Data General

TECHNICAL STATEMENT

TEXT LISTING

068-000219-03

PROGRAM

8K VIDEO DISPLAY TEST

TEXT TAPE

097-000219-03

ABSTRACT

THE NOVA 6012 VIDEO DISPLAY DIAGNOSTIC PROGRAM CONTAINS FIVE SEPARATE TEST PROGRAMS DESIGNED TO FACILITATE CHECKOUT AND EVALUATION OF THE OPERATION OF THE 6012 DISPLAY.

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 0001 .MAIN    MACRO REV 06.30          14:54:12 02/14/79
01
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03
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05
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07              ;*************************************************************
08              ;
09              ; NAME: 8VDTST.TX                          PART NUMBER: 097-000219
10              ;
11              ;
12              ; DESCRIPTION: 8K VIDEO DISPLAY TEST
13              ;
14              ;
15              ; REVISION HISTORY:
16              ;
17              ;       REV.            DATE
18              ;
19              ;       00              10/04/74
20              ;       01              06/20/75
21              ;       02              10/15/75
22              ;       03              04/30/76
23
24              ;
25              ; COPYRIGHT (C) DATA GENERAL CORPORATION, 1974, 1975,1976
26              ; ALL RIGHTS RESERVED.
27              ;*************************************************************
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!0002 .MAIN
01              ;       NOVA 6012 DISPLAY DIAGNOSTIC (8K)
02
03
04
05
06
07              ;1.     ABSTRACT
08              ;       THE NOVA 6012 VIDEO DISPLAY DIAGNOSTIC PROGRAM
09              ;       CONTAINS FIVE SEPARATE TEST PROGRAMS DESIGNED TO
10              ;       FACILITATE CHECKOUT AND EVALUATION OF THE OPERATION
11              ;       OF THE 6012 DISPLAY.  THE MAIN TEST PROGRAM IS
12              ;       THE 6012 DIAGNOSTIC WHICH PROVIDES A SEQUENCE
13              ;       OF AUTOMATIC TESTS.  THE OTHER AUTOMATIC TEST
14              ;       PROGRAM IS THE VISUAL DISPLAY TEST WHICH CON-
15              ;       TINUOUSLY FILL THE SCREEN WITH REPEATING SEQUENCES
16              ;       OF THE CHARACTER SET.  CHARACTERS ARE ROTATED
17              ;       IN ORDER OF APPEARANCE AS EACH FRAME OF CHARACTERS
18              ;       IS WRITTEN.  THE OTHER THREE TESTS UNDER MANUAL
19              ;       CONTROL ARE: A VISUAL DISPLAY OF A FULL SCREEN
20              ;       OF A SINGLE CHARACTER FROM THE CHARACTER SET,
21              ;       CHARACTER ECHO IN THE (PAGE) BUFFER MODE, AND
22              ;       FINALLY CHARACTER ECHO IN THE ROLL MODE.
23              ;       THIS DIAGNOSTIC IS A FOREGROUND/BACKGROUND TYPE.
24              ;       COMMUNICATION WITH THE DISPLAY IS INITIATTED BY
25              ;       THE INPUT AND OUTPUT ROUTINES IN THE FOREGROUND
26              ;       AND IS HANDLED TO COMPLETION IN THE BACKGROUND
27              ;       UNDER INTERRUPT CONTROL.THIS MEANS THAT THE FIRST
28              ;       CHARACTER TO BE TRANSMITTED TO THE SCREEN FROM
29              ;       THE ASSIGNED BUFFER IS SENT OUT VIA THE OUTPUT
30              ;       ROUTINE AFTER WHICH CONTROL IS TURNED OVER TO THE
31              ;       INTERRUPT HANDLER TO COMPLETE THE TRANSMISSION.
32              ;       DATA TRANSMITTED FROM THE SCREEN TO THE CPU IS
33              ;       HANDLED THE SAME WAY EXCEPT USING THE INPUT
34              ;       ROUTINE TO INITIATE THE TRANSFER.
35
36
37
38              ;2.     PREREQUISITES
39              ;2.1            IMPORTANT
40              ;       ********************************************
41              ;       *  THIS TEST CAN ONLY BE RUN WITH THE      *
42              ;       *  "BUFFERED, PAGE, ROLL" SWITCH SET TO    *
43              ;       *  THE PAGE POSITION.                      *
44              ;       ********************************************
45
46              ;2.2    THE NOVA 6012 DISPLAY MAY BE DRIVEN BY ANY
47              ;       DATA GENERAL TYPE ASYNCHRONOUS
48              ;       INTERFACE ASSEMBLY; SUCH AS TYPE 4010, OR TYPE
49              ;       4060. A SEQUENCE OF AT LEAST TWO SUCCESSFUL PASSES
50              ;       THROUGH THE DIAGNOSTIC PROGRAM FOR THE PARTICULAR
51              ;       INTERFACE INSTALLED IS A MANDATORY PREREQUISITE
52              ;       FOR THIS PROGRAM. PERFORM ALL SPECIFIED TESTS
53              ;       AND PROCEDURES FOR THE INTERFACE ASSEMBLY AND
54              ;       VERIFY THAT THE INTERFACE IS FULLY OPERATIONAL
55              ;       BEFORE PERFORMING THE PROCEDURES AND TESTS
56              ;       COMPRISING THE 6012 DIAGNOSTIC.
