DataGeneral

TECHNICAL STATEMENT

TEXT LISTING

068-001658-00

PROGRAM

6093 VIDEO DISPLAY TEST AND
SERIAL PRINTER OPTION TESTS

TEXT TAPE

097-001658-00

ABSTRACT

THE 6093 VIDEO DISPLAY DIAGNOSTIC/EXERCISER PROGRAM CONTAINS 5 SEPARATE TEST PROGRAMS DESIGNED TO FACILITATE CHECKOUT AND EVALUATION OF THE 6093 DISPLAY.

NOTICE

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 0001 .MAIN    MACRO REV 06.30          08:19:09 08/06/79
01
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07              ;*************************************************************
08              ;
09              ; NAME: CYCII.TX                        PART NUMBER: 097-001658
10              ;
11              ;
12              ; DESCRIPTION:  6093 VIDEO DISPLAY TEST AND
13              ;               SERIAL PRINTER OPTION TEST'S
14              ;
15              ;
16              ; REVISION HISTORY:
17              ;
18              ;       REV.            DATE
19              ;
20              ;       00              7/11/79
21              ;
22              ;
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24              ; ALL RIGHTS RESERVED.
25              ;*************************************************************
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10002 .MAIN
01              ;1. PROGRAM NAME: CYCIT.SR 6093 VIDEO DISPLAY DIAGNOSTIC/
02              ;       EXERCISER PLUS THE SERIAL PRINTER OPTION TESTS
03              ;
04              ;2. REVISION HISTORY
05              ;       00      7/11/79
06              ;
07              ;3. MACHINE REQUIREMENTS
08              ;
09              ;3.1    NOVA/U-NOVA/ECLIPSE PROCESSOR
10              ;
11              ;3.2    16K READ/WRITE MEMORY
12              ;
13              ;3.3    EITHER A TYPE 4060,4010, OR ALM I/O INTERFACE
14              ;       **THE 4075,77 INTERFACE IS THE SAME AS A
15              ;       4010 TO THIS PROGRAM AND SHOULD BE ENTERED
16              ;       AS A 4010.(SEE 9.3,9.4)
17              ;
18              ;3.4    6093 DASHER D3 DISPLAY TERMINAL
19              ;
20              ;3.5    OPTIONAL- SERIAL PRINTER
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;0003 .MAIN
01
02              ; 4. TEST REQUIREMENTS
03              ;
04              ;THE 6093 DISPLAY MAY BE DRIVEN BY EITHER
05              ;DATA GENERAL TYPE ASYNCHRONOUS INTERFACE
06              ;ASSEMBLY; THE ALM, THE TYPE 4010, OR THE
07              ;4060.  A SEQUENCE OF AT LEAST TWO SUCESSFUL PASSES
08              ;THROUGH THE DIAGNOSTIC PROGRAM FOR THE PARTICULAR
09              ;INTERFACE INSTALLED IS A MANDATORY PREREQUISITE
10              ;FOR THIS PROGRAM.  PERFORM ALL SPECIFIED TESTS
11              ;AND PROCEDURES FOR THE INTERFACE ASSEMBLY AND
12              ;VERIFY THAT THE INTERFACE IS FULLY OPERATIONAL
13              ;BEFORE PERFORMING THE PROCEDURES AND TESTS
14              ;COMPRISING THE 6093 VIDEO DISPLAY DIAGNOTIC.
15              ;
16              ; 4.1 SYSGEN PARAMETERS
17              ;
18              ;BEFORE RUNNING THE TESTS IT IS NECESSARY TO SET THE
19              ;OPERATING PARAMETER'S FOR THE TERMINAL.  THE SYSGEN
20              ;PRESENTATION IS DISPLAYED BY ENTERING LOCAL MODE (CMD-
21              ;LINE), THEN DEPRESSING CMD-SHIFT-LINE SIMULTANEOUSLY.
22              ;THE CURRENT PARAMETER'S ARE DISPLAYED.  INITIALLY SET PARITY
23              ;TO MARK.  VERIFY THAT THE DISPLAY'S RECEIVE AND TRANSMIT BAUD
24              ;RATES ARE THE SAME AS THE INTERFACE.  SET TRANSMIT CHARACTER
25              ;PACING TO NONE, KEYBOARD REPEAT RATE TO 10, IF A PRINTER IS
26              ;AVAILABLE SET THE PRINTER BAUD RATE TO THAT OF THE PRINTER.
27              ;INTERNAL MODEM (D4)? =NO, FULLY 6053 COMPATIBLE? =YES.  AFTER
28              ;SETTING THE PARAMETERS THE SEQUENCE OF ESCAPE AND LINE
29              ;WILL PUT THE DISPLAY ON-LINE.
30              ;
31              ; 5. SUMMARY
32              ;
33              ;THE 6093 VIDEO DISPLAY DIAGNOSTIC/EXERCISER PROGRAM
34              ;CONTAINS 5 SEPARATE TEST PROGARMS DESIGNED TO FACILITATE
35              ;CHECKOUT AND EVALUATION OF THE 6093 DISPLAY.  THE FIRST
36              ;PROGRAM (SA 500) IS A SERIES OF AUTOMATIC TESTS (A,B,CX,BX)
37              ;WHICH ARE RUN SEQUENTIALLY.  THE OTHER 4 TESTS UNDER OPERATOR
38              ;CONTROL ARE: A SEQUENCE OF TESTS TO CHECK THE BELL, ROLL
39              ;FUNCTIONS, GRAPHIC CHAR. DISPLAY, AND ALPHA/NUMERIC CHAR.
40              ;AND ATTRIBUTE DISPLAY TEST (SA 501).  KEYBOARD CHAR. ECHO
41              ;TEST (SA 502).  KEYBOARD CHAR. OCTAL VALUE DUMP (SA 503).
42              ;SERIAL PRINTER TESTS IF SO EQUIPPED (SA 504).
43              ;
44              ; 6. RESTRICTIONS
45              ;
46              ;IF RUNNING THE TESTS WITHOUT A SYSGEN MODULE CHANGE
47              ;THE CONTENTS OF CX31+1 TO THE ADDRESS OF LOCATION CX32.
48              ;THIS WILL BYPASS TEST CX31, WHICH ISSUES A MASTER RESET.
