DataGeneral

TECHNICAL STATEMENT

TEXT LISTING

068-000477-03

PROGRAM

6052, 6053 VIDEO DISPLAY TEST
WITH 6054,55 PRINTER OPTION TEST

TEXT TAPE

097-000477-03

ASTRACT

THE 6052, 6053 VIDEO DISPLAY DIAGNOSTIC PROGRAM CONTAINS SIX SEPARATE TEST PROGRAMS DESIGNED TO FACILITATE CHECKOUT AND EVALUATION OF THE OPERATION OF THE 6052, 6053 DISPLAY. THE FIRST TEST PROGRAM IS THE 6052, 6053 DIAGNOSTIC WHICH PROVIDES A SEQUENCE OF AUTOMATIC TESTS. THE OTHER FIVE TESTS ARE UNDER OPERATOR CONTROL.

```
 0001 .MAIN MACRO REV 05.20              11:21:56 05/09/79
01
02
03
04
05
06
07              ;*************************************************************
08              ;
09              ; NAME: LCD.TX                              PART NUMBER: 097-00477
10              ;
11              ;
12              ; DESCRIPTION: 6052, 6053 VIDEO DISPLAY TEST AND
13              ;                6054,6055 PRINTER OPTION TEST
14              ;
15              ;
16              ; REVISION HISTORY:
17              ;
18              ;       REV.            DATE
19              ;
20              ;       00              11/19/76
21              ;       01              06/03/77
22              ;       02              03/31/78
23              ;       03              05/11/79
24              ;
25              ;
26              ; COPYRIGHT (C) DATA GENERAL CORPORATION, 1976,1977,1978,1979
27              ; ALL RIGHTS RESERVED.
28              ;*************************************************************
```

```
10002 .MAIN
01              ;1. PROGRAM NAME: LCD.SR 6052,6053 VIDEO DISPLAY DIAGNOSTIC/
02              ;       EXERCISER PLUS THE 6054,6055 PRINTER OPTION TESTS
03              ;
04              ;2. REVISION HISTORY
05              ;       01      ADD 6054,6055 PRINTER OPTION TESTS
06              ;       02      ADD ALM DRIVER OPTION TO PROGRAM
07              ;       03      UPDATED TO RUN UNDER MICRO NOVA ALM
08
09
10              ;3. MACHINE REQUIREMENTS
11              ;3.1    NOVA/U-NOVA/ECLIPSE PROCESSOR
12              ;3.2    4K READ/WRITE MEMORY
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    EITHER A 6052(UPPER CASE ONLY) DISPLAY
19              ;       OR A 6053 (UPPER/LOWER CASE) VIDEO DISPLAY
20              ;3.5    OPTIONAL- 6054 OR 6055 PRINTER OPTION
```

```
!0003 .MAIN
01              ; 4. TEST REQUIREMENTS
02
03              ;       THE 6052,6053 DISPLAY MAY BE DRIVEN BY EITHER
04              ;       DATA GENERAL TYPE  ASYNCHRONOUS
05              ;       INTERFACE ASSEMBLY: THE ALM, THE TYPE 4010, OR TYPE
06              ;       4060. A SEQUENCE OF AT LEAST TWO SUCCESSFUL PASSES
07              ;       THROUGH THE DIAGNOSTIC PROGRAM FOR THE PARTICULAR
08              ;       INTERFACE INSTALLED IS A MANDATORY PREREQUISITE
09              ;       FOR THIS PROGRAM. PERFORM ALL SPECIFIED TESTS
10              ;       AND PROCEDURES FOR THE INTERFACE ASSEMBLY AND
11              ;       VERIFY THAT THE INTERFACE IS FULLY OPERATIONAL
12              ;       BEFORE PERFORMING THE PROCEDURES AND TESTS
13              ;       COMPRISING THE 6052,6053 VIDEO DISPLAY DIAGNOSTIC.
14
15              ;       BILATERAL BAUD REQUIREMENT
16              ;       IT IS NECESSARY TO VERIFY THAT THE DISPLAY
17              ;       AND THE INTERFACE ARE SET TO OPERATE AT THE
18              ;       SAME BAUD RATE. VERIFY AND NOTE
19              ;       THE OPERATIONAL BAUD RATE OF THE INTERFACE
20              ;       CONTROLLER(4010,4060 OR ALM). VERIFY THAT THE BAUD RATE
21              ;       SELECTION SWITCH IS SET TO SELECT THE CORRESP-
22              ;       ONDING BAUD RATE.