57
58              ;2.3    BILATERAL BAUD REQUIREMENT
59              ;2.4    IT IS NECESSARY TO VERIFY THAT THE DISPLAY
60              ;       AND THE INTERFACE ARE SET TO OPERATE AT THE
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 0003 .MAIN
01                ;       SAME BAUD RATE. VERIFY AND NOTE
02                ;       THE OPERATIONAL BAUD RATE OF THE INTERFACE
03                ;       CONTROLLER(4010 OR 4060). REMOVE THE DISPLAY
04                ;       HOUSING COVER AND VERIFY THAT THE BAUD RATE
05                ;       SELECTION SWITCH IS SET TO SELECT THE CORRESP-
06                ;       ONDING BAUD RATE.
07
08                ;3.     MACHINE REQUIREMENTS
09                ;3.1    NOVA (EXCEPT MICRO NOVA) OR ECLIPSE PROCESSOR
10                ;3.2    8K READ/WRITE MEMORY
11                ;3.3    EITHER A TYPE 4060 OR 4010 I/O INTERFACE
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!0004 .MAIN
01                ;3.4    (1) 6012 DISPLAY
02                ;3.5    SEE "HOW TO USE THE NOVA
03                ;       COMPUTERS" REFERENCE MANUAL FOR A
04                ;       DESCRIPTION OF THE INFORMATION BIT
05                ;       OPTIONS OF THE 4010 AND 4060 INTERFACE.
06
07
08                ;4.     SWITCH SETTINGS
09                ;4.1    STARTING ADDRESSES
10                ;4.2            000002= 6012 DIAGNOSTIC - AUTOMATIC
11                ;               TESTS.
12                ;4.3            000003= VISUAL DISPLAY TEST - FULL SCREEN
13                ;               DISPLAY OF EACH CHARACTER IN CHARACTER
14                ;               SET, SEQUENCED UNDER MANUAL CONTROL.
15                ;4.4            000004= VISUAL DISPLAY TEST-ROTATING
16                ;               CHARACTER SET.
17                ;4.5            000005= CHARACTER ECHO TEST IN THE
18                ;               (PAGE) BUFFER MODE.
19                ;4.6            000006= CHARACTER ECHO IN ROLL MODE.
20                ;4.7            000007= CHANGE INTERFACE DEVICE CODE.
21                ;4.8            000010= READ (DISPLAY) CHARACTER SCOPE LOOP.
22                ;4.9            000011= WRITE(DISPLAY) CHARACTER SCOPE LOOP.
23                ;4.10           000014 = RELOAD OPERATION PARAMETERS
24                ;                       DATA INTO THE PROGRAM.
25                ;4.11   DISCRETE SWITCH SELECTIONS
26                ;               SWITCH 1(1)=  PROCEED FROM THE ERROR LOOP.
27                ;               SWITCH 7(1)= DO NOT HALT ON ERROR - ROTATING
28                ;                            CHARACTER SET. LOOP IN CURRENT TEST
29                ;                            UNCONDITIONALLY-AUTO TEST MODE.
30
31                ;               SWITCH 8(1)= NO HALT ON TIMEOUT - ROTATING
32                ;                            CHARACTER SET
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10005 .MAIN
01
02              ;5.     DIAGNOSTIC OPERATING PROCEDURE
03              ;5.1    VERIFY THAT THE INTERFACE IS INSTALLED PROPERLY
04              ;       AND ALL THE EXTERNAL CONNECTIONS BETWEEN THE
05              ;       COMPUTER AND THE DISPLAY CHASSIS ARE PROPERLY
06              ;       SECURED. LOAD THE PROGRAM VIA THE BINARY LOADER
07              ;       OR DIAGNOSTIC OPERATING SYSTEM.
08              ;       SET THE SWITCHES TO 000002 AND PRESS START.
