FLUKE®

CUSTOMER SERVICE

9000A-8080 INTERFACE POD TEST FIXTURE

PREPARED BY ED FERGUSON

CUSTOMER SERVICE ENGINEERING

JOHN FLUKE MFG. CO., INC.

INTRODUCTION

The Fluke Customer Service 9000 series test fixtures will verify proper operation of 9000 interface pods. Accompanying test software will exercise the pod and identify faulty functions and lines. A separate test fixture and program is required for each pod type. Each test fixture consists of test points for all UUT cable lines, a ROM to execute a 'RUN UUT' program, and a divider circuit to simulate power supply faults. Once the software has identified a faulty line, a technican familiar with the pod theory may use the 9010A's troubleshooting functions to locate the cause.

The test program utilizes the 9010A and probe to verify proper activity at all test test points in both a NORMAL and 'RUN UUT' mode. One hand operation is allowed with software that senses when the probe is in place, stimulates the test point, takes a reading, and compares the result with the expected result. Input lines are stimulated by jumpering a test point high or low. The software will optionally loop on a failure to allow probing back thru the pod circuitry. A complete pod test takes under seven minutes to complete.

OPERATION

Plug the test fixture into the pod self test socket and the UUT cable into the fixture socket. Load the 8080 pod tape and execute program 0. A menu will appear allowing selection of either the 'NORMAL' or the 'RUN UUT' tests. Follow the displayed test instructions to probe or jumper the fixture test points. A pass is indicated with a single beep and brief display message such as :

```
TP 17 LOGIC LVL HL = HL PASS
```

A failure is indicated with three beeps and a display message such as :

```
TP 17 LOGIC LVL HL=H FAIL LOOP?
```

The operator may loop on the failure by pressing YES or LOOP. When looping on a failure a beep will indicate a pass condition, allowing intermittents to be traced without watching the 9010 display. Press CONT to exit the loop and continue to the next test. In addition to faults detected by the test program, the 9010 will interrupt and report any time that it's software detects a failure. Note however that the test program has disabled certain UUT system errors with the set up commands. Refer to the program listings for set up information.

NOTE

A 'POD TIMEOUT-ATTEMPTING RESET' error message indicates an inoperative pod and will not allow the program to run. Refer to section 5 of the pod manual to troubleshoot an inoperative pod.

NORMAL TEST

The 'NORMAL' test is divided into 12 sub tests. Upon selection of this test, the starting sub test number (1-12) must be entered. This allows branching to a specific routine during troubleshooting. The tests are sequenced to find major faults early. If the condition of the pod is unknown begin with sub test 1; the remaining tests will automatically follow in sequence.

SUB TEST 1 - POWER SUPPLY CHECK

The probe is used to check the presence of supply voltages. Because the probe threshold is set for logic levels only, measure the supply test points with a DMM if a supply problem is suspected.

SUB TEST 2 - CLOCK CHECK

The probe is used to verify the phase 1 and 2 clocks are toggling.

SUB TEST 3 - STATUS CHECK

All status lines are probed for proper inactive levels.

SUB TEST 4 - READ STATUS TEST

The status lines are read by the pod for proper inactive levels. Each status line is then jumpered to the active state and read by the pod.

SUB TEST 5 - POWER SUPPLY STATUS TEST

Power supply status is read by the pod and checked for a no-fault condition. Divider switches S1 - S3 are then pressed in sequence and status is checked for a fault condition.

SUB TEST 6 - CONTROL CHECK

Each contol line is read by the probe for proper levels.

SUB TEST 7 - WRITE CONTROL TEST

User writable control lines are toggled in sequence and verified with the probe for proper levels.

SUB TEST 8 - ADDRESS TOGGLE TEST

Each address line is toggled in sequence and verified with the probe for proper levels.

SUB TEST 9 - DATA TOGGLE TEST

Each data line is toggled in sequence and verified with the probe for proper levels.

SUB TEST 10 - BUS TEST

A bus test is executed.

SUB TEST 11 - READ DATA TEST

Data is read at address FFFF and checked for FF.
Data is read at address 0002 (ROM) and checked for 00.

SUB TEST 12 - TEST FIXTURE ROM TEST (8080 FIXTURE ROM VER 1.1)

A ROM test is executed from 0 - 7FF and signature 39FF is verified. At the completion of sub test 12 the test menu is displayed again.

RUN UUT TEST

The 'RUN UUT ' test executes a program in the fixture ROM that toggles certain address lines and allows an interrupt to vector the program to a routine toggling a different set of lines. All lines are probed for proper activity. Finally the pod hold and wait functions are tested. Refer to the fixture theory of operation for a description of the ROM program.

The 'RUN UUT' test is divided into 9 sub tests. No provision is made to branch to a particular sub test because the outcome of some tests are dependent on previous test conditions.

SUB TEST 1 - CONTROL TESTS
The 9010A program places the pod in the 'RUN UUT' mode. A reset is performed and the fixture ROM executes the program at address 0. All control lines are probed for proper activity.

SUB TEST 2 - ADDRESS TESTS
All address lines are probed for proper activity as defined by the fixture ROM program.

SUB TEST 3 - DATA TESTS
All data lines are probed for activity.

SUB TEST 4 - INTERRUPT TEST
The 9010A program is halted so an interrupt may be performed.

SUB TEST 5 - INTE CONTROL TEST
All control lines are probed for proper activity.

NOTE

The INTE line (TP30) should be low after an interrupt is received. It will remain high if the interupt performed at sub test 4 did not get accepted. Execute program 0 and begin the 'RUN UUT' test over. This does not indicate a problem with the pod unless TP30 fails consistantly.

SUB TEST 6 - ADDRESS TESTS
All address lines are probed for proper activity as defined by the fixture ROM program.

SUB TEST 7 - DATA TESTS
All data lines are probed for activity.

SUB TEST 8 - HOLD TEST
The HOLD line is tied high and the HLDA line probed for an acknowledge.

SUB TEST 9 - WAIT TEST
The READY line is tied low and the WAIT line is probed for a wait. At the completion of sub test 9 the menu is displayed again.

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FIXTURE THEORY OF OPERATION

The test fixture receives power and clock signals from the pod self test socket. No other connections to the self test socket are made. A divider and switch for each supply allows low line fault testing. S1 reduces the -5 volt supply to -4.5V, S2 reduces +5V to +4.5V, and S3 reduces +12v to +11V.