23
24
25
26              ; 5. SUMMARY
27              ;       THE 6052,6053 VIDEO DISPLAY DIAGNOSTIC PROGRAM
28              ;       CONTAINS SIX SEPARATE TEST PROGRAMS DESIGNED TO
29              ;       FACILITATE CHECKOUT AND EVALUATION OF THE OPERATION
30              ;       OF THE 6052,6053 DISPLAY.  THE 1ST TEST PROGRAM IS
31              ;       THE 6052,6053 DIAGNOSTIC WHICH PROVIDES A SEQUENCE
32              ;       OF AUTOMATIC TESTS. THE OTHER FIVE TESTS UNDER OPERATOR
33              ;       CONTROL ARE: A VISUAL DISPLAY OF A FULL SCREEN
34              ;       OF 1 OF 4 WORST CASE 2 CHAR PATTERNS WITH OPTION
35              ;       FOR A SINGLE CHARACTER FROM THE CHARACTER SET,
36              ;       A VISUAL DISPLAY IN WHICH THE SCREEN IS REPEATEDLY
37              ;       FILLED WITH FULL SEQUENCES OF THE ENTIRE CHAR
38              ;       SET, A SPECIAL SEQUENCE OF TEST PATTERNS TO CHECK
39              ;       THE BELL,BLINK,DIM,UNDERSCORE AND ROLL FUNCTIONS
40              ;       OF THE DISPLAY, AND TWO CHAR ECHO TESTS UTILIZING
41              ;       THE KEYBOARD.
42
43              ;       SA 507 PROVIDES A TEST FOR THE 6054 OR 6055
44              ;       PRINTER OPTION.
45              ;
46              ; 6. RESTRICTIONS: N/A
```

```
!0004 .MAIN
01              :7.0 PROGRAM DESCRIPTIONS
02
03              :7.1    RUNALL TESTS (SA 500)
04
05              ;       RUN THROUGH ALL TESTS DESCRIBED IN 7.2 THROUGH 7.5E
06
07              :7.2    AUTOMATIC DIAGNOSTIC TESTS (SA 501)
08
09              ;       AFTER A BRIEF TEST OF THE INTERFACE BEING USED, THE
10              ;       PROGRAM CHECKS THE DISPLAY CURSOR CONTROLS VIA THE
11              ;       READ CURSOR FUNCTION.
12
13              :7.3    WORST CASE TWO CHARACTER VISUAL DISPLAY (SA 502)
14              ;       WITH ANY SINGLE CHARACTER OPTION.
15
16              ;       THE PROGRAM FILLS THE SCREEN WITH 4 DISPLAYS AS
17              ;       DESCRIBED BELOW:
18
19              ;       1.      U*U*U* ETC.
20              ;       2.      *U*U*U ETC.
21              ;       3.      ?@?@?@ ETC.
22              ;       4.      @?@?@? ETC.
23
24              ;       UPON FILLING THE SCREEN, THE PROGRAM WAITS FOR
25              ;       THE OPERATOR TO SEQUENCE PROGRAM (UNLESS IN AUTO MODE).
26              ;*****************************************************************
27              ;       ###AS AN EXCEPTION TO 6.2 A PRINTABLE CHAR
28              ;       ENTERED HERE WILL CAUSE THE NEXT SCREEN TO BE FILLED
29              ;       WITH THAT CHARACTER. ALSO, A CONTROL-B CAUSES SAME
30              ;       SCREEN TO REPEAT.
31              ;*****************************************************************
32
33              :7.4    FULL CHARACTER SET VISUAL DISPLAY (SA 503)
34
35              ;       THE SCREEN IS FILLED WITH FULL SEQUENCES OF THE
36              ;       THE ENTIRE CHARACTER SET IN THE DISPLAY PAGE MODE.
37              ;       THE PROGRAM WAITS FOR OPERATOR SEQUENCING AFTER EACH
38              ;       1920 CHARACTERS (1 SCREEN). 4 SCREENS ARE OUTPUT
39              ;       IN THE RUNALL TEST SEQUENCE.