09
10              ;5.2    IF THIS IS THE INITIAL PASS OF THE PROGRAM (AFTER
11              ;       BEING LOADED) THE PROGRAM WILL REQUIRE THESE
12              ;       FOLLOWING DATA: A) THE STATE OF THE PARITY SELECT
13              ;       JUMPERS(LOCATED INSIDE THE DISPLAY CHASSIS),
14              ;       SELECTING EITHER ODD, EVEN, OR NO PARITY(MARKED), B)THE
15              ;       TYPE # OF THE INTERFACE ASSEMBLY INSTALLED
16              ;       IN THE COMPUTER WHICH WILL BE DRIVING THE DISPLAY,
17              ;       C)THE DEVICE CODE # OF THE INTERFACE ASSEMBLY,
18              ;       AND FINALLY D)THE # OF THE LINE OR CHANNEL
19              ;       THAT THE DISPLAY IS CONNECTED TO(NOT
20              ;       APPLICABLE IF TYPE 4010 INTERFACE ASSEMBLY
21              ;       IS INSTALLED).
22              ;       NOTE:  IF THE DEVICE CODE OF THE 4010 MODULE
23              ;       IS OTHER THAN 10 OR 11 OR THE 4060 MODULE IS
24              ;       OTHER THAN 30, THE PROCEDURE LISTED IN SECTION
25              ;       10 HAS TO BE DONE FIRST TO CHANGE THE DEVICE
26              ;       CODES BEFORE STARTING AT LOC 2.
27              ;5.3    THE PROGRAM WILL HALT AFTER AN INITIAL START
28              ;       AT LOC. 2,3, 4 ,OR 5 IF THE SPECIFICATION DATA
29              ;       HAS NOT BEEN ENTERED. ENTER THE FIRST WORD OF
30              ;       THE REQUIRED DATA INTO THE COMPUTER CONSOLE
31              ;       SWITCHES USING THE FORMAT SHOWN BELOW....
32
33
34              ;       0   1 2 3    4 5 6   7 8 9   10 11 12   13 14 15
35              ;       X   X P P    I I I   I I I   D  D  D    D  D  D
36
37              ;       WHERE: P= PARITY; 1 FOR ODD, 2 FOR EVEN, 0 FOR
38              ;              NO PARITY (MARKED,MSB=1)
39              ;              X= NOT USED (DON'T CARE STATES)
40              ;              I= LAST 2 OCTAL DIGITS OF INTERFACE TYPE#
41              ;                 SUCH AS 10 FOR TYPE# 4010.
42              ;              D= 2 DEVICE CODE OCTAL DIGITS (EVEN #
43              ;                 DEVICE CODE IF INTERFACE IS A 4010).
44
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10006 .MAIN
01              ;       AFTER THE SWITCHES HAVE BEEN SET UP
02              ;       PRESS CONTINUE.  THE PROGRAM WILL
03              ;       HALT AGAIN FOR THE BAUD RATE INPUT DATA,
04              ;       ENTER THE BAUD RATE INTO THE COMPUTER
05              ;       CONSOLE SWITCHES 10 THRU 15.  THE STATES
06              ;       OF SWITCHES 0 THRU 9 ARE NOT USED BY THE
07              ;       PROGRAM AND ARE "DON'T CARE STATES".
08              ;       EXAMINE THE TABLE BELOW AND ENTER
09              ;       SWITCH DATA LISTED OPPOSITE THE BAUD RATE OF
10              ;       THE INTERFACE ASSEMBLY.  IF THE BAUD RATE
11              ;       OF ANY PARTICULAR INTERFACE ASSEMBLY
12              ;       IS NOT LISTED, USE THE SWITCH DATA OF
13              ;       THE BAUD RATE LISTED THAT IS CLOSEST IN VALUE.
14
15              ;       BAUD            BITS 0-9 10 11 12 13 14 15
16              ;        110                 X-X  0  0  0  0  0  0
17              ;        150                 X-X  0  0  0  0  0  1
18              ;        300                 X-X  0  0  0  0  1  0
19              ;        600                 X-X  0  0  0  0  1  1
20              ;       1200                 X-X  0  0  0  1  0  0
21              ;       1800                 X-X  0  0  0  1  0  1
22              ;       2400                 X-X  0  0  0  1  1  0
23              ;       3600                 X-X  0  0  0  1  1  1
24              ;       4800                 X-X  0  0  1  0  0  0
25              ;       7200                 X-X  0  0  1  0  0  1
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!0007 .MAIN
01
02              ;       AFTER THE SWITCHES HAVE BEEN SETUP PRESS
03              ;       CONTINUE. NO FURTHER INFORMATION IS REQUIRED IF
04              ;       THE INTERFACE TYPE 4010 IS INSTALLED AND EXECUTION
05              ;       WILL BEGIN FROM THIS POINT.