Test points 1 - 40 allow access to all lines of the pod UUT cable for probing or stimulus as required. RESET, INT ,HOLD , and READY are tied to their inactive state with R7 - R10. All data lines are pulled high with Z1. TP 41 is connected to +5V thru a 20 ohm resistor to provide a logic high level for stimulus of other test points. TP 40 is used to tie other test points low.

ROM U1 contains a program to test the 'RUN UUT' function. A high on the RESET line will cause the program to start at address location 0, enable the interupt line, and toggle address lines A0 - A5, A11, A13, and A14. The other address lines will remain low.

A high on the INT line will cause the program to vector to a routine that toggles A0-A10, A12, A13, and A15. The other address lines remain low. Note that this INT routine cannot be entered until the reset program described above has been used, as the reset routine enables the interupt line.

SOFTWARE DESCRIPTION

The test software consists of 17 programs, 2 of which are the 'NORMAL' and 'RUN UUT' tests for a particular pod. The remaining 15 programs are subroutines common to all fixtures. The program functions are outlined below. Refer to the program listings for detailed descriptions.

PROGRAM 0 is a menu to select either the 'NORMAL' or 'RUN UUT' tests.

PROGRAM 1 performs a read probe.

PROGRAM 2 toggles the address bit specified in REG D four times and performs a read probe.

PROGRAM 3 toggles the data bit specified in REG D four times and performs a read probe.

PROGRAM 4 toggles the control bit specified in REG D four times and performs a read probe.

PROGRAM 5 performs a read probe after a 1/4 second delay.

PROGRAM 90 performs a read operation at the location specified in REG 3. Expected data is specified in REG 2. Program exits if expected data equals the actual, else the operator may branch to a loop - on - fail routine.

PROGRAM 91 performs a read status and displays the actual (REG C) and expected (REG A) levels.

PROGRAM 92 performs a status read operation at the test point specified in REG 9. Operator is instructed to place jumpers or press buttons as specified in REG 8. Program exits if expected status equals the actual, else the operator may branch to a loop-on-fail routine.

PROGRAM 93 calls program 1 to perform a read probe, then decodes the the probe history in REG C into level, count, or signature information as specified in REG 8. Only level information is used in the 8080 pod tests. The expected and decoded probe history is displayed.

PROGRAM 94 selects the sync mode specified in REG 8 and calls PROG 93 to perform a read probe and display the history at the test point specified in REG 9. Program exits if expected history equals the actual, else the operator may branch to a loop-on-fail routine.

PROGRAM 95 detects when the probe has been removed from the test point.

PROGRAM 96 detects when the probe has been placed on a test point. If a valid level has not been detected within four seconds, the program will timeout and exit.

PROGRAM 97 provides a one second delay for viewing display messages.

PROGRAM 98 provides a 1/4 second delay for brief display messages and multiple beeps.

PROGRAM 64 is the 'NORMAL' test for the 8080 pod. The starting sub test is selected and the program branches to the appropriate label. REG 8 is encoded with the test information as outlined in the REGISTER DECODING charts shown in the next section. The appropriate subroutine (program 90, 92, or 94) is called for read data, read status, or read probe operations respectively. Refer to the program listings for test discriptions.

PROGRAM 65 is the 'RUN UUT' test for the 8080 pod. The pod is placed in the 'RUN UUT' mode and a reset is performed to run the ROM program. REG 8 is encoded with test information as outlined in the REGISTER 8 DECODING charts shown in the next section. The appropriate subroutine (program 90,92, or 94) is called for read data, read status, or read probe operations respectively. Refer to the program listings for test discriptions.

REGISTER 8 ENCODING

(1) REGISTER 8 ENCODING FOR DATA READS - PROGRAM 90

```
             READ ADDRESS            DATA
             bits  23 - 8            7 - 0
         \___________________/    \_________/
0000 0000 XXXX XXXX XXXX XXXX      XXXX XXXX
              ( 0 - FFFF )         ( 0 - FF )
```

EXAMPLE : REG 8 = 00FFFFFF, CALL PROGRAM 90

PERFORM READ @ FFFF
EXPECTED DATA = FF

(2) REGISTER 8 ENCODING FOR STATUS READS - PROGRAM 92

```
           STATUS BIT MASK  PASS       SWITCH         TIE  TP      TEST POINT
              bits 19-12     11        10 - 9          8 - 7         5 - 0
              \_________/   \_/         \__/           \__/        \________/
0000 0000 0000 XXXX XXXX     X           XX             XX         0XX  XXXX
              ( 0 - 255 )                                          ( 0 - 63 )

                             0 = LO      00 = NO PUSH   00 = DO NOT TIE TP
                             1 = HI      01 = PUSH S1   01 = TIE TP LOW
                                         10 = PUSH S2   11 = TIE TP HI
                                         11 = PUSH S3
```

EXAMPLE: REG8 = 00010999 , CALL PROG 92

Test point = 25
Tie TP 25 high
Do not push button
Pass if status reads high
Status bit mask = 00010000

(3) REGISTER 8 ENCODING FOR PROBE HISTORY - PROGRAM 94

```
     Expected signature,count,     Sync &      Stimulus        Test point
     or level history.             read.       Program #

          bits  31 - 16            15 - 12      11 - 6           5 - 0
    \___________________________/  \____/      \________/       \________/
SIG  XXXX   XXXX   XXXX   XXXX      XXXX        XXXX  XX         XX  XXXX
                                               ( 0 - 63 )       ( 0 - 63 )
HIST 0000   0000   0000   01xh
                                    0000 = freerun - signature
CONT 0XXX   XXXX   0XXX   XXXX      0001 = freerun - level
      \________/    \________/      0010 = freerun - count
       MIN COUNT     MAX COUNT      0100 = address - signature
       ( 0-127 )     ( 0-127 )      0101 = address - level
                                    0110 = address - count
                                    1000 = data - signature
                                    1001 = data - level
                                    1010 = data - count
```

EXAMPLE: REG8 = 00051081 , CALL PROGRAM 94

Test point = 1
Stimulus program = 2
Sync = freerun
Read = level history
Expected level history = LH

```
***********************************************************
***********************************************************
***                                                     ***
***   TITLE:    FLUKE 9000A 8080 INTERFACE POD TESTS    ***
***   VERSION:  REV 1.0   DEC 15 1981                   ***
***   AUTHOR:   ED FERGUSON                             ***
***             CUSTOMER SERVICE ENGINEERING            ***
***             JOHN FLUKE MFG. CO., INC.               ***
***                                                     ***
***********************************************************
***********************************************************
```