```

```
!0005 .MAIN
01
02              ;7.5    SPECIAL CONTROL TESTS (SA 504)
03              ;       ### FOLLOWING TESTS ARE RUN IN SEQUENCE AS DESCRIBED
04              ;       BELOW SO THAT FOLLOWING MAY BE USED AS A GUIDE FOR
05              ;       OPERATOR VERIFICATION. PROGRAM WAITS FOR THE OPERATOR
06              ;       TO SEQUENCE PROGRAM AFTER EACH TEST UNLESS IN AUTO
07              ;       MODE.
08
09              ;7.5A   SP0- DISPLAY BELL SHOULD SOUND 10. TIMES.
10
11              ;7.5AB  SP1- SCREEN IS FILLED WITH A ROTATING CHARACTER SET.
12              ;       THE PROGRAM THEN ERASES THE LAST 11 CHAR'S OF LINE 1,
13              ;       THE LAST 14 CHAR'S OF LINE 2 , THE LAST 17 OF LINE 3,
14              ;       ECT. UNTIL ALL OF LINE 24 IS ERASED.
15
16              ;7.5B   SP2- SCREEN IS FILLED A ROTATING CHARACTER SET
17              ;       WITH COL'S 21.-60. IN THE BLINK MODE.
18              ;7.5BB  SP2- SCREEN IS AGAIN FILLED WITH  A ROTATING CHARACTER
19              ;       SET WITH COL'S 1-20 AND 61-80 IN BLINK MODE.
20              ;       ###BLINKING CHARACTERS SHOULD BEGIN BLINKING AS PRINTED.
21
22              ;7.5BBB SP2X- DISPLAY DESCRIBED IN 7.5BB WITH BLINK ENABLED FOR
23              ;       3 SEC AND DISABLED FOR 3 SEC. CYCLE REPEATS 4 TIMES.
24              ;*************************************************************
25              ;       TESTS 7.5C,7.5CC,7.5D,7.5DD ARE RUN ONLY WITH UPPER/
26              ;       LOWER CASE CHARACTER SET OPTION(IE. 6053 DISPLAY).
27
28              ;7.5C   SP3- SCREEN IS FILLED WITH A ROTATING CHARACTER
29              ;       SET WITH COL'S 21-60. IN THE DIM MODE.
30              ;7.5CC  SP3- SCREEN IS AGAIN FILLED WITH A ROTATING CHARACTER
31              ;       SET WITH COL'S 1-20 AND 61-80 IN THE DIM MODE.
32
33              ;7.5D   SP4- SCREEN IS FILLED WITH A ROTATING CHARACTER SET
34              ;       WITH COL'S 21-60 WITH AN UNDERSCORE.
35              ;7.5DD  SP4- SCREEN IS AGAIN FILLED WITH A ROTATING CHARACTER
36              ;       SET WITH COL'S 1-20 AND 61-80 WITH UNDERSCORE.
37              ;*************************************************************
38
39
40              ;7.5E   SP5- PROGRAM WRITES 48. LINES OF(SCREEN !NOT! IN ROLL
41              ;       MODE) WITH EACH LINE SHIFTED LEFT 1 COL. SCREEN IS THEN
42              ;       CLEARED/PUT IN ROLL MODE AND 48. LINES OF(SCREEN IN ROLL
```

```
!0006 .MAIN
01
02              ;7.6    CHARACTER ECHO TEST (SA 505)
03              ;       PROGRAM ECHO'S TO DISPLAY ANY PRINTABLE CHAR OR ANY
04              ;       DISPLAY CONTROL CHARACTER (WITH EXCEPTION OF CURSOR
05              ;       WRITE AND READ) ENTERED BY THE OPERATOR VIA
06              ;       THE KEYBOARD.
07
08              ;       A CONTROL-A WILL ABORT TESTING ON A GIVEN DISPLAY AND
09              ;       OPEN TESTING ON THE NEXT LINE NUMBER ENTERED, IF TESTING
10              ;       IN A MULTIPLE 4060 OR ALM CONFIGURATION. IF ONLY A
11              ;       SINGLE DISPLAY EXISTS, THEN TESTING WILL CONTINUE ON
12              ;       THAT DISPLAY.
13
14              ;       A CONTROL-B PERFORMS 2 SPECIAL FUNCTIONS-
15              ;       THE FIRST ENTERED BEGINS STORING ALL CHARACTERS ENTERED
16              ;       IN A BUFFER. THE 2ND ENTERED CLOSES THE BUFFER AND
17              ;       STARTS THE FOLLOWING LOOP:
18
19              ;       THE SCREEN IS CLEARED/ CURSOR RESET AND THE BUFFER
20              ;       IS OUTPUT TO THE DISPLAY UNTIL COMPLETION. THE
21              ;       OPERATION IS REPEATED INDEFINATELY. ANY KEYBOARD INPUT
22              ;       DURING THE LOOP WILL ABORT THE LOOP AND RETURN CONTROL
23              ;       TO THE NORMAL ECHO PROGRAM.
