                                   /READ THE BANK WITH WORD PATTERN FROM LO TO HI,
                                   /THEN HI TO LO, AND THEN RECHECK REST OF MEMORY
                                   /
    01431     000000               RFWD5     0
    01432     205010                         LAC PATBNK          /BANK WITH WORD PATTERN
    01433     045000                         DAC MEMADR          /ADDRESS COUNTER
    01434     345103                         TAD K17S            /ADD 017777
    01435     044777                         DAC LSTLOC
    01436     101674                         JMS CBANK           /SEE IF BANK HAS PROGRAM
    01437     205036               RBLK5     LAC CNTRL           /CNTRL = 036074  OR 741700
    01440     045037                         DAC COMPR
    01441     777760                         LAW -20
    01442     045006                         DAC LOOPT           /COUNT 16 SHIFTS
    01443     777770               FWD5      LAW -10
    01444     045004                         DAC RPETE           /READ 8 TIMES
    01445     707702                         EEM
    01446     205037                         LAC COMPR
    01447     744010                         RCL
    01450     045037                         DAC COMPR
    01451     751400                         SZL!CLA             /READ 0'S IF LINK = 0
    01452     740001                         CMA                 /READ 1'S
    01453     045007                         DAC PATR            /USED FOR COMPARISON
    01454     225000                         LAC* MEMADR         /READ
    01455     545007                         SAD PATR            /COMPARE
    01456     741000                         SKP                 /O.K
    01457     102100                         JMS ERROR           /PRINT INFO
    01460     445004               ERR5      ISZ RPETE           /SKIP AFTER 8 READS
    01461     601454                         JMP .-5
    01462     205000                         LAC MEMADR
    01463     544777                         SAD LSTLOC          /DONE 1 BANK IF EQUAL
    01464     601471                         JMP .+5
    01465     445000                         ISZ MEMADR          /INCREMENT ADDRESS COUNT
    01466     445006                         ISZ LOOPT           /DONE 16 SHIFTS IF 0
    01467     601443                         JMP FWD5
    01470     601437                         JMP FWD5-4          /RESTORE LOOPT AND COMPR
                                                                 /READ NEXT IN SEQUENCE
    01471     760000                         LAW
    01472     545012                         SAD BLOC1           /NO BLOCK IF = LAW
    01473     601476                         JMP RBAK5           /READ BACKWARD
    01474     707704                         LEM
    01475     625011                         JMP* EXIT           /C(EXIT) = BLKB5 OR BLKH5
                                   /
                                             .EJECT
```

```
                                /READ SAME BANK WITH WORD PATTERN FROM HI TO LO,
                                /THEN RECHECK REST OF MEMORY
                                /
   01476     205010             RBAK5     LAC PATBNK          /CURRENT BANK WITH WORD PATTERN
   01477     045000                       DAC MEMADR          /EQUALS LAST LOC. TO TEST
   01500     101744                       JMS CKBAK           /SEE IF TESTED BANK HAS PROGRAM
   01501     707702                       EEM
   01502     205036                       LAC CNTRL           /CNTRL = 036074 OR 741700
   01503     045037                       DAC COMPR
   01504     777760                       LAW -20
   01505     045006                       DAC LOOPT           /COUNT 16 SHIFTS
   01506     777770             BAK5      LAW -10
   01507     045004                       DAC RPETE           /READ 8 TIMES
   01510     205037                       LAC COMPR
   01511     744010                       RCL
   01512     045037                       DAC COMPR
   01513     750400                       SNL!CLA             /READ 0'S IF LINK = 1
   01514     740001                       CMA                 /READ 1'S
   01515     045007                       DAC PATR            /COMPARE WORD
   01516     224777                       LAC* LSTLOC         /READ ONE
   01517     545007                       SAD PATR
   01520     741000                       SKP                 /O.K.
   01521     102070                       JMS ERRORA          /PRINT INFO
   01522     445004                       ISZ RPETE           /SKIP AFTER 8 TIMES
   01523     601516                       JMP .-5
   01524     204777                       LAC LSTLOC          /CURRENT ADDRESS
   01525     545000                       SAD MEMADR          /DONE IF LOWEST ADDRESS
   01526     601535                       JMP CKBD
   01527     777777                       LAW -1
   01530     344777                       TAD LSTLOC          /DECREMENT ADDRESS COUNT
   01531     044777                       DAC LSTLOC
   01532     445006                       ISZ LOOPT           /16 SHIFTS IF 0
   01533     601506                       JMP BAK5
   01534     601502                       JMP RBAK5+4         /RESTORE COMPR AND LOOPT
                                                              /READ NEXT IN DESCENDING ORDER
                                /
   01535     760000             CKBD      LAW
   01536     545012                       SAD BLOC1           /NO BLOCK IF = LAW
   01537     621431                       JMP* RFWD5                  /EXIT AND CHECK REST OF MEMORY
   01540     707704                       LEM
   01541     625011                       JMP* EXIT           /C(EXIT) = BLKC5 OR BLKJ5
                                /
                                          .EJECT
                                /TEST 5A.  WRITE IN SAME BANK FROM HI TO LO
                                /
    Ø1542      1Ø2Ø35           TST5A      JMS WRT1S           /WRITE 1'S IN ALL OF MEMORY
    Ø1543      2Ø5Ø1Ø                      LAC PATBNK          /CURRENT BANK WITH PATTERN
    Ø1544      Ø45ØØØ                      DAC MEMADR          /MEMADR = LAST LOC. TO TEST
    Ø1545      1Ø1744                      JMS CKBAK           /SEE IF TESTED BANK HAS PROGRAM
    Ø1546      2Ø5Ø35                      LAC PCWA            /PCWA = 7417ØØ
    Ø1547      Ø45Ø36                      DAC CNTRL
    Ø155Ø      2Ø5Ø36           LOP5A      LAC CNTRL
    Ø1551      Ø45Ø37                      DAC COMPR
    Ø1552      77776Ø                      LAW -2Ø
    Ø1553      Ø45ØØ6                      DAC LOOPT           /COUNT 16 SHIFTS
    Ø1554      7Ø77Ø2                      FEM
    Ø1555      777754           BAK5A      LAW -24
    Ø1556      Ø45ØØ4                      DAC RPETE           /WRITE 8 TIMES
    Ø1557      2Ø5Ø37                      LAC COMPR
    Ø156Ø      744Ø1Ø                      RCL
    Ø1561      Ø45Ø37                      DAC COMPR
    Ø1562      7514ØØ                      SZL!CLA             /WRITE Ø'S IF LINK = Ø
    Ø1563      74ØØØ1                      CMA                 /WRITE 1'S
    Ø1564      Ø64777                      DAC* LSTLOC         /WRITE
    Ø1565      445ØØ4                      ISZ RPETE           /SKIP AFTER 8 WRITES
    Ø1566      6Ø1564                      JMP .-2
    Ø1567      2Ø4777                      LAC LSTLOC          /CURRENT ADDRESS
    Ø157Ø      545ØØØ                      SAD MEMADR          /DONE 1 BANK IF EQUAL
    Ø1571      6Ø16ØØ                      JMP RST5
    Ø1572      777777                      LAW -1
    Ø1573      344777                      TAD LSTLOC          /DECREMENT ADDRESS COUNT
    Ø1574      Ø44777                      DAC LSTLOC
    Ø1575      445ØØ6                      ISZ LOOPT           /16 SHIFTS  IF Ø
    Ø1576      6Ø1555                      JMP BAK5A
    Ø1577      6Ø155Ø                      JMP LOP5A           /RESTORE
                                /
    Ø16ØØ      76ØØØØ           RST5       LAW
    Ø16Ø1      545Ø12                      SAD BLOC1           /NO BLOCK IF = LAW
    Ø16Ø2      741ØØØ                      SKP
    Ø16Ø3      6Ø4326                      JMP BLKF5
    Ø16Ø4      1Ø14Ø2                      JMS REST5           /SETUP TO CHECK REST OF MEMORY
    Ø16Ø5      2Ø5Ø35                      LAC PCWA            /= 7417ØØ CONTROL WORD
    Ø16Ø6      545Ø36                      SAD CNTRL           /SEE IF IT'S THE PRESENT PATTERN
    Ø16Ø7      2Ø5Ø34                      LAC PCW             /YES.  GET COMPLEMENT FOR READ FORWARD
    Ø161Ø      Ø45Ø36                      DAC CNTRL
    Ø1611      1Ø1431                      JMS RFWD5           /GO READ LO TO HI; HI TO LO
    Ø1612      1Ø14Ø2                      JMS REST5           /RECHECK REST OF MEMORY
    Ø1613      2Ø5Ø1Ø                      LAC PATBNK
    Ø1614      Ø45ØØØ                      DAC MEMADR                  /RESTORE FIRST TO TEST
                                /
                                           .EJECT
```

```
                                        /WRITE COMPLFMENT PATTFRN FROM HI TO LO
                                        /
      Ø1615     2Ø5Ø35                              LAC PCWA
      Ø1616     545Ø36                              SAD CNTRL
      Ø1617     6Ø1622                              JMP NXPT5          /SETUP FOR NEXT BANK
      Ø162Ø     1Ø1744                              JMS CK9AK          /RESTORE ADDRESS COUNTERS
      Ø1621     6Ø155Ø                              JMP LOP5A          /WRITE COMPLEMENT BACKWARDS
                                        /
                                                    .EJECT
```

```
                                /SETUP TO WRITE NEXT BANK
                                /
     Ø1622      2Ø5Ø1Ø          NXPT5     LAC PATBNK          /CURRENT BANK
     Ø1623      3451Ø3                    TAD K17S            /ADD Ø17777
     Ø1624      544775                    SAD LAST1           /EQUALS LAST LOC. OF HIGHEST BANK
     Ø1625      6ØØ212                    JMP EXAM5+4                   /DONE ALL TESTS ON ALL MEMORY
                                                              /GO SETUP TO RELOCATE
     Ø1626      1Ø2Ø35                    JMS WRT1S           /WRITE 1'S IN ALL OF MEMORY
     Ø1627      2Ø5Ø1Ø                    LAC PATBNK          /CURRENT BANK
     Ø163Ø      345Ø73                    TAD K2ØK            /ADD 8K TO GET NEXT BANK
     Ø1631      Ø45Ø1Ø                    DAC PATBNK
     Ø1632      Ø45ØØØ                    DAC MEMADR          /ADDRESS COUNT
     Ø1633      3451Ø3                    TAD K17S            /ADD Ø17777
     Ø1634      Ø44777                    DAC LSTLOC          /LAST LOC. IN NEXT BANK
     Ø1635      6Ø1331                    JMP LOP5-2          /START OVER WITH NEW BANK
                                /
                                /
                                /ROUTINE TO DETERMINE NEXT BANK TO TEST
                                /
     Ø1636      ØØØØØØ          NXTBNK    Ø
     Ø1637      2Ø4777                    LAC LSTLOC          /LAST LOC. OF CURRENT BANK
     Ø164Ø      544776                    SAD LAST2           /LAST LOC. OF HIGHEST BANK
     Ø1641      6Ø1655                    JMP THRU            /DONE ALL BANKS
     Ø1642      2Ø5ØØØ                    LAC MEMADR                    /1ST OF NEXT TO TEST
     Ø1643      5Ø5Ø72                    AND K1ØK            /CLEAR ALL BUT BIT 5
     Ø1644      74Ø2ØØ                    SZA
     Ø1645      6Ø1663                    JMP HIGH4           /IN HIGH 4K NOW
     Ø1646      2Ø5ØØØ          NOTIN     LAC MEMADR
     Ø1647      3451Ø3                    TAD K17S
     Ø165Ø      Ø44777                    DAC LSTLOC
     Ø1651      75ØØØ4                    LAS
     Ø1652      7411ØØ                    SPA                 /CHECK ACSØ FOR HALT
     Ø1653      1Ø2Ø62                    JMS HALT            /GO HALT
     Ø1654      621636                    JMP* NXTBNK         /EXIT
                                /
     Ø1655      75ØØØ4          THRU      LAS
     Ø1656      7411ØØ                    SPA                 /CHECK ACS Ø FOR HALT
     Ø1657      1Ø2Ø62                    JMS HALT            /GO HALT
     Ø166Ø      441636                    ISZ NXTBNK          /NXTBNK+2
     Ø1661      441636                    ISZ NXTBNK
     Ø1662      621636                    JMP* NXTBNK         /EXIT
                                /
     Ø1663      2Ø5ØØØ          HIGH4     LAC MEMADR
     Ø1664      5Ø5Ø76                    AND K6ØK            /CLEAR ALL BUT BITS 3,4
     Ø1665      544771                    SAD FLOADA                   /SEE IF TESTING THIS BANK
     Ø1666      741ØØØ                    SKP                 /YES..
     Ø1667      6Ø1646                    JMP NOTIN
     Ø167Ø      2Ø5ØØØ                    LAC MEMADR
     Ø1671      345Ø72                    TAD K1ØK            /MEMADR NOW = 1ST LOC. OF NEXT BANK
     Ø1672      Ø45ØØØ                    DAC MEMADR
     Ø1673      6Ø1646                    JMP NOTIN
                                /
                                          .EJECT
```

```
                                  /ROUTINE TO DETERMINE IF BANK UNDER TEST CONTAINS
                                  /PROGRAM.  USED FOR WRITING AN READING FORWARDS.
                                  /
Ø1674       ØØØØØØ                CBANK     Ø
Ø1675       2Ø5ØØØ                          LAC MEMADR                /C(MEMADR) = BITS 3 AND 4 ONLY
Ø1676       5Ø5Ø76                          AND K6ØK
Ø1677       544771                          SAD FLOADA                /FLOADA = BANK WITH PROGRAM
Ø17ØØ       6Ø17Ø7                          JMP CFIELD      /ADJUST ADDRESS CONSTANTS
Ø17Ø1       2Ø5ØØØ                          LAC MEMADR
Ø17Ø2       3451Ø3                          TAD K17S        /ADD Ø17777
Ø17Ø3       Ø44777                          DAC LSTLOC      /LAST ADDRESS OF TESTED BANK
Ø17Ø4       2Ø4775                          LAC LAST1
Ø17Ø5       Ø44776                          DAC LAST2       /VERY LAST TO TEST
Ø17Ø6       621674                          JMP* CBANK      /EXIT
                                  /
Ø17Ø7       1Ø171Ø                CFIELD    JMS .+1         /STORE EPC
Ø171Ø       ØØØØØØ                          Ø
Ø1711       2Ø171Ø                          LAC .-1
Ø1712       5Ø5Ø72                          AND K1ØK        /MASK ALL BUT BIT 5
Ø1713       7402ØØ                          SZA             /IN LOWER 4K IF Ø
Ø1714       6Ø1727                          JMP HIADJ       /ADJUST FOR UPPER 4K
Ø1715       2Ø5ØØØ                          LAC MEMADR
Ø1716       245Ø72                          XOR K1ØK
Ø1717       Ø45ØØØ                          DAC MEMADR      /FIRST TO TEST IS NOW Ø1ØØØØ
                                                            /INSTEAD OF ØØØØØØ
Ø172Ø       2451Ø3                          XOR K17S
Ø1721       Ø45ØØ7                          DAC PATR
Ø1722       245Ø72                          XOR K1ØK        /ADD 17777
Ø1723       Ø44777                          DAC LSTLOC      /LAST LOC. IN TESTED BANK
Ø1724       2Ø4775                          LAC LAST1
Ø1725       Ø44776                          DAC LAST2       /VERY LAST TO TEST
Ø1726       621674                          JMP* CBANK      /EXIT
                                  /
                                  /
                                  /ADJUST CONSTANTS WHEN PROGRAM IS IN HI 4K
                                  /
Ø1727       2Ø5ØØØ                HIADJ     LAC MEMADR      /FIRST ADDRESS TO TEST
Ø173Ø       2451Ø2                          XOR K7S
Ø1731       Ø44777                          DAC LSTLOC      /LAST TO TEST = ØØ7777
Ø1732       2Ø4775                          LAC LAST1       /VERY LAST IN LAST BANK
Ø1733       5Ø5Ø76                          AND K6ØK        /MASK BITS 3,4
Ø1734       544771                          SAD FLOADA      /SEE IF PROGRAM IS IN HIGH BANK
Ø1735       6Ø1741                          JMP .+4         /YES
Ø1736       2Ø4775                          LAC LAST1
Ø1737       Ø44776                          DAC LAST2       /VERY LAST TO TEST = Ø17777
Ø174Ø       621674                          JMP* CBANK      /EXIT
Ø1741       2451Ø2                          XOR K7S
Ø1742       Ø44776                          DAC LAST2       /VERY LAST = ØØ7777 INSTEAD OF Ø17777
Ø1743       621674                          JMP* CBANK
                                  /
                                            .EJECT
```

```
                              /ROUTINE TO DETERMINE IF BANK UNDER TEST CONTAINS
                              /PROGRAM.  USED FOR WRITING AND READING BACKWARDS.
                              /
      Ø1744      ØØØØØØ       CKBAK      Ø
      Ø1745      205ØØØ                  LAC MEMADR           /LAST LOC. TO TEST
      Ø1746      5Ø5Ø76                  AND K6ØK
      Ø1747      544771                  SAD FLOADA           /FLOADA = BANK WITH PROGRAM
      Ø175Ø      6Ø1756                  JMP HILO             /ADJUST ADDRESS CONSTANTS
      Ø1751      3451Ø3                  TAD K17S             /ADD Ø17777
      Ø1752      Ø44777                  DAC LSTLOC           /1ST ADR. OF TESTED BANK
      Ø1753      2Ø5ØØ1                  LAC FIRST1
      Ø1754      Ø45ØØ2                  DAC FIRST2           /VERY LAST TO TEST IN LOW BANK
      Ø1755      621744                  JMP* CKBAK           /EXIT
                              /
      Ø1756      1Ø1757       HILO       JMS .+1              /STORE EPC
      Ø1757      ØØØØØØ                  Ø
      Ø176Ø      2Ø1757                  LAC .-1
      Ø1761      5Ø5Ø72                  AND K1ØK             /MASK ALL BUT BIT 5
      Ø1762      74Ø2ØØ                  SZA                  /NO SKIP IF IN HI 4K FIELD
      Ø1763      6Ø2ØØ2                  JMP ADJHI            /ADJUST FOR UPPER 4K
      Ø1764      2Ø5ØØØ                  LAC MEMADR
      Ø1765      Ø45ØØ7                  DAC PATR
      Ø1766      245Ø72                  XOR K1ØK
      Ø1767      Ø45ØØØ                  DAC MEMADR           /MEMADR = Ø1ØØØØ
      Ø177Ø      2451Ø2                  XOR K7S              /ADD ØØ7777 TO GET Ø17777
      Ø1771      Ø44777                  DAC LSTLOC           /= 1ST LOC. TO TEST GOING BACKWARDS
      Ø1772      2Ø5ØØ1                  LAC FIRST1           /FIRST LOC. OF LOWEST BANK
      Ø1773      544771                  SAD FLOADA           /DOES LOWEST HAVE PROGRAM
      Ø1774      6Ø1777                  JMP .+3              /YES
      Ø1775      Ø45ØØ2                  DAC FIRST2           /VERY LAST TO TEST EQUALS 1ST
                                                              /LOCATION OF LOWEST BANK
      Ø1776      621744                  JMP* CKBAK           /EXIT
      Ø1777      245Ø72                  XOR K1ØK             /ADD Ø1ØØØØ
      Ø2ØØØ      Ø45ØØ2                  DAC FIRST2           /VERY LAST TO TEST GOING BACKWARDS
      Ø2ØØ1      621744                  JMP* CKBAK           /EXIT
                              /
                              /
                              /ADJUST WHEN PROGRAM IS IN HI 4K
                              /
      Ø2ØØ2      2Ø5ØØØ       ADJHI      LAC MEMADR
      Ø2ØØ3      2451Ø2                  XOR K7S              /ADD ØØ7777
      Ø2ØØ4      Ø44777                  DAC LSTLOC           /LAST LOC = 1ST TO TEST
      Ø2ØØ5      2451Ø3                  XOR K17S
      Ø2ØØ6      Ø45ØØ7                  DAC PATR
      Ø2ØØ7      2Ø5ØØ1                  LAC FIRST1           /FIRST LOC. OF LOWEST BANK
      Ø2Ø1Ø      Ø45ØØ2                  DAC FIRST2                 /LAST TO TEST = 1ST LOC. IN LO BA
      Ø2Ø11      621744                  JMP* CKBAK           /EXIT
                              /
                                         .EJECT
```