```

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;0004 .MAIN
01              ;7.0 PROGRAM DESCRIPTIONS
02              ;
03              ;7.1    AUTOMATIC DIAGNOSTIC/EXERSISER TESTS (SA 500)
04              ;       THESE TESTS ARE DIVIDED INTO 4 BLOCKS: A,B,CX,BX
05              ;       NOTE!!!!  THESE TESTS (500) ARE NOT MEANT TO BE VISUAL
06              ;       TESTS, DATA VERIFICATION IS UNDER PROGRAM CONTROL.
07              ;       ALTHOUGH, IF AN ERROR IS ENCOUNTERED INFORMATION ON
08              ;       THE SCREEN MAY BE USEFUL FOR DEBUGGING.
09              ;
10              ;7.1A   THE A SERIES TESTS ARE A BRIEF CHECK OF THE INTERFACE
11              ;       BEING USED.
12              ;
13              ;7.1B   THE B SERIES TESTS CHECK THE CURSOR MOVEMENT COMMANDS
14              ;       WITH THE USE OF THE READ CURSOR FUNCTION.
15              ;
16              ;7.1C   THE CX SERIES  CHECK THE EXTENDED INTERACTIVE COMMANDS
17              ;       (036 TYPE) IN THE INTERACTIVE MODE. **I.E. READ SCREEN
18              ;       READ ATTRIBUTES, FILL UNPROTECTED FIELDS ETC.  THIS IS
19              ;       ACCOMPLISHED BY MAINTAINING A SCREEN IMAGE REFERRED TO
20              ;       AS SIMBF, THE HOST UPON ISSUING A COMMAND TO THE DISPLAY
21              ;       PERFORMS THE SAME FUNCTION TO SIMBF. THE DISPLAY DATA
22              ;       AND ATTRIBUTES ARE THEN READ AND STORED IN A
23              ;       BUFFER AT THE END OF THE PROGRAM REFERRED TO AS PRGEND.
24              ;       ATTRIBUTE BYTE IS STORED IN BITS 0-7 AND THE DATA BYTE
25              ;       IS STORED IN BITS 8-15 OF THE WORD FOR EACH CHARACTER
26              ;       POSITION ON THE SCREEN (1920.).  A COMPARISON IS MADE
27              ;       BETWEEN THE TWO BUFFERS (SIMBF + PRGEND) TO VERIFY THAT
28              ;       THE OPERATION WAS PERFORMED CORRECTLY.
29              ;
30              ;7.1D   THE BX SERIES TESTS CHECK THE SPECIAL EDITING COMMANDS
31              ;       IN BUFFERED MODE.  FOR THIS SERIES OF TESTS THE ENTIRE
32              ;       SCREEN IS FORMATTED WITH COL'S 0-19. AND 40.-59.
33              ;       DISPLAYING AN ASTERISK (*) WITH THE PROTECT ATTRIBUTE
34              ;       SET, COL'S 20.-39. AND 60.-79. DISPLAY THE MESSAGE
35              ;       "BUFFERED MODE TEST" WITHOUT THE PROTECT ATTRIBUTE SET.
36              ;       THESE COLUMN'S ARE REFERRED TO AS FIELDS.  THE SCREEN
37              ;       DISPLAY AND ATTRIBUTES ARE MAINTAINED IN A SCREEN
38              ;       IMAGE BUFFER (SIMBF).  WITH THE AID OF A SPECIAL DIAG-
39              ;       NOSTIC COMMAND SEQUENCE THE HOST CAN SEND SIMULATED
40              ;       KEYBOARD INPUT TO THE TERMINAL WHILE IN BUFFERED MODE.
41              ;       FOR ANY EDITING COMMAND ISSUED, THE SAME OPERATION IS
42              ;       PERFORMED BY THE HOST ON SIMBF.  UPON COMPLETION OF
43              ;       THE EDIT COMMAND THE HOST SETS THE TERMINAL TO
44              ;       INTERACTIVE MODE, THEN READS THE SCREEN DATA AND ATTR-
45              ;       IBUTES AND STORES THEM IN THE BUFFER CALLED PRGEND.
46              ;       A COMPARISON IS THEN MADE BETWEEN SIMBF AND PRGEND TO
47              ;       VERIFY THE RESULTS OF THE EDIT COMMAND PERFORMED.
48              ;*****************************************************************
49              ;       CONTROL-A
50              ;       *** NOTE!!!- THERE SHOULD BE NO KEYBOARD INPUT DURING
51              ;       THESE AUTOMATIC TESTS, EXCEPT THE CONTROL-A.  ANY OTHER
52              ;       KEYBOARD INPUT DURING THESE TESTS COULD CHANGE THE
53              ;       DESIRED TEST RESULTS.  THE CONTROL-A SEQUENCE ENTERED
54              ;       DURING THESE TESTS WILL START TESTING ON THE NEXT LINE
55              ;       IF RUNNING IN A MULTIPLE LINE CONFIGURATION, OTHERWISE
56              ;       THE RESTART ADDRESS MESSAGE WILL BE DISPLAYED.  THIS
57              ;       GIVES THE UPERTUR CONTROL TO RESTART AT ANY OF THE 5
58              ;       TEST'S.  *** IF THE DEVICE UNDER TEST IS THE PRIMARY
59              ;       CONSOLE THE KEYBOARD MAY BE LOCKED OUT AT VARIOUS TIMES
60              ;       DURING TESTING, IN WHICH CASE THE CONTROL-A MAY HAVE TO
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 0005 .MAIN
01                ;       BE ENTERED SEVERAL TIMES UNTIL THE KEYBOARD BECOMES FREE.
02                ;       AT THE END OF THE TESTS THE PASS # IS DISPLAYED
03                ;       (UNLESS SW2=1) AND THE AUTOMATIC TESTS ARE RESTARTED.
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!0006 .MAIN
01                ;7.2    SPECIAL DISPLAY TESTS (SA 501)
02                ;       ### FOLLOWING TESTS ARE RUN IN SEQUENCE AS DESCRIBED
03                ;       BELOW SO THAT FOLLOWING MAY BE USED AS A GUIDE FOR
04                ;       OPERATOR VERIFICATION. PROGRAM WAITS FOR THE OPERATOR
05                ;       TO SEQUENCE PROGRAM AFTER EACH TEST UNLESS IN AUTO
06                ;       MODE (SW7=1).