24
25
26              ;7.7    OCTAL CHARACTER ECHO TEST (SA 506)
27
28              ;       PROGRAM ECHO'S BACK OCTAL DUMP OF CHARACTERS INPUT VIA
29              ;       THE KEYBOARD FOLLOWED BY A CR-LF. IF AN RS-FUNCTION CHAR
30              ;       IS INPUT (2 BYTES), 2 BYTES ARE DUMPED SEPARATED BY
31              ;       A COMA. ## PROGRAM IS INTENDED FOR USE IN VERIFICATION
32              ;       OF NON-PRINTABLE CONTROL INPUTS VIA THE KEYBOARD.
33
34              ;       A CONTROL-A WILL ABORT TESTING ON A GIVEN DISPLAY AND
35              ;       OPEN TESTING ON THE NEXT LINE NUMBER ENTERED, IF TESTING
36              ;       IN A MULTIPLE 4060 OR ALM CONFIGURATION. IF ONLY A
37              ;       SINGLE DISPLAY EXISTS, THEN TESTING WILL CONTINUE ON
38              ;       THAT DISPLAY.
```

```
!0007 .MAIN
01
02              ;7.8    6054,6055 PRINTER OPTION TEST (SA 507)
03
04              ;7.81   THE SCREEN IS CLEARED AND THE MESSAGE -PRINTER TEST-
05              :       IS DISPLAYED ON LINE 24., THEN PRINTED 4 TIMES ON
06              :       THE PRINTER.
07
08              ;7.82   4 DISPLAYS AS DESCRIBED IN 7.3 ARE GENERATED THEN
09              :       PRINTED.
10
11              ;7.83   1 DISPLAY AS DESCRIBED IN 7.4 IS GENERATED THEN
12              :       PRINTED 4 TIMES.
13
14              ;7.84   THE DISPLAY AS DESCRIBED IN 7.5AB IS GENERATED. THE
15              :       ENTIRE DISPLAY IS PRINTED FOLLOWED BY THE BOTTOM 2 LINES,
16              :       THEN THE BOTTOM 13. LINES AS THE CURSOR IS LOADED TO
17              :       ROWS 0,21., AND 10. RESPECTIVELY. THE COLUMN LOADED
18              :       IS 16(OCT) WHICH SHOULD BE IGNORED BY THE PRINTER.
19
20              ;7.85   A DIAGONAL OF A'S IS GENERATED THEN PRINTED. EACH (A)
21              :       IS BUMPED 1 ROW AND 3 COLUMNS TO THE RIGHT OF THE
22              :       PRECEEDING (A).
23
24              ;7.86   A DISPLAY OF 24. LINES, EACH CONTAINING A SINGLE CHAR.
25              :       (STARTING WITH (A) AND BUMPED 1 WITH EACH NEW LINE)
26              :       IS GENERATED THEN PRINTED.
27
28              ;7.87   A DISPLAY CONSISTING OF 6 (40. CHARACTER LINES OF ALL
29              :       A'S,B'S -F'S) EACH FOLLOWED BY 3 BLANK LINES IS
30              :       GENERATED THEN PRINTED.
31
32              ;7.88   ***THE FOLLOWING 3 DISPLAY'S ARE GENERATED ONLY WITH THE
33              :       6053 DISPLAY.
34
35              :       THE 2 DISPLAYS OF 7.5C AND 7.5CC ARE GENERATED AND
36              :       PRINTED. THOSE AREAS OF THE DISPLAY WHICH ARE DIMMED
37              :       SHOULD BE BLANKED ON THE PRINTOUT. THE MODE IS THEN
38              :       CHANGED BACK TO NO WRITE PROTECT AND THE ENTIRE DISPLAY
39              :       (BOTH DIM AND NON-DIM) SHOULD BE PRINTED.
```

```
!0008 .MAIN
01              ;8. OPERATING MODES/SWITCH SETTINGS
02
03              ;8.1    STARTING ADDRESSES
04              :       4       RELOAD PROGRAM PARAMETERS/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 EVEN OR NO PARITY
08              :               ***FOR PROGRAM INITIALIZATION.