```
                                        /SETUP FOR NEXT BANK IN DESCENDING ORDER
                                        /
  Ø2Ø12       ØØØØØØ                    NXBAK       Ø
  Ø2Ø13       2Ø5ØØØ                                LAC MEMADR           /LAST LOC. OF CURRENT BANK
  Ø2Ø14       545ØØ2                                SAD FIRST2           /= LAST TO TEST IN LOWEST BANK
  Ø2Ø15       6Ø2Ø27                                JMP NOBAK            /ALL DONE
  Ø2Ø16       5Ø5Ø76                                AND K6ØK             /MASK 3 AND 4
  Ø2Ø17       345Ø74                                TAD M2ØK             /SUBTRACT 8K
  Ø2Ø2Ø       Ø45ØØØ                                DAC MEMADR           /LAST TO TEST IN NEXT BANK
  Ø2Ø21       2451Ø3                                XOR K17S             /ADD Ø17777
  Ø2Ø22       Ø44777                                DAC LSTLOC           /FIRST TO TEST IN NEXT BANK
  Ø2Ø23       75ØØØ4                                LAS
  Ø2Ø24       7411ØØ                                SPA                  /CHECK ACS Ø FOR HALT
  Ø2Ø25       1Ø2Ø62                                JMS HALT             /GO HALT
  Ø2Ø26       622Ø12                                JMP* NXBAK           /EXIT
                                        /
  Ø2Ø27       75ØØØ4                    NOBAK       LAS
  Ø2Ø3Ø       7411ØØ                                SPA                  /CEHCK CS Ø FOR HALT
  Ø2Ø31       1Ø2Ø62                                JMS HALT             /GO HALT
  Ø2Ø32       442Ø12                                ISZ NXBAK
  Ø2Ø33       442Ø12                                ISZ NXBAK            /NXBAK+2
  Ø2Ø34       622Ø12                                JMP* NXBAK           /EXIT TO NEXT ROUTINE
                                        /
                                                    .EJECT
```

```
                                  /ROUTINE TO WRITE 1'S INTO ALL OF MEMORY
                                  /
      Ø2Ø35      ØØØØØØ           WRT1S     Ø
      Ø2Ø36      2Ø5ØØ1                     LAC FIRST1
      Ø2Ø37      Ø45ØØØ                     DAC MEMADR
      Ø2Ø4Ø      1Ø1674                     JMS CBANK             /SEE IF 1ST HAS PROGRAM
      Ø2Ø41      7Ø77Ø2                     FEM                   /EXTED ON
      Ø2Ø42      777777           RITE      LAW -1                /AC = 777777
      Ø2Ø43      Ø65ØØØ                     DAC* MEMADR           /WRITE ONE
      Ø2Ø44      2Ø5ØØØ                     LAC MEMADR
      Ø2Ø45      544777                     SAD LSTLOC            /LSTLOC = LAST LOC. TO TEST
      Ø2Ø46      6Ø2Ø51                     JMP .+3               /DONE ONE BANK
      Ø2Ø47      445ØØØ                     ISZ MEMADR            /INCREMENT ADDRESS COUNT
      Ø2Ø5Ø      6Ø2Ø42                     JMP RITE              /WRITE IN NEXT
      Ø2Ø51      445ØØØ                     ISZ MEMADR
      Ø2Ø52      1Ø1636                     JMS NXTBNK
                                                                          /SETUP FOR NEXT BANK
      Ø2Ø53      1Ø1674                     JMS CBANK             /SEE IF NEXT HAS PROGRAM
      Ø2Ø54      6Ø2Ø41                     JMP RITE-1
      Ø2Ø55      2Ø5ØØ1                     LAC FIRST1            /RESTORE 1ST BANK ADDRESSES
      Ø2Ø56      Ø45ØØØ                     DAC MEMADR            /FIRST TO TEST IN FIRST BANK
      Ø2Ø57      3451Ø3                     TAD K17S
      Ø2Ø6Ø      Ø44777                     DAC LSTLOC            /LAST TO TEST IN 1ST BANK
      Ø2Ø61      622Ø35                     JMP* WRT1S            /EXIT
                                  /
                                  /
                                  /ALL ACSØ HALTS OCCUR HERE.  ACS MAY BE CHANGED.
                                  /PRESS CONTINUE TO RESUME HALTED TEST IF NO ACS
                                  /CHANGES.  PRESS CONTINUE TO EXECUTE ANY ACS CHANGES.
                                  /
      Ø2Ø62      ØØØØØØ           HALT      Ø
      Ø2Ø63      74ØØ4Ø                     HLT
      Ø2Ø64      75ØØØ4                     LAS                   /READ ACS
      Ø2Ø65      544773                     SAD MCWA              /SEE IF CHANGED FROM PREVIOUS
      Ø2Ø66      622Ø62                     JMP* HALT             /NO CHANGES, RESUME HALTED TEST
      Ø2Ø67      6ØØ127                     JMP STOVER            /DECODE NEW ACS
                                  /
                                            .EJECT
```

```
                                   /ERROR ROUTINE.  ACSØ WILL CAUSE HALT AFTER
                                   /PRINT-OUT IF RAISED.
                                   /
Ø2Ø7Ø      ØØØØØØ                  ERRORA     Ø
Ø2Ø71      7Ø77Ø4                             LEM
Ø2Ø72      Ø44755                             DAC BAD               /SAVE BAD DATA
Ø2Ø73      2Ø4777                             LAC LSTLOC            /OCTAL ADR.
Ø2Ø74      Ø45Ø4Ø                             DAC OCADR             /SAVE
Ø2Ø75      2Ø2Ø7Ø                             LAC ERRORA                      /C(ERRORA) = (PC) FROM TEST ROUTINE
Ø2Ø76      Ø421ØØ                             DAC ERROR
Ø2Ø77      6Ø21Ø5                             JMP ERROR+5
                                   /
                                              .EJECT
```

```
                                /
    02100      000000           ERROR      0
    02101      707704                      LEM                     /EXTEND OFF
    02102      044755                      DAC BAD                 /SAVE BAD DATA
    02103      205000                      LAC MEMADR              /OCTAL ADDRESS
    02104      045040                      DAC OCADR
    02105      205007                      LAC PATR
    02106      045041                      DAC GOOD                /GOOD DATA
    02107      777777                      LAW -1
    02110      045004                      DAC REPTE               /LAW -1 PREVENTS SECOND TYPE-OUTS
    02111      045005                      DAC WRCNT               /OF SAME ADDRESS
    02112      204757                      LAC ERWRD
    02113      542311                      SAD ENERR               /ERROR TABLE DONE IF EQUAL
    02114      741000                      SKP
    02115      602121                      JMP .+4
    02116      202310                      LAC ERTBL               /RESTORE POINTER
    02117      044757                      DAC ERWRD               /C(ERTBL)=ERWRD+1
    02120      602130                      JMP SW2                 /CHECK ACS 2
    02121      205040                      LAC OCADR               /OCTAL ADR
    02122      505067                      AND K70K                /MASK 3,4 AND 5
    02123      545022                      SAD LAST                /SAME 4K AS LAST ERROR IF EQUAL
    02124      602130                      JMP .+4                 /SAME
    02125      045022                      DAC LAST
    02126      064757                      DAC* ERWRD                        /STORE IN TABLE
    02127      444757                      ISZ ERWRD               /INCREMENT POINTER
    02130      750004           SW2        LAS
    02131      742010                      RTL
    02132      740100                      SMA                     /CHECK ACS 2 FOR BELL
    02133      602141                      JMP SW1
    02134      760207                      LAW 207
    02135      102254                      JMS PRERR               /RING BELL
    02136      744000           EREXIT     CLL
    02137      707702                      EEM
    02140      622100                      JMP* ERROR              /RETURN TO CURRENT TEST
    02141      750004           SW1        LAS
    02142      740010                      RAL
    02143      741100                      SPA                     /CHECK ACS 1 FOR INHIBIT PRINT
    02144      602136                      JMP EREXIT              /INHIBIT
                                /
                                /SETUP TO PRINT
                                /
    02145      760000                      LAW
    02146      562537                      SAD* SUPTBL             /IF 1ST LOC. OF SUPTBL=LAW,
                                                                   /NO ADR. SUPPRESSION WANTED
    02147      602152                      JMP .+3
    02150      102232                      JMS CSUP                /SEE IF THIS ERROR IS SUPPRESSED
    02151      602136                      JMP EREXIT              /YES. RETURN TO CURRENT TEST
    02152      104537                      JMS CRLF                /CR, LF
    02153      205003                      LAC TNUM                /NOT SUPPRESSED
    02154      102254                      JMS PRERR               /PRINT TEST NO.
    02155      777767                      LAW -11                 /-9
    02156      045006                      DAC LOOPT               /COUNTS SPACES
    02157      102301                      JMS SPING               /SPACE 9
                                /
                                           .EJECT
```

```
  Ø216Ø     2Ø5Ø4Ø                 LAC OCADR           /OCTAL ADDRESS
  Ø2161     Ø44537                 DAC CRLF            /SAVE TEMPORARILY
  Ø2162     1Ø2261                 JMS PROCTL          /PRINT THE ADDRESS
  Ø2163     777771                 LAW -7
  Ø2164     Ø45ØØ6                 DAC LOOPT           /COUNTS SPACES
  Ø2165     1Ø23Ø1                 JMS SPING           /SPACE 7
  Ø2166     2Ø5Ø41                 LAC GOOD            /COMPARE WORD
  Ø2167     Ø44537                 DAC CRLF            /SAVE
  Ø217Ø     1Ø2261                 JMS PROCTL          /PRINT THE GOOD
  Ø2171     777775                 LAW -3
  Ø2172     Ø45ØØ6                 DAC LOOPT           /SPACE COUNTER
  Ø2173     1Ø23Ø1                 JMS SPING           /SPACE 3
  Ø2174     2Ø4755                 LAC BAD             /DATA AS READ
  Ø2175     Ø44537                 DAC CRLF            /SAVE
  Ø2176     1Ø2261                 JMS PROCTL          /PRINT THE BAD
  Ø2177     777773                 LAW -5
  Ø22ØØ     Ø45ØØ6                 DAC LOOPT           /SPACE COUNTER
  Ø22Ø1     1Ø23Ø1                 JMS SPING           /SPACE 5
  Ø22Ø2     2Ø5ØØ3                 LAC TNUM
  Ø22Ø3     5Ø5Ø64                 AND K377
  Ø22Ø4     545Ø55                 SAD K261
  Ø22Ø5     741ØØØ                 SKP
  Ø22Ø6     6Ø2213                 JMP .+5
  Ø22Ø7     2Ø23Ø7                 LAC LAL
  Ø221Ø     Ø45Ø32                 DAC PRNT
  Ø2211     1Ø3Ø1Ø                 JMS PNXT
  Ø2212     6Ø2222                 JMP SWØ
  Ø2213     2Ø5Ø1Ø                 LAC PATBNK          /BANK WITH PATTERN
  Ø2214     744Ø1Ø                 RCL;       RTL;     RTL;      RAL
  Ø2215     742Ø1Ø
  Ø2216     742Ø1Ø
  Ø2217     74ØØ1Ø
  Ø222Ø     345Ø54                 TAD K26Ø
  Ø2221     1Ø2254                 JMS PRERR           /PRINT BANK NO.
  Ø2222     75ØØØ4         SWØ     LAS
  Ø2223     7411ØØ                 SPA                 /CHECKACS Ø FOR HALT
  Ø2224     1Ø2Ø62                 JMS HALT            /GO HALT
  Ø2225     75ØØØ4                 LAS
  Ø2226     5Ø5Ø51                 AND K2ØØ
  Ø2227     74Ø2ØØ                 SZA                 /CHECK FOR KEYBOARD INPUT
  Ø223Ø     6Ø2312                 JMP KYBRD           /BIT 1Ø A 1.  ACCEPT INPUT
  Ø2231     6Ø2136                 JMP EREXIT          /RETURN TO CURRENT TEST
                           /
                           /ROUTINE TO CHECK FOR SUPPRESSED ADDRESS
                           /
  Ø2232     ØØØØØØ         CSUP    Ø
  Ø2233     222537                 LAC* SUPTBL
  Ø2234     545Ø4Ø                 SAD OCADR           /COMPARE WITH CURRENT ADDRESS
  Ø2235     6Ø2245                 JMP TOP             /SPPRESSED.
  Ø2236     545Ø16                 SAD LSTSUP          /SEE IF DONE WITH LIST
  Ø2237     6Ø225Ø                 JMP SPEXT
  Ø224Ø     2Ø2537                 LAC SUPTBL
  Ø2241     54254Ø                 SAD ENTBL           /SEE IF DONE WITH TABLE
  Ø2242     6Ø225Ø                 JMP SPEXT           /YES
  Ø2243     442537                 ISZ SUPTBL                  /INCREMENT POINTER
  Ø2244     6Ø2233                 JMP CSUP+1          /COMPARE NEXT
  Ø2245     2Ø2536         TOP     LAC STBL            /RESTORE POINTER
```

```
      Ø2246      Ø42537                 DAC SUPTBL
      Ø2247      622232                 JMP* CSUP           /EXIT
                               /
                                        .EJECT
```

```
                                   /
  Ø225Ø      2Ø2536           SPEXT      LAC STBL
  Ø2251      Ø42537                      DAC SUPTBL
  Ø2252      442232                      ISZ CSUP
  Ø2253      622232                      JMP* CSUP
                                   /
  Ø2254      ØØØØØØ           PRERR      Ø                        /PRINT TEST OR BANK#
  Ø2255      7ØØ4Ø6                      TLS
  Ø2256      7ØØ4Ø1                      TSF
  Ø2257      6Ø2256                      JMP .-1
  Ø226Ø      622254                      JMP* PRERR
                                   /
                                   /PRINT 6 DIGIT OCTAL NOS.
                                   /
  Ø2261      ØØØØØØ           PROCTL     Ø
  Ø2262      777772                      LAW -6
  Ø2263      Ø45ØØ6                      DAC LOOPT                /DIGIT COUNTER
  Ø2264      2Ø4537                      LAC CRLF
  Ø2265      744Ø1Ø           POSITN     RCL;       RTL
  Ø2266      742Ø1Ø
  Ø2267      Ø44537                      DAC CRLF
  Ø227Ø      74ØØ1Ø                      RAL
  Ø2271      5Ø5Ø66                      AND K7                   /MASK AC 15-17
  Ø2272      345Ø54                      TAD K26Ø                 /MAKE ASCII
  Ø2273      1Ø2254                      JMS PRERR                /PRINT 1
  Ø2274      445ØØ6                      ISZ LOOPT                /DONE 6 WHEN SKIP
  Ø2275      741ØØØ                      SKP
  Ø2276      622261                      JMP* PROCTL              /EXIT
  Ø2277      2Ø4537                      LAC CRLF
  Ø23ØØ      6Ø2265                      JMP POSITN               /POSITION NEXT NUMBER
                                   /
  Ø23Ø1      ØØØØØØ           SPING      Ø
  Ø23Ø2      76Ø24Ø                      LAW 24Ø
  Ø23Ø3      1Ø2254                      JMS PRERR                /PRINT SPACE
  Ø23Ø4      445ØØ6                      ISZ LOOPT                /DONE SPACING IF SKIP
  Ø23Ø5      6Ø23Ø2                      JMP SPING+1              /ONE MORE
  Ø23Ø6      6223Ø1                      JMP* SPING               /EXIT
                                   /
  Ø23Ø7      ØØ4745           LAL        ALL
  Ø231Ø      ØØ476Ø           ERTBL      ERWRD+1
  Ø2311      ØØ477Ø           ENERR      ERWRD+11
                                   /
                                   /XMADR9 - TAPE 3
                                   /
                                   /ROUTINES TO ACCEPT KEYBOARD INPUT FOR TEST SELECTION;
                                   /ADDRESS SUPPRESSION AND BLOCK TEST LIMITS.  PLACE ACS1Ø DOWN
                                   /BEFORE RE-INITIATING MAIN PROGRAM.
                                   /
  Ø2312      7Ø33Ø2           KYBRD      CAF                      /CLEAR FLAGS
  Ø2313      7Ø77Ø4                      LEM
  Ø2314      145Ø33                      DZM BITN                 /TEMP. STORAGE FOR INPUT CHARS.
                                   /
                                   /TYPE "TEST#" AND WAIT FOR INPUT
                                   /
  Ø2315      2Ø2541           TSTNO      LAC TSNX
  Ø2316      Ø45Ø32                      DAC PRNT
  Ø2317      1Ø4537                      JMS CRLF                 /CR,LF
```

```
    02320     103010                    JMS PNXT         /PRINT "TEST#"
    02321     102766                    JMS KEYIN        /GOT WAIT FOR INPUT
    02322     045033                    DAC BITN         /SAVE TTY CHAR.
    02323     545064                    SAD K377         /IS INPUT A RUBOUT
    02324     602312                    JMP KYBRD        /YES. START OVER
    02325     545052                    SAD K215         /NO TEST WANTED IF A C.R.
    02326     602350                    JMP SUPIN        /LAST TEST PATTERN WILL BE USED
    02327     777517                    LAW -261
    02330     345033                    TAD BITN
    02331     740100                    SMA              /IF AC IS NEG., TEST # IS <1
    02332     602335                    JMP .+3          /IT IS >1
    02333     103657                    JMS WOTIS        /PRINT QUESTION MARK
    02334     602312                    JMP KYBRD        /START OVER
    02335     205033                    LAC BITN
    02336     740001                    CMA
    02337     345043                    TAD K1           /2'S COMPLEMENT TEST #
    02340     345061                    TAD K265         /
    02341     740100                    SMA              /IF AC IS NEG., TEST # IS >5
    02342     602345                    JMP .+3
    02343     103657                    JMS WOTIS        /THERE ISN'T MORE THAN 5 TESTS
    02344     602312                    JMP KYBRD        /START OVER
    02345     205033          TSTN      LAC BITN
    02346     045003                    DAC TNUM
    02347     602350                    JMP SUPIN        /WAIT FOR C.R.
                              /
                                        .EJECT
                              /DONE WITH TEST#.  NOWDO ADR. SUPPRESSION
                              /
02350     202536              SUPIN     LAC STBL           /1ST LOCATION IN SUPRESS TABLE
02351     042537                        DAC SUPTBL                 /POINTER
02352     202530                        LAC ROTB
02353     042527                        DAC ROTA
02354     222527                        LAC* ROTA
02355     045017                        DAC NROTA          /SHIFT COUNTER
02356     760000                        LAW
02357     062537                        DAC* SUPTBL        /A LAW IN 1ST LOC. SAYS NO
                                                           /ADDRESS TO BE SUPPRESSED
02360     145021                        DZM ADRCW          /USED TO STORE 15 BIT ADDRESS
02361     104537                        JMS CRLF
02362     202542                        LAC SUPSX
02363     045032                        DAC PRNT
02364     103010                        JMS PNXT           /PRINT "SUPPRESS"
                              /