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```
SET UP COMMANDS

   TRAP BAD PWR SUPPLY ? NO             TRAP ILLEGAL ADDR ? YES
   TRAP ACTIVE INTERRUPT ? NO           TRAP ACTIVE FORCE LINE ? YES
   TRAP CTL ERR ? YES                   TRAP ADDR ERR ? YES
   TRAP DATA ERR ? YES                  ENABLE READY ? NO
   ENABLE HOLD ? NO                     BUS TEST @ FFFF
   RUN UUT @ 0000                       TIMEOUT 200
   EXERCISE ERRORS ? YES                BEEP ON ERR TRANSITION ? YES
   STALL 13                             UNSTALL 11
   NEWLINE 00000D0A                     LINESIZE 79


PROGRAM 0  MENU

   DPY *** 8080 POD TESTS
   DPY-+ REV 1.0 ***#
   EXECUTE PROGRAM 97
   DPY- *** FLUKE CUSTOMER
   DPY-+ SERVICE ***#
   EXECUTE PROGRAM 97
0: LABEL 0
   DPY-TEST? 1-8080 NORM
   DPY-+ 2-8080 RUN UUT
1: LABEL 1
   DPY-+#
   REG1 = 40
   DPY-+%1
2: LABEL 2
   IF REG1 = 40 GOTO 2
   IF REG1 = 1 GOTO 3
   IF REG1 = 2 GOTO 4
   GOTO 1
3: LABEL 3
   EXECUTE PROGRAM 64
   GOTO 0
4: LABEL 4
   EXECUTE PROGRAM 65
   GOTO 0
```

```
PROGRAM 1  READ PROBE; NO DELAY

   READ PROBE                                    CLEAR PROBE
   READ PROBE                                    READ LOGIC HISTORY
   REGC = REG0                                   ASSIGN HISTORY TO GLOBAL REG C


PROGRAM 2  ADDRESS TOGGLE

   READ PROBE                                    CLEAR PROBE
   ATOG @ 0 BIT REGD REPT REPT REPT              TOGGLE ADDR BIT(REG D) 4 TIMES
   READ PROBE                                    READ LOGIC HISTORY
   REGC = REG0                                   ASSIGN HISTORY TO GLOBAL REG C


PROGRAM 3  DATA TOGGLE

   READ PROBE                                    CLEAR PROBE
   DTOG @ FFFF = FF BIT REGD REPT REPT REPT      TOGGLE DATA BIT(REG D) 4 TIMES
   READ PROBE                                    READ LOGIC HISTORY
   REGC = REG0                                   ASSIGN HISTORY TO GLOBAL REG C


PROGRAM 4  CONTROL TOGGLE

   SYNC FREE-RUN
   READ PROBE                                    CLEAR PROBE
   DTOG @ CTL = 00000000 BIT REGD REPT REPT REPT TOGGLE CTL BIT(REG D) 4 TIMES
   READ PROBE                                    READ LOGIC HISTORY
   REGC = REG0                                   ASSIGN HISTORY TO GLOBAL REG C


PROGRAM 5   READ PROBE; 1/4 SECOND DELAY

    READ PROBE                                   CLEAR PROBE
    EXECUTE PROGRAM 98                           DELAY 1/4 SECOND
    READ PROBE                                   READ LOGIC HISTORY
    REGC = REG 0                                 ASSIGN HISTORY TO GLOBAL REG C
```

```
PROGRAM 90   DATA TEST

   REG2 = REG8 AND FF                   EXPECTED DATA (REG 2)
   REG3 = REG8 SHR SHR SHR SHR
   REG3 = REG3 SHR SHR SHR SHR
   REG3 = REG3 AND FFFF                 READ ADDRESS (REG 3)
   READ @ REG3                          READ DATA
   DPY-READ DATA $2=$E                  EXPECTED DATA = ACTUAL DATA
   IF REG2 = REGE GOTO 6                BRANCH PASS
   DPY-+ FAIL LOOP?#                    FAIL;LOOP?
   EXECUTE PROGRAM 98                   DELAY
   DPY-+#                               BEEP
   EXECUTE PROGRAM 98                   DELAY
0: LABEL 0
   DPY-+#                               BEEP
   REG1 = 40                            NO KEYS THIS VALUE
   DPY-+%1                              ENABLE INPUT
1: LABEL 1                              SELECT OPTION ENTRY
   IF REG1 = 40 GOTO 1                  LOOP UNTIL INPUT
   IF REG1 = 1C GOTO 2                  PRESSED 'YES'
   IF REG1 = 27 GOTO 2                  PRESSED 'LOOP'
   IF REG1 = 1D GOTO F                  PRESSED 'NO'
   IF REG1 = 25 GOTO F                  PRESSED 'CONTINUE'
   GOTO 0                               PRESSED INVALID KEY
2: LABEL 2                              LOOP ENTRY
   REGB = 40                            NO KEYS THIS VALUE
   DPY-+%B                              ENABLE INPUT
3: LABEL 3
   READ @ REG3                          READ DATA
   DPY-READ DATA $2=$E                  EXPECTED DATA = ACTUAL DATA
   IF REG2 = REGE GOTO 4                BRANCH PASS
   DPY-+ FAIL                           FAIL
   GOTO 5                               BRANCH CHECK KEY
4: LABEL 4                              PASS ENTRY
   DPY-+ PASS#                          PASS
5: LABEL 5                              CHECK KEY
   IF REGB = 40 GOTO 3                  LOOP UNTILL CONT PRESSED
   IF REGB = 25 GOTO F                  PRESSED CONT;BRANCH EXIT
   DPY-+#                               BEEP
   GOTO 2                               PRESSED INVALID KEY
6: LABEL 6                              PASS ENTRY
   DPY-+ PASS#                          PASS
   EXECUTE PROGRAM 98                   DELAY
F: LABEL F                              EXIT
```

PROGRAM 91   STATUS READER