07                ;
08                ;7.2A   SP0= DISPLAY BELL SHOULD SOUND 5 TIMES.
09                ;
10                ;7.2B   SP1= SCREEN IS FILLED WITH THE ENTIRE CHARACTER SET IN
11                ;       A SHIFTING PATTERN.  THE PROGRAM THEN ERASES THE LAST 11
12                ;       CHAR'S OF LINE 1, THE LAST 14 CHAR'S OF LINE 2, THE LAST
13                ;       17 CHAR'S OF LINE 3, ETC. UNTIL ALL OF LINE 24 IS ERASED.
14                ;
15                ;7.2C   SP2= PROGRAM WRITES 48. LINES OF(SCREEN !NOT! IN ROLL
16                ;       MODE) WITH EACH LINE SHIFTED RIGHT 1 COL. SCREEN IS THEN
17                ;       CLEARED/PUT IN ROLL MODE AND 48. LINES OF(SCREEN IN ROLL
18                ;       MODE) ARE WRITTEN WITH EACH LINE SHIFTED AS BEFORE.
19                ;
20                ;7.2D   GRPHC= SCREEN DISPLAYS THE 32. GRAPHIC CHARACTERS, AFTER
21                ;       DISPLAYING ONE LINE (ROW) THE COL AND ROW ARE INCREM-
22                ;       ENTED AND THE NEXT LINE IS DISPLAYED THIS GIVES A
23                ;       DIAGONAL PATTERN.
24                ;
25                ;7.2E   CHRAT= THE MESSAGE CHAR. AND ATTRIBUTE TEST IS OUTPUT
26                ;       TO THE DISPLAY UNDER TEST, THE PROGRAM THEN WAITS FOR
27                ;       OPERATOR SELECTED ATTRIBUTES TO BE ENTERED VIA PRIMARY
28                ;       KEYBOARD(TTI).  IF ENTERING MULTIPLE ATTRIBUTES SEPARATE
29                ;       WITH SPACES OR COMMA'S.  IF A KEYBOARD IS NOT AVAILABLE
30                ;       THE PROCESSOR WILL HALT FOR THE ATTRIBUTES TO BE ENTERED
31                ;       VIA THE PANEL SWITCHES (0-5)/THEN DEPRESS CONTINUE.
32                ;       THE CHARACTER SET IS DISPLAYED WITH THE ATTRIBUTES
33                ;       SELECTED SWITCHED ON.  EACH NEW LINE THE FIRST CHAR-
34                ;       ACTER OF THE LINE IS INCREMENTED GIVING A SHIFTING (DIAG-
35                ;       ONAL) CHAR. PATTERN.  ATTRIBUTE VALUES ARE AS FOLLOWS:
36                ;
37                ;       0= NO ATTRIBUTES        3= REVERSE VIDEO
38                ;       1= BLOCK FILL           4= DIM
39                ;       2= BLINK                5= UNDERSCORE
40                ;
41                ;       FOLLOWING THIS TEST THE NEXT LINE # ENTERED WILL BE OPENED
42                ;       FOR TESTING IF USING AN ALM CONFIGURATION, OTHERWISE THE
43                ;       MESSAGE "RESTART ADDRESS-" WILL BE OUTPUT TO THE DISPLAY
44                ;       UNDER TEST, THE PROGRAM THEN WAITS FOR THE OPERATOR TO
45                ;       ENTER ONE OF THE STARTING ADDRESSES (500-504) VIA THE
46                ;       PRIMARY KEYBOARD (TTI).  IF A KEYBOARD IS NOT AVAILABLE
47                ;       SET THE PANEL SWITCHES TO THE DESIRED ADDRESS, DEPRESS
48                ;       START.
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10007 .MAIN
01
02              ;7.3    CHARACTER ECHO TEST (SA 502)
03              ;
04              ;       PROGRAM ECHO'S TO DISPLAY ANY PRINTABLE CHAR OR ANY
05              ;       DISPLAY CONTROL CHARACTER, WITH EXCEPTION OF CURSOR
06              ;       WRITE, READ, AND THE EXTENDED INTERACTIVE COMMANDS
07              ;       (036 TYPE) ENTERED BY THE OPERATOR VIA THE KEYBOARD.
08              ;
09              ;       A CONTROL-A WILL ABORT TESTING ON A GIVEN DISPLAY AND
10              ;       OPEN TESTING ON THE NEXT LINE NUMBER ENTERED, IF TESTING
11              ;       IN A MULTIPLE 4060 OR ALM CONFIGURATION. IF ONLY A
12              ;       SINGLE DISPLAY EXISTS THE TEST WILL BE
13              ;       ABORTED AND THE RESTART ADDRESS MESSAGE WILL BE
14              ;       OUTPUT TO THE DISPLAY UNDER TEST.  ANY ONE OF THE 5
15              ;       TESTS MAY BE SELECTED VIA THE PRIMARY KEYBOARD (TTI).
16              ;       IF A KEYBOARD IS NOT AVAILABLE USE PANEL SWITCHES.
17              ;
18              ;       A CONTROL-B PERFORMS 2 SPECIAL FUNCTIONS-
19              ;       THE FIRST ENTERED BEGINS STORING ALL CHARACTERS ENTERED
20              ;       IN A BUFFER. THE 2ND ENTERED CLOSES THE BUFFER AND
21              ;       STARTS THE FOLLOWING LOOP:
22              ;
23              ;       THE SCREEN IS CLEARED/ CURSOR RESET AND THE BUFFER
24              ;       IS OUTPUT TO THE DISPLAY FOLLOWED BY A 2 SEC. DELAY. THE
25              ;       OPERATION IS REPEATED INDEFINATELY. ANY KEYBOARD INPUT
26              ;       DURING THE LOOP WILL ABORT THE LOOP AND RETURN CONTROL
27              ;       TO THE NORMAL ECHO PROGRAM.