                              /
                              /ACCEPT 1ST ADDRESS AND THEN WAIT FOR A COLON
                              /OR A COMMA
                              /
02365     203577              NXSUP     LAC INSUP          /C(INSUP) = SUPIN
02366     045020                        DAC OVER
02367     203600                        LAC SUPDN          /C(SUPDN) = DNSUP
02370     045011                        DAC EXIT
02371     102766                        JMS KEYIN          /WAIT FOR INPUT
02372     102775                        JMS LEGAL          /CHECK VALIDITY
02373     222527                        LAC* ROTA
02374     045017                        DAC NROTA          /C(NROTA) = COUNT FOR LEFT SHIFTS
02375     205033                        LAC BITN
02376     505066                        AND K7             /MASK 15-17
02377     045033                        DAC BITN           /SAVE
02400     104416                        JMS GENADR         /START ASSEMBLING 1ST ADDRECS
02401     602365                        JMP NXSUP          /GET NEXT INPUT
                              /
                              /RETURN HERE FROM GENADR AFTER 5 CHARS. REC'D.
                              /
02402     205021                        LAC ADRCW          /FIRST ADDRESS
02403     062537                        DAC* SUPTBL        /STORE IN 1ST LOC. OF TABLE
02404     442537                        ISZ SUPTBL
02405     145021                        DZM ADRCW          /CLEAR
02406     102766                        JMS KEYIN          /WAIT FOR A: , OR C.R.
02407     545064                        SAD K377           /CHECK FOR RUBOUT
02410     602312                        JMP KYBRD          /START OVER WITH TEST #
02411     545052                        SAD K215           /CHECK FOR C.R.
02412     602517                        JMP DNSUP
02413     545053                        SAD K254           /CHECK FOR COMMA
02414     602451                        JMP SUPBLK         /A COMMA = SUPPRESS A BLOCK
02415     545062              CKCLN     SAD K272           /CHECK FOR COLON
02416     741000                        SKP
02417     603006                        JMP QUERY          /NONE OF THE ABOVE.
                              /
                                        .EJECT
                                        /ACCEPT INDIVIDUAL ADDRESSES
                                        /
    02420       102766                  SUP1      JMS KEYIN           /WAIT FOR INPUT
    02421       102775                            JMS LEGAL           /CHECK VALIDITY
    02422       222527                            LAC* ROTA
    02423       045017                            DAC NROTA           /COUNTS LEFT SHIFTS MADE
    02424       205033                            LAC BITN
    02425       505066                            AND K7              /MASK ACS 15-17
    02426       045033                            DAC BITN
    02427       104416                            JMS GENADR          /ASSEMBLE ADDRESS
    02430       602420                            JMP SUP1            /WAIT FOR NEXT CHAR.
    02431       205021                            LAC ADRCW           /COMPLETE ADDRESS
    02432       062537                            DAC* SUPTBL         /STORE IN SUPPRESSION TABLE
    02433       045016                            DAC LSTSUP                    /LSTSUP = LAST TO SUPPRESS
    02434       202537                            LAC SUPTBL
    02435       542540                            SAD ENTBL           /CHECK FOR 256 ADDRESSES
    02436       602443                            JMP .+5             /WAIT FOR C.R.
    02437       442537                            ISZ SUPTBL          /INCREMENT POINTER
    02440       145021                            DZM ADRCW
    02441       102766                            JMS KEYIN           /WAIT FOR COLON INPUT
    02442       545052                            SAD K215            /DONE IF C. R.
    02443       602517                            JMP DNSUP
    02444       602415                            JMP CKCLN           /IS IT REALLY A COLON
                                        /
    02445       102766                            JMS KEYIN           /WAIT FOR C.R.
    02446       545052                            SAD K215
    02447       602517                            JMP DNSUP
    02450       603006                            JMP QUERY           /NOT A C.R.
                                        /
                                        /ACCEPT TWO INPUTS FOR A SUPPRESSED BLOCK
                                        /
    02451       102766                  SUPBLK    JMS KEYIN           /WAIT FOR INPUT
    02452       102775                            JMS LEGAL           /CHECK VALIDITY
    02453       222527                            LAC* ROTA
    02454       045017                            DAC NROTA           /COUNT LEFT SHIFTS
    02455       205033                            LAC BITN
    02456       505066                            AND K7              /MASK ACS 15-17
    02457       045033                            DAC BITN
    02460       104416                            JMS GENADR          /ASSEMBLE ADDRESS
    02461       602451                            JMP SUPBLK          /WAIT FOR NEXT
                                        /
                                                  .EJECT
    02462      205021                      LAC ADRCW           /COMPLETE ADDRESS
    02463      045016                      DAC LSTSUP          /SAVF
    02464      202536                      LAC STBL
    02465      042537                      DAC SUPTBL          /SETUP TABLE POINTER
    02466      222537                      LAC* SUPTBL
    02467      740001                      CMA
    02470      345043                      TAD K1              /2'S COMP. 1ST ADDRESS
    02471      345016                      TAD LSTSUP                    /SUBTRACT 2ND ADDRESS
    02472      740100                      SMA                 /1ST IS > LAST IF SKIP
    02473      602502                      JMP SETSUP-3
    02474      222537                      LAC* SUPTBL                   /REVERSE THE TWO ADDRESSES
    02475      045006                      DAC LOOPT           /SAVF FIRST
    02476      205016                      LAC LSTSUP
    02477      062537                      DAC* SUPTBL                   /LAST IS NOW FIRST
    02500      205006                      LAC LOOPT
    02501      045016                      DAC LSTSUP                    /FIRST IS NOW LAST
    02502      222537                      LAC* SUPTBL
    02503      545016                      SAD LSTSUP                    /ARE THEY EQUAL
    02504      602517                      JMP DNSUP           /YES
    02505      202537            SETSUP    LAC SUPTBL
    02506      542540                      SAD ENTBL
    02507      602517                      JMP DNSUP           /256 CHARS STORED.  IGNORE ANY MORF
    02510      222537                      LAC* SUPTBL
    02511      345043                      TAD K1
    02512      442537                      ISZ SUPTBL                    /INCREMENT POINTER
    02513      062537                      DAC* SUPTBL
    02514      545016                      SAD LSTSUP          /WAS LAST THE LAST TO SUPPRESS
    02515      602517                      JMP DNSUP           /YES
    02516      602505                      JMP SETSUP
                                 /
                                 /RFSTORE POINTERS BEFORE ENTERING NEXT LINE
                                 /
    02517      202536            DNSUP     LAC STBL
    02520      042537                      DAC SUPTBL
    02521      202530                      LAC ROTB            /ROTR AND ROTA MUST RF EQUAL
    02522      542527                      SAD ROTA
    02523      602543                      JMP BLK1
    02524      042527                      DAC ROTA            /RESTORE SHIFT COUNT POINTER
    02525      103657                      JMS WOTIS           /LAST ADDRESS WAS <5 CHARS
    02526      602350                      JMP SUPIN           /START OVER WITH SUPPRESS
                                 /
    02527      002531            ROTA      .+2                 /= LOC. OF 1ST LAW
    02530      002531            ROTB      .+1                 /= LOC. OF 1ST LAW
    02531      777763                      LAW -15             /ROTATE 12 LEFT FOR 1ST DIGIT
    02532      777766                      LAW -12             /9 LFFT FOR 2ND
    02533      777771                      LAW -7              /6 LFFT FOR 3RD
    02534      777774                      LAW -4              /3 LEFT FOR 4TH
    02535      777777                      LAW -1              /NONF FOR 5TH
                                 /
                                           .EJECT
```

```
  02536     005111          STBL      KEND+2              /VALUE = LAST LOC. OF PROGRAM+2
  02537     000000          SUPTBL    0
  02540     005510          ENTBL     KEND+401            /TABLE = 256 LOCS. (DECIMAL)
  02541     004605          TSNX      TSN
  02542     004613          SUPSX     SUPS
                            /
                            /INPUT ROUTINE FOR ADDRESS LIMITS OF BLOCK #1.
                            /PRESS CR IF NO BLOCKS WANTED.
                            /
  02543     703302          BLK1      CAF
  02544     145021                    DZM ADRCW
  02545     760000                    LAW
  02546     045012                    DAC BLOC1
  02547     045013                    DAC BLOC2
  02550     222527                    LAC* ROTA
  02551     045017                    DAC NROTA           /SHIFT COUNTER
  02552     104537                    JMS CRLF
                            /
                            /TYPE "BLOCK#1" AND WAIT FOR INPUT
                            /
  02553     203605          BLKN1     LAC BLKSX
  02554     045032                    DAC PRNT
  02555     103010                    JMS PNXT            /PRINT BLOCK #1
  02556     203603                    LAC DONE2           /C(DONE2) = DBLK1
  02557     045011                    DAC EXIT
  02560     203601                    LAC NBLK            /C(NBLK) = BLK1
  02561     045020                    DAC OVER
  02562     102766          BLK1A     JMS KEYIN           /WAIT FOR INPUT
  02563     102775                    JMS LEGAL           /CHECK FOR LEGAL CHAR.
  02564     205033                    LAC BITN            /INPUT CHAR.
  02565     505066                    AND K7              /MASK AC 15-17
  02566     045033                    DAC BITN
  02567     104416                    JMS GENADR          /ASSEMBLE ADDRESS
  02570     602562                    JMP BLK1A
                            /
                            /ENTER HERE AFTER FIRST ADDRESS RECEIVED
                            /
  02571     205021                    LAC ADRCW           /ASSEMBLED ADDRESS
  02572     045012                    DAC BLOC1           /FIRST ADR. OF FIRST BLOCK
  02573     145021                    DZM ADRCW           /CLEAR
  02574     102766                    JMS KEYIN           /WAIT FOR COMMA
  02575     545053                    SAD K254            /CHECK FOR COMMA
  02576     741000                    SKP                 /O.K.
  02577     603006                    JMP QUERY           /PRINT QUERY MARK
  02600     102766          BLK1B     JMS KEYIN           /WAIT FOR INPUT
  02601     102775                    JMS LEGAL           /SEE IF IT'S LEGAL
  02602     205033                    LAC BITN            /INPUT CHAR.
  02603     505066                    AND K7              /MASK AC 15-17
  02604     045033                    DAC BITN
  02605     104416                    JMS GENADR          /ASSEMBLE SECOND ADR.
  02606     602600                    JMP BLK1B
                            /
                                      .EJECT
```

```
                                  /
                                  /ENTER HERE AFTER SECOND ADDRESS
                                  /
     Ø26Ø7      2Ø5Ø21                      LAC ADRCW            /ASSEMBLED ADDRESS
     Ø261Ø      Ø45Ø13                      DAC BLOC2            /LAST ADR. OF 1ST BLOCK
     Ø2611      145Ø21                      DZM ADRCW
                                  /
     Ø2612      2Ø253Ø            DBLK1     LAC ROTB
     Ø2613      542527                      SAD ROTA             /MUST BE EQUAL
     Ø2614      6Ø2617                      JMP .+3              /O.K.
     Ø2615      Ø42527                      DAC ROTA
     Ø2616      6Ø3ØØ6                      JMP QUERY            /ADDRESS IS NOT 5 CHARS.
     Ø2617      76ØØØØ                      LAW                  /LAW = NO INPUT
     Ø262Ø      545Ø12                      SAD BLOC1
     Ø2621      6Ø2662                      JMP BLK2
     Ø2622      545Ø13                      SAD BLOC2            /CHECK FOR 2 INPUTS
     Ø2623      6Ø3ØØ6                      JMP QUERY            /PRINT QUERY AND START OVER
     Ø2624      2Ø5Ø12                      LAC BLOC1
     Ø2625      5Ø5Ø67                      AND K7ØK
     Ø2626      Ø45Ø33                      DAC BITN             /TEMP. SAVE ADR. BITS 3,4 AND 5
     Ø2627      2Ø5Ø13                      LAC BLOC2
     Ø263Ø      5Ø5Ø67                      AND K7ØK
     Ø2631      Ø44537                      DAC CRLF             /DO SAME WITH UPPER LIMIT
     Ø2632      1Ø2645                      JMS PROG             /SEE IF LIMITS OVERLAP PROGRAM
     Ø2633      6Ø2662                      JMP BLK2             /O.K.
     Ø2634      1Ø4537                      JMS CRLF             /LIMITS IN SAME 4K AS PROGRAM
     Ø2635      2Ø36Ø5                      LAC BLKSX
     Ø2636      Ø45Ø32                      DAC PRNT
     Ø2637      1Ø3Ø1Ø                      JMS PNXT             /PRINT BLOCK #1
     Ø264Ø      2Ø36Ø6                      LAC OVRLP
     Ø2641      Ø45Ø32                      DAC PRNT
     Ø2642      1Ø3Ø1Ø                      JMS PNXT             /PRINT BLOCK #1
     Ø2643      1Ø361Ø                      JMS LOCAT            /PRINT AREA OF PROGRAM
     Ø2644      6Ø2543                      JMP BLK1             /START OVER
                                  /
     Ø2645      ØØØØØØ            PROG      Ø
     Ø2646      1Ø2647                      JMS .+1              /STORE EPC
     Ø2647      ØØØØØØ                      Ø
     Ø265Ø      2Ø2647                      LAC .-1
     Ø2651      5Ø5Ø67                      AND K7ØK             /MASK PC 3,4 AND 5
     Ø2652      545Ø33                      SAD BITN             /CHECK IF SAME AS LOW LIMIT
     Ø2653      741ØØØ                      SKP                  /YES.  ERROR
     Ø2654      6Ø2657                      JMP .+3              /NO
     Ø2655      442645                      ISZ PROG
     Ø2656      622645                      JMP* PROG
     Ø2657      544537                      SAD CRLF             /SEE IF SAME AS HIGH LIMIT
     Ø266Ø      442645                      ISZ PROG             /YES
     Ø2661      622645                      JMP* PROG            /EXIT
                                  /
                                            .EJECT
```

```
                            /INPUT ROUTINE FOR BLOCK #2
                            /
    02662     703302        BLK2      CAF
    02663     145021                  DZM ADRCW
    02664     760000                  LAW
    02665     045014                  DAC BLOC3
    02666     045015                  DAC BLOC4
    02667     104537                  JMS CRLF
                            /
                            /TYPE BLOCK #2 AND WAIT FOR INPUT
                            /
    02670     203607        BLKN2     LAC BLKTX
    02671     045032                  DAC PRNT
    02672     103010                  JMS PNXT            /PRINT BLOCK #2
    02673     203604                  LAC DONE3           /C(DONE3)=DBLK2
    02674     045011                  DAC EXIT
    02675     203602                  LAC TBLK            /C(TBLK) = BLK2
    02676     045020                  DAC OVER
    02677     102766        BLK2A     JMS KEYIN           /WAIT FOR INPUT
    02700     102775                  JMS LEGAL           /CHECK FOR LEGAL CHAR.
    02701     205033                  LAC BITN
    02702     505066                  AND K7              /MASK AC15-17
    02703     045033                  DAC BITN
    02704     104416                  JMS GENADR          /ASSEMBLE ADDRESS
    02705     602677                  JMP BLK2A
                            /
                            /ENTER HERE AFTER FIRST ADDRESS
                            /
    02706     205021                  LAC ADRCW           /ASSEMBLED ADDRESS
    02707     045014                  DAC BLOC3           /1ST ADR. OF 2ND BLOCK
    02710     145021                  DZM ADRCW
    02711     102766                  JMS KEYIN           /WAIT FOR COMMA
    02712     545053                  SAD K254
    02713     741000                  SKP
    02714     603006                  JMP QUERY           /PRINT QUERY
    02715     102766        BLK2B     JMS KEYIN           /WAIT FOR INPUT
    02716     102775                  JMS LEGAL           /SEE IF IT'S LEGAL
    02717     205033                  LAC BITN
    02720     505066                  AND K7
    02721     045033                  DAC BITN
    02722     104416                  JMS GENADR
    02723     602715                  JMP BLK2B
                            /
                            /RETURN HERE AFTER 2ND ADDRESS
                            /
    02724     205021                  LAC ADRCW           /ASSEMBLED ADDRESS
    02725     045015                  DAC BLOC4           /LAST ADR. OF 2ND BLOCK
    02726     145021                  DZM ADRCW
    02727     102766                  JMS KEYIN           /WAIT FOR C.R.
    02730     545052                  SAD K215
    02731     741000                  SKP                 /DONE
    02732     603006                  JMP QUERY           /PRINT QUERY
                            /
                                      .EJECT
```