09              :       200     RUNALL TESTS
10              :       500     RUNALL TESTS
11              :       501     AUTOMATIC DIAGNOSTIC TESTS
12              :       502     WORST CASE CHARACTER VISUAL DISPLAY
13              :               WITH ANY SINGLE CHAR OPTION.
14              :       503     FULL CHARACTER SET VISUAL DISPLAY
15              :       504     SPECIAL CONTROL PATTERN TESTS (SEE 7.5)
16              :       505     CHARACTER ECHO TEST (WITH KEYBOARD)
17              :       506     OCTAL CHARACTER ECHO TEST(WITH KEYBOARD)
18              :       507     6054,6055 PRINTER OPTION TEST.(SEE 7.8)
19
20
21
22              ;8.11   DISCRETE (SWITCH OR SWREG) SELECTIONS
23              :               SW0=1   USE KEYBOARD INPUTS TO CONTROL
24              :                       SWITCH(SWREG) SELECTIONS -SEE 8.12
25              :               SW1=1   PROCEED FROM ERROR LOOP
26              :               SW2=1   DISABLE TTY(4010) MONITER OUTPUT
27              :                       SW2 SHOULD BE 1 UNLESS TTY(4010) PROGRAM
28              :                       INITIALIZATION IS DESIRED OR IF TEST
29              :                       DISPLAY'S ARE ON A 4060 INTERFACE.
30              :                       **IE. IF TESTS DISPLAYS ARE ON A 4010
31              :                       TYPE INTERFACE, SW2 SHOULD BE A 1
32              :                       DURING TESTING.
33              :               SW3=1   PRINT FAILURE RATE
34              :               SW5=1   OUTPUT ERROR OUTPUT TO LPT
35              :               SW6=1   HALT ON ERROR
36              :               SW7=1   PUT PROGRAM IN AUTO MODE
37              :                       OPERATOR RESPONSE REPLACED BY
38              :                       A 2 SECOND DELAY.
```

```
10009 .MAIN
01              :8.12  KEYBOARD OPTIONS (IF PRESENT)
02              :8.12A          IF A KEYBOARD IS PRESENT, THE PANEL SWITCHES
03              ;               MAY BE REPLACED BY A SOFTWARE REGISTER
04              ;               CONTROLLED BY THE KEYBOARD VIA THE FOLLOWING
05              ;               PROCEDURE.
06
07              ;               AN ESCAPE KEY IS HIT AT ONE OF THE FOLLOWING
08              ;               TIMES.
09
10              ;               AT PROGRAM STARTUP AFTER MESSAGE
11              ;               -SET SWREG AS PER 8.11,8.12 - TO 1ST DISPLAY
12
13              ;               AFTER AN ABORT(C^-A) WHILE TEST IS IN PROGRESS.
14
15              ;               OR WHEN A VISUAL TEST HAS COMPLETED AND IS
16              ;               REQUIREING AN OPERATOR RESPONSE.
17
18              ;               AFTER THE ESCAPE KEY IS ENTERED, THE FOLLOWING
19              ;               KEYS ARE INTERPRETED AS FOLLOWS:
20
21              :8.12B          M -PRINT CONTENTS OF SWREG IN OCTAL
22              ;               K -ZERO CONTENTS OF SWREG
23              ;               0-9 -COMPLIMENT STATE OF SWITCH VALUE 0-9
24              ;               L -RESTART PROGRAM AT LOC 6 (TTY INITIALIZE)
25
26              ;               ANOTHER CONTROL-A WILL EXIT TEST AND A CARRIAGE
27              ;               RETURN OR NEWLINE WILL RESULT IN NORMAL PROGRAM
28              ;               SEQUENCING.
29
30              ;               ***FOR PROGRAM TO INTERPRET (SWREG) AS THE
31              ;               SWITCH VALUES, SW0 MUST BE SET TO 1, OTHERWISE
32              ;               PROGRAM WILL MONITER PANEL SWITCHES FOR CONTROL.