28              ;
29              ;
30              ;7.4    OCTAL CHARACTER ECHO TEST (SA 503)
31              ;
32              ;       PROGRAM ECHO'S BACK OCTAL DUMP OF CHARACTERS INPUT VIA
33              ;       THE KEYBOARD FOLLOWED BY A CR-LF. IF AN RS-FUNCTION CHAR
34              ;       IS INPUT (2 BYTES), 2 BYTES ARE DUMPED SEPARATED BY
35              ;       A COMA. ## PROGRAM IS INTENDED FOR USE IN VERIFICATION
36              ;       OF NON-PRINTABLE CONTROL INPUTS VIA THE KEYBOARD.
37              ;
38              ;       A CONTROL-A WILL ABORT TESTING ON A GIVEN DISPLAY AND
39              ;       OPEN TESTING ON THE NEXT LINE NUMBER ENTERED, IF TESTING
40              ;       IN A MULTIPLE 4060 OR ALM CONFIGURATION. IF ONLY A
41              ;       SINGLE DISPLAY EXISTS THE TEST WILL BE ABORTED
42              ;       AND THE RESTART ADDRESS MESSAGE WILL BE OUTPUT TO
43              ;       THE DISPLAY UNDER TEST.  ENTER ONE OF THE STARTING
44              ;       ADDRESSES (500-504) VIA THE KEYBOARD IF AVAILABLE OR
45              ;       USE THE PANEL SWITCHES TO RESTART.
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10008 .MAIN
01              ;7.5    SERIAL PRINTER OPTION TEST (SA 504)
02              ;
03              ;       PROGRAM WAITS FOR OPERATOR TO SEQUENCE AFTER EACH
04              ;       TEST, UNLESS IN AUTO MODE (SW7=1).
05              ;
06              ;7.5A   THE SCREEN IS CLEARED AND THE MESSAGE -PRINTER TEST-
07              ;       IS DISPLAYED ON LINE 24., THEN PRINTED 4 TIMES ON
08              ;       THE PRINTER.
09              ;
10              ;7.5B   THE PROGRAM GENERATES 4 TWO CHAR SCREEN DISPLAYS AS
11              ;       FOLLOWS:
12              ;
13              ;       1.      U*U*U* ETC.
14              ;       2.      *U*U*U ETC.
15              ;       3.      ?@?@?@ ETC.
16              ;       4.      @?@?@? ETC.
17              ;       AFTER EACH DISPLAY IS GENERATED THE PAGE IS PRINTED.
18              ;
19              ;7.5C   THE SCREEN IS FILLED WITH A ROTATING CHAR. SET AND
20              ;       THEN PRINTED 2 TIMES
21              ;
22              ;7.5D   THE DISPLAY AS DESCRIBED IN 7.2B IS GENERATED. THE
23              ;       ENTIRE DISPLAY IS PRINTED FOLLOWED BY THE BOTTOM 2 LINES,
24              ;       THEN THE BOTTOM 13. LINES AS THE CURSOR IS LOADED TO
25              ;       ROWS 0,21., AND 10. RESPECTIVELY. THE COLUMN LOADED
26              ;       IS 16(OCT) WHICH SHOULD BE IGNORED BY THE PRINTER.
27              ;
28              ;7.5E   A DIAGONAL OF A'S IS GENERATED THEN PRINTED. EACH (A)
29              ;       IS BUMPED 1 ROW AND 3 COLUMNS TO THE RIGHT OF THE
30              ;       PRECEDING (A).
31              ;
32              ;7.5F   A DISPLAY OF 24. LINES, EACH CONTAINING A SINGLE CHAR.
33              ;       (STARTING WITH (A) AND BUMPED 1 WITH EACH NEW LINE)
34              ;       IS GENERATED THEN PRINTED.
35              ;
36              ;7.5G   A DISPLAY CONSISTING OF 6 (40. CHARACTER LINES OF ALL
37              ;       A'S,B'S -F'S) EACH FOLLOWED BY 3 BLANK LINES IS
38              ;       GENERATED THEN PRINTED.
39              ;
40              ;7.5H   2 DISPLAY'S ARE GENERATED, THE FIRST IS A FULL
41              ;       SCREEN WITH A ROTATING CHAR. SET AND THE CHAR'S IN
42              ;       COL'S 20.-59. ARE DIMMED.  THE PRINT FORM COMMAND (001)
43              ;       IS GIVEN, THE DIMMED COL'S SHOULD NOT BE PRINTED. THE
44              ;       2ND DISPLAY GENERATED IS THE REVERSE OF THE FIRST WITH
45              ;       COL'S 0-19. AND 60.-79. DIMMED, AGAIN THE PRINT FORM
46              ;       COMMAND IS GIVEN AND THE DIMMED CHAR'S SHOULD NOT BE
47              ;       PRINTED.  WITH THE SAME DISPLAY THE PRINT COMMAND IS
48              ;       ISSUED (021), ALL CHAR'S ARE PRINTED (DIM AND NON-DIM).
49              ;
50              ;7.5I   THIS TEST CHECKS THE ABILITY OF THE TERMINAL TO OUTPUT
51              ;       A STRING OF CHAR'S TO THE PRINTER WITHOUT AFFECTING
52              ;       THE SCREEN DISPLAY.  THE SCREEN IS FILLED WITH THE
53              ;       CHAR SET., EACH LINE THE FIRST CHAR IS INCREMENTED BY
54              ;       ONE PRODUCING A SHIFTING (DIAGONAL) PATTERN.  10.
55              ;       LINES ARE PRINTED EACH CONSISTS OF 40. 1'S FOLLOWED BY
56              ;       40. 2'S.  EACH LINE IS FOLLOWED BY A BLANK LINE.
57              ;       AFTER THIS A FORM FEED SHOULD BE PERFORMED AND 20.
58              ;       LINES ARE PRINTED CONTAINING 80. CHAR'S
59              ;       EACH OF ALL 3'S.
60              ;
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 0009 .MAIN
01              ;       THE RESTART ADDRESS MESSAGE IS DISPLAYED AFTER
02              ;       THIS TEST UNLESS RUNNING ALM OR 4060, IN WHICH CASE
03              ;       TESTING WILL CONTINUE ON THE NEXT LINE #.
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10010 .MAIN
01              ;8. OPERATING MODES/SWITCH SETTINGS
02              ;
03              ;8.1    STARTING ADDRESSES
04              ;       4       RELOAD PARAMETERS VIA SWITCHES/JMP TO 500
05              ;       6       INITIALIZE PROGRAM PARAMETERS VIA A TTY (4010)
06              ;               (SEE SW2 OPT. FOR TTY DISABLE AND 9,3)
07              ;               ***4010 PACKAGE ASSUMES MARK OR NO PARITY
08              ;               ***FOR PROGRAM INITIALIZATION.