06              ;5.4    OTHER INTERFACE TYPES REQUIRE A SECOND DATA WORD
07              ;       AND THEREFORE THE PROGRAM WILL COME TO A
08              ;       SECOND HALT TO ALLOW THESE DATA TO BE SET INTO
09              ;       THE CONSOLE SWITCHES. THE SECOND WORD MUST
10              ;       CONTAIN THE OCTAL # OF THE LINE DRIVING THE
11              ;       6012 DISPLAY. THE FORMAT OF THE LINE CODE PLACED
12              ;       INTO THE SWITCHES IS AS FOLLOWS:
13
14              ;       0   1 2 3   4 5 6   7 8 9   10 11 12   13 14 15
15              ;       X   X X X   X X X   X X X   L  L  L    L  L  L
16
17              ;       WHERE: X= NOT USED (DON'T CARE STATES)
18              ;              L= 2 LINE CODE OCTAL DIGITS
19
20              ;       A CONTINUE FROM THIS POINT CAUSES THE PROGRAM
21              ;       TO BEGIN EXECUTION.
22
23              ;5.5    THE FIRST TASK PERFORMED BY THE PROGRAM IS
24              ;       TO VERIFY THAT THE DATA ENTERED VIA THE CONSOLE
25              ;       SWITCHES IS CORRECT. IF A ERROR IS DISCOVERED
26              ;       DURING THIS CHECK THE PROGRAM WILL COME TO A
27              ;       HARD HALT. THIS TYPE OF HALT DIFFERS FROM THE
28              ;       ERROR HALT IN THAT A CONTINUE WILL SIMPLY LOOP
29              ;       ON THE HALT MAKING IT IMPOSSIBLE TO CONTINUE
30              ;       FROM THIS TYPE OF HALT. EXAMINE
31              ;       AC3 FOR THE ERROR ADDRESS AFTER A HARD HALT.
32              ;       THIS WILL SERVE TO IDENTIFY THE SWITCH DATA
33              ;       ENTERED INCORRECTLY. TO PROCEED FROM THIS
34              ;       TYPE OF ERROR HALT, RESTART AT LOCATION 14.
35              ;       THEN RESTART AT LOCATION 2,3,4 OR 5,
36              ;       AND REPEAT THE PROCEDURES DESCRIBED
37              ;       IN PARAGRAPHS 5.3 AND 5.4.
38              ;       A SIMPLE RESTART WITHOUT THESE PROCEDURES
39              ;       RESULTS IN ANOTHER HARD HALT AS THE PROGRAM
40              ;       AUTOMATICALLY CHECKS THE SPECIFICATION DATA
41              ;       PRIOR TO STARTING EXECUTION.
42              ;       NOTE.  ***********
43              ;5.6    TO CHANGE PARAMETERS SUCH AS PARITY, OR
44              ;       LINE CODE, RESTART AT LOCATION 14,
45              ;       THEN RESTART AT LOCATION 2,3,4, OR 5.
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!0008 .MAIN
01              ;5.6    PROGRAM EXECUTION WILL NOW BEGIN.
02              ;5.7    THE PROGRAM WILL NOT REQUEST (VIA
03              ;       THE INITIAL HALTS ) OPERATOR PARAMETERS
04              ;       UPON SUBSEQUENT RESTARTS. TO CHANGE OPERATION
05              ;       PARAMETER DATA (PARITY DATA, LINE NUMBER, ETC)
06              ;       RESTART WITH SWITCH 3 SET TO THE 1 POSITION.
07
08              ;6.     DIAGNOSTIC ERROR PROCEDURES
09              ;6.1    IF A MALFUNCTION IS DETECTED THE PROGRAM WILL
10              ;       HALT IN THE ERROR SUBROUTINE. ON THE INITIAL
11              ;       ERROR HALT, LOCATION "ROW" WILL CONTAIN THE
12              ;       ROW, AND LOC. "ERPOSIT" WILL CONTAIN THE COLUMN
13              ;       POSITION(ON THE SCREEN) WITH INCORRECT DATA.
14              ;       THE OPERATOR MAY CHANGE THE SETTING OF SWITCH
15              ;       1 AT THIS TIME IF SO DESIRED. WITH
16              ;       SWITCH 1 IN THE 0 POSITION, PRESSING CONTINUE
17              ;       WILL CAUSE THE PROGRAM TO ENTER A SCOPE LOOP.
18              ;       ERROR COMMENTARIES ARE LISTED AT THE END MAJOR TESTS.