```
                                    /
 Ø2733      2Ø253Ø          DBLK2       LAC ROTB
 Ø2734      542527                      SAD ROTA            /MUST BE EQUAL
 Ø2735      60274Ø                      JMP .+3             /O.K.
 Ø2736      Ø42527                      DAC ROTA
 Ø2737      6Ø3ØØ6                      JMP QUERY           /ADR. IS NOT 5 CHARS.
 Ø274Ø      76ØØØØ                      LAW
 Ø2741      545Ø14                      SAD BLOC3           /LAW=NO INPUT
 Ø2742      6Ø3666                      JMP STLOOP
 Ø2743      545Ø15                      SAD BLOC4           /CHECK FOR 2 INPUTS
 Ø2744      602732                      JMP DBLK2-1         /START OVER
 Ø2745      2Ø5Ø14                      LAC BLOC3
 Ø2746      5Ø5Ø67                      AND K7ØK
 Ø2747      Ø45Ø33                      DAC BITN            /TEMP. SAVE MA 3, 4 AND 5
 Ø275Ø      2Ø5Ø15                      LAC BLOC4
 Ø2751      5Ø5Ø67                      AND K7ØK
 Ø2752      Ø44537                      DAC CRLF            /TEMP. SAVE HIGH LIMIT
 Ø2753      1Ø2645                      JMS PROG            /SEE IF LIMITS OVERLAP PROGRAM
 Ø2754      6Ø3666                      JMP STLOOP          /SETUP TO START LOOPS
 Ø2755      1Ø4537                      JMS CRLF            /LIMITS IN SAME 4K AS PROGRAM
 Ø2756      2Ø36Ø7                      LAC BLKTX
 Ø2757      Ø45Ø32                      DAC PRNT
 Ø276Ø      1Ø3Ø1Ø                      JMS PNXT            /PRINT BLOCK #2
 Ø2761      2Ø36Ø6                      LAC OVRLP
 Ø2762      Ø45Ø32                      DAC PRNT
 Ø2763      1Ø3Ø1Ø                      JMS PNXT            /PRINT LIMITS OVERLAP PROGRAM
 Ø2764      1Ø361Ø                      JMS LOCAT           /PRINT AREA OF PROGRAM
 Ø2765      6Ø2662                      JMP BLK2            /START OVER
                                    /
                                    /CHARACTER INPUT ROUTINE
                                    /
 Ø2766      ØØØØØØ          KEYIN       Ø
 Ø2767      7ØØ312                      KRB                 /INITIALIZE
 Ø277Ø      7ØØ3Ø1                      KSF                 /WAIT
 Ø2771      6Ø277Ø                      JMP .-1
 Ø2772      7ØØ312                      KRB
 Ø2773      Ø45Ø33                      DAC BITN            /TEMP. SAVE
 Ø2774      622766                      JMP* KEYIN          /EXIT
                                    /
                                    /SEE IF CHARACTER IS LEGAL
                                    /
 Ø2775      ØØØØØØ          LEGAL       Ø
 Ø2776      2Ø5Ø33                      LAC BITN            /TTY CHAR.
 Ø2777      545Ø64                      SAD K377            /CHECK FOR RUBOUT
 Ø3ØØØ      6Ø2312                      JMP KYBRD           /START OVER WITH TEST #
 Ø3ØØ1      545Ø52                      SAD K215            /CHECK FOR C.R.
 Ø3ØØ2      625Ø11                      JMP* EXIT           /TERMINATE
 Ø3ØØ3      5Ø5Ø63                      AND K37Ø
 Ø3ØØ4      545Ø54                      SAD K26Ø
 Ø3ØØ5      622775                      JMP* LEGAL          /EXIT
 Ø3ØØ6      1Ø3657          QUERY       JMS WOTIS           /PRINT QUESTION MARK
 Ø3ØØ7      625Ø2Ø                      JMP* OVER           /START PRESENT LINE OVER
                                    /
                                                .EJECT
```

```
    Ø3Ø1Ø     ØØØØØØ        PNXT      Ø
    Ø3Ø11     445Ø32                  ISZ PRNT            /INCREMENT POINTER
    Ø3Ø12     225Ø32                  LAC* PRNT
    Ø3Ø13     7412ØØ                  SNA
    Ø3Ø14     623Ø1Ø                  JMP* PNXT           /ALL DONE
    Ø3Ø15     7ØØ4Ø6                  TLS
    Ø3Ø16     7ØØ4Ø1                  TSF
    Ø3Ø17     6Ø3Ø16                  JMP .-1
    Ø3Ø2Ø     742Ø2Ø                  RTR; RTR; RTR
    Ø3Ø21     742Ø2Ø
    Ø3Ø22     742Ø2Ø
    Ø3Ø23     742Ø2Ø                  RTR; RAR
    Ø3Ø24     74ØØ2Ø
    Ø3Ø25     7ØØ4Ø6                  TLS
    Ø3Ø26     7ØØ4Ø1                  TSF
    Ø3Ø27     6Ø3Ø26                  JMP .-1
    Ø3Ø3Ø     6Ø3Ø11                  JMP PNXT+1
                            /
                            /ROUTINE TO SETUP FOR FIRST PROGRAM MOVE
                            /
    Ø3Ø31     7077Ø4        CMOVE     LEM
    Ø3Ø32     20231Ø                  LAC ERTBL
    Ø3Ø33     Ø44757                  DAC ERWRD
    Ø3Ø34     204756                  LAC FLAGS
    Ø3Ø35     74ØØ2Ø                  RAR                 /PUT AC 17 IN LINK
    Ø3Ø36     7414ØØ                  SZL                 /FORCED MOVE MADE IF=1
    Ø3Ø37     6ØØ156                  JMP EXTST           /KEEP RUNNING
    Ø3Ø4Ø     74ØØ1Ø                  RAL
    Ø3Ø41     7411ØØ                  SPA                 /NOT 1ST MOVE IF A 1
    Ø3Ø42     6Ø3146                  JMP NXTMV           /SEE WHERE TO GO NEXT
    Ø3Ø43     2451ØØ                  XOR K4ØØK
    Ø3Ø44     Ø44756                  DAC FLAGS           /SET BIT Ø
    Ø3Ø45     75ØØØ4                  LAS
    Ø3Ø46     5Ø5Ø44                  AND K3              /MASK UPPER LIMIT
    Ø3Ø47     Ø44774                  DAC ULBNK
    Ø3Ø5Ø     75ØØØ4                  LAS
    Ø3Ø51     742Ø2Ø                  RTR
    Ø3Ø52     5Ø5Ø44                  AND K3              /MASK LOWER LIMIT
    Ø3Ø53     544774                  SAD ULBNK           /ONLY ONE BANK IF EQUAL
    Ø3Ø54     6Ø3241                  JMP ONLY1           /MOVE TO OPPOSITE 4K
    Ø3Ø55     2Ø3Ø55                  LAC .               /CURRENT BANK
    Ø3Ø56     5Ø5Ø72                  AND K1ØK            /MASK BIT 5
    Ø3Ø57     7402ØØ                  SZA                 /DON'T MOVE IF NOW IN HI 4K
    Ø3Ø6Ø     6ØØ1ØØ                  JMP BEGIN           /CLEAR AND START OVER.
    Ø3Ø61     2Ø4775                  LAC LAST1           /LAST BANK TO TEST
    Ø3Ø62     5Ø5Ø76                  AND K6ØK
    Ø3Ø63     Ø44771                  DAC FLOADA          /LAST BAN WILL=CURRENT BANK
    Ø3Ø64     76ØØØØ                  LAW                 /-8K
    Ø3Ø65     344771                  TAD FLOADA
    Ø3Ø66     Ø45Ø23                  DAC NXLOC           /NEXT DEST'N AFTER THIS ONE
    Ø3Ø67     1Ø3552                  JMS WHERE           /SEE WHERE THE PROGRAM IS
    Ø3Ø7Ø     Ø4477Ø                  DAC FLOAD
    Ø3Ø71     544771                  SAD FLOADA          /IS PRESENT SAME AS NEXT
    Ø3Ø72     6Ø3134                  JMP SUR1            /YES, SETUP FOR NEXT 1 LOWER
                            /

                            /XMADR9 - TAPE 4
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```
                                /NOW CHECK FOR ERROR RECORDED IN DEST'N BANK
                                /
    Ø3Ø73     76ØØØØ            CKERR     LAW
    Ø3Ø74     564757                      SAD* ERWRD          /NO ERRORS IF = LAW
    Ø3Ø75     6Ø31Ø6                      JMP STMV

    Ø3Ø76     224757                      LAC* ERWRD
    Ø3Ø77     544771                      SAD FLOADA          /DOES ERROR ADR. = NEW BANK
    Ø31ØØ     6Ø3117                      JMP EQUAL           /YES.
    Ø31Ø1     444757                      ISZ ERWRD
    Ø31Ø2     2Ø4757                      LAC ERWRD
    Ø31Ø3     542311                      SAD ENERR
    Ø31Ø4     741ØØØ                      SKP                 /DONE TABLE AND NO ERRORS
    Ø31Ø5     6Ø3Ø76                      JMP CKERR+3         /LOOK AT NEXT
                                /
    Ø31Ø6     2Ø231Ø            STMV      LAC ERTBL
    Ø31Ø7     Ø44757                      DAC ERWRD           /RESTORE POINTER
    Ø311Ø     2Ø4771                      LAC FLOADA          /NEXT BANK
    Ø3111     Ø45Ø25                      DAC DESTN
    Ø3112     1Ø3552                      JMS WHERE /CURRENT BANK AND FIELD
    Ø3113     Ø45Ø24                      DAC SOURCE
    Ø3114     545Ø25                      SAD DESTN           /ARE THEY EQUAL
    Ø3115     6ØØ1Ø5                      JMP BEGIN+5         /YES, START OVER, DON'T MOVE
    Ø3116     6Ø3473                      JMP MOVE            /MOVE FROM HERE TO C(DESTN)
                                /
                                /ERROR IN NEW BANK, TRY NEXT BANK LOWER
                                /
    Ø3117     545ØØ1            EQUAL     SAD FIRST1          /DOES ADR. = LOWEST BANK
    Ø312Ø     6Ø3131                      JMP DNMVE           /YES. DON'T MOVE
    Ø3121     7412ØØ                      SNA                 /IS IT ADR. Ø, BANK Ø
    Ø3122     6Ø3126                      JMP .+4             /YES
    Ø3123     76ØØØØ                      LAW                 /-8K
    Ø3124     344771                      TAD FLOADA          /SUBTRACT 8K FROM NEW BANK
    Ø3125     Ø45Ø23                      DAC NXLOC           /NEXT NEW BANK
    Ø3126     2Ø231Ø                      LAC ERTBL
    Ø3127     Ø44757                      DAC ERWRD           /RESTORE POINTER
    Ø313Ø     6Ø3134                      JMP SUB1
                                /
    Ø3131     2Ø231Ø            DNMVE     LAC ERTBL           /RESTORE POINTER
    Ø3132     Ø44757                      DAC ERWRD
    Ø3133     6ØØ1Ø5                      JMP BEGIN+5         /START OVER
                                /
                                /SUBTRACT 8K FROM NEW BANK
                                /
    Ø3134     2Ø5Ø23            SUB1      LAC NXLOC           /NEXT NEW BANK
    Ø3135     544771                      SAD FLOADA          /SEE IF IT'S = CURRENT NEW ONE
    Ø3136     6Ø3117                      JMP EQUAL           /YES.  TRY NEXT LOWER
    Ø3137     Ø44771                      DAC FLOADA          /NEW NEW ONE
    Ø314Ø     545ØØ1                      SAD FIRST1          /IS IT LOWEST BANK
    Ø3141     6Ø3Ø73                      JMP CKERR           /YES. CHECK FOR ERRORS
    Ø3142     76ØØØØ                      LAW                 /-8K
    Ø3143     344771                      TAD FLOADA
    Ø3144     Ø45Ø23                      DAC NXLOC           /NEW BANK FOR NEXT PASS
    Ø3145     6Ø3Ø73                      JMP CKERR           /CHECK FOR ERRORS.
                                /
                                          .EJECT
```

```
                                        /ROUTINE TO DETERINE PROGRAM MOVE AFTER ONE MOVE HAS BEEN MADE.
                                        /
      Ø3146      2Ø4756                 NXTMV      LAC FLAGS
      Ø3147      74ØØ1Ø                            RAL
      Ø315Ø      7411ØØ                            SPA                  /MOVE WITHIN A BANK IF A 1
      Ø3151      6Ø3241                            JMP ONLY1
      Ø3152      1Ø3552                            JMS WHERE            /WHERE IS THE PROGRAM NOW
      Ø3153      Ø45Ø24                            DAC SOURCE
      Ø3154      76ØØØØ                 CKNXT      LAW
      Ø3155      564757                            SAD* ERWRD           /NO ERRORS IF 1ST = LAW
      Ø3156      6Ø3171                            JMP STNXT
      Ø3157      2Ø231Ø                            LAC ERTBL
      Ø316Ø      Ø44757                            DAC ERWRD
      Ø3161      224757                            LAC* ERWRD           /GET AN ERROR ADDRESS
      Ø3162      545Ø23                            SAD NXLOC
      Ø3163      6Ø3211                            JMP SUB2             /ERROR IN NEXT BANK. TRY NEXT
      Ø3164      444757                            ISZ ERWRD
      Ø3165      2Ø4757                            LAC ERWRD
      Ø3166      542311                            SAD ENERR
      Ø3167      741ØØØ                            SKP                  /DONE TABLE AND NO ERRORS
      Ø317Ø      6Ø3161                            JMP CKNXT+5
                                        /
      Ø3171      2Ø231Ø                 STNXT      LAC ERTBL
      Ø3172      Ø44757                            DAC ERWRD            /RESTORE POINTER
      Ø3173      2Ø5Ø23                            LAC NXLOC            /NEW BANK
      Ø3174      544771                            SAD FLOADA           /DOES IT = CURRENT BANK
      Ø3175      6Ø32ØØ                            JMP .+3              /YES
      Ø3176      545ØØ1                            SAD FIRST1           /DOES IT = LOWEST BANK
      Ø3177      6Ø3222                            JMP MVBK             /YES. CLEAR FLAGS AND MOVE
      Ø32ØØ      545ØØ1                            SAD FIRST1           /DOES THE CURRENT ALSO=
                                                                        /THE LOWEST BANK
      Ø32Ø1      6Ø3234                            JMP NXTHI            /YES.  SETUP FOR HIGHEST BANK
      Ø32Ø2      Ø44771                            DAC FLOADA           /NEW CURRENT BANK
      Ø32Ø3      76ØØØØ                            LAW                  /-8K
      Ø32Ø4      344771                            TAD FLOADA
      Ø32Ø5      Ø45Ø23                            DAC NXLOC            /NEW NEXT BANK
      Ø32Ø6      2Ø4771                            LAC FLOADA
      Ø32Ø7      Ø45Ø25                            DAC DESTN
      Ø321Ø      6Ø3473                            JMP MOVE             /MOVE FROM HERE TO C(DESTN)
                                        /
      Ø3211      2Ø5Ø23                 SUB2       LAC NXLOC
      Ø3212      7412ØØ                            SNA                  /IS NEXT = BANK Ø
      Ø3213      6Ø3131                            JMP DNMVE            /YES. DON'T MOVE
      Ø3214      76ØØØØ                            LAW                  /-8K
      Ø3215      345Ø23                            TAD NXLOC            /NEW NEXT BANK
      Ø3216      Ø45Ø23                            DAC NXLOC
      Ø3217      544771                            SAD FLOADA           /DOES IT = CURRENT BANK
      Ø322Ø      6Ø3212                            JMP SUB2+1           /YES
      Ø3221      6Ø3157                            JMP CKNXT+3          /SEE IF ERROR IN NEW BANK
                                        /
                                                   .EJECT
```

```
    03222    205023      MVBK     LAC NXLOC           /
    03223    044771               DAC FLOADA          /NEW CURRENT BANK
    03224    045025               DAC DESTN
    03225    103552               JMS WHERE           /WHERE IS PROGRAM
    03226    045024               DAC SOURCE
    03227    760000               LAW
    03230    064757               DAC* ERWRD
    03231    045022               DAC LAST
    03232    144756               DZM FLAGS           /CLEAP PROGRAM FLAGS
    03233    603473               JMP MOVE            /MOVF
                         /
    03234    204775      NXTHI    LAC LAST1
    03235    505076               AND K60K
    03236    045023               DAC NXLOC           /HIGHEST BANK = NEXT BANK
    03237    044770               DAC FLOAD
    03240    603157               JMP CKNXT+3         /CHECK FOR ERROR
                         /
                         /ROUTINE TO MOVE ROUTINE TO OPPOSITE 4K FIELD
                         /WITHIN ONE BANK
                         /
    03241    205001      ONLY1    LAC FIRST1
    03242    544771               SAD FLOADA          /DON'T MOVE IF NOT EQUAL
    03243    603246               JMP .+3
    03244    144756               DZM FLAGS
    03245    600127               JMP STOVER          /START OVER
    03246    103552               JMS WHERE           /WHERE IS PROGRAM NOW
    03247    045024               DAC SOURCE          /MOVF FROM HERE -
    03250    245072               XOR K10K
    03251    045025               DAC DESTN           /TO HERE
    03252    205100               LAC K400K
    03253    744020               RCR
    03254    244756               XOR FLAGS           /SET BIT 1
    03255    044756               DAC FLAGS
                         /
                         /CHECK FOR ERROR IN 4K FIELD
                         /
    03256    760000      CFLD     LAW
    03257    564757               SAD* ERWRD          /NO FRRORS IF = LAW
    03260    603273               JMP MV4K
    03261    202310               LAC ERTBL
    03262    044757               DAC ERWRD
    03263    224757               LAC* ERWRD
    03264    545025               SAD DESTN
    03265    603131               JMP DNMVE           /FRROR IN 4K FIELD
    03266    444757               ISZ ERWRD
    03267    204757               LAC ERWRD
    03270    542311               SAD ENERR
    03271    741000               SKP
                         /
                                  .EJECT
    03272     603263                   JMP CFLD+5
    03273     202310       MV4K        LAC ERTBL
    03274     044757                   DAC ERWRD              /RESTORE POINTER
    03275     205025       CLR4K       LAC DESTN
    03276     045026                   DAC MOVED
    03277     770000                   LAW -10000             /-4K
    03300     045006                   DAC LOOPT
    03301     165026                   DZM* MOVED             /CLEAR THE 4K FIELD FIRST
    03302     445026                   ISZ MOVED
    03303     445006                   ISZ LOOPT              /DONF CLFARING WHEN = 0
    03304     603301                   JMP .-3
                           /
                           /STARTING MOVING TO OPPOSITE 4K
                           /
    03305     205024                   LAC SOURCE
    03306     045027                   DAC MOVES              /MOVF FROM HERE
    03307     205025                   LAC DESTN
    03310     045026                   DAC MOVED              /TO HERE
    03311     445027       MVRTN       ISZ MOVES
    03312     225027                   LAC* MOVES             /GET 1 FROM THIS FIELD
    03313     044537                   DAC CRLF               /SAVF TEMPORARILY
    03314     505101                   AND K700K              /CLEAR ALL BUT OP CODE
    03315     245101                   XOR K700K
    03316     741200                   SNA                    /OP CODE IS A 7X IF 0
    03317     603327                   JMP OPRAT              /DON'T MODIFY IT
    03320     204537                   LAC CRLF
    03321     245072                   XOR K10K               /ADJUST ADR. BY 10000
    03322     445026       MVOPR       ISZ MOVED
    03323     065026                   DAC* MOVED             /PUT IN OPPOSITE 4K FIELD
    03324     544550                   SAD DLMT               /C(DLMT) = 752525
    03325     603331                   JMP MVCST              /NOW MOVE CONSTANT TABLES
    03326     603311                   JMP MVRTN              /MOVF ANOTHER
                           /
    03327     204537       OPRAT       LAC CRLF
    03330     603322                   JMP MVOPR
                           /
    03331     445027       MVCST       ISZ MOVES
    03332     225027                   LAC* MOVES
    03333     445026                   ISZ MOVED
    03334     065026                   DAC* MOVED
    03335     544550                   SAD DLMT               /DONF CONSTANTS IF = 752525
    03336     741000                   SKP
    03337     603331                   JMP MVCST
    03340     204756                   LAC FLAGS
    03341     505043                   AND K1
    03342     740200                   SZA                    /HALT IF FORCED MOVE
    03343     103547                   JMS FCHLT              /PRESS CONT. AFTER RESTORING ACS
                           /
                                       .EJECT
    03344    203344                   LAC .
    03345    505072                   AND K10K
    03346    741200                   SNA                /SEE WHICH 4K CURRENTLY IN
    03347    625031                   JMP* BGNHI         /LOWER EXIT TO UPPER
    03350    204756                   LAC FLAGS
    03351    505043                   AND K1
    03352    054756                   DAC FLAGS+10000
    03353    625030                   JMP* BGNLO         /UPPER EXIT TO LOWER