```
    READ @ STS REPT                             READ STATUS
    REGC = REGC AND FF                          ACTUAL STATUS 8 LINES (REG C)
    REGA = REG8 SHR SHR SHR SHR
    REGA = REGA SHR SHR SHR SHR
    REGA = REGA SHR SHR SHR SHR
    REGA = REGA AND FF                          EXPECTED STATUS (REG A)
    IF REG9 > 0 GOTO 0                          BRANCH DISPLAY TEST POINT
    DPY-POWER                                   POWER SUPPLY STATUS
    GOTO 1                                      BRANCH DISPLAY STATUS
0:  LABEL 0                                     TEST POINT ENTRY
    DPY-TP@9                                    DISPLAY TEST POINT (REG 9)
1:  LABEL 1                                     DISPLAY STATUS ENTRY
    IF REG8 AND 800 = 800 GOTO 2                EXPECTING HIGH STATUS
    CPL REGC                                    EXPECTING LOW ;COMPLEMENT ACTUAL STATUS
    REGC = REGC AND FF                          8 STATUS LINES (REG C)
    DPY-+ STATUS LOW=                           EXPECTING LOW STATUS
    GOTO 3                                      BRANCH DISPLAY ACTUAL STATUS
2:  LABEL 2                                     EXPECTING HIGH STATUS ENTRY
    DPY-+ STATUS HIGH=                          EXPECTING HIGH STATUS
3:  LABEL 3                                     DISPLAY ACTUAL STATUS ENTRY
    IF REGA AND REGC = REGA GOTO 5              EXPECTED STATUS=ACTUAL; BRANCH PASS
    IF REG8 AND 800 = 800 GOTO 4                EXPECTED HIGH STATUS; BRANCH FAIL LOW
    DPY-+HIGH FAIL                              EXPECTED LOW STATUS; FAIL HIGH
    GOTO F                                      BRANCH EXIT
4:  LABEL 4                                     FAIL LOW ENTRY
    DPY-+LOW FAIL                               FAIL LOW STATUS
    GOTO F                                      BRANCH EXIT
5:  LABEL 5                                     PASS STATUS ENTRY
    IF REG8 AND 800 = 800 GOTO 6                BRANCH;EXPECTED A HIGH
    DPY-+LOW PASS#                              PASS LOW
    GOTO F                                      BRANCH EXIT
6:  LABEL 6                                     PASS HIGH ENTRY
    DPY-+HIGH PASS#                             PASS HIGH
F:  LABEL F                                     EXIT
```

```
PROGRAM 92   STATUS TEST

   REG9 = REG8 AND 3F                   TEST POINT (REG 9)
   IF REG8 AND 80 = 0 GOTO 3            BRANCH PRESS SWITCH
0: LABEL 0                              TEST POINT ENTRY
   DPY-JUMPER TP@9                      JUMPER TEST POINT (REG 9)
   IF REG8 AND 100 = 100 GOTO 1         BRANCH JUMPER TEST POINT HIGH
   DPY-+ LOW                            JUMPER TEST POINT LOW
   GOTO 2                               BRANCH WAIT FOR CONTINUE
1: LABEL 1                              JUMPER TEST POINT HIGH ENTRY
   DPY-+ HIGH                           JUMPER TEST POINT HIGH
2: LABEL 2                              WAIT FOR CONTINUE ENTRY
   DPY-+ THEN PRESS CONT#               PRESS CONTINUE KEY
   STOP                                 WAIT FOR CONTINUE
3: LABEL 3                              PRESS SWITCH ENTRY
   IF REG8 AND 600 = 0 GOTO 4           NO SWITCH; BRANCH READ STATUS
   REGD = REG8 SHR SHR SHR SHR
   REGD = REGD SHR SHR SHR SHR
   REGD = REGD SHR AND 3                SWITCH NUMBER (REG D)
   DPY-HOLD SWITCH                      HOLD SWITCH DOWN
   DPY-+@D THEN PRESS CONT#             PRESS CONTINUE KEY
   STOP                                 WAIT FOR CONTINUE
4: LABEL 4                              READ STATUS ENTRY
   EXECUTE PROGRAM 91                   STATUS READER
   IF REGA AND REGC = REGA GOTO B       EXPECTED=ACTUAL; BRANCH PASS
   DPY-+ LOOP?#                         FAIL; LOOP?
   EXECUTE PROGRAM 98                   DELAY
   DPY-+#                               BEEP
   EXECUTE PROGRAM 98                   DELAY
5: LABEL 5                              ENABLE INPUT ENTRY
   DPY-+#                               BEEP
   REG1 = 40                            NO KEYS THIS VALUE
   DPY-+%1                              ENABLE INPUT
6: LABEL 6                              SELECT OPTION ENTRY
   IF REG1 = 40 GOTO 6                  LOOP UNTIL INPUT
   IF REG1 = 1C GOTO 7                  PRESSED 'YES'
   IF REG1 = 27 GOTO 7                  PRESSED 'LOOP'
   IF REG1 = 1D GOTO B                  PRESSED 'NO'
   IF REG1 = 25 GOTO B                  PRESSED 'CONTINUE'
   GOTO 5                               PRESSED INVALID KEY
7: LABEL 7                              LOOP ENTRY
   REGB = 40                            NO KEYS THIS VALUE
   DPY-+%B                              ENABLE INPUT
8: LABEL 8
   EXECUTE PROGRAM 91                   STATUS READER
   IF REGA AND REGC = REGA GOTO 9       EXPECTED=ACTUAL; BRANCH PASS
   GOTO A                               EXPECTED<>ACTUAL;BRANCH CHECK KEY
9: LABEL 9                              PASS ENTRY
   DPY-+#                               BEEP
A: LABEL A                              CHECK KEY ENTRY
   IF REGB = 40 GOTO 8                  LOOP UNTIL CONT PRESSED
   IF REGB = 25 GOTO B                  PRESSED CONT;BRANCH EXIT
   DPY-+#                               BEEP
   GOTO 7                               PRESSED INVALID KEY
B: LABEL B                              PASS ENTRY
   EXECUTE PROGRAM 98                   DELAY
C: LABEL C                              EXIT LOOP ENTRY
   IF REG8 AND 80 = 80 GOTO D           BRANCH REMOVE JUMPER
```

```
    IF REG8 AND 600 > 0 GOTO E              BRANCH RELEASE SWITCH
    GOTO F                                  BRANCH EXIT
D:  LABEL D                                 REMOVE JUMPER ENTRY
    DPY-REMOVE JUMPER                       REMOVE JUMPER
    DPY-+ THEN PRESS CONT#                  PRESS CONTINUE
    STOP                                    WAIT FOR CONTINUE
    GOTO F                                  BRANCH EXIT
E:  LABEL E                                 RELEASE SWITCH ENTRY
    DPY-RELEASE SW@D                        RELEASE SWITCH
    DPY-+ THEN PRESS CONT#                  PRESS CONTINUE
    STOP                                    WAIT FOR CONTINUE
F:  LABEL F                                 EXIT
```