```

```
10010 .MAIN
01
02              :8.12C          OPERATOR RESPONSES TO VISUAL DISPLAYS
03
04              ;***********************************************************
05              ;               CONTROL-A  EXIT THIS TEST
06              ;               ***IF THE ABORT KEY IS ENTERED WHILE A TEST IS
07              ;               IN AUTO MODE (SW7), OR IS IN PROGRESS, THE C^-A
08              ;               MUST BE FOLLOWED BY A SECOND CHARACTER AS THE
09              ;               PROGRAM IS OPEN TO SWREG CONTROL. IE. AN ESCAPE
10              ;               SEQUENCE MAY BE ENTERED ,ANOTHER C^-A OR CR WILL
11              ;               EXIT TEST, AND ANYTHING ELSE WILL RESULT IN AN
12              ;               ERROR RETURN.
13
14              ;               ALSO, DUE THE THE NATURE OF THE TESTS, THE
15              ;               ABORT KEY IS NOT VALID DURING THE A-SERIES
16              ;               INTERFACE TESTS.
17              ;***********************************************************
18
19              ;               A CARRIAGE RETURN OR NEWLINE WILL RESULT IN
20              ;               NORMAL PROGRAM SEQUENCING.
21
22              ;               ANYTHING ELSE RESULTS IN AN ERROR RETURN
23              ;               AND ERROR LOOP.(EXCEPTION SA 502) IF SW6=1,
24              ;               PROGRAM ¡WILL¡ HALT ON OPERATOR DEFINED ERROR.
25              ;               TO PLACE IN CONTINUOUS ERROR LOOP, SW7 MUST
26              ;               BE SET WITH SW1=0. TO EXIT LOOP, SET SW1=1
27              ;               OR HIT CONTROL-A.
28
29              ;               ## IF KEYBOARD NOT PRESENT
30              ;               HIT CONTINUE WITH SW1=1 FOR NORMAL CONTINUE
31              ;               SW1=0 FOR ERROR RETURN.
```

```
!0011 .MAIN
01
02              ;9. OPERATING PROCEDURE/OPERATOR INPUT
03              ;9.1    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              ;       SET THE SWITCHES TO STARTING ADDRESS AND PRESS START.
08
09              ;9.2    IF THIS IS THE INITIAL PASS OF THE PROGRAM (AFTER
10              ;       BEING LOADED) THE PROGRAM WILL REQUIRE THESE
11              ;       FOLLOWING DATA: A) STATE OF THE PARITY SELECT SWITCH,
12              ;       SELECTING EITHER ODD, EVEN, OR NO PARITY(MARKED), B)THE
13              ;       TYPE #(SEE 9.3) OF THE INTERFACE ASSEMBLY INSTALLED
14              ;       IN THE COMPUTER WHICH WILL BE DRIVING THE DISPLAY,
15              ;       C)THE DEVICE CODE # OF THE INTERFACE ASSEMBLY,
16              ;       OUTPUT CHARACTER SET OPTION (UPPER/LOWER
17              ;       CASE OR UPPER CASE ONLY), WHETHER KEYBOARD IS PRESENT,
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
```

```
!0012 .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 ? 6053 ? (0=NO 1=YES)         1,1 OR 0,1 ETC.
41              ;
42              ;ALM OR 4060 LINE #'S                   UP TO 8. 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 -                     500-507
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
```

```
10013 .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   O P P    I I I   I I I   D  D  D    D  D  D
19
20              ;       WHERE: P= PARITY; 1 FOR ODD, 2 FOR EVEN, 0 FOR
21              ;                 NO PARITY (MARKED,MSB=1)
22              ;              K=1 IF KEYBOARD PRESENT,0 OTHERWISE
23              ;              O=1 IF 6053 DISPLAY, 0 IF 6052 DISPLAY
24              ;             I= LAST 2 OCTAL DIGITS OF INTERFACE TYPE#
25              ;                ENTER 10 FOR 4010,4075,OR 4077
26              ;                ENTER 60 FOR 4060
27              ;                ENTER 0 FOR ANY ALM INTERFACE
28
29              ;             D= 2 DEVICE CODE OCTAL DIGITS (EVEN #
30              ;                DEVICE CODE IF INTERFACE IS A 4010 TYPE).
31
```

```
10014 .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
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 THE PANEL SWICH SETTING.