                           /
                           /ROUTINE TO FORCE MOVE THE PROGRAM
                           /
    03354    744002        FCDMV      STL
    03355    750010                   GLK
    03356    044756                   DAC FLAGS          /SET FLAG FOR FORCED MOVE
    03357    202310                   LAC ERTBL
    03360    044757                   DAC ERWRD
    03361    707704                   LEM
    03362    750004                   LAS
    03363    742020                   RTR;      RTR;     RTR
    03364    742020
    03365    742020
    03366    505076                   AND K60K
    03367    045025                   DAC DESTN          /SAVE NEW BANK
    03370    103552                   JMS WHERE          /WHERE IS PROGRAM NOW
    03371    045024                   DAC SOURCE         /CURRENT FIELD AND BANK
    03372    750004                   LAS
    03373    505050                   AND K100
    03374    740200                   SZA                /IF BIT 11 A 1 MOVE TO HI 4K
    03375    603432                   JMP MVFHI
    03376    760000        CKFCD      LAW
    03377    564757                   SAD* ERWRD         /NO ERRORS IF 1ST = LAW
    03400    603414                   JMP WHWAY          /NONE.  SEE WHICH WAY TO MOVE
    03401    202310                   LAC ERTBL
    03402    044757                   DAC ERWRD          /RESTORE POINTER
    03403    224757                   LAC* ERWRD
    03404    545025                   SAD DESTN          /SEE IF ERROR ADR. = NEW BANK
    03405    603413                   JMP XPRT           /YES. PRINT MESSAGE
    03406    444757                   ISZ ERWRD
    03407    204757                   LAC ERWRD
    03410    542311                   SAD ENERR
    03411    603414                   JMP .+3
                                                               /INCREMENT POINTER
    03412    603403                   JMP CKFCD+5
    03413    103556        XPRT       JMS PRSEL          /PRINT ERROR IN SELECTED 4K
                           /
    03414    205025        WHWAY      LAC DESTN          /IS DESTN TO THIS BANK
    03415    544771                   SAD FLOADA
    03416    603273                   JMP MV4K           /YES. MOVE TO OTHER 4K
    03417    044771                   DAC FLOADA                /NEW CURRENT BANK
    03420    203420                   LAC .
    03421    505072                   AND K10K
    03422    741200                   SNA                /MOVE FROM HI TO LO 4K IF A 1
    03423    603473                   JMP MOVE           /MOVE SAME 4K TO SAME 4K
    03424    205030                   LAC BGNLO          /BGNLO = JMP STOVER
    03425    505102                   AND K7S
    03426    245025                   XOR DESTN          /PUT BANK # ON THE JMP
```

```
      03427     045030                 DAC BGNLO
      03430     707702                 FEM
      03431     603273                 JMP MV4K
                             /
                                       .EJECT
```

```
                                /
                                /FORCE MOVE TO AN UPPER 4K
                                /
    03432       205025          MVEHI       LAC DESTN
    03433       245072                      XOR K10K            /SET BIT 5 FOR HI 4K
    03434       045025                      DAC DESTN
    03435       760000          FCDCK       LAW
    03436       564757                      SAD* ERWRD          /NO ERRORS IF EQUAL
    03437       603453                      JMP WCHWA           /SEE WHICH WAY TO MOVE
    03440       202310                      LAC ERTBL
    03441       044757                      DAC ERWRD           /RESTORE POINTER
    03442       224757                      LAC* ERWRD
    03443       545025                      SAD DESTN           /DOES ERROR ADR. = NEW BANK
    03444       603452                      JMP PRTSL           /YES. PRINT MESSAGE
    03445       444757                      ISZ ERWRD
    03446       204757                      LAC ERWRD
    03447       542311                      SAD ENERR
    03450       603453                      JMP .+3
                                                                            /INCREMENT POINTER
    03451       603442                      JMP FCDCK+5
    03452       103556          PRTSL       JMS PRSEL           /PRINT ERROR IN SELECTED 4K
                                /
    03453       205025          WCHWA       LAC DESTN
    03454       505076                      AND K60K
    03455       544771                      SAD FLOADA                      /IS DESTN TO THIS BANK
    03456       603273                      JMP MV4K            /YES. MOVE TO OTHER 4K
    03457       205025                      LAC DESTN
    03460       044771                      DAC FLOADA                      /NEW CURRENT BANK
    03461       203461                      LAC .
    03462       505072                      AND K10K
    03463       740200                      SZA                 /MOVE FROM HI TO HI IF A 1
    03464       603473                      JMP MOVE
    03465       205031                      LAC BGNHI           /BGNHI = JMP STOVER IN HI 4K
    03466       505102                      AND K7S
    03467       245025                      XOR DESTN           /PUT BIT 5 AND BANK # ON THE JMP
    03470       045031                      DAC BGNHI
    03471       707702                      EEM
    03472       603273                      JMP MV4K
                                /
                                /MOVE ROUTINE TO MOVE ONE 4K TO SAME 4K
                                /
    03473       707702          MOVE        EEM
    03474       205025                      LAC DESTN
    03475       045026                      DAC MOVED
    03476       770000                      LAW -10000
    03477       045006                      DAC LOOPT
    03500       165026                      DZM* MOVED          /CLEAR THE 4K FIELD
    03501       445026                      ISZ MOVED
    03502       445006                      ISZ LOOPT
    03503       603500                      JMP .-3
                                /
                                            .EJECT
```

```
     03504     205025               LAC DESTN
     03505     045026               DAC MOVED          /MOVF FROM HERE
     03506     205024               LAC SOURCE
     03507     045027               DAC MOVES          /TO HERE
     03510     445027      MOVEI    ISZ MOVES          /INCRFMENT SOURCE POINTER
     03511     225027               LAC* MOVES
     03512     445026               ISZ MOVED          /INCR. DESTINATION POINTFR
     03513     065026               DAC* MOVED
     03514     544550               SAD DLMT           /DONF INSTRUCTIONS IF=752525
     03515     741000               SKP
     03516     603510               JMP MOVEI
     03517     205030               LAC BGNLO          /JMP STOVER IN LO 4K
     03520     505102               AND K7S
     03521     245025               XOR DESTN          /PUT BANK# ON STOVER ADR.
     03522     045030               DAC BGNLO
     03523     205031               LAC BGNHI          /JMP STOVER IN HI 4K
     03524     505103               AND K17S
     03525     245025               XOR DESTN          /PUT BANK# ON STOVER ADR.
     03526     045031               DAC BGNHI
     03527     445027      MOVEC    ISZ MOVES
     03530     225027               LAC* MOVES
     03531     445026               ISZ MOVED
     03532     065026               DAC* MOVED
     03533     544550               SAD DLMT           /DONF CONSTANTS IF = 752525
     03534     741000               SKP
     03535     603527               JMP MOVEC
     03536     204756               LAC FLAGS
     03537     505043               AND K1
     03540     740200               SZA                /GO HALT IF A FORCED MOVF
     03541     103547               JMS FCHLT
     03542     203542               LAC .
     03543     505072               AND K10K           /SEE WHICH 4K CURRENTLY IN
     03544     740200               SZA                /LOWFR IF SKIP
     03545     625031               JMP* BGNHI         /JMP TO STOVER IN HI 4K
     03546     625030               JMP* BGNLO         /JMP TO STOVER IN LO 4K
                           /
                                    .EJECT
```

```
                                /
                                /HALT HERE IN CURRENT BANK AFTER A FORCED MOVE.
                                /RESTORE ACS AND PRESS CONTINUE TO START PROGRAM IN NEW LOCATION.
                                /
        Ø3547      ØØØØØØ       FCHLT     Ø
        Ø3550      74ØØ4Ø                 HLT                /RESTORE ACS AND PRESS CONT.
        Ø3551      623547                 JMP* FCHLT
                                /
        Ø3552      ØØØØØØ       WHERE     Ø
        Ø3553      203552                 LAC .-1
        Ø3554      5Ø5Ø67                 AND K7ØK
        Ø3555      623552                 JMP* WHERE
                                /
                                /PRINT ERROR IN SELECTED 4K
                                /
        Ø3556      ØØØØØØ       PRSEL     Ø
        Ø3557      1Ø4537                 JMS CRLF           /CR,LF
        Ø356Ø      2Ø3566                 LAC ERSEL
        Ø3561      Ø45Ø32                 DAC PRNT
        Ø3562      1Ø3Ø1Ø                 JMS PNXT           /PRINT MESSAGE
        Ø3563      1Ø4537                 JMS CRLF           /CR,LF
        Ø3564      1Ø2Ø62                 JMS HALT           /GO HALT
        Ø3565      623556                 JMP* PRSEL         /RETURN HERE IF NO ACS CHANGES
                                /
        Ø3566      ØØ4716       ERSEL     SLTER
                                /
                                /PRINT L.L. EXCEEDS U.L.
                                /
        Ø3567      2Ø3576       HEXED     LAC XCEED
        Ø357Ø      Ø45Ø32                 DAC PRNT
        Ø3571      1Ø4537                 JMS CRLF           /CR,LF
        Ø3572      1Ø3Ø1Ø                 JMS PNXT           /L.L. EXCEEDS U.L.
        Ø3573      1Ø4537                 JMS CRLF
        Ø3574      1Ø2Ø62                 JMS HALT           /GO HALT
        Ø3575      6ØØ127                 JMP STOVER         /START OVER
                                /
        Ø3576      ØØ4732       XCEED     LMTUL
                                /
                                          .EJECT
                                /
03577       002350              INSUP     SUPIN
03600       002517              SUPDN     DNSUP
03601       002543              NBLK      BLK1
03602       002662              TBLK      BLK2
03603       002612              DONE2     DBLK1
03604       002733              DONE3     DBLK2
03605       004623              BLKSX     BLKS
03606       004643              OVRLP     OVLAP
03607       004633              BLKTX     BLKT
                                /
                                /PRINT AREA OF PROGRAM
                                /
03610       000000              LOCAT     0
03611       104537                        JMS CRLF
03612       203656                        LAC PISIN
03613       045032                        DAC PRNT
03614       103010                        JMS PNXT              /PRINT "PROGRAM IS IN"
03615       103616                        JMS .+1
03616       000000              EPC       0
03617       203616                        LAC .-1
03620       505067                        AND K70K              /MASK PC 3, 4 AND 5
03621       744010                        RCL; RTL; RTL
03622       742010
03623       742010
03624       740010                        RAL
03625       345054                        TAD K260              /BANK #
03626       044537                        DAC CRLF              /SAVE EMPORARILY
03627       203616                        LAC EPC
03630       505072                        AND K10K              /MASK BIT 5
03631       740200                        SZA                   /SEE IF IN LOW OR HIGH 4K
03632       603647                        JMP HIGHR
03633       203653                        LAC LOW
03634       045032                        DAC PRNT
03635       103010                        JMS PNXT  /PRINT "LOWER"
                                /
                                          .EJECT
```

```
03636   203655   OFBNK   LAC FLDBNK
03637   045032           DAC PRNT
03640   103010           JMS PNXT          /PRINT "4K FIELD OF BANK"
03641   204537           LAC CRLF
03642   700406           TLS               /PRINT BANK NO.
03643   700401           TSF
03644   603643           JMP .-1
03645   104537           JMS CRLF
03646   623610           JMP* LOCAT
                 /
03647   203654   HIGHR   LAC HIRE
03650   045032           DAC PRNT
03651   103010           JMS PNXT          /PRINT "UPPER"
03652   603636           JMP OFBNK
                 /
03653   004671   LOW     LOWER
03654   004676   HIRE    HIGH              /HIGHER
03655   004703   FLDBNK  FIFLD             /4K FIELD OF BANK
03656   004660   PISIN   PLOC              /PROGRAM IS IN
                 /
03657   000000   WOTIS   0
03660   104537           JMS CRLF          /CR, LF
03661   760277           LAW 277           /QUESTION MARK
03662   700406           TLS
03663   700401           TSF
03664   603663           JMP .-1
03665   623657           JMP* WOTIS
                 /
                 /SETUP ROUTINES FOR TESTING BLOCKS OF CORE
                 /
03666   104537   STLOOP  JMS CRLF
03667   760000           LAW               /SEE IF ANY BLOCKS SELECTED
03670   545012           SAD BLOC1
03671   741000           SKP               /LAW=NONE SELECTED
03672   603676           JMP SETU1
03673   545014           SAD BLOC3
03674   600127           JMP STOVER        /NO BLOCKS SELECTED
03675   603731           JMP SETU2
                 /
03676   205003   SETU1   LAC TNUM          /SEE IF A TEST WANTED
03677   741200           SNA
03700   760261           LAW 261           /NO, USE TEST 1
03701   045003           DAC TNUM
                 /

                 /XMADR9 - TAPE 5
                 /
03702   205012           LAC BLOC1
03703   740001           CMA
03704   345043           TAD K1            /2'S COMPLEMENT UPPER LIMIT
03705   345013           TAD BLOC2
03706   741100           SPA               /REVERSE IF NEG.
03707   603760           JMP REVR1
03710   205012   SINGL   LAC BLOC1
03711   505076           AND K60K
03712   045010           DAC PATBNK
```

```
      Ø3713      2Ø5ØØ3                    LAC TNUM          /DETERMINE PATTERN
      Ø3714      5Ø5Ø64                    AND K377
      Ø3715      545Ø55                    SAD K261
      Ø3716      6Ø3767                    JMP SIMU1         /TEST 1 PATTERN
      Ø3717      545Ø56                    SAD K262
      Ø372Ø      6Ø4Ø56                    JMP SIMU2         /TEST 2 PATTERN
      Ø3721      545Ø57                    SAD K263
      Ø3722      6Ø4116                    JMP SIMU3         /TEST 3 PATTERN
      Ø3723      545Ø6Ø                    SAD K264
      Ø3724      6Ø42ØØ                    JMP SIMU4         /TEST 4 PATTERN
      Ø3725      545Ø61                    SAD K265
      Ø3726      6Ø4256                    JMP SIMU5         /TEST 5 PATTERN
      Ø3727      2Ø5ØØ3                    LAC TNUM
      Ø373Ø      74ØØ4Ø                    HLT               /SHOULD NEVER GET HERE
                              /
      Ø3731      2Ø5ØØ3       SETU2        LAC TNUM
      Ø3732      7412ØØ                    SNA
      Ø3733      76Ø261                    LAW 261
      Ø3734      Ø45ØØ3                    DAC TNUM
      Ø3735      2Ø5Ø14                    LAC BLOC3
      Ø3736      74ØØØ1                    CMA
      Ø3737      345Ø43                    TAD K1
      Ø374Ø      345Ø15                    TAD BLOC4
      Ø3741      7411ØØ                    SPA               /LAST ADR. IS >FIRST IF Ø
      Ø3742      6Ø3753                    JMP REVR2         /REVERSE CONTENTS
      Ø3743      2Ø5Ø14                    LAC BLOC3
      Ø3744      Ø45Ø12                    DAC BLOC1         /1ST TO TEST
      Ø3745      2Ø5Ø15                    LAC BLOC4
      Ø3746      Ø45Ø13                    DAC BLOC2         /LAST TO TEST
      Ø3747      76ØØØØ                    LAW               /A LAW = NO BLOCK SELECTED
      Ø375Ø      Ø45Ø14                    DAC BLOC3
      Ø3751      Ø45Ø15                    DAC BLOC4
      Ø3752      6Ø371Ø                    JMP SINGL
                              /
      Ø3753      2Ø5Ø15       REVR2        LAC BLOC4
      Ø3754      Ø45Ø12                    DAC BLOC1
      Ø3755      2Ø5Ø14                    LAC BLOC3
      Ø3756      Ø45Ø13                    DAC BLOC2
      Ø3757      6Ø3747                    JMP REVR2-4
                              /
      Ø376Ø      2Ø5Ø13       REVR1        LAC BLOC2
      Ø3761      Ø45Ø33                    DAC BITN
      Ø3762      2Ø5Ø12                    LAC BLOC1
      Ø3763      Ø45Ø13                    DAC BLOC2
      Ø3764      2Ø5Ø33                    LAC BITN
      Ø3765      Ø45Ø12                    DAC BLOC1
      Ø3766      6Ø371Ø                    JMP SINGL
                                           .EJECT
```

```
                    /
                    /SETUP FOR TEST 1
                    /
03767     102035    SIMU1     JMS WRT1S          /PUT 1'S INTO ALL OF CORE
03770     205012              LAC BLOC1          /1ST LOC. OF BLOCK 1
03771     045000              DAC MEMADR         /ADDRESS COUNT
03772     205013              LAC BLOC2          /LAST LOC. OF BLOCK 1
03773     044777              DAC LSTLOC         /LAST LOC. TO TEST
03774     600327              JMP WBLK1          /WRITE PATTERN IN BLOCK 1
                    /
                    /RETURN HERE AFTER WRITING BLOCK 1
                    /
03775     205000    BLKA1     LAC MEMADR         /LAST ADDRESS WRITTEN
03776     545015              SAD BLOC4          /SEE IF 2 BLOCKS WRITTEN
03777     604011              JMP T1RDF          /SETUP TO READ FORWARD
04000     760000              LAW                /SEE IF BLOCK 2 WANTED
04001     545014              SAD BLOC3
04002     604011              JMP T1RDF          /NO. READ BLOCK 1 FORWARDS
04003     104371              JMS CKADR
04004     205014              LAC BLOC3          /1ST LOC. OF BLOCK 2
04005     045000              DAC MEMADR         /ADDRESS COUNT
04006     205015              LAC BLOC4          /LAST LOC. OF BLOCK 2
04007     044777              DAC LSTLOC         /LAST TO TEST
04010     600327              JMP WBLK1          /WRITE PATTERN IN BLOCK 2
                    /
                    /SETUP TO READ FORWARD
                    /
04011     205012    T1RDF     LAC BLOC1          /1ST LOC., BLOCK 1
04012     045000              DAC MEMADR
04013     205013              LAC BLOC2          /LAST LOC., BLOCK 1
04014     044777              DAC LSTLOC
04015     600366              JMP RLOP1          /READ BLOCK 1 FORWARDS
                    /
                    /RETURN HERE AFTER READING A BLOCK FORWARD
                    /
04016     205000    BLKB1     LAC MEMADR         /LAST READ
04017     545015              SAD BLOC4          /DONE BOTH BLOCKS IF EQUAL
04020     604031              JMP T1RDA          /READ 2 BLOCKS BACKWARD
04021     760000              LAW
04022     545014              SAD BLOC3          /SEE IF 2 SELECTED
04023     604036              JMP T1RDB          /NO. READ 1 BACKWARD
04024     205014              LAC BLOC3          /1ST LOC. OF BLOCK 2
04025     045000              DAC MEMADR
04026     205015              LAC BLOC4          /LAST LOC. OF BLOCK 2
04027     044777              DAC LSTLOC
04030     600366              JMP RLOP1          /READ BLOCK 2 BACKWARD
                    /
04031     205014    T1RDA     LAC BLOC3          /1ST IN BLOCK 2 = LAST TO READ
04032     045000              DAC MEMADR
04033     205015              LAC BLOC4          /LAST IN BLOCK 2 = 1ST TO READ
04034     044777              DAC LSTLOC
04035     600430              JMP BAK1           /READ BLOCK 2 BACKWARD
                    /
                              .EJECT
```