19
20              ;6.2    A SPECIAL SCOPE LOOP IS PROVIDED AT ADDRESS 10, AND
21              ;       IS DESIGNED TO READ IN CHARACTERS FROM ANY POSITION
22              ;       OF THE DISPLAY SCREEN. THIS REQUIRES THE OPERATOR
23              ;       MAKE USE OF THE PROTECT BIT FEATURE OF THE 6012
24              ;       DISPLAY, AND VERIFY THAT THIS FUNCTION IS WORKING
25              ;       PROPERLY. THIS MAY BE VERIFIED IN THE BUFFER MODE
26              ;       OF OPERATION BY TYPING DATA INTO THE DISPLAY
27              ;       AND SETTING THE PROTECT BITS ON EITHER SIDE
28              ;       OF THE DATA. AFTER THIS HAS BEEN DONE, VERIFY
29              ;       THAT THE CURSOR CANNOT BE MOVED INTO THE PROTECTED
30              ;       DATA ZONE. TO SET THE SCREEN UP, IN THE BUFFER
31              ;       MODE PLACE THE CHARACTERS TO BE READ INTO THE
32              ;       DESIRED POSITION ON THE SCREEN. PLACE A START
33              ;       PROTECT CHARACTER (CONTROL-SHIFT-N ON THE
34              ;       KEYBOARD) IMMEDIATELY AFTER THE LAST DATA CHARACTER
35              ;       TO BE READ IN. SET AN END PROTECT CHARACTER (CONTROL-
36              ;       SHIFT-M ON THE KEYBOARD) IMMEDIATELY BEFORE THE
37              ;       1ST DATA CHARACTER TO BE READ IN. SET A START
38              ;       PROTECT CHARACTER (CONTROL-SHIFT-N) INTO THE 1ST
39              ;       CHARACTER POSITION OF THE 1ST LINE.
40              ;       IN ANY CASE DO NOT ALLOW ANY UNPROTECTED
41              ;       POSITIONS BETWEEN THE HOME POSITION AND THE 1ST
42              ;       DATA CHARACTER, OR FROM THE 2ND DATA CHARACTER
43              ;       AND THE LAST POSITION OF THE LAST LINE.
44
45              ;       *****OPERATING PROCEDURE *****
46              ;       LOAD 10 INTO THE CONSOLE SWITCHES AND START.
47              ;       THE PROGRAM WILL HALT. SET UP CONSOLE
48              ;       SWITCHES (RIGHT JUSTIFIED) WITH THE OCTAL
49              ;       NUMBER OF CHARACTERS EXPECTED TO BE READ
50              ;       FROM THE DISPLAY.  PRESS CONTINUE.  THE
51              ;       PROGRAM WILL HALT AGAIN.  SET UP DISPLAY
52              ;       WITH DATA AND PROTECTED ZONES AND PRESS CONTINUE
53              ;       TO INSTALL SCOPE LOOP. CHARACTERS READ IN WILL
54              ;       BE STORED IN SUCCESSION IN BUFFER A.
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10009 .MAIN
01              ;6.3    A SPECIAL SCOPE LOOP IS PROVIDED AT ADDRESS 11
02              ;       TO TRANSMIT CHARACTERS TO THE DISPLAY. THE
03              ;       PROGRAM WILL HALT INITIALLY TO ALLOW THE OPERATOR
04              ;       TO SET THE CHARACTERS INTO THE CONSOLE SWITCH
05              ;       REGISTER(AT THE COMPUTER), WITH THE 1ST CHARCTER
06              ;       APPEARING IN THE RIGHT HAND BYTE (BITS 8- 15), AND
07              ;       THE SECOND CHARACTER APPEARING IN THE LEFT HAND
08              ;       BYTE (BITS 0- 7). AFTER THE SWITCH REGISTER HAS
09              ;       BEEN SET UP, PRESS CONTINUE.  THE PROGRAM
10              ;       WILL HALT AGAIN.  SET UP THE SWITCH
11              ;       REGISTER WITH THE NEXT PAIR OF CHARACTERS,
12              ;       THEN PRESS CONTINUE TO LOAD IN THE NEXT
13              ;       PAIR OF CHARACTERS, ETC.  THE CHARACTER
14              ;       LOADING SEQUENCE IS TERMINATED BY SETTING
15              ;       THE SWITCH REGISTER TO 0 AND PRESSING
16              ;       CONTINUE.  FOR EXAMPLE TO LOAD 1 CHARACTER
17              ;       ENTER THE CHARACTER INTO THE RIGHT HAND
18              ;       BYTE AND PRESS CONTINUE.  THE PROGRAM
19              ;       WILL HALT AGAIN.  CLEAR THE SWITCH REGISTER
20              ;       TO 0 AND PRESS CONTINUE.  THE SECOND
21              ;       CONTINUE (WITH SWITCHES 0-15 = 0) TERMINATES
22              ;       LOADING AND INSTALLS THE SCOPE LOOP.