```
PROGRAM 93   PROBE HISTORY READER

   IF REG8 AND 2000 = 2000 GOTO 1                BRANCH EVENTS
   IF REG8 AND 1000 = 1000 GOTO 5                BRANCH HISTORY
0: LABEL 0                                       SIGNATURE ENTRY
   REGC = REGC SHR SHR SHR SHR
   REGC = REGC SHR SHR SHR SHR AND FFFF          ACTUAL SIGNATURE (REG C)
   DPY-TP@9 SIG $A=$C                            EXPECTED SIG = ACTUAL
   GOTO F                                        BRANCH EXIT
1: LABEL 1                                       EVENTS ENTRY
   REGC = REGC AND 7F                            ACTUAL COUNT
   REG2 = REGA AND 7F                            MAX COUNT EXPECTED
   REG1 = REGA SHR SHR SHR SHR SHR               MIN COUNT EXPECTED
   REGA = REGA SHR SHR SHR AND 7F
   IF REG1 > REG2 GOTO 2                         BRANCH COUNT WRAP
   IF REGC > REG2 GOTO 3                         BRANCH >MAX FAIL
   IF REG1 > REGC GOTO 3                         BRANCH < MIN FAIL
   GOTO 4                                        BRANCH PASS
2: LABEL 2                                       COUNT WRAP ENTRY
   IF REG2 >= REGC GOTO 4                        BRANCH PASS
   IF REGC >= REG1 GOTO 4                        BRANCH PASS
3: LABEL 3                                       FAIL COUNT ENTRY
   DPY-TP@9 COUNT @1-@2 =@C                      MIN-MAX=ACTUAL
   GOTO F                                        BRANCH EXIT
4: LABEL 4                                       PASS ENTRY
   DPY-TP@9 COUNT @1-@2 =@C                      MIN-MAX=ACTUAL
   REGC = REGA                                   FORCE A PASS;COUNTS IN RANGE
   GOTO F                                        BRANCH EXIT
5: LABEL 5                                       HISTORY ENTRY
   REGC = REGC SHR SHR SHR SHR
   REGC = REGC SHR SHR SHR SHR
   REGC = REGC SHR SHR SHR SHR
   REGC = REGC SHR SHR SHR SHR
   REGC = REGC SHR SHR SHR SHR
   REGC = REGC SHR SHR SHR SHR                   LOGIC LEVEL HISTORY (REG C)
   DPY-TP@9 LOGIC LVL                            TEST POINT (REG 9)
   IF REGA AND 1 = 0 GOTO 6                      BRANCH NOT HIGH
   DPY-+H                                        EXPECTED HIGH
6: LABEL 6
   IF REGA AND 2 = 0 GOTO 7                      BRANCH NOT TRI
   DPY-+X                                        EXPECTED TRISTATE
7: LABEL 7
   IF REGA AND 4 = 0 GOTO 8                      BRANCH NOT LOW
   DPY-+L                                        EXPECTED LOW
8: LABEL 8
   DPY-+=                                        EQUALS
9: LABEL 9
   IF REGC AND 1 = 0 GOTO A                      BRANCH NOT HIGH
   DPY-+H                                        READ HIGH
A: LABEL A
   IF REGC AND 2 = 0 GOTO B                      BRANCH NOT TRISTATE
   DPY-+X                                        READ TRISTATE
B: LABEL B
   IF REGC AND 4 = 0 GOTO C                      BRANCH NOT LOW
   DPY-+L                                        READ LOW
C: LABEL C
   IF REGC > 0 GOTO F                            BRANCH NOT TRISTATE
   DPY-+X                                        READ TRISTATE
F: LABEL F                                       EXIT
```

PROGRAM 94   PROBE HISTORY TEST

```
   REG9 = REG8 AND 3F                                   TEST POINT (REG 9)
   REGA = REG8 SHR SHR SHR SHR SHR SHR SHR SHR
   REGA = REGA SHR SHR SHR SHR SHR SHR SHR SHR          EXPECTED PROBE READING
   DPY-PROBE TP@9                                       TEST POINT (REG 9)
   EXECUTE PROGRAM 96                                   PLACE PROBE
   SYNC FREE-RUN
   IF REG8 AND C000 = 0 GOTO 0                          SYNC FREE RUN
   SYNC ADDRESS
   IF REG8 AND 4000 > 0 GOTO 0                          SYNC ADDRESS
   SYNC DATA                                            SYNC DATA
0: LABEL 0
   REG2 = REG8 SHR SHR SHR SHR SHR SHR AND 3F
   EXECUTE PROGRAM REG2                                 TEST PROGRAM (REG 2)
   EXECUTE PROGRAM 93                                   PROBE HISTORY READER
   IF REGA = REGC GOTO 7                                EXPECTED=PROBE READING
   DPY-+ FAIL LOOP?#                                    FAIL; LOOP ?
   EXECUTE PROGRAM 98                                   DELAY
   DPY-+#                                               BEEP
   EXECUTE PROGRAM 98                                   DELAY
1: LABEL 1                                              ENABLE INPUT ENTRY
   DPY-+#                                               BEEP
   REG1 = 40                                            NO KEYS THIS VALUE
   DPY-+%1                                              ENABLE INPUT
2: LABEL 2                                              SELECT OPTION ENTRY
   IF REG1 = 40 GOTO 2                                  LOOP UNTIL INPUT
   IF REG1 = 1C GOTO 3                                  PRESSED 'YES'
   IF REG1 = 27 GOTO 3                                  PRESSED 'LOOP'
   IF REG1 = 1D GOTO 8                                  PRESSED 'NO'
   IF REG1 = 25 GOTO 8                                  PRESSED 'CONTINUE'
   GOTO 1                                               PRESSED INVALID KEY
3: LABEL 3                                              LOOP ENTRY
   REGB = 40                                            NO KEYS THIS VALUE
   DPY-+%B                                              ENABLE INPUT
4: LABEL 4
   REG2 = REG8 SHR SHR SHR SHR SHR SHR AND 3F
   EXECUTE PROGRAM REG2                                 TEST PROGRAM (REG 2)
   EXECUTE PROGRAM 93                                   PROBE HISTORY READER
   IF REGA = REGC GOTO 5                                EXPECTED=ACTUAL;PASS
   DPY-+ FAIL                                           FAIL
   GOTO 6                                               BRANCH CHECK KEY
5: LABEL 5                                              PASS ENTRY
   DPY-+ PASS#                                          PASS
6: LABEL 6                                              CHECK KEY ENTRY
   IF REGB = 40 GOTO 4                                  LOOP UNTILL CONT PRESS
   IF REGB = 25 GOTO 8                                  PRESSED CONT;EXIT
   DPY-+#                                               BEEP
   GOTO 3                                               PRESSED INVALID KEY
7: LABEL 7                                              PASS ENTRY
   DPY-+ PASS#                                          PASS
   EXECUTE PROGRAM 98                                   DELAY
8: LABEL 8                                              EXIT LOOP ENTRY
   EXECUTE PROGRAM 95                                   REMOVE PROBE
```

PROGRAM 95 REMOVE PROBE