```
     03713    205003                 LAC TNUM          /DETERMINE PATTERN
     03714    505064                 AND K377
     03715    545055                 SAD K261
     03716    603767                 JMP SIMU1         /TEST 1 PATTERN
     03717    545056                 SAD K262
     03720    604056                 JMP SIMU2         /TEST 2 PATTERN
     03721    545057                 SAD K263
     03722    604116                 JMP SIMU3         /TEST 3 PATTERN
     03723    545060                 SAD K264
     03724    604200                 JMP SIMU4         /TEST 4 PATTERN
     03725    545061                 SAD K265
     03726    604256                 JMP SIMU5         /TEST 5 PATTERN
     03727    205003                 LAC TNUM
     03730    740040                 HLT               /SHOULD NEVER GET HERE
                           /
     03731    205003       SETU2     LAC TNUM
     03732    741200                 SNA
     03733    760261                 LAW 261
     03734    045003                 DAC TNUM
     03735    205014                 LAC BLOC3
     03736    740001                 CMA
     03737    345043                 TAD K1
     03740    345015                 TAD BLOC4
     03741    741100                 SPA               /LAST ADR. IS >FIRST IF 0
     03742    603753                 JMP REVR2         /REVERSE CONTENTS
     03743    205014                 LAC BLOC3
     03744    045012                 DAC BLOC1         /1ST TO TEST
     03745    205015                 LAC BLOC4
     03746    045013                 DAC BLOC2         /LAST TO TEST
     03747    760000                 LAW               /A LAW = NO BLOCK SELECTED
     03750    045014                 DAC BLOC3
     03751    045015                 DAC BLOC4
     03752    603710                 JMP SINGL
                           /
     03753    205015       REVR2     LAC BLOC4
     03754    045012                 DAC BLOC1
     03755    205014                 LAC BLOC3
     03756    045013                 DAC BLOC2
     03757    603747                 JMP REVR2-4
                           /
     03760    205013       REVR1     LAC BLOC2
     03761    045033                 DAC BITN
     03762    205012                 LAC BLOC1
     03763    045013                 DAC BLOC2
     03764    205033                 LAC BITN
     03765    045012                 DAC BLOC1
     03766    603710                 JMP SINGL
                                     .EJECT
```

```
                                  /
                                  /SETUP FOR TEST 1
                                  /
  03767      102035               SIMU1     JMS WRT1S          /PUT 1'S INTO ALL OF CORE
  03770      205012                         LAC BLOC1          /1ST LOC. OF BLOCK 1
  03771      045000                         DAC MEMADR         /ADDRESS COUNT
  03772      205013                         LAC BLOC2          /LAST LOC. OF BLOCK 1
  03773      044777                         DAC LSTLOC         /LAST LOC. TO TEST
  03774      600327                         JMP WBLK1          /WRITE PATTERN IN BLOCK 1
                                  /
                                  /RETURN HERE AFTER WRITING BLOCK 1
                                  /
  03775      205000               BLKA1     LAC MEMADR         /LAST ADDRESS WRITTEN
  03776      545015                         SAD BLOC4          /SEE IF 2 BLOCKS WRITTEN
  03777      604011                         JMP T1RDF          /SETUP TO READ FORWARD
  04000      760000                         LAW                /SEE IF BLOCK 2 WANTED
  04001      545014                         SAD BLOC3
  04002      604011                         JMP T1RDF          /NO. READ BLOCK 1 FORWARDS
  04003      104371                         JMS CKADR
  04004      205014                         LAC BLOC3          /1ST LOC. OF BLOCK 2
  04005      045000                         DAC MEMADR         /ADDRESS COUNT
  04006      205015                         LAC BLOC4          /LAST LOC. OF BLOCK 2
  04007      044777                         DAC LSTLOC         /LAST TO TEST
  04010      600327                         JMP WBLK1          /WRITE PATTERN IN BLOCK 2
                                  /
                                  /SETUP TO READ FORWARD
                                  /
  04011      205012               T1RDF     LAC BLOC1          /1ST LOC., BLOCK 1
  04012      045000                         DAC MEMADR
  04013      205013                         LAC BLOC2          /LAST LOC., BLOCK 1
  04014      044777                         DAC LSTLOC
  04015      600366                         JMP RLOP1          /READ BLOCK 1 FORWARDS
                                  /
                                  /RETURN HERE AFTER READING A BLOCK FORWARD
                                  /
  04016      205000               BLKB1     LAC MEMADR         /LAST READ
  04017      545015                         SAD BLOC4          /DONE BOTH BLOCKS IF EQUAL
  04020      604031                         JMP T1RDA          /READ 2 BLOCKS BACKWARD
  04021      760000                         LAW
  04022      545014                         SAD BLOC3          /SEE IF 2 SELECTED
  04023      604036                         JMP T1RDB          /NO. READ 1 BACKWARD
  04024      205014                         LAC BLOC3          /1ST LOC. OF BLOCK 2
  04025      045000                         DAC MEMADR
  04026      205015                         LAC BLOC4          /LAST LOC. OF BLOCK 2
  04027      044777                         DAC LSTLOC
  04030      600366                         JMP RLOP1          /READ BLOCK 2 BACKWARD
                                  /
  04031      205014               T1RDA     LAC BLOC3          /1ST IN BLOCK 2 = LAST TO READ
  04032      045000                         DAC MEMADR
  04033      205015                         LAC BLOC4          /LAST IN BLOCK 2 = 1ST TO READ
  04034      044777                         DAC LSTLOC
  04035      600430                         JMP BAK1           /READ BLOCK 2 BACKWARD
                                  /
                                            .EJECT
```

```
                                        /
     Ø4Ø36      2Ø5Ø12                  T1RDB      LAC BLOC1            /1ST IN BLOCK 1 = LAST TO READ
     Ø4Ø37      Ø45ØØØ                             DAC MEMADR
     Ø4Ø4Ø      2Ø5Ø13                             LAC BLOC2            /LAST IN BLOCK 1 = 1ST TO READ
     Ø4Ø41      Ø44777                             DAC LSTLOC
     Ø4Ø42      6ØØ43Ø                             JMP BAK1             /READ BLOCK 1 BACKWARD
                                        /
                                        /RETURN HERE AFTER READING A BLOCK BACKWARD
                                        /
     Ø4Ø43      2Ø4777                  BLKC1      LAC LSTLOC           /LAST READ
     Ø4Ø44      545Ø12                             SAD BLOC1            /ALL DONE IF EQUAL
     Ø4Ø45      741ØØØ                             SKP
     Ø4Ø46      6Ø4Ø36                             JMP T1RDB            /SETUP FOR BLOCK 1
     Ø4Ø47      75ØØØ4                             LAS
     Ø4Ø5Ø      7411ØØ                             SPA                  /CHECK ASC Ø FOR HALT
     Ø4Ø51      1Ø2Ø62                             JMS HALT             /GO HALT
     Ø4Ø52      5Ø5Ø51                             AND K2ØØ
     Ø4Ø53      7402ØØ                             SZA                  /CHECK ASC 1Ø
     Ø4Ø54      6Ø2312                             JMP KYBRD
     Ø4Ø55      6Ø3767                             JMP SIMU1            /START ALL OVER
                                        /
                                        /SETUP FOR TEST 2
                                        /
     Ø4Ø56      1Ø2Ø35                  SIMU2      JMS WRT1S            /WRITE 1'S INTO ALL OF CORE
     Ø4Ø57      2Ø5Ø12                             LAC BLOC1            /1ST LOC. IN BLOCK 1
     Ø4Ø6Ø      Ø45ØØØ                             DAC MEMADR           /ADDRESS COUNT
     Ø4Ø61      74ØØØ1                             CMA                  /COMPLEMENT
     Ø4Ø62      5Ø51Ø3                             AND K17S             /CLEAR BITS Ø-4
     Ø4Ø63      Ø45ØØ7                             DAC PATR
     Ø4Ø64      2Ø5Ø13                             LAC BLOC2
     Ø4Ø65      5Ø5Ø76                             AND K6ØK
     Ø4Ø66      245ØØ7                             XOR PATR             /PUT BANK# ON PATR
     Ø4Ø67      Ø45ØØ7                             DAC PATR             /PATTERN TO WRITE IN BLOCK 1
     Ø4Ø7Ø      2Ø5Ø13                             LAC BLOC2            /LAST LOC. IN BLOCK 1
     Ø4Ø71      Ø44777                             DAC LSTLOC           /LAST TO TEST
     Ø4Ø72      6ØØ47Ø                             JMP LOP2+2           /WRITE PATTERN IN BLOCK 1
                                        /
                                        /RETURN HERE AFTER READING BLOCK 1
                                        /
     Ø4Ø73      76ØØØØ                  BLKA2      LAW
     Ø4Ø74      545Ø14                             SAD BLOC3            /SEE IF 2 BLOCKS SELECTED
     Ø4Ø75      6Ø41Ø7                             JMP BLKB2            /NO. WRITE AND READ BLOCK 1
     Ø4Ø76      1Ø4371                             JMS CKADR
     Ø4Ø77      2Ø5Ø14                             LAC BLOC3            /1ST LOC. IN BLOCK 2
     Ø41ØØ      Ø45ØØØ                             DAC MEMADR
     Ø41Ø1      2Ø5Ø15                             LAC BLOC4            /LAST LOC. IN BLOCK 2
     Ø41Ø2      Ø44777                             DAC LSTLOC
     Ø41Ø3      2Ø41Ø6                             LAC DONE4            /C(DONE4) = BLKB2
     Ø41Ø4      Ø45Ø11                             DAC EXIT
     Ø41Ø5      6ØØ672                             JMP REST2+2          /SEE IF BLOCK  2=ALL 1'S
                                        /
     Ø41Ø6      ØØ41Ø7                  DONE4      BLKB2
                                        /
                                        /RETURN HERE AFTER READING BLOCK 2
                                        /
     Ø41Ø7      75ØØØ4                  BLKB2      LAS
     Ø411Ø      7411ØØ                             SPA                  /CHECK ASC Ø FOR HALT
     Ø4111      1Ø2Ø62                             JMS HALT             /GO HALT
```

```
                                   /
                                               .EJECT
```

```
     04112     505051                  AND K200          /MAST BIT 10
     04113     740200                  SZA
     04114     602312                  JMP KYBRD         /GO ACCEPT INPUT
     04115     604056                  JMP SIMU2         /START OVER WITH BLOCK 1
                            /
                            /SETUP FOR TEST 3
                            /
     04116     102035       SIMU3      JMS WRT1S         /WRITT 1'S INTO ALL OF CORE
     04117     205012                  LAC BLOC1         /1ST LOC. OF BLOCK 1
     04120     045000                  DAC MEMADR
     04121     205013                  LAC BLOC2         /LAST LOC. OF BLOCK 1
     04122     044777                  DAC LSTLOC
     04123     600737                  JMP LOP3+1        /WRITE BLOCK1
                            /
     04124     760000       BLKA3      LAW
     04125     545014                  SAD BLOC3         /SEE IF 2 BLOCKS SELECTED
     04126     604140                  JMP BLKB3         /ONLY ONE
     04127     104371                  JMS CKADR
     04130     205014                  LAC BLOC3         /1ST LOC. OF BLOCK 2
     04131     045000                  DAC MEMADR
     04132     205015                  LAC BLOC4         /LAST LOC. OF BLOCK 2
     04133     044777                  DAC LSTLOC
     04134     204137                  LAC DONE5         /C(DONE5)=BLKB3
     04135     045011                  DAC EXIT
     04136     600672                  JMP REST2+2
                            /
     04137     004140       DONE5      BLKB3
                            /
     04140     205012       BLKB3      LAC BLOC1
     04141     045000                  DAC MEMADR
     04142     205013                  LAC BLOC2
     04143     044777                  DAC LSTLOC
     04144     601031                  JMP FWD3-1        /READ BLOCK1 FORWARD
                            /
     04145     205012       BLKC3      LAC BLOC1
     04146     045000                  DAC MEMADR
     04147     205013                  LAC BLOC2
     04150     044777                  DAC LSTLOC
     04151     601055                  JMP BAK3-1        /READ BLOCK 1 BACKWARD
                            /
     04152     760000       BLKD3      LAW
     04153     545014                  SAD BLOC3         /SEE IF 2 BLOCKS
     04154     604165                  JMP BLKE3         /ONLY ONE
     04155     205014                  LAC BLOC3         /1ST LOC. OF BLOCK2
     04156     045000                  DAC MEMADR
     04157     205015                  LAC BLOC4         /LAST LOC. OF BLOCK 2
     04160     044777                  DAC LSTLOC
     04161     204164                  LAC DONE6         /C(DONE6)=BLKE3
     04162     045011                  DAC EXIT
     04163     600672                  JMP REST2+2       /READ BLOCK 2
                            /
     04164     004165       DONE6      BLKE3
                            /
                                       .EJECT
```

```
    Ø4165      2Ø5Ø12          BLKE3      LAC BLOC1          /RESTORE BLOCK 1 LIMITS
    Ø4166      Ø45ØØØ                     DAC MEMADR
    Ø4167      2Ø5Ø13                     LAC BLOC2
    Ø417Ø      Ø44777                     DAC LSTLOC
    Ø4171      75ØØØ4                     LAS
    Ø4172      7411ØØ                     SPA                /CHECK ACS Ø FOR HALT
    Ø4173      1Ø2Ø62                     JMS HALT           /GO HALT
    Ø4174      5Ø5Ø51                     AND K2ØØ
    Ø4175      7402ØØ                     SZA                /CHECK BIT 1Ø
    Ø4176      6Ø2312                     JMP KYBRD          /GO ACCEPT INPUT
    Ø4177      6Ø111Ø                     JMP BAK3A-1
                               /
                               /SETUP FOR TEST 4
                               /
    Ø42ØØ      1Ø2Ø35          SIMU4      JMS WRT1S          /WRITE 1'S INTO ALL OF CORE
    Ø42Ø1      2Ø5Ø12                     LAC BLOC1
    Ø42Ø2      Ø45ØØØ                     DAC MEMADR
    Ø42Ø3      2Ø5Ø13                     LAC BLOC2
    Ø42Ø4      Ø44777                     DAC LSTLOC
    Ø42Ø5      6Ø1162                     JMP LOP4+1         /WRITE BLOCK 1
                               /
    Ø42Ø6      2Ø4221          BLKA4      LAC DONE7          /C(DONE7)=BLKB4
    Ø42Ø7      Ø45Ø11                     DAC EXIT
    Ø421Ø      76ØØØØ                     LAW
    Ø4211      545Ø14                     SAD BLOC3          /SEE IF 2 BLOCKS
    Ø4212      6Ø4222                     JMP BLKB4
    Ø4213      1Ø4371                     JMS CKADR
    Ø4214      2Ø5Ø14                     LAC BLOC3
    Ø4215      Ø45ØØØ                     DAC MEMADR
    Ø4216      2Ø5Ø15                     LAC BLOC4          /C(DONE7) = BLKB4
    Ø4217      Ø44777                     DAC LSTLOC
    Ø422Ø      6ØØ672                     JMP REST2+2        /READ BLOCK 2
                               /
                                          .EJECT
```

```
                                     /
     Ø4221        ØØ4222             DONE7     BLKB4
                                     /
     Ø4222        205Ø12             BLKB4     LAC BLOC1
     Ø4223        Ø45ØØØ                       DAC MEMADR
     Ø4224        205Ø13                       LAC BLOC2
     Ø4225        Ø44777                       DAC LSTLOC
     Ø4226        6Ø1246                       JMP FWD4-4          /READ BLOCK 1 AGAIN
                                     /
     Ø4227        2Ø4255             BLKC4     LAC DONE8           /C(DONE8)=BLKD4
     Ø4230        Ø45Ø11                       DAC EXIT
     Ø4231        76ØØØØ                       LAW
     Ø4232        545Ø14                       SAD BLOC3
     Ø4233        6Ø4235                       JMP BLKD4
     Ø4234        6Ø4214                       JMP BLKA4+6
                                     /
     Ø4235        75ØØØ4             BLKD4     LAS
     Ø4236        7411ØØ                       SPA                 /CHECK ACS Ø
     Ø4237        1Ø2Ø62                       JMS HALT            /GO HALT
     Ø424Ø        5Ø5Ø51                       AND K2ØØ
     Ø4241        7402ØØ                       SZA                 /CHECK BIT 1Ø
     Ø4242        6Ø2312                       JMP KYBRD           /GO ACCEPT INPUT
     Ø4243        2Ø5Ø33                       LAC BITN
     Ø4244        5451ØØ                       SAD K4ØØK           /DONE 18 BITS IF EQUAL
     Ø4245        6Ø42ØØ                       JMP SIMU4           /START OVER
     Ø4246        744Ø1Ø                       RCL
     Ø4247        Ø45Ø33                       DAC BITN
     Ø425Ø        2Ø5Ø12                       LAC BLOC1
     Ø4251        Ø45ØØØ                       DAC MEMADR
     Ø4252        2Ø5Ø13                       LAC BLOC2
     Ø4253        Ø44777                       DAC LSTLOC
     Ø4254        6Ø1164                       JMP LOP4+3          /DO NEXT BIT POSITION
                                     /
     Ø4255        ØØ4235             DONE8     BLKD4
                                     /
                                               .EJECT
```

```
                                /SETUP FOR TEST 5
                                /
    Ø4256     1Ø2Ø35            SIMU5       JMS WRT1S           /WRT1S INTO ALL OF CORE
    Ø4257     2Ø5Ø34                        LAC PCW                       /PCW=Ø36Ø74
    Ø426Ø     Ø45Ø36                        DAC CNTRL           /CNTR=PATTERN CONTROL WORD
    Ø4261     2Ø5Ø12                        LAC BLOC1           /1ST LOC. OF BLOCK 1
    Ø4262     Ø45ØØØ                        DAC MEMADR
    Ø4263     2Ø5Ø13                        LAC BLOC2           /LAST LOC. OF BLOCK 1
    Ø4264     Ø44777                        DAC LSTLOC
    Ø4265     6Ø1334                        JMP LOP5+1          /WRITE BLOCK 1 FORWARD