23              ;       THIS LOOP IS CAPABLE OF TRANSMITTING FROM
24              ;       1 TO N CHARACTERS (INCLUDING CONTROL CHARACTERS)
25              ;       TO THE DISPLAY.  ****REMEMBER TO LOAD
26              ;       CHARACTERS (IN THE SWITCH REGISTER) FROM
27              ;       RIGHT TO LEFT IN THE ORDER OF TRANSMISSION.****
28              ;       IF CHARACTERS A & B ARE TO BE DISPLAYED
29              ;       AB; THEY MUST BE PUT IN THE CONSOLE
30              ;       SWITCHES SUCH THAT THE ASCII CODE FOR
31              ;       A IS SET INTO SWITCHES 8-15, WITH THE
32              ;       ASCII CODE FOR B IN SWITCHES 0-7.
33
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!0010 .MAIN
01              ;7.     VISUAL DISPLAY TEST PROCEDURES
02
03              ;7.1            IMPORTANT
04              ;       ************************************************
05              ;       *  THIS TEST CAN ONLY BE RUN WITH THE "BUFFERED  *
06              ;       *  PAGE, ROLL" SWITCH SET TO THE PAGE POSITION   *
07              ;       ************************************************
08
09
10              ;7.2    THE PURPOSE OF THE VISUAL DISPLAY TEST IS TO
11              ;       PROVIDE VISUAL VERIFICATION THAT THE CHARACTER
12              ;       SCAN AND DOT SHIFTER FUNCTIONS ARE BOTH
13              ;       CONGRUENT AND FUNCTIONAL IN PRODUCING THE
14              ;       ACTUAL CHARACTER ON THE CRT SCREEN.
15              ;7.3    SET 000003 IN THE CONSOLE SWITCHES AND PRESS START.
16              ;       THE PROGRAM WILL INITIALLY HALT IF THE INTERFACE
17              ;       SPECIFICATION DATA HAS NOT BEEN ENTERED PREVIOUSLY.
18              ;       ENTER THESE DATA AS DESCRIBED IN PARAGRAPHS
19              ;       5.3 AND 5.4.
20              ;7.4    THE PROGRAM FILLS THE ENTIRE SCREEN WITH ONE
21              ;       CHARACTER FOM THE 6012 CHARACTER SET. THE PROGRAM
22              ;       WAITS FOR THE OPERATOR TO SIGNAL AFTER THE SCREEN
23              ;       HAS BEEN CHECKED FOR MISSING OR INCOMPLETE CHARAC-
24              ;       TERS IN ANY POSITION OF ANY LINE. THE OPERATOR
25              ;       SIGNALS BY HITTING THE SPACE BAR, WHICH WILL
26              ;       ALLOW THE PROGRAM TO PROVIDE A FULL SCREEN
27              ;       DISPLAY OF THE NEXT CHARACTER IN THE SET. THIS
28              ;       SECTION OF THE PROGRAM IS AN ENDLESS LOOP AND
29              ;       WILL CONTINUE TO REPEAT THE CHARCTER SET AS LONG
30              ;       AS IT IS ALLOWED TO RUN.
31              ;       THE OPERATOR HAS THE OPTION OF TYPING K$$ ($=ESCAPE
32              ;       KEY), IMMEDIATELY FOLLOWED BY THE CHARACTER TO BE
33              ;       DISPLAYED. CONTROL CHARACTERS, NULLS, AND SPACES
34              ;       ARE NOT ALLOWED IN THE STRING. AFTER THE COMMAND
35              ;       AND CHARACTER ARE TYPED, THE PROGRAM WILL FILL
36              ;       THE SCREEN WITH THE SELECTED CHARACTER.
37              ;7.5    WHEREAS ERROR DETECTION AND REPORTING FOR
38              ;       THIS TEST IS THE COMPLETE RESPONSIBILITY OF THE
39              ;       OPERATOR, PROGRAMMED MANAGEMENT IS NOT PROVIDED.
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!0011 .MAIN
01              ;7.6    VISUAL DISPLAY TEST - ROTATING CHARACTER SET.
02
03              ;7.7    THE PURPOSE OF THIS SECTION OF THE VISUAL
04              ;       DISPLAY TEST IS TO PROVIDE AN AUTOMATIC FULL
05              ;       SCREEN DISPLAY OF THE ENTIRE CHARACTER SET.
06              ;       AS THE PROGRAM RUNS IT SHIFTS ALL CHARACTERS
07              ;       DISPLAYED ONE CHARACTER POSITION.
08              ;7.8    SET THE CONSOLE SWITCHES TO 000004, AND PRESS
09              ;       START. PROGRAM WILL RUN CONTINUOUSLY WITHOUT
10              ;       OPERATOR INTERVENTION UNLESS INTERFACE SPECIFICATION
11              ;       DATA HAS NOT BEEN ENTERED OR AN ERROR OCCURS.