```
   SYNC FREE-RUN                             FREE RUN PROBE
0: LABEL 0                                   BEGIN PASS COUNT ENTRY
   REG1 = 4                                  INITIALIZE PASS COUNTER
1: LABEL 1                                   BEGIN HISTORY LOOP
   READ PROBE                                READ PROBE HISTORY
   IF REG0 AND 5000000 = 0 GOTO 2            BRANCH; NOT HIGH OR LOW
   DPY-REMOVE PROBE                          HIGH OR LOW DETECTED
   GOTO 0                                    START OVER
2: LABEL 2                                   TRI-STATE ENTRY
   DEC REG1                                  DECREMENT PASS COUNTER
   IF REG1 > 0 GOTO 1                        LOOP 4 TIMES
F: LABEL F                                   EXIT WHEN 4 CONSECITIVE
                                             READS ARE TRISTATE.
```

PROGRAM 96   PLACE PROBE

```
   SYNC FREE-RUN                             FREE RUN PROBE
   REG1 = 6F                                 INITIALIZE TIME OUT COUNTER
0: LABEL 0                                   BEGIN PASS COUNT ENTRY
   DEC REG1                                  DECREMENT TIME OUT COUNTER
   IF REG1 = 0 GOTO F                        BRANCH TIME OUT
   REG2 = 4                                  INITIALIZE PASS COUNTER
1: LABEL 1                                   BEGIN HISTORY LOOP
   READ PROBE                                READ PROBE HISTORY
   IF REG0 AND 5000000 = 0 GOTO 0            BRANCH NOT HIGH OR LOW
   DEC REG2                                  DECREMENT PASS COUNTER
   IF REG2 > 0 GOTO 1                        BRANCH READ AGAIN
F: LABEL F                                   EXIT WHEN 4 CONSECITIVE READS
                                             ARE NON-TRISTATE, OR AFTER A
                                             4 SECOND TIMEOUT.
```

PROGRAM 97   1 SECOND DELAY