    Ø4266     2Ø44Ø7            BLKA5       LAC DONE9           /C(DONE9)=BLKB5
    Ø4267     Ø45Ø11                        DAC EXIT
    Ø427Ø     2Ø5Ø12                        LAC BLOC1           /RESTORE LIMITS
    Ø4271     Ø45ØØØ                        DAC MEMADR
    Ø4272     6Ø1437                        JMP RBLK5           /READ BLOCK 1 FORWARD
                                /
    Ø4273     2Ø441Ø            BLKB5       LAC DON1Ø           /C(DON1Ø)=BLKC5
    Ø4274     Ø45Ø11                        DAC EXIT
    Ø4275     2Ø5Ø12                        LAC BLOC1           /RESTORE LIMITS
    Ø4276     Ø45ØØØ                        DAC MEMADR
    Ø4277     6Ø15Ø1                        JMP RBAK5+3         /READ BLOCK 1 BACKWARD
                                /
    Ø43ØØ     2Ø4411            BLKC5       LAC DON11           /C(DON11)=BLKD5
    Ø43Ø1     Ø45Ø11                        DAC EXIT
    Ø43Ø2     76ØØØØ                        LAW
    Ø43Ø3     545Ø14                        SAD BLOC3           /SEE IF 2 BLOCKS
    Ø43Ø4     6Ø4313                        JMP BLKD5           /NO. WRITE COMPLEMENT
    Ø43Ø5     1Ø4371                        JMS CKADR
    Ø43Ø6     2Ø5Ø14                        LAC BLOC3           /1ST LOC. OF BLOCK 2
    Ø43Ø7     Ø45ØØØ                        DAC MEMADR
    Ø431Ø     2Ø5Ø15                        LAC BLOC4           /LAST LOC. OF BLOCK 2
    Ø4311     Ø44777                        DAC LSTLOC
    Ø4312     6ØØ672                        JMP REST2+2         /READ BLOCK 2
                                /
    Ø4313     2Ø5Ø35            BLKD5       LAC PCWA            /PCWA=7417ØØ
    Ø4314     545Ø36                        SAD CNTRL           /DONE COMPLEMENT IF EQUAL
    Ø4315     6Ø432Ø                        JMP BLKE5           /SETUP TO WRITE BACKWARD
    Ø4316     Ø45Ø36                        DAC CNTRL
    Ø4317     6Ø4261                        JMP SIMU5+3         /WRITE COMPLEMENT IN BLOCK 1
                                /
    Ø432Ø     1Ø2Ø35            BLKE5       JMS WRT1S           /WRITE 1'S INTO ALL OF CORE
    Ø4321     2Ø5Ø12                        LAC BLOC1           /1ST LOC. OF BLOCK 1
    Ø4322     Ø45ØØØ                        DAC MEMADR
    Ø4323     2Ø5Ø13                        LAC BLOC2           /LAST LOC. OF BLOCK 1
    Ø4324     Ø44777                        DAC LSTLOC
    Ø4325     6Ø155Ø                        JMP LOP5A           /WRITE BLOCK 1 BACKWARD
                                /
    Ø4326     2Ø4412            BLKF5       LAC DON12           /C(DON12)=BLKG5
    Ø4327     Ø45Ø11                        DAC EXIT
    Ø433Ø     76ØØØØ                        LAW
    Ø4331     545Ø14                        SAD BLOC3           /SEE IF 2 BLOCKS
    Ø4332     6Ø4334                        JMP BLKG5
    Ø4333     6Ø43Ø5                        JMP BLKC5+5         /READ BLOCK 2
                                /
                                            .EJECT
```

```
                                   /
   Ø4334      2Ø4413      BLKG5      LAC DON13         /C(DON13)=BLKH5
   Ø4335      Ø45Ø11                 DAC EXIT
   Ø4336      2Ø5Ø13                 LAC BLOC2
   Ø4337      Ø44777                 DAC LSTLOC
   Ø434Ø      2Ø5Ø35                 LAC PCWA          /PCWA=7417ØØ
   Ø4341      545Ø36                 SAD CNTRL         /SEE WHICH TO READ
   Ø4342      2Ø5Ø34                 LAC PCW           /PCW=Ø36Ø74
   Ø4343      Ø45Ø36                 DAC CNTRL
   Ø4344      6Ø427Ø                 JMP BLKA5+2       /READ BLOCK 1 FORWARD
                                   /
   Ø4345      2Ø4414      BLKH5      LAC DON14         /C(DON14)=BLKJ5
   Ø4346      Ø45Ø11                 DAC EXIT
   Ø4347      6Ø4275                 JMP BLKB5+2       /READ BLOCK 1 BACKWARD
                                   /
   Ø435Ø      2Ø4415      BLKJ5      LAC DON15         /C(DON15)=BLKL5
   Ø4351      Ø45Ø11                 DAC EXIT
   Ø4352      76ØØØØ                 LAW
   Ø4353      545Ø14                 SAD BLOC3         /SEE IF 2 SELECTED
   Ø4354      6Ø4356                 JMP BLKL5
   Ø4355      6Ø43Ø5                 JMP BLKC5+5       /READ BLOCK 2
                                   /
   Ø4356      2Ø5Ø35      BLKL5      LAC PCWA          /PCWA=7417ØØ
   Ø4357      545Ø36                 SAD CNTRL         /ALL DONE IF EQUAL
   Ø436Ø      741ØØØ                 SKP
   Ø4361      6Ø432Ø                 JMP BLKE5         /WRITE COMPLEMENT BACKWARD
   Ø4362      75ØØØ4                 LAS
   Ø4363      7411ØØ                 SPA               /CHECK ACSØ FOR HALT
   Ø4364      1Ø2Ø62                 JMS HALT          /GO HALT
   Ø4365      5Ø5Ø51                 AND K2ØØ
   Ø4366      7402ØØ                 SZA               /CHECK ACS 1Ø
   Ø4367      6Ø2312                 JMP KYBRD         /GO ACCEPT INPUT
   Ø437Ø      6Ø4256                 JMP SIMU5         /LEEP LOOPING
                                   /
   Ø4371      ØØØØØØ      CKADR      Ø
   Ø4372      2Ø5Ø14                 LAC BLOC3
   Ø4373      74ØØØ1                 CMA
   Ø4374      345Ø43                 TAD K1
   Ø4375      345Ø15                 TAD BLOC4
   Ø4376      74Ø1ØØ                 SMA               /1ST ADR. IS > 2ND IF A 1
   Ø4377      624371                 JMP* CKADR                /1ST IS < 2ND
   Ø44ØØ      2Ø5Ø14                 LAC BLOC3         /REVERSE BLOC3 AND BLOC4
   Ø44Ø1      Ø44537                 DAC CRLF          /SAVE BLOC3
   Ø44Ø2      2Ø5Ø15                 LAC BLOC4
   Ø44Ø3      Ø45Ø14                 DAC BLOC3
   Ø44Ø4      2Ø4537                 LAC CRLF
   Ø44Ø5      Ø45Ø15                 DAC BLOC4
   Ø44Ø6      624371                 JMP* CKADR                /EXIT
                                   /
                                     .EJECT
```

```
                                    /
    04407     004273        DONE9     BLKB5
    04410     004300        DON10     BLKC5
    04411     004313        DON11     BLKD5
    04412     004334        DON12     BLKG5
    04413     004345        DON13     BLKH5
    04414     004350        DON14     BLKJ5
    04415     004356        DON15     BLKL5
                            /
    04416     000000        GENADR    0                 /ROUTINE TO ASSEMBLE ADDRESSES
    04417     707704                  LEM
    04420     222527                  LAC* ROTA
    04421     045017                  DAC NROTA
    04422     205033                  LAC BITN          /INPUT NUMBER
    04423     445017        CNROT     ISZ NROTA         /INCREMEN SHIFT COUNT
    04424     604442                  JMP GOLEFT        /ROTATE 1 LEFT
    04425     245021                  XOR ADRCW         /XOR WITH PARTIAL ADDRESS
    04426     045021                  DAC ADRCW
    04427     777777                  LAW -1
    04430     562527                  SAD* ROTA         /REC'D 5 NUMBERS IF EQUAL
    04431     604434                  JMP .+3
    04432     442527                  ISZ ROTA          /INCREMENT LAW POINTER
    04433     624416                  JMP* GENADR       /GO WAIT FOR NEXT
    04434     202530                  LAC ROTB
    04435     042527                  DAC ROTA          /RESTORE LAW POINTER
    04436     222527                  LAC* ROTA
    04437     045017                  DAC NROTA
    04440     444416                  ISZ GENADR
    04441     624416                  JMP* GENADR       /EXIT
                            /
    04442     744010        GOLEFT    RCL
    04443     604423                  JMP CNROT
                            /
                                      .EJECT
```

```
                                  /
                                  /HEADER ROUTINE
                                  /
    Ø4444      ØØØØØØ             PHDR       Ø
    Ø4445      1Ø4537                        JMS CRLF             /CR, LF
    Ø4446      2Ø4467                        LAC TSTX             /POINTER FOR "TEST"
    Ø4447      Ø45Ø32                        DAC PRNT
    Ø445Ø      1Ø45ØØ                        JMS CLMN
    Ø4451      2Ø447Ø                        LAC ADRX             /OCTAL ADR.
    Ø4452      Ø45Ø32                        DAC PRNT
    Ø4453      1Ø45ØØ                        JMS CLMN
    Ø4454      2Ø4471                        LAC GDATX            /GOOD
    Ø4455      Ø45Ø32                        DAC PRNT
    Ø4456      1Ø45ØØ                        JMS CLMN
    Ø4457      2Ø4472                        LAC BDATX            /BAD
    Ø446Ø      Ø45Ø32                        DAC PRNT
    Ø4461      1Ø45ØØ                        JMS CLMN
    Ø4462      2Ø4473                        LAC BWPA             /BANK WITH PAT.
    Ø4463      Ø45Ø32                        DAC PRNT
    Ø4464      1Ø45ØØ                        JMS CLMN
    Ø4465      1Ø4537             HDONE      JMS CRLF             /CR,LF
    Ø4466      624444                        JMP* PHDR /START PROGRAM

                                  /
                                  /
    Ø4467      ØØ4551             TSTX       TST                  /POINTER FOR "TEST"
    Ø447Ø      ØØ4555             ADRX       ADR                  /"OCTAL ADR."
    Ø4471      ØØ4564             GDATX      GDAT                 /"GOOD"
    Ø4472      ØØ457Ø             BDATX      BDAT                 /"BAD"
    Ø4473      ØØ4574             BWPA       BWPAT                /"BANK WITH PAT."
    Ø4474      ØØ4751             END        PEND
                                  /
    Ø4475      1Ø4444             HDR        JMS PHDR
    Ø4476      74ØØ4Ø                        HLT
    Ø4477      6ØØ1ØØ                        JMP BEGIN
                                  /
                                             .EJECT
```

```
                                /
                                /PRINT
                                /
 04500      000000              CLMN      0
 04501      445032                        ISZ PRNT            /INCREMENT CHAR. POINTER
 04502      225032                        LAC* PRNT           /GET 2 CHARS
 04503      741200                        SNA                 /DONE 1 COLUMN HEADER IF 0
 04504      604521                        JMP SPAC5           /DO 5 SPACES
 04505      700406                        TLS                 /PRINT 1ST
 04506      700401                        TSF
 04507      604506                        JMP .-1
 04510      742020                        RTR;      RTR;      RTR
 04511      742020
 04512      742020
 04513      742020                        RTR;      RAR
 04514      740020
 04515      700406                        TLS                 /PRINT 2ND
 04516      700401                        TSF
 04517      604516                        JMP .-1
 04520      604501                        JMP CLMN+1          /GET NEXT PAIR
                                /
 04521      204500              SPAC5     LAC CLMN            /C(CLMN)=(PC) AFTER JMS
 04522      505103                        AND K17S
 04523      544536                        SAD DNHDR           /C(DNHDR)= LOCATION HDONE
 04524      624500                        JMP* CLMN           /DONE WITH HEADER
 04525      777773                        LAW -5              /-5
 04526      045006                        DAC LOOPT
 04527      760240                        LAW 240             /SPACE
 04530      700406              SPCE      TLS
 04531      700401                        TSF
 04532      604531                        JMP .-1
 04533      445006                        ISZ LOOPT           /SKIP AFTER 5 SPACES
 04534      604530                        JMP SPCE
                                /
 04535      624500                        JMP* CLMN           /GET NEXT COLUMN HEADER
                                /
 04536      004465              DNHDR     HDONE
                                /
 04537      000000              CRLF      0
 04540      760215                        LAW 215             /CR
 04541      700406                        TLS
 04542      700401                        TSF
 04543      604542                        JMP .-1
 04544      544546                        SAD .+2
 04545      624537                        JMP* CRLF
 04546      760212                        LAW 212             /LF
 04547      604541                        JMP CRLF+2
 04550      752525              DLMT      752525
                                /
                                          .EJECT
```

```
     04551     004551          TST        .                         /TEST
     04552     305324                     305324;    324323
     04553     324323
     04554     000000                     0
                               /
     04555     004555          ADR        .                         /OCTAL ADR.
     04556     303317                     303317;    301324;        240314;    304301
     04557     301324
     04560     240314
     04561     304301
     04562     256322                     256322;    0
     04563     000000
                               /
     04564     004564          GDAT       .                         /GOOD
     04565     317307                     317307;    304317
     04566     304317
     04567     000000                     0
                               /
     04570     004570          BDAT       .                         /BAD
     04571     301302                     301302;    377304
     04572     377304
     04573     000000                     0
                               /
     04574     004574          BWPAT      .                         /BANK WITH PAT.
     04575     301302                     301302;    313316;        327240;    324311
     04576     313316
     04577     327240
     04600     324311
     04601     240310                     240310;    301320;        256324
     04602     301320
     04603     256324
     04604     000000                     0
                               /
                                          .EJECT
     04605       004605         TSN        .
     04606       305324                    305324;   324323;   240243;   240255
     04607       324323
     04610       240243
     04611       240255
     04612       000000                    0
                                /
     04613       004613         SUPS       .
     04614       325323                    325323;   320320;   305322;   323323
     04615       320320
     04616       305322
     04617       323323
     04620       255240                    255240;   377240;   0
     04621       377240
     04622       000000
                                /
     04623       004623         BLKS       .
     04624       314302                    314302;   303317;   240313;   261243
     04625       303317
     04626       240313
     04627       261243
     04630       255240                    255240;   377240;   0
     04631       377240
     04632       000000
                                /
     04633       004633         BLKT       .
     04634       314302                    314302;   303317;   240313;   262243
     04635       303317
     04636       240313
     04637       262243
     04640       255240                    255240;   377240;   0
     04641       377240
     04642       000000
                                /
     04643       004643         OVLAP      .
     04644       311314                    311314;   311315;   323324;   317240
     04645       311315
     04646       323324
     04647       317240
     04650       305326                    305326;   314322;   320301;   320240
     04651       314322
     04652       320301
     04653       320240
     04654       317322                    317322;   322307;   315301;   0
     04655       322307
     04656       315301
     04657       000000
                                /
     04660       004660         PLOC       .
     04661       322320                    322320;   307317;   301322;   240315
     04662       307317
     04663       301322
     04664       240315
     04665       323311                    323311;   311240;   240316;   0
     04666       311240
     04667       240316
     04670       000000
```

```
    04671     004671          LOWER         .
    04672     317314                        317314;    305327;    240322;    0
    04673     305327
    04674     240322
    04675     000000
                              /
    04676     004676          HIGH          .
    04677     320325                        320325;    305320;    240322;    0
    04700     305320
    04701     240322
    04702     000000
                              /
    04703     004703          FIELD         .
    04704     313264                        313264;    306240;    305311;    304314
    04705     306240
    04706     305311
    04707     304314
    04710     317240                        317240;    240306;    301302;    313316
    04711     240306
    04712     301302
    04713     313316
    04714     377240                        377240;    0
    04715     000000
                              /
    04716     004716          SLTER         .
    04717     322305                        322305;    317322;    240322;    316311
    04720     317322
    04721     240322
    04722     316311
    04723     323240                        323240;    314305;    303305;    305324
    04724     314305
    04725     303305
    04726     305324
    04727     240304                        240304;    313264;    0
    04730     313264
    04731     000000
                              /
    04732     004732          LMTUL         .
    04733     256314                        256314;    256314;    305240;    303330
    04734     256314
    04735     305240
    04736     303330
    04737     305305                        305305;    323304;    325240;    314256
    04740     323304
    04741     325240
    04742     314256
    04743     377256                        377256;    0
    04744     000000
                              /
    04745     004745          ALL           .
    04746     314301                        314301;    377314;    0
    04747     377314
    04750     000000
    04751     004751          PEND          .
    04752     316305                        316305;    377304;    0
    04753     377304
    04754     000000
                                            .EJECT
```

```
                                    /
   Ø4755    ØØØØØØ         BAD         Ø                    /SAVES BAD DATA
   Ø4756    ØØØØØØ         FLAGS       Ø                    /VARIOUS BITS = PROGRAM FLAGS
   Ø4757    ØØØØØØ         ERWRD       Ø
   Ø476Ø    ØØØØØØ                     Ø                    /STORES ADR. OF 1ST ERROR IN EACH BANK
   Ø4761    ØØØØØØ                     Ø
   Ø4762    ØØØØØØ                     Ø
   Ø4763    ØØØØØØ                     Ø
   Ø4764    ØØØØØØ                     Ø
   Ø4765    ØØØØØØ                     Ø
   Ø4766    ØØØØØØ                     Ø
   Ø4767    ØØØØØØ                     Ø
   Ø477Ø    ØØØØØØ         FLOAD       Ø                    /BANK PROGRAM LOADED IN
   Ø4771    ØØØØØØ         FLOADA      Ø                    /BANK CURRENTY WITH PROGRAM
   Ø4772    ØØØØØØ         MCW         Ø                    /VALUE OF ACS
   Ø4773    ØØØØØØ         MCWA        Ø                    /SAME AS MCW
   Ø4774    ØØØØØØ         ULBNK       Ø                    /HAS HIGHEST BANK TO TEST
   Ø4775    ØØØØØØ         LAST1       Ø                    /VERY LAST LOC. TO TEST IN HIGH BANK
   Ø4776    ØØØØØØ         LAST2       Ø                    /SAME AS LAST1, BUT CHANGES
   Ø4777    ØØØØØØ         LSTLOC      Ø                    /LAST LOC. TO TEST IN CURRENT BANK
   Ø5ØØØ    ØØØØØØ         MEMADR      Ø                    /ADDRESS COUNTER
   Ø5ØØ1    ØØØØØØ         FIRST1      Ø                    /1ST LOC. TO TEST IN FIRST BANK
   Ø5ØØ2    ØØØØØØ         FIRST2      Ø                    /SAME AS FIRST1, BUT CHANGES
   Ø5ØØ3    ØØØØØØ         TNUM        Ø                    /CURRENT TEST# (ASCII)
   Ø5ØØ4    ØØØØØØ         RPETE       Ø                    /LOOP COUNTER
   Ø5ØØ5    ØØØØØØ         WRCNT       Ø                    /LOOP COUNTER
   Ø5ØØ6    ØØØØØØ         LOOPT       Ø                    /TEST LOOP COUNTER
   Ø5ØØ7    ØØØØØØ         PATR        Ø                    /DATA FOR COMPARISON
   Ø5Ø1Ø    ØØØØØØ         PATBNK      Ø                    /CURRENT BANK WITH PATTERN
   Ø5Ø11    ØØØØØØ         EXIT        Ø                    /EXITS TO READ FORWARD OR BACKWARD
   Ø5Ø12    76ØØØØ         BLOC1       LAW                  /1ST ADR. IN BLOCK 1
   Ø5Ø13    76ØØØØ         BLOC2       LAW                  /LAST ADR. IN BLOCK 1
   Ø5Ø14    76ØØØØ         BLOC3       LAW                  /1ST ADR. IN BLOCK 2
   Ø5Ø15    76ØØØØ         BLOC4       LAW                  /LAST ADR. IN BLOCK 2.
   Ø5Ø16    ØØØØØØ         LSTSUP      Ø                    /SAVES LAST SUPRESSED ADR.
   Ø5Ø17    ØØØØØØ         NROTA       Ø                    /SHIFT COUNTER
   Ø5Ø2Ø    ØØØØØØ         OVER        Ø                    /SAVES EXIT ADRS.
   Ø5Ø21    ØØØØØØ         ADRCW       Ø                    /CONTAINS PARTIALLY ASSEM. ADR.
   Ø5Ø22    ØØØØØØ         LAST        Ø                    /ADR. OF LAST READ  ERROR
   Ø5Ø23    ØØØØØØ         NXLOC       Ø                    /NEXT BANK TO MOVE TO
   Ø5Ø24    ØØØØØØ         SOURCE      Ø                    /BANK TO MOVE FROM
   Ø5Ø25    ØØØØØØ         DESTN       Ø                    /BANK TO MOVE TO
   Ø5Ø26    ØØØØØØ         MOVED       Ø                    /ADR. COUNTERS FOR MOVING
   Ø5Ø27    ØØØØØØ         MOVES       Ø
   Ø5Ø3Ø    ØØØ127         BGNLO       STOVER               /EXIT ADR. TO LO 4K
   Ø5Ø31    Ø1Ø127         BGNHI       STOVER +1ØØØØ        /EXIT ADR. TO HI 4K
                                    /
                                               .EJECT
```