09              ;
10              ;       200     SAME AS STARTING ADDRESS 6
11              ;       500     AUTOMATIC DIAGNOSTIC/EXERCISER TESTS
12              ;       501     SPECIAL DISPLAY TESTS
13              ;       502     CHARACTER ECHO TEST (WITH KEYBOARD)
14              ;       503     OCTAL CHARACTER ECHO TEST (WITH KEYBOARD)
15              ;       504     SERIAL PRINTER OPTION TESTS
16              ;
17              ;8.11   DISCRETE (SWITCH OR SWREG) SELECTIONS
18              ;
19              ;       SW0=1   USE KEYBOARD INPUTS TO CONTROL
20              ;               SWITCH(SWREG) SELECTIONS -SEE 8.12
21              ;       SW1=1   PROCEED FROM ERROR LOOP
22              ;       SW2=1   DISABLE TTY(4010) MONITER OUTPUT
23              ;               SW2 SHOULD NORMALLY BE 0
24              ;       SW3=1   PRINT FAILURE RATE
25              ;       SW5=1   OUTPUT ERROR OUTPUT TO LPT
26              ;       SW6=1   HALT ON ERROR
27              ;       SW7=1   PUT PROGRAM IN AUTO MODE
28              ;               OPERATOR RESPONSE REPLACED BY
29              ;               A 2 SECOND DELAY.  ONLY APPLICABLE FOR
30              ;               SPECIAL DISPLAY TESTS (SA 501)
31              ;               AND PRINTER TESTS (SA 504).
32
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10011 .MAIN
01              ;8.12  KEYBOARD OPTIONS (IF PRESENT)
02              ;
03              ;8.12A          IF A KEYBOARD IS PRESENT, THE PANEL SWITCHES
04              ;               MAY BE REPLACED BY A SOFTWARE REGISTER
05              ;               CONTROLLED BY THE KEYBOARD VIA THE FOLLOWING
06              ;               PROCEDURE.
07              ;
08              ;               AN ESCAPE KEY IS HIT AT ONE OF THE FOLLOWING
09              ;               TIMES.
10              ;
11              ;               AT PROGRAM STARTUP AFTER MESSAGE
12              ;               =SET SWREG AS PER 8.11,8.12 = TO 1ST DISPLAY
13              ;
14              ;               AFTER AN ABORT(C^=A) WHILE A MANUAL TEST
15              ;               IS IN PROGRESS.  A (C^=A) IN THE AUTOMATIC TEST
16              ;               WILL ABORT TO THE RESTART MESSAGE OR BEGIN
17              ;               TESTING ON THE NEXT LINE IF ALM.
18              ;
19              ;               OR WHEN A VISUAL TEST HAS COMPLETED AND IS
20              ;               REQUIRING AN OPERATOR RESPONSE.
21              ;
22              ;               AFTER THE ESCAPE KEY IS ENTERED, THE FOLLOWING
23              ;               KEYS ARE INTERPRETED AS FOLLOWS:
24              ;
25              ;8.12B          M =PRINT CONTENTS OF SWREG IN OCTAL
26              ;               K =ZERO CONTENTS OF SWREG
27              ;               0=9 =COMPLIMENT STATE OF SWITCH VALUE 0=9
28              ;               L =RESTART PROGRAM AT LOC 6 (TTY INITIALIZE)
29              ;
30              ;               ANOTHER CONTROL=A WILL EXIT TEST AND A CARRIAGE
31              ;               RETURN OR NEWLINE WILL RESULT IN NORMAL PROGRAM
32              ;               SEQUENCING.
33              ;
34              ;               ***FOR PROGRAM TO INTERPRET (SWREG) AS THE
35              ;               SWITCH VALUES, SW0 MUST BE SET TO 1, OTHERWISE
36              ;               PROGRAM WILL MONITER PANEL SWITCHES FOR CONTROL.
```

```
10012 .MAIN
01
02              ;8.12C          OPERATOR RESPONSES TO VISUAL DISPLAYS (501)
03              ;               AND PRINTER TESTS (SA 504)
04              ;
05              ;***************************************************
06              ;               CONTROL=A  EXIT THIS TEST
07              ;               IF THE ABORT KEY IS ENTERED WHILE A VISUAL
08              ;               TEST (SA 501,504) IS IN PROGRESS, THE C^=A
09              ;               MUST BE FOLLOWED BY A SECOND CHARACTER AS THE
10              ;               PROGRAM IS OPEN TO SWREG CONTROL. IE. AN ESCAPE
11              ;               SEQUENCE MAY BE ENTERED ,ANOTHER C^=A OR CR WILL
12              ;               EXIT TEST, AND ANYTHING ELSE WILL RESULT IN AN
13              ;               ERROR RETURN.
14              ;
15              ;***************************************************
16              ;
17              ;               A CARRIAGE RETURN OR NEWLINE WILL RESULT IN
18              ;               NORMAL PROGRAM SEQUENCING.
19              ;
20              ;               ANYTHING ELSE RESULTS IN AN ERROR RETURN
21              ;               AND ERROR LOOP. IF SW6=1 (HALT ON ERROR)
22              ;               PROGRAM !WILL! HALT ON OPERATOR DEFINED ERROR.
23              ;               TO PLACE IN CONTINUOUS ERROR LOOP, SW7 MUST
24              ;               BE SET WITH SW1=0. TO EXIT LOOP, SET SW1=1
25              ;               OR HIT CONTROL=A.
26              ;
27              ;               ## IF KEYBOARD NOT PRESENT
28              ;               HIT CONTINUE WITH SW1=1 FOR NORMAL CONTINUE
29              ;               SW1=0 FOR ERROR RETURN.
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```
!0013 .MAIN
01
02              ;9. OPERATING PROCEDURE/OPERATOR INPUT
03              ;
04              ;9.1    VERIFY THAT THE INTERFACE IS INSTALLED PROPERLY
05              ;       AND ALL THE EXTERNAL CONNECTIONS BETWEEN THE
06              ;       COMPUTER AND THE DISPLAY CHASSIS ARE PROPERLY
07              ;       SECURED. LOAD THE PROGRAM VIA THE BINARY LOADER.