```
0: LABEL 0
   INC REG1
   IF 4F > REG1 GOTO 0
```

PROGRAM 98   1/4 SECOND DELAY

```
0: LABEL 0
   INC REG1
   IF F > REG1 GOTO 0
```

```
PROGRAM 64  8080 POD TESTS

0: LABEL 0
   DPY-ENTER STARTING TEST 1-12 ?
   DPY-+\1
   IF REG1 = 1 GOTO 1                   POWER SUPPLY CHECK
   IF REG1 = 2 GOTO 2                   CLOCK CHECK
   IF REG1 = 3 GOTO 3                   STATUS CHECK
   IF REG1 = 4 GOTO 4                   READ STATUS TEST
   IF REG1 = 5 GOTO 5                   POWER SUPPLY STATUS TEST
   IF REG1 = 6 GOTO 6                   CONTROL CHECK
   IF REG1 = 7 GOTO 7                   WRITE CONTROL TEST
   IF REG1 = 8 GOTO 8                   ADDRESS TOGGLE TEST
   IF REG1 = 9 GOTO A                   DATA TOGGLE TEST
   IF REG1 = A GOTO C                   BUS TEST
   IF REG1 = B GOTO D                   READ DATA TEST
   IF REG1 = C GOTO E                   FIXTURE ROM TEST
   GOTO 0
1: LABEL 1                              *** POWER SUPPLY CHECK ***
   DPY-POWER SUPPLY CHECK#
   EXECUTE PROGRAM 97
   REG8 = 00041068                      GROUND
   EXECUTE PROGRAM 94
   REG8 = 00011067                      +12 VOLT
   EXECUTE PROGRAM 94
   REG8 = 00011066                      +5 VOLT
   EXECUTE PROGRAM 94
   REG8 = 00041065                      -5 VOLT
   EXECUTE PROGRAM 94
2: LABEL 2                              *** CLOCK CHECK ***
   DPY-CLOCK CHECK#
   EXECUTE PROGRAM 97
   REG8 = 00051064                      PHASE 2
   EXECUTE PROGRAM 94
   REG8 = 00051063                      PHASE 1
   EXECUTE PROGRAM 94
3: LABEL 3                              *** STATUS CHECK ***
   DPY-STATUS CHECK#
   EXECUTE PROGRAM 97
   REG8 = 00041059                      RESET
   EXECUTE PROGRAM 94
   REG8 = 0004105A                      INT
   EXECUTE PROGRAM 94
   REG8 = 0004105B                      HOLD
   EXECUTE PROGRAM 94
   REG8 = 0001105C                      READY
   EXECUTE PROGRAM 94
4: LABEL 4                              *** READ STATUS TEST ***
   DPY-READ STATUS TEST-WAIT#
   EXECUTE PROGRAM 97
   REG8 = 00010019                      RESET
   EXECUTE PROGRAM 92
   REG8 = 0000801A                      INT
   EXECUTE PROGRAM 92
   REG8 = 0000201B                      HOLD
   EXECUTE PROGRAM 92
   REG8 = 0000181C                      READY
```

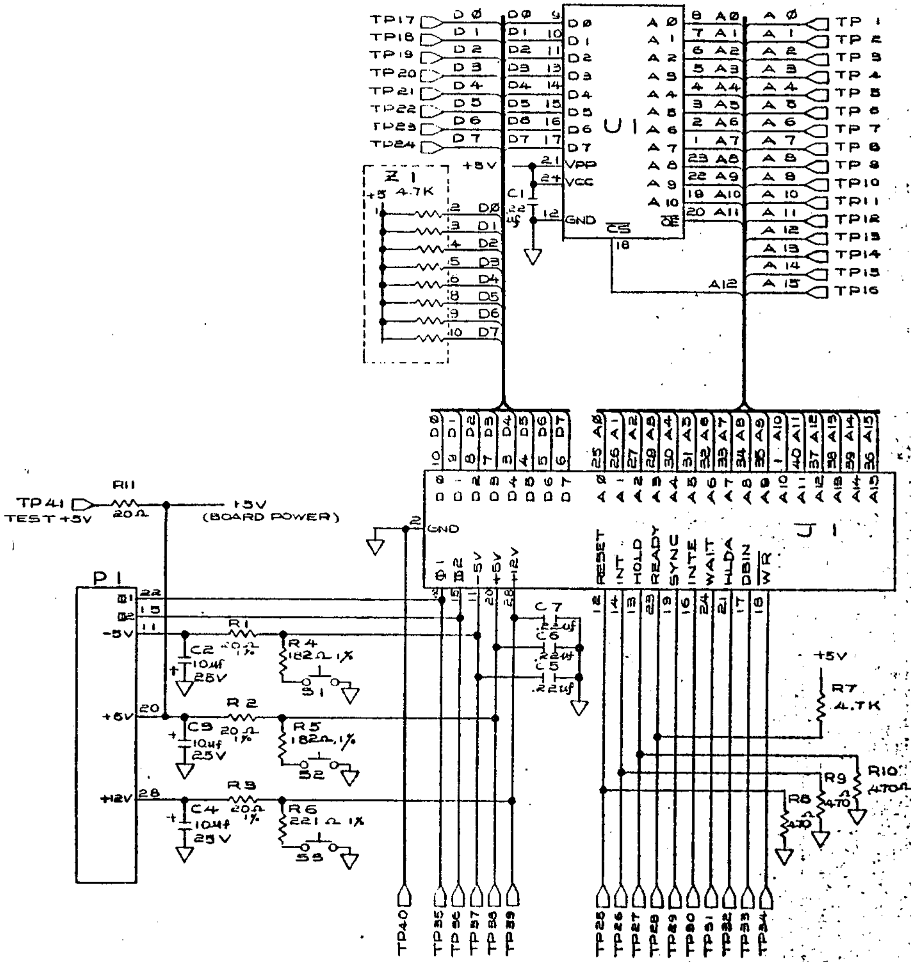
```
    EXECUTE PROGRAM 92
    REG8 = 00010999                     JUMPER RESET HIGH
    EXECUTE PROGRAM 92
    REG8 = 0000899A                     JUMPER INT HIGH
    EXECUTE PROGRAM 92
    REG8 = 0000299B                     JUMPER HOLD HIGH
    EXECUTE PROGRAM 92
    REG8 = 0000109C                     JUMPER READY LOW
    EXECUTE PROGRAM 92
5:  LABEL 5                             *** POWER SUPPLY STATUS TEST ***
    DPY-POWER SUPPLY STATUS TEST#
    EXECUTE PROGRAM 97
    REG8 = 00080000                     NO FAULT
    EXECUTE PROGRAM 92
    REG8 = 00080A00                     +5  VOLT FAULT
    EXECUTE PROGRAM 92
    REG8 = 00080C00                     -5  VOLT FAULT
    EXECUTE PROGRAM 92
    REG8 = 00080E00                     +12 VOLT FAULT
    EXECUTE PROGRAM 92
6:  LABEL 6                             *** CONTROL CHECK ***
    DPY-CONTROL CHECK#
    EXECUTE PROGRAM 97
    REG8 = 0005105D                     SYNC
    EXECUTE PROGRAM 94
    REG8 = 0004105E                     INTE
    EXECUTE PROGRAM 94
    REG8 = 0004105F                     WAIT
    EXECUTE PROGRAM 94
    REG8 = 00041060                     HLDA
    EXECUTE PROGRAM 94
    REG8 = 00051061                     DBIN
    EXECUTE PROGRAM 94
    REG8 = 00011062                     WR
    EXECUTE PROGRAM 94
7:  LABEL 7                             *** WRITE CONTROL TEST ***
    DPY-WRITE CONTROL TEST#
    EXECUTE PROGRAM 97
    REGD = 2
    REG8 = 0005111E                     TOGGLE INTE
    EXECUTE PROGRAM 94
    DEC REGD
    REG8 = 0005111F                     TOGGLE WAIT
    EXECUTE PROGRAM 94
    DEC REGD
    REG8 = 00051120                     TOGGLE HLDA
    EXECUTE PROGRAM 94
8:  LABEL 8                             *** ADDRESS TOGGLE TEST ***
    DPY-ADDRESS TOGGLE TEST#            TOGGLE AD0-AD15
    EXECUTE PROGRAM 97
    REGD = 0
    REG8 = 00055081
9:  LABEL 9
    EXECUTE PROGRAM 94
    INC REGD
    INC REG8
    IF 10 > REGD GOTO 9
A:  LABEL A                             *** DATA TOGGLE TEST ***
```

```
   DPY-DATA TOGGLE TEST#                TOGGLE D0-D7
   EXECUTE PROGRAM 97
   REGD = 0
   REG8 = 00590D1
B: LABEL B
   EXECUTE PROGRAM 94
   INC REGD
   INC REG8
   IF 8 > REGD GOTO B
C: LABEL C                               *** BUS TEST ***
   DPY-BUS TEST#
   EXECUTE PROGRAM 97
   DPY-+-WAIT
   BUS TEST
D: LABEL D                              *** READ DATA TEST ***
   DPY-READ DATA TEST-WAIT#
   EXECUTE PROGRAM 97
   REG8 = FFFFFF                        READ @ FFFF=FF
   EXECUTE PROGRAM 90
   REG8 = 000200                        READ @ 0002=00
   EXECUTE PROGRAM 90
E: LABEL E                              *** FIXTURE ROM TEST ***
   DPY-FIXTURE ROM TEST#
   EXECUTE PROGRAM 97
   DPY-+-WAIT
   ROM TEST @ 0-7FF SIG 39FF
   EXECUTE PROGRAM 65
F: LABEL F
   DPY-*** NORMAL TEST
   DPY+ COMPLETE ***#
   EXECUTE PROGRAM 97
```