12              ;       CONSOLE SWITCH 7 IN 0 POSITION WILL
13              ;       CAUSE A HALT ON DATA ERROR.  ON A HALT EXAMINE THE
14              ;       CONSOLE ADDRESS LIGHTS TO VERIFY THAT
15              ;       IT IS A DATA ERROR HALT, THEN EXAMINE
16              ;       AC0 FOR GOOD CHARACTER, AC1 = BAD CHARACTER
17              ;       AND AC3 FOR THE (OCTAL) NUMBER OF THE BAD CHARACTER
18              ;       IN THE PRESENT FRAME.  CONVERT THIS
19              ;       OCTAL NUMBER (IN AC3) TO DECIMAL TO
20              ;       DETERMINE ITS CHARACTER POSITION ON THE
21              ;       DISPLAY SCREEN.  CHECK THAT POSITION
22              ;       ON THE SCREEN FOR AN OUT OF SEQUENCE
23              ;       CHARACTER, SUCH AS 67898 WHERE THE
24              ;       8 AFTER THE 9 GENERALLY INDICATES A DISPLAY MEMORY
25              ;       ERROR.  A LARGE NUMBER OF ERRORS WITH
26              ;       NO APPARENT ERRORS DISPLAYED ON THE
27              ;       SCREEN ARE GENERALLY TRANSMITTER LOGIC
28              ;       ERRORS.  EXAMINE THE ERROR PATTERN TO
29              ;       DETERMINE BIT SHIFT OR BIT DROPOUT.  FOR LONG
30              ;       TERM RELIABILITY RUNS, SET SWITCH 7 TO A 1
31              ;       TO ALLOW THE PROGRAM TO CONTINUE AUTOMATICALLY
32              ;       AFTER AN ERROR.  THE # OF ERRORS WILL BE
33              ;       REPORTED UPON HITTING THE SPACE BAR TWICE.
34              ;       CONSOLE SWITCH 8 IN THE 0 POSITION WILL
35              ;       CAUSE A HALT ON A TIMEOUT ERROR.
36              ;       EXAMINE THE "XMTFLG" LOCATION.  IF
37              ;       THIS LOCATION = -1, THE TIMEOUT OCCURRED
38              ;       ON A PROCESSOR-TO-DISPLAY DATA TRANSFER.
39              ;       IF XMTFLG = 0, THE TIMEOUT OCCURRED ON
40              ;       A DISPLAY-TO-PROCESSOR DATA TRANSFER.
41              ;       EXAMINE LOCATION "CHARS" FOR THE NUMBER
42              ;       OF CHARACTERS LEFT TO BE TRANSFERRED.  CONVERT
43              ;       THIS NUMBER FROM OCTAL TO DECIMAL AND SUBTRACT 1
44              ;       TO DETERMINE THE NUMBER (IN THE FRAME) OF THE
45              ;       LAST CHARACTER TRANSFERRED.
46              ;       SWITCH 8 IN THE 1 POSITION WILL ALLOW THE
47              ;       PROGRAM TO CONTINUE AUTOMATICALLY AFTER AN
48              ;       ERROR.  ERROR REPORTING IS PROVIDED
49              ;       IN THIS TEST, AND MAY BE ACCESSED
50              ;       BY HITTING THE SPACE BAR TWICE WHEN THE DISPLAY
51              ;       IS NOT CHANGING WITH A SCREEN FULL OF CHARACTERS.
52              ;       AFTER THE REPORT HAS BEEN READ THE OPERATOR CAN
53              ;       RESUME TESTING BY HITTING ANY DISPLAY KEY.
54
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!0012 .MAIN
01              ;8.     CHARACTER ECHO TEST PROCEDURE.
02
03              ;8.1    SET THE "BUFFERED, PAGE, ROLL" SWITCH TO THE
04              ;       "BUFFERED" POSITION.
05              ;8.2    SET 000005 INTO THE CONSOLE SWITCHES AND PRESS
06              ;       START.
07              ;8.3    TYPE IN ENOUGH CHARACTERS TO FILL THE ENTIRE
08              ;       BUFFER(AND SCREEN). MAKE SURE THE START AND END
09              ;       PROTECT BITS ARE INSERTED INTO AT LEAST TWO
10              ;       OF THE 24 LINES. HOME THE CURSOR & PRESS THE
11              ;       CONTROL - N  KEY ON THE DISPLAY KEYBOARD.
12              ;        THIS PARTICULAR KEYING ACTION TRANSMITS THE
13              ;       PAGE OF DATA TO THE COMPUTER.
14              ;8.4    HOLDING THE DISPLAY XMIT KEY DOWN, TYPE THE E
15              ;       KEY WITH NO COMMAS OR SPACES TO
16              ;       ECHO THE DATA SENT TO THE COMPUTER.