08              ;       SET THE SWITCHES TO STARTING ADDRESS AND PRESS START.
09              ;       IF LOADED BY DTOS CONTROL IS AUTOMATICALLY
10              ;       PASSED TO LOC. 200 FOR TTY (4010) INITIALIZATION.
11              ;
12              ;9.2    IF THIS IS THE INITIAL PASS OF THE PROGRAM (AFTER
13              ;       BEING LOADED) THE PROGRAM WILL REQUIRE THESE
14              ;       FOLLOWING DATA: A) TYPE OF PARITY BEING USED,
15              ;       SELECTING EITHER ODD, EVEN, OR NO PARITY(MARKED), B)THE
16              ;       TYPE #(SEE 9.3) OF THE INTERFACE ASSEMBLY INSTALLED
17              ;       IN THE COMPUTER WHICH WILL BE DRIVING THE DISPLAY,
18              ;       C)THE DEVICE CODE # OF THE INTERFACE ASSEMBLY,
19              ;       WHETHER KEYBOARD IS PRESENT AND FINALLY
20              ;       D)THE # OF THE LINE OR CHANNEL
21              ;       THAT THE DISPLAY IS CONNECTED TO(NOT
22              ;       APPLICABLE IF TYPE 4010 INTERFACE ASSEMBLY
23              ;       IS INSTALLED).
24
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```
!0014 .MAIN
01
02              ;9.3    TTY INITIALIZATION (4010) FOR SA 6 OR 200
03              ;       *** ANSWER FOLLOWING QUESTIONS
04              ;
05              ;DEVICE CODE, INTERFACE-                DEVICE CODE = 10-76(8)
06              ;                                       INTERFACE- 0= ALM
07              ;                                       10= 4010
08              ;                                       60= 4060
09              ;
10              ;IF NOT AN ALM-
11              ;PARITY (0-2)                           0= MARKED (ALWAYS 1)
12              ;                                       1= ODD
13              ;                                       2= EVEN
14              ;
15              ;IF AN ALM-
16              ;MICRO NOVA (0=NO 1=YES)?-              0 OR 1
17              ;
18              ;       IF MICRO NOVA ALM-
19              ;       ALM BAUD RATE =                 ENTER RATE IN DEC.
20              ;       PARITY (0-2)-                   0=NONE, 1=ODD, 2=EVEN
21              ;
22              ;       IF COMBO MUX ALM-
23              ;       ALM PARITY (0-2),CLOCK (0-3)-   EX: 2,0 INDICATES
24              ;                                       EVEN PARITY AT 9600
25              ;                                       WHERE: PARITY=
26              ;                                       0=NONE 1=ODD 2=EVEN
27              ;                                       CLOCK= AS FOLLOWS:
28              ;
29              ;       CLOCK           BAUD            JUMPERS
30              ;       0               9600            FIXED
31              ;       1               600             FIXED
32              ;       2               4800            W3
33              ;       2               1800            W5
34              ;       2               1200            NONE
35              ;       3               2400            W4,W6
36              ;       3               300             W6
37              ;       3               150             W4
38              ;       3               110             NONE
39              ;
40              ;KEYBOARD ? (1-YES, 0-NO)               0 OR 1
41              ;
42              ;ALM OR 4060 LINE #'S                   UP TO 16. OCTAL #'S
43              ;                                       SEPARATE #'S WITH COMMA'S
44              ;
45              ;**NOTE- IF RUNNING ON MULTIPLE ALM LINES, ALL LINES
46              ;MUST HAVE SAME CLOCK AND PARITY.
47              ;
48              ;STARTING ADDRESS -                     500-504
49              ;
50              ;FOLLOWING STARTING ADDRESS INPUT, AND PROVIDING A
51              ;KEYBOARD IS INDICATED, THE MESSAGE -SET SWREG AS PER
52              ;8.11.8.12- SHOULD APPEAR TO THE FIRST TEST DISPLAY.
53              ;OTHERWISE THE PROGRAM WILL HALT TO ALLOW THE PANEL
54              ;SWITCH SETTINGS.  ABOVE SHOULD OCCUR ALSO ON ANY
55              ;PROGRAM START WITH NO INITIALIZATION.
56              ;
57              ;IF SA IS OTHER THAN 6 OR 200 PROGRAM WILL ENTER A SERIES OF
58              ;HALTS FOR THE FOLLOWING INFORMATION TO BE ENTERED VIA
59              ;THE SWITCHES
```

```
!0015 .MAIN
01              ;#### 1ST PROGRAM HALT ####
02              ;9.4    THE PROGRAM WILL HALT AFTER AN INITIAL START
03              ;       IN SUBROUTINE .ISWT IF THE SPECIFICATION DATA
04              ;       HAS NOT BEEN ENTERED. ENTER THE FIRST WORD OF
05              ;       THE REQUIRED DATA INTO THE COMPUTER CONSOLE
06              ;       SWITCHES USING THE FORMAT SHOWN BELOW....
07              ;
08              ;*********************************************************
09              ;NOTE, IF U=NOVA AND OR THE READS RESULT
10              ;IS A 177777 (ALL 1'S), A DIAC N,4 WILL
11              ;FOLLOW TO ALLOW HAND-HELD U=NOVA CONSOLE
12              ;TO BE USED FOR PROGRAM INITIALIZATION. SAME
13              ;WORD FORMAT IS USED. FOR SWITCH CONTROL, LOC 65 (SWREG)
14              ;SHOULD BE LOADED AS PER 8.11 FORMAT.
15              ;*********************************************************
16              ;
17              ;       0   1 2 3    4 5 6   7 8 9   10 11 12   13 14 15
18              ;       K   U P P    I I I   I I I   D  D  D    D  D  D
19              ;
20              ;
21              ;       WHERE:  K=1 IF KEYBOARD IS PRESENT, 0 OTHERWISE
22              ;
23              ;               U= UNUSED
24              ;
25              ;               P= PARITY; 0 FOR MARKED (NONE), 1 FOR ODD
26              ;                  2 FOR EVEN
27              ;
28              ;               I= LAST 2 OCTAL DIGITS OF INTERFACE TYPE #
29              ;                  ENTER 10 FOR 4010, 4075, OR 4077
30              ;                  ENTER 60 FOR 4060
31              ;                  ENTER 0 FOR ANY ALM INTERFACE
32              ;
33              ;               D= 2 DEVICE CODE OCTAL DIGITS (EVEN #
34              ;                  DEVICE CODE IF INTERFACE IS A 4010 TYPE).