```
05032   000000      PRNT    0               /POINTER FOR PRINT ROUTINES
05033   000000      BITN    0               /HOLDS A SLIDING BIT PATTERN
05034   036074      PCW     036074          /PATTERN WORD FOR TEST 5
05035   741700      PCWA    741700          /COMPLEMENT OF PCW
05036   000000      CNTRL   0               /TEMP. STORAGE FOR PCW OR PCWA
05037   000000      COMPR                   /TEMP. STORAGE FOR TST5 COMPARE WORD
05040   000000      OCADR   0               /FAILING OCTAL ADR.
05041   000000      GOOD    0               /GOOD DATA
05042   000000      K0      0
05043   000001      K1      1
05044   000003      K3      3
05045   000014      K14     14
05046   000017      K17     17
05047   000040      K40     40
05050   000100      K100    100
05051   000200      K200    200
05052   000215      K215    215
05053   000254      K254    254
05054   000260      K260    260
05055   000261      K261    261
05056   000262      K262    262
05057   000263      K263    263
05060   000264      K264    264
05061   000265      K265    265
05062   000272      K272    272
05063   000370      K370    370
05064   000377      K377    377
05065   000400      K400    400
05066   000007      K7      7
05067   070000      K70K    070000
05070   002000      K2K     2000
05071   004000      K4K     4000
05072   010000      K10K    10000
05073   020000      K20K    20000
05074   760000      M20K    760000
05075   040000      K40K    40000
05076   060000      K60K    60000
05077   076000      K76K    76000
05100   400000      K400K   400000
05101   700000      K700K   700000
05102   007777      K7S     7777
05103   017777      K17S    17777
05104   037777      K37S    37777
05105   057777      K57S    57777
05106   077777      K77S    77777
05107   005111      KEND    .+2
                    /
        004475              .END HDR        /PRINT HEADER AFTER LOADING
                            NO ERROR LINES
```

```
ADJHT      Ø2ØØ2
ADR        Ø4555
ADRCW      Ø5Ø21
ADRX       Ø447Ø
ADR1       ØØ245
ADR2       ØØ251
ADR3       ØØ253
ADR4       ØØ255
ADR5       ØØ257
ADR6       ØØ263
ADR7       ØØ265
ADR8       ØØ267
ADR9       ØØ273
AD1Ø       ØØ275
ALT        Ø4745
ALT1       ØØ675
BAD        Ø4755
BAK1       ØØ43Ø
BAK2       ØØ616
BAK3       Ø1Ø56
BAK3A      Ø1111
BAK5       Ø15Ø6
BAK5A      Ø1555
BASE       ØØ32Ø
BDAT       Ø457Ø
BDATX      Ø4472
BEGIN      ØØ1ØØ
BGNHI      Ø5Ø31
BGNLO      Ø5Ø3Ø
BITN       Ø5Ø33
BLKA1      Ø3775
BLKA2      Ø4Ø73
BLKA3      Ø4124
BLKA4      Ø42Ø6
BLKA5      Ø4266
BLKB1      Ø4Ø16
BLKB2      Ø41Ø7
BLKB3      Ø414Ø
BLKB4      Ø4222
BLKB5      Ø4273
BLKC1      Ø4Ø43
BLKC3      Ø4145
BLKC4      Ø4227
BLKC5      Ø43ØØ
BLKD3      Ø4152
BLKD4      Ø4235
BLKD5      Ø4313
BLKE3      Ø4165
BLKE5      Ø432Ø
BLKF5      Ø4326
BLKG5      Ø4334
BLKH5      Ø4345
BLKJ5      Ø435Ø
BLKL5      Ø4356
BLKN1      Ø2553
BLKN2      Ø267Ø
BLKS       Ø4623
BLKSX      Ø36Ø5
```

```
BLKT        Ø4633
BLKTX       Ø36Ø7
BLK1        Ø2543
BLK1A       Ø2562
BLK1B       Ø26ØØ
BLK2        Ø2662
BLK2A       Ø2677
BLK2B       Ø2715
BLOC1       Ø5Ø12
BLOC2       Ø5Ø13
BLOC3       Ø5Ø14
BLOC4       Ø5Ø15
BWPA        Ø4473
BWPAT       Ø4574
CBANK       Ø1674
CFIELD      Ø17Ø7
CFLD        Ø3256
CKADR       Ø4371
CKBA        ØØ515
CKBAK       Ø1744
CKBB        ØØ572
CKBC        ØØ636
CKBD        Ø1535
CKCLN       Ø2415
CKERR       Ø3Ø73
CKFCD       Ø3376
CKNXT       Ø3154
CK18B       Ø1274
CLMN        Ø45ØØ
CLOF       7ØØØØ4
CLON       7ØØØ44
CLR4K       Ø3275
CLSF       7ØØØØ1
CMOVF       Ø3Ø31
CNROT       Ø4423
CNTRL       Ø5Ø36
COMPR       Ø5Ø37
CRLF        Ø4537
CSUP        Ø2232
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DBLK2       Ø2733
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DLMT        Ø455Ø
DNHDR       Ø4536
DNMVF       Ø3131
DNSUP       Ø2517
DOALL       ØØ314
DONE2       Ø36Ø3
DONE3       Ø36Ø4
DONE4       Ø41Ø6
DONE5       Ø4137
DONE6       Ø4164
DONE7       Ø4221
DONE8       Ø4255
DONE9       Ø44Ø7
DON1Ø       Ø441Ø
DON11       Ø4411
DON12       Ø4412
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SMADR9      PAGE  80

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DON14         04414
DON15         04415
END           04474
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ENTBL         02540
EPC           03616
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EREXIT        02136
ERROR         02100
ERRORA        02070
ERR1A         00440
ERR5          01460
ERSEL         03566
ERTBL         02310
ERWRD         04757
EXAM1         00166
EXAM2         00172
EXAM3         00176
EXAM4         00202
EXAM5         00206
EXIT          05011
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FCOMV         03354
FCHLT         03547
FIFLD         04703
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FIRST2        05002
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FLORNK        03655
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FLOADA        04771
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FWD3          01032
FWD4          01252
FWD5          01443
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GDATX         04471
GETADR        04416
GOLEFT        04442
GOOD          05041
HALT          02062
HDONE         04465
HDR           04475
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HIADJ         01727
HIGH          04676
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HIGH4         01663
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BLK2A       02677
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BLOC3       05014
BLOC4       05015
BWPA        04473
BWPAT       04574
CBANK       01674
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CKBA        00515
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CKBB        00572
CKBC        00636
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CKFCD       03376
CKNXT       03154
CK18B       01274
CLMN        04500
CLOF       700004
CLON       700044
CLR4K       03275
CLSF       700001
CMOVE       03031
CNBOT       04423
CNTRL       05036
COMPR       05037
CRLF        04537
CSUP        02232
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DBLK2       02733
DESTN       05025
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DNHDR       04536
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DNSUP       02517
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DONE3       03604
DONE4       04106
DONE5       04137
DONE6       04164
DONE7       04221
DONE8       04255
DONE9       04407
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DON11       04411
DON12       04412
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DON15      Ø4415
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ERR1A      ØØ44Ø
ERR5       Ø146Ø
ERSEL      Ø3566
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ERWRD      Ø4757
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EXAM2      ØØ172
EXAM3      ØØ176
EXAM4      ØØ2Ø2
EXAM5      ØØ2Ø6
EXIT       Ø5Ø11
EXTST      ØØ156
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FCOMV      Ø3354
FCHLT      Ø3547
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FIRST2     Ø5ØØ2
FLAGS      Ø4756
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FLOAD      Ø477Ø
FLOADA     Ø4771
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FWD3       Ø1Ø32
FWD4       Ø1252
FWD5       Ø1443
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GDATX      Ø4471
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GOLEFT     Ø4442
GOOD       Ø5Ø41
HALT       Ø2Ø62
HDONE      Ø4465
HDR        Ø4475
HEXED      Ø3567
HIADJ      Ø1727
HIGH       Ø4676
HIGHR      Ø3647
HIGH4      Ø1663
HILO       Ø1756
HIRE       Ø3654
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KRB       7ØØ312
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K100         05050
K14          05045
K17          05046
K17S         05103
K2K          05070
K20K         05073
K200         05051
K215         05052
K254         05053
K260         05054
K261         05055
K262         05056
K263         05057
K264         05060
K265         05061
K272         05062
K3           05044
K37S         05104
K370         05063
K377         05064
K4K          05071
K44          05047
K40K         05075
K400         05065
K400K        05100
K57S         05105
K60K         05076
K7           05066
K7S          05102
K70K         05067
K700K        05101
K76K         05077
K77S         05106
LAL          02307
LAST         05022
LAST1        04775
LAST2        04776
LEGAL        02775
LMTUL        04732
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LOOPT        05006
LOOP1        00417
LOP2         00466
LOP3         00736
LOP4         01161
LOP5         01333
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LOWB         00310
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MCWA      04773
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MOVEC     03527
MOVED     05026
MOVEI     03510
MOVES     05027
MV K      03222
MV ST     03331
MV HI     03432
MVOPR     03322
MVRTN     03311
MV K      03273
M2 K      05074
NBLK      03601
NOBAK     02027
NOTIN     01646
NROTA     05017
NXBAK     02012
NXLOC     05023
NXPT3     01132
NXPT4     01307
NXPT5     01622
NXSUP     02365
NXTBNK    01636
NXTHI     03234
NXTMV     03146
NXTPAT    00720
OCADR     05040
OFBNK     03636
ONLY1     03241
OPPAT     03327
OVER      05020
OVLAP     04643
OVRLP     03606
PATBNK    05010
PATR      05007
PCF      700202
PCW       05034
PCWA      05035
PEND      04751
PHOR      04444
PISIN     03656
PLOC      04660
PNXT      03010
POSITN    02265
PRERR     02254
PRNT      05032
PROCTL    02261
PROG      02645
PRSEI     03556
PRTSI     03452
PSA      700204
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RBAK5       Ø1476
RBLK2       ØØ543
RBLK5       Ø1437
RCF        7ØØ1Ø2
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RDFWD       ØØ534
READ1       ØØ361
REST        ØØ642
REST1       ØØ647
REST2       ØØ67Ø
REST3       ØØ772
REST3A      Ø1ØØ2
REST4       Ø1211
REST4A      Ø1217
REST5       Ø14Ø2
REST5A      Ø141Ø
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REVR2       Ø3753
RFWD3       Ø1Ø23
RFWD4       Ø124Ø
RFWD5       Ø1431
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RLOP1       ØØ366
ROTA        Ø2527
ROTB        Ø253Ø
RPFTF       Ø5ØØ4
RRB        7ØØ112
RSA        7ØØ1Ø4
RSB        7ØØ144
RSF        7ØØ1Ø1
RST5        Ø16ØØ
RTN3        Ø1ØØØ
RTN4        Ø1215
RTN5        Ø14Ø6
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SETU1       Ø3676
SETU2       Ø3731
SIMU1       Ø3767
SIMU2       Ø4Ø56
SIMU3       Ø4116
SIMU4       Ø42ØØ
SIMU5       Ø4256
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SLTER       Ø4716
SOURCE      Ø5Ø24
SPAC5       Ø4521
SPCE        Ø453Ø
SPFXT       Ø225Ø
SPING       Ø23Ø1
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STLOOP      Ø3666
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SUPS        04613
SUPSX       02542
SUPTRL      02537
SU 1        02420
SW          02222
SW          02141
SW2         02130
TBLK        03602
TCF        700402
THRU        01655
TLS        700406
TNUM        05003
TOP         02245
TSF        700401
TS          04605
TS X        02541
TST         04551
TSTN        02345
TSTNO       02315
TSTX        04467
TST1        00321
TST2        00461
TST3        00730
TST3A       01104
TST4        01151
TST5        01323
TST5A       01542
T1RDA       04031
T1RDB       04036
T1RDF       04011
ULANK       04774
WBLK1       00327
WCHWA       03453
WHERE       03552
WHWAY       03414
WLOP1       00334
WLOP2       00475
WLOP3       00744
WLOP4       01170
WLOP5       01341
WOTIS       03657
WRINT       05005
WRT1S       02035
XCFED       03576
XPRT        03413
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 EXAM2      ØØ172
 EXAM3      ØØ176
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 EXAM5      ØØ2Ø6
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 ADR1       ØØ245
 ADR2       ØØ251
 ADR3       ØØ253
 ADR4       ØØ255
 ADR5       ØØ257
 ADR6       ØØ263
 ADR7       ØØ265
 ADR8       ØØ267
 ADR9       ØØ273
 AD1Ø       ØØ275
 LOWA       ØØ3Ø2
 LOWB       ØØ31Ø
 LOWC       ØØ312
 DOALI      ØØ314
 BASE       ØØ32Ø
 TST1       ØØ321
 WBLK1      ØØ327
 WLOP1      ØØ334
 READ1      ØØ361
 RLOP1      ØØ366
 LOOP1      ØØ417
 RBAK1      ØØ422
 BAK1       ØØ43Ø
 ERR1A      ØØ44Ø
 TST2       ØØ461
 LOP2       ØØ466
 WLOP2      ØØ475
 CKRA       ØØ515
 RDFWD      ØØ534
 RBLK2      ØØ543
 FWD2       ØØ55Ø
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 RDBAK      ØØ611
 BAK2       ØØ616
 CKRC       ØØ636
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 REST2      ØØ67Ø
 ALI1       ØØ675
 NXTPAT     ØØ72Ø
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TST4        Ø1151
LOP4        Ø1161
NLOP4       Ø117Ø
REST4       Ø1211
RTN4        Ø1215
REST4A      Ø1217
RFND4       Ø124Ø
FWD4        Ø1252
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NXPT4       Ø13Ø7
TST5        Ø1323
LOP5        Ø1333
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LOP5A       Ø155Ø
BAK5A       Ø1555
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NOTIN       Ø1646
THRU        Ø1655
HIGH4       Ø1663
CBANK       Ø1674
CFIELD      Ø17Ø7
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HILO        Ø1756
ADJHI       Ø2ØØ2
NXBAK       Ø2Ø12
NOBAK       Ø2Ø27
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RITE        Ø2Ø42
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ERFXIT      Ø2136
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SWØ         Ø2222
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SPEXT       02250
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PROCTL      02261
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SPING       02301
LAI         02307
ERTBL       02310
LNERR       02311
KYBRD       02312
TSTNO       02315
TSTN        02345
SUPIN       02350
NXSUP       02365
CKCLN       02415
SUP1        02420
SUPBLK      02451
SETSUP      02505
ONSUP       02517
ROTA        02527
ROTB        02530
STRL        02536
SUPTRL      02537
ENTBL       02540
TSNX        02541
SUPSX       02542
BLK1        02543
BLKN1       02553
BLK1A       02562
BLK1B       02600
DBLK1       02612
PROG        02645
BLK2        02662
BLKN2       02670
BLK2A       02677
BLK2B       02715
DBLK2       02733
KEYIN       02766
LEGAL       02775
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PNXT        03010
CMOVE       03031
CKERR       03073
STMV        03106
EQUAL       03117
ONMVE       03131
SUB1        03134
NXTMV       03146
CKNXT       03154
STNXT       03171
SUB2        03211
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NXTHI       03234
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CFLD        03256
MV4K        03273
CLR4K       03275
MVRTN       03311
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FCDMV       03354
CKFCD       03376
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XHWAY       03414
MVFHI       03432
FCDCK       03435
PRTSI       03452
XCHWA       03453
MOVE        03473
MOVEI       03510
MOVEC       03527
FCHLT       03547
XHWRF       03552
PRSFI       03556
FRSFI       03566
HEXED       03567
XCFED       03576
INSUP       03577
SUPDN       03600
NBLK        03601
IBLK        03602
DONE2       03603
DONE3       03604
BLKSX       03605
OVRLP       03606
BLKTX       03607
LOCAT       03610
EPC         03616
OFBNK       03636
HIGHR       03647
LOW         03653
HIRE        03654
FLDBNK      03655
PISIN       03656
NOTIS       03657
STLOOP      03666
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SINGL       03710
SETU2       03731
REVR2       03753
REVR1       03760
SIMU1       03767
BLKA1       03775
T1RDF       04011
BLKB1       04016
T1RDA       04031
T1RDR       04036
BLKC1       04043
SIMU2       04056
BLKA2       04073
DONE4       04106
BLKB2       04107
SIMU3       04116
BLKA3       04124
DONE5       04137
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BLKB4       Ø4222
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DONE8       Ø4255
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DON12       Ø4412
DON13       Ø4413
DON14       Ø4414
DON15       Ø4415
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ADR         Ø4555
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BLKS        Ø4623
BLKT        Ø4633
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HIGH       04676
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ALI        04745
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FLOADA     04771
CN         04772
CNA        04773
LINK       04774
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LAST2      04776
LSTLOC     04777
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FIRST1     05001
FIRST2     05002
INUM       05003
RPSTF      05004
NRCNT      05005
LOOPT      05006
PATR       05007
PATRNK     05010
EXIT       05011
RLOC1      05012
RLOC2      05013
RLOC3      05014
RLOC4      05015
LSTSUP     05016
NROTA      05017
OVER       05020
ADRCW      05021
LAST       05022
NXLOC      05023
SOURCE     05024
DESTN      05025
MOVED      05026
MOVES      05027
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SGNHI      05031
PRNT       05032
SITN       05033
PCN        05034
PCNA       05035
CNTRI      05036
COMPR      05037
OCADR      05040
GOOD       05041
K0         05042
K1         05043
K3         05044
K14        05045
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K40       05047
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K261      05055
K262      05056
K263      05057
K264      05060
K265      05061
K272      05062
K370      05063
K377      05064
K440      05065
K7        05066
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K2K       05070
K4K       05071
K10K      05072
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M20K      05074
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K60K      05076
K76K      05077
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K17S      05103
K37S      05104
K57S      05105
K77S      05106
KEND      05107
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CLOF     700004
CLON     700044
RSF      700101
RCF      700102
RSA      700104
RRB      700112
RSB      700144
PSF      700201
PCF      700202
PSA      700204
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KSF      700301
KRB      700312
TSF      700401
TCF      700402
TLS      700406
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