```

```
!0015 .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              ;       A ERROR LOOP (SW1=0) BETWEEN CALLS
24              ;       SETUP AND LOOP OR CONTINUE TO NEXT TEST (SW1=1)
25
```

```
!0016 .MAIN
01              :10.2   OPERATOR SEQUENCING AND ERROR DETECTION
02
03              ;       IN THE VISUAL DISPLAY THE OPERATOR IS REQUIRED TO
04              ;       SEQUENCE THE PROGRAM AFTER THE COMPLETION OF EACH
05              ;       PATTERN UNLESS THE PROGRAM IS IN AUTO MODE(SW2=1)
06              ;       HOWEVER, PROGRAM MAY STILL DETECT AND HALT ON
07              ;       TRANSMIT TIMEOUT ERRORS DURING VISUAL TESTS.
08              ;       IF MANUAL MODE IS IN EFFECT THE OPERATOR OPTIONS
09              ;       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.
```

```
!0017 .MAIN
01              ;11. DEBUG HELP
02              ;11.1 SUBROUTINES AND CALLS
03              ;
04              ;       OUTPUT CHARACTER IN AC1 VIA INTERFACE
05              ;CALL   OUT1
06              ;       RETURN 1        INTERRUPT TIMEOUT OR
07              ;                       UNDEFINED INTERRUPT(SEE 10.1)
08              ;       RETURN 2        NORMAL
09              ;
10              ;       WAIT FOR INTERRUPT
11              ;CALL   IWAIT
12              ;       RETURN 1        INTERRUPT TIMEOUT OR
13              ;                       UNDEFINED INTERRUPT(SEE 10.1)
14              ;       RETURN 2        NORMAL RETURN
15              ;                       IF TRANSMIT DONE, AC1 =40000
16              ;                       IF RECV'R DONE AC1=BIT0+CHAR IN
17              ;                       BITS 8-15
18              ;
19              ;       OUTPUT CHARACTER ADDRESSED BY ARG1, ARG2 TIMES
20              ;CALL   COUT1
21              ;       ARG1            ADDRESS OF CHARACTER
22              ;       ARG2            # OF TIMES TO OUTPUT
23              ;       RETURN 1        INTERRUPT TIMEOUT (AC0=# RECV'D) OR
24              ;                       UNDEFINED INTERRUPT (SEE 10.1)
25              ;       RETURN 2        NORMAL
26              ;
27              ;       OUTPUT A MESSAGE VIA THE INTERFACE
28              ;CALL   MESGR
29              ;       ARG1            BYTE POINTER TO MESSAGE
30              ;       RETURN 1        INTERRUPT TIMEOUT (AC0=# RECV'D) OR
31              ;                       UNDEFINED INTERRUPT (SEE 10.1)
32              ;       RETURN 2        NORMAL
33              ;
34              ;       SET UP LOOP RETURN FROM ERROR HANDLER
35              ;CALL   ADDSET
36              ;       ARG1            ADDRESS OF LOOP CALL
37              ;       RETURN 1        NORMAL RETURN
38              ;
39              ;       OUTPUT LOAD CURSOR COMMAND FOLLOWED BY 2 BYTES (ARG1)
40              ;       DEFINING CURSOR POSITION.
41              ;CALL   CURL
42              ;       ARG1            COL BITS 0-7, ROW BITS 8-15
43              ;       RETURN 1        INTERRUPT TIMEOUT(AC0 =# RECV'D) OR
44              ;                       UNDEFINED INTERRUPT (SEE 10.1)
45              ;       RETURN 2        NORMAL
46              ;
47              ;       OUTPUT READ CURSOR COMMAND, PROCESS THE 3 INPUTS FROM
48              ;       THE DISPLAY DEFINING THE POSITION, AND CHECK AGAINST ARG1.
49              ;CALL   CURR
50              ;       ARG1            EXPECTED COL(BITS 0-7) AND ROW (BITS 8-15)
51              ;       RETURN 1        INTERRUPT TIMEOUT (AC0 =# RECV'D) OR
52              ;                       UNDEFINED INTERRUPT (SEE 10.1)
53              ;       RETURN 2        RECV'R INTERRUPT TIMEOUT (AC0 =# RECV'D)
54              ;       RETURN 3        ALM STATUS ERROR (AC0=RECV'R STATUS)
55              ;       RETURN 4        PARITY ERROR (AC1 SHOULD =AC0)
56              ;       RETURN 5        AC1 (1ST CHAR BACK) SHOULD=37
57              ;       RETURN 6        COL/ROW ERROR, AC1 SHOULD =AC0
58              ;       RETURN 7        NORMAL RETURN
```

```
!0018 .MAIN
01                      .EOT
```

```
!0019 .MAIN
**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS
```