```

```
!0016 .MAIN
01              ;### 2ND PROGRAM HALT
02              ;9.4A   AFTER THE SWITCHES HAVE BEEN SET UP
03              ;       PRESS CONTINUE.  THE PROGRAM WILL
04              ;       HALT AGAIN FOR THE ALM PARAMETERS (IF ALM)
05              ;       AND THE MUX LINE NUMBERS(IF ALM OR 4060) IN
06              ;       BITS 1-7.
07              ;
08              ;       UPON PROGRAM HALT, ENTER DATA AS PER FORMAT BELOW.
09              ;       IF 4010, JUST HIT CONTINUE.
10              ;
11              ;       0  1 2 3  4 5 6  7 8 9  10 11 12  13 14 15
12              ;       M  L L L  L L L  L C C  S  S  D   D  P  P
13              ;
14              ;       IF ALM BITS 8-15 ARE DESCRIBED AS FOLLOWS:
15              ;               C=      0-3 FOR CLOCKS 0-3 OF ALM BOARD
16              ;               S=      0,1 FOR 1 OR 2 STOP BITS
17              ;               D=      0-3 FOR 5-8 BIT CODE LEVELS EXCLUDING
18              ;                       PARITY
19              ;               P=      0-2 FOR NO,ODD, OR EVEN PARITY
20              ;                       RESPECTIVELY
21              ;
22              ;       THE L BITS FORM THE 7 BIT LINE NUMBER IF THE ALM OR 4060
23              ;       IS USED. OTHERWISE THE BITS ARE A DON'T CARE.
24              ;       IF BIT 0(M) IS SET, MORE 4060 LINES ARE INDICATED AND
25              ;       THE PROGRAM WILL HALT AGAIN FOR ANOTHER LINE NUMBER
26              ;       IN THE L BITS. IF MORE LINES ARE DESIRED (UP TO 8) ,
27              ;       SET BIT 0 AGAIN.
28              ;
29              ;       ##NOTE- ALM LINE #'S ARE RESTRICTED TO 7 BITS
30              ;       AND ALL ALM LINES MUST HAVE THE SAME LINE
31              ;       CHARACTERISTICS AS ENTERED IN THE SWITCHES.
32              ;
33              ;
34              ;9.4B   AFTER ALL CONFIGURATION INFORMATION HAS BEEN
35              ;       ENTERED AND PROVIDING A KEYBOARD HAS BEEN
36              ;       INDICATED, THE MESSAGE -SET SWREG AS PER
37              ;       8.11,8.12- SHOULD APPEAR TO THE FIRST TEST
38              ;       DISPLAY.(SEE 8.11,8.12) OTHERWISE THE PROGRAM
39              ;       WILL HALT AGAIN TO ALLOW SWREG TO BE
40              ;       SET FROM THE PANEL SWITCHES 0-7 (SEE 8.11 FOR
41              ;       SWITCH MEANING), AFTER SETTING THE SWITCHES
42              ;       DEPRESS CONTINUE.
```

```
!0017 .MAIN
01              ;10.0 PROGRAM OUTPUT/ERROR DESCRIPTION
02              ;
03              ;10.1   PROGRAM DETECTED ERRORS
04              ;
05              ;       ANY PROGRAM DETECTED ERROR WILL RESULT IN A
06              ;       PROGRAM HALT !UNLESS SW6 =0!
07              ;       AC3 WILL CONTAIN THE ERROR PC
08              ;       AC'S 0-2 WILL CONTAIN VALUES AT THE POINT OF ERROR
09              ;       THE OPERATOR SHOULD THEN CHECK LISTING AT THE
10              ;       ERROR PC FOR SIGNIFICANCE OF THE ACCUMULATORS.
11              ;*****************************************************
12              ;       NOTE-EHALT CALLS WITH XMIT OR RECV'R TIMEOUT GIVEN AS
13              ;       ERROR CONDITION MAY ALSO BE THE RESULT OF AN
14              ;       UNDEFINED INTERRUPT. IN WHICH CASE, AC0=INTA EXPECTED,
15              ;       AC1 =INTA RECV'D AND AC2 =NIOC XX(XX=INTA VALUE)
16              ;       IF A MONITER DEVICE IS IN USE(SW2=0 OR SW5=1) AN
17              ;       UNDEFINED INTERRUPT MESSAGE WILL RESULT.
18              ;*********************************************************
19              ;       IF A MONITER DEVICE IS IN USE (SW2=0 OR SW5=1), THE
20              ;       PC AND ACCUMULATOR VALUES MAY BE OUTPUT TO LPT OR 4010.
21              ;
22              ;       UPON HITTING CONTINUE, PROGRAM WILL EITHER STAY IN
23              ;       AN ERROR LOOP (SW1=0) BETWEEN CALLS
24              ;       SETUP AND LOOP OR CONTINUE TO NEXT TEST (SW1=1)
25
```

```
!0018 .MAIN
01              ;10.2   OPERATOR SEQUENCING AND ERROR DETECTION
02              ;
03              ;       IN THE VISUAL DISPLAY TESTS AND THE PRINTER TEST
04              ;       THE OPERATOR IS REQUIRED TO SEQUENCE THE PROGRAM
05              ;       AFTER THE COMPLETION OF EACH PATTERN UNLESS THE
06              ;       PROGAM IS IN AUTO MODE (SW7=1).  HOWEVER PROGRAM
07              ;       MAY STILL DETECT AND HALT ON TRANSMIT TIMEOUT
08              ;       ERRORS DURING VISUAL TESTS.  IF MANUAL MODE IS IN
09              ;       EFFECT THE OPERATOR OPTIONS ARE AS FOLLOWS:
10              ;
11              ;10.2A  NO KEYBOARD
12              ;
13              ;       UPON COMPLETION OF EACH COMPLETE PATTERN THE PROGRAM
14              ;       WILL HALT. THE OPERATOR THEN PRESSES CONTINUE
15              ;       WITH SW1=1 IF HE WANTS THE PROGRAM TO PROCEED
16              ;       NORMALLY OR WITH SW1=0 IF AN ERROR LOOP IS DESIRED.