17              ;       VERIFY THAT THE BUFFERED PAGE (INCLUDING THE
18              ;       PROTECTED BITS) ARE RETURNED TO THE SCREEN.
19              ;8.5    TO CONTINUE TESTING REPEAT PARAGRAPHS
20              ;       8.3 AND 8.4, THIS TIME USING BLINKING CHARACTERS
21              ;       ALONG WITH PROTECT CHARACTERS.
22              ;8.6    THE CHARACTER ECHO TEST MAY BE REPEATED
23              ;       AS MANY TIMES AS DESIRED TO TEST THE ECHO
24              ;       TRANSMISSION AND DISPLAY CHARCTERISTICS
25              ;       OF PAGE DATA ASSEMBLED IN THE BUFFER MODE.
26              ;       JUST REMEMBER TO TOGGLE THE "BUFFERED, PAGE
27              ;       ROLL" SWITCH TO THE PROPER POSITION RELATIVE TO THE
28              ;       FUNCTION BEING PERFORMED.
29              ;8.7    NO PROGRAMMED ERROR MANAGEMENT IS PROVIDED IN
30              ;       THE CHARACTER ECHO TEST.
31
```

```
!0013 .MAIN
01
02
03              ;9.     ROLL MODE TEST PROCEDURE.
04
05              ;9.1    SET THE "BUFFERED, PAGE, ROLL" SWITCH TO THE BUFFERED
06              ;       POSITION. LOAD 000006 INTO THE CONSOLE SWITCHES AND
07              ;       START. THE PROGRAM WILL HALT. WHEN THE PROGRAM WAS
08              ;       STARTED, A CLEAR SCREEN COMMAND WAS ISSUED. VERIFY
09              ;       THAT THE SCREEN IS CLEAR, AND THE CURSOR IS IN THE
10              ;       HOME POSITION.
11
12              ;9.2    SET THE "BUFFERED, PAGE ,ROLL" SWITCH TO THE "ROLL"
13              ;       POSITION. AT THE DISPLAY KEYBOARD, PRESS CONTROL-
14              ;       RESET KEYS. VERIFY CURSOR MOVES TO 1ST CHARACTER
15              ;       POSITION OF THE LAST LINE. PRESS CONTINUE AND TYPE
16              ;       IN EACH CHARACTER IN THE CHARACTER SET. VERIFY
17              ;       CHARACTERS TYPED ARE ECHOED BACK ON THE SCREEN.
18
19              ;9.3    AFTER A LINE IS TYPED A CR/LF MUST BE TYPED.
20              ;       VERIFY THAT A LINEFEED OCCURS
21              ;       AND CURSOR RETURNS TO THE 1ST CHARACTER POSITION
22              ;       OF THE LAST LINE AND THAT THE LINE JUST ENTERED
23              ;       ROLLS UP ONE LINE.
24
25              ;9.4    AFTER THE CHARACTER SET HAS BEEN TYPED AND ECHOED,
26              ;       HOLD DOWN ANY CHARACTER KEY, ALONG WITH THE REPT
27              ;       (REPEAT) KEY UNTIL THE SCREEN HAS BEEN FILLED WITH
28              ;       CHARACTERS. CONTINUE TYPING AND VERIFY THAT THE TOP
29              ;       LINE OF CHARACTERS ROLLS OFF THE SCREEN ON THE
30              ;       NEXT LINEFEED.
31
32              ;10.    TO CHANGE DEVICE CODES.....
33
34              ;10.1   LOAD 000007 INTO THE CONSOLE SWITCHES
35              ;       AND START. THE PROGRAM WILL HALT. LOAD THE 2 OCTAL
36              ;       DIGITS OF THE NEW DEVICE CODE INTO CONSOLE
37              ;       SWITCHES 10 THRU 15, AND PRESS CONTINUE.
38
39              ;10.2   THE PROGRAM WILL HALT WHEN CHANGES ARE COMPLETED
40              ;       AND CAN BE VERIFIED BY PRESSING CONTINUE AFTER THE
41              ;       HALT. IF THE PROGRAM ENTERS A JUMP LOOP, THE CODE
42              ;       CHANGES HAVE BEEN COMPLETED SUCCESSFULLY. IF AN
43              ;       IMMEDIATE HALT RESULTS FROM PRESSING CONTINUE, AN
44              ;       ERROR IN THE CONSOLE DATA INPUT VIA THE SWITCHES HAS
45              ;       BEEN DETECTED BY THE PROGRAM. UNDER THESE CONDITIONS
46              ;       RESTART AT LOCATION 7, AND REINSERT NEW DEVICE CODE
47              ;       INTO THE CONSOLE SWITCHES AGAIN.
48
49
50
51                      .EOT
```

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 0014 .MAIN

**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS
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