17              ;
18              ;10.2B  KEYBOARD OPTIONS
19              ;
20              ;       UPON COMPLETION OF EACH PATTERN THE PROGRAM WAITS
21              ;       FOR A KEYBOARD INPUT WITH FOLLOWING OPTIONS:
22              ;
23              ;       CONTROL-A  EXIT THIS TEST (** SEE 8.12C **)
24              ;
25              ;       ESCAPE  SEE 8.12A,B
26              ;
27              ;       A CARRIAGE RETURN WILL RESULT IN A NORMAL PROCEED.
28              ;
29              ;       ANYTHING ELSE WILL RESULT IN AN ERROR
30              ;       RETURN AND PROGRAM HALT,IF SW6=1. IF AN ERROR
31              ;       LOOP IS DESIRED SW1=0. UNLESS SW7=1, THE PROGRAM WILL
32              ;       WAIT FOR OPERATOR SEQUENCING DURING ERROR LOOP.
33              ;       USE SW1=1 TO EXIT LOOP OR CONTROL-A.
34              ;
35              ;10.2C  IF PROGRAM IS IN AUTO MODE (SW7=1) EACH OPERATOR
36              ;       RESPONSE IS REPLACED BY A 2 SEC DELAY.
```

```
!0019 .MAIN
01              ;11. DEBUG HELP
02              ;
03              ;11.1 SUBROUTINES AND CALLS
04              ;
05              ;       OUTPUT CHARACTER IN AC1 VIA INTERFACE
06              ;CALL   OUT1
07              ;       RETURN 1        INTERRUPT TIMEOUT OR
08              ;                       UNDEFINED INTERRUPT(SEE 10.1)
09              ;       RETURN 2        NORMAL
10              ;
11              ;       WAIT FOR INTERRUPT
12              ;CALL   IWAIT
13              ;       RETURN 1        INTERRUPT TIMEOUT OR
14              ;                       UNDEFINED INTERRUPT(SEE 10.1)
15              ;       RETURN 2        NORMAL RETURN
16              ;                       IF TRANSMIT DONE, AC1 =40000
17              ;                       IF RECV'R DONE AC1=BIT0+CHAR IN
18              ;                       BITS 8-15
19              ;
20              ;       OUTPUT CHARACTER ADDRESSED BY ARG1, ARG2 TIMES
21              ;CALL   COUT1
22              ;       ARG1            ADDRESS OF CHARACTER
23              ;       ARG2            # OF TIMES TO OUTPUT
24              ;       RETURN 1        INTERRUPT TIMEOUT (AC0=# RECV'D) OR
25              ;                       UNDEFINED INTERRUPT (SEE 10.1)
26              ;       RETURN 2        NORMAL
27
28              ;       OUTPUT A MESSAGE VIA THE INTERFACE
29              ;CALL   MESGR
30              ;       ARG1            BYTE POINTER TO MESSAGE
31              ;       RETURN 1        INTERRUPT TIMEOUT (AC0=# RECV'D) OR
32              ;                       UNDEFINED INTERRUPT (SEE 10.1)
33              ;       RETURN 2        NORMAL
34
35              ;       SET UP LOOP RETURN FROM ERROR HANDLER
36              ;CALL   ADDSET
37              ;       ARG1            ADDRESS OF LOOP CALL
38              ;       RETURN 1        NORMAL RETURN
39
40              ;       OUTPUT LOAD CURSOR COMMAND FOLLOWED BY 2 BYTES (ARG1)
41              ;       DEFINING CURSOR POSITION.
42              ;CALL   CURL
43              ;       ARG1            COL BITS 0-7, ROW BITS 8-15
44              ;       RETURN 1        INTERRUPT TIMEOUT(AC0 =# RECV'D) OR
45              ;                       UNDEFINED INTERRUPT (SEE 10.1)
46              ;       RETURN 2        NORMAL
47
48              ;       OUTPUT READ CURSOR COMMAND, PROCESS THE 3 INPUTS FROM
49              ;       THE DISPLAY DEFINING THE POSITION, AND CHECK AGAINST ARG1.
50              ;CALL   CURR
51              ;       ARG1            EXPECTED COL(BITS 0-7) AND ROW (BITS 8-15)
52              ;       RETURN 1        INTERRUPT TIMEOUT (AC0 =# RECV'D) OR
53              ;                       UNDEFINED INTERRUPT (SEE 10.1)
54              ;       RETURN 2        RECV'R INTERRUPT TIMEOUT (AC0 =# RECV'D)
55              ;       RETURN 3        ALM STATUS ERROR (AC0=RECV'R STATUS)
56              ;       RETURN 4        PARITY ERROR (AC1 SHOULD =AC0)
57              ;       RETURN 5        AC1 (1ST CHAR BACK) SHOULD=37
58              ;       RETURN 6        COL/ROW ERROR, AC1 SHOULD =AC0
59              ;       RETURN 7        NORMAL RETURN
```

```
!0020 .MAIN
01
02              ;MACRO CALL     .CK8FX  ARG1
03              ;
04              ;       CPR8F           COMPARE SIM8F TO PRGEND
05              ;       ARG1            # OF WORDS TO COMPARE.
06              ;       RETURN 1        COMPARISON ERROR, AC0= WORD FROM SIM8F
07              ;                       (GOOD) AC1= WORD FROM PRGEND (BAD)
08              ;                       AC2= OCTAL # OF WORD UPON ERROR (1-3600)
09              ;                       I.E. WORD 1= COL 0 ROW 0 COL'S ARE
10              ;                       NUMBERED 0-79., ROW'S 0-23. TO
11              ;                       INTERPRET OCTAL # AS COL/ROW COORDINATES
12              ;                       CONVERT OCTAL # TO DECIMAL AND DIVIDE
13              ;                       BY 80. QUOTIENT= ROW REMAINDER-1= COL.
14              ;
15              ;       RETURN 2        NORMAL
16              ;
17              ;
18
19                      .EOT
```

```
 0021 .MAIN
**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS
```