```
PROGRAM 65  8080 POD "RUN UUT" TEST

   DPY-*** 8080 POD 'RUN UUT'
   DPY-+ TESTS ***#
   EXECUTE PROGRAM 97
0: LABEL 0                              *** 'RUN UUT' CONTROL TESTS ***
   DPY-'RUN UUT' CONTROL TESTS#
   EXECUTE PROGRAM 97
   RUN UUT @ 0
   DPY-TOUCH TP25 HIGH                  PERFORM RESET
   DPY-+ THEN PRESS CONT#
   STOP
   REG8 = 0005105D                      SYNC TOGGLE
   EXECUTE PROGRAM 94
   REG8 = 0001105E                      INTE HIGH
   EXECUTE PROGRAM 94
   REG8 = 0004105F                      WAIT LOW
   EXECUTE PROGRAM 94
   REG8 = 00041060                      HLDA LOW
   EXECUTE PROGRAM 94
   REG8 = 00051061                      DBIN TOGGLE
   EXECUTE PROGRAM 94
   REG8 = 00051062                      WR TOGGLE
   EXECUTE PROGRAM 94
1: LABEL 1                              *** 'RUN UUT' ADDRESS TESTS ***
   DPY-'RUN UUT' ADDRESS TESTS#              ---------------
   EXECUTE PROGRAM 97                        | AD0  TOGGLE |
   REG8 = 00051041                           | AD1  TOGGLE |
2: LABEL 2                                   | AD2  TOGGLE |
   EXECUTE PROGRAM 94                        | AD3  TOGGLE |
   INC REG8                                  | AD4  TOGGLE |
   IF 00051047 > REG8 GOTO 2                 | AD5  TOGGLE |
   REG8 = 00041047                           | AD6  LOW    |
3: LABEL 3                                   | AD7  LOW    |
   EXECUTE PROGRAM 94                        | AD8  LOW    |
   INC REG8                                  | AD9  LOW    |
   IF 0004104C > REG8 GOTO 3                 | AD10 LOW    |
   REG8 = 0005104C                           | AD11 TOGGLE |
   EXECUTE PROGRAM 94                        | AD12 LOW    |
   REG8 = 0004104D                           | AD13 TOGGLE |
   EXECUTE PROGRAM 94                        | AD14 TOGGLE |
   REG8 = 0005104E                           | AD15 LOW    |
   EXECUTE PROGRAM 94                        ---------------
   REG8 = 0005104F
   EXECUTE PROGRAM 94
   REG8 = 00041050
   EXECUTE PROGRAM 94
4: LABEL 4                              *** 'RUN UUT' DATA TESTS ***
   DPY-'RUN UUT' DATA TESTS#            CHECK D0-D7 H-X-L
   EXECUTE PROGRAM 97
   REG8 = 0071051
5: LABEL 5
   EXECUTE PROGRAM 94
   INC REG8
   IF 0071059 > REG8 GOTO 5
6: LABEL 6
   DPY-'RUN UUT' INTERRUPT TESTS#       *** 'RUN UUT' INTERRUPT TESTS ***
   EXECUTE PROGRAM 97
   DPY-TOUCH TP26 HIGH                  PERFORM INTERRUPT
   DPY-+ THEN PRESS CONT#
   STOP
7: LABEL 7
   DPY-'RUN UUT' INTE CTL TESTS#        *** 'RUN UUT' INTE CONTROL TESTS ***
   EXECUTE PROGRAM 97
   REG8 = 0005105D                      SYNC TOGGLE
   EXECUTE PROGRAM 94
   REG8 = 0004105E                      INTE LOW
   EXECUTE PROGRAM 94
   REG8 = 0004105F                      WAIT LOW
   EXECUTE PROGRAM 94
   REG8 = 00041060                      HLDA LOW
   EXECUTE PROGRAM 94
   REG8 = 00051061                      DBIN TOGGLE
   EXECUTE PROGRAM 94
   REG8 = 00051062                      WR TOGGLE
   EXECUTE PROGRAM 94
8: LABEL 8                                *** 'RUN UUT' INTERRUPT ADDR TESTS ***
   DPY-'RUN UUT' INTE ADDR TESTS#              -------------
   EXECUTE PROGRAM 97                          | A0  TOGGLE |
   REG8 = 00051041                             | A1  TOGGLE |
9: LABEL 9                                     | A2  TOGGLE |
   EXECUTE PROGRAM 94                          | A3  TOGGLE |
   INC REG8                                    | A4  TOGGLE |
   IF 0005104C > REG8 GOTO 9                   | A5  TOGGLE |
   REG8 = 0004104C                             | A6  TOGGLE |
   EXECUTE PROGRAM 94                          | A7  TOGGLE |
   REG8 = 0005104D                             | A8  TOGGLE |
   EXECUTE PROGRAM 94                          | A9  TOGGLE |
   REG8 = 0005104E                             | A10 TOGGLE |
   EXECUTE PROGRAM 94                          | A11 LOW    |
   REG8 = 0004104F                             | A12 TOGGLE |
   EXECUTE PROGRAM 94                          | A13 TOGGLE |
   REG8 = 00051050                             | A14 LOW    |
   EXECUTE PROGRAM 94                          | A15 TOGGLE |
A: LABEL A                                     --------------
   DPY-'RUN UUT' INTE DATA TESTS#         *** 'RUN UUT' INTERRUPT DATA TESTS ***
   EXECUTE PROGRAM 97
   REG8 = 00071051
B: LABEL B
   EXECUTE PROGRAM 94
   INC REG8
   IF 00071059 > REG8 GOTO B
C: LABEL C                                *** 'RUN UUT' HOLD TEST ***
   DPY-'RUN UUT' HOLD TEST#
   EXECUTE PROGRAM 97
   DPY-JUMPER TP27 HIGH                   HOLD
   DPY-+ THEN PRESS CONT#
   STOP
   REG8 = 00011060                        CHECK HLDA
   EXECUTE PROGRAM 94
   DPY-REMOVE JUMPER
   DPY-+ THEN PRESS CONT#
   STOP
D: LABEL D                                *** 'RUN UUT' WAIT TEST ***
   DPY-'RUN UUT' WAIT TEST#
   EXECUTE PROGRAM 97
   DPY-JUMPER TP28 LOW                    READY
   DPY-+ THEN PRESS CONT#
   STOP
   REG8 = 0001105F                        CHECK WAIT
   EXECUTE PROGRAM 94
E: LABEL E
   DPY-REMOVE JUMPER
   DPY-+ THEN PRESS CONT#
   STOP
F: LABEL F
   DPY-*** RUN UUT TEST
   DPY-+ COMPLETE ***#
   EXECUTE PROGRAM 97
```

9000A-8080-1073 SH 1 OF 1	LTR	DESCRIPTION	REVISIONS EFF	APPROVAL / DATE



NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS, 1/4W, 5%
ALL CAPACITORS ARE IN MICROFARADS.

SIGNEL	VERIFIED NORMAL MODE	VERIFIED WITH RUN UUT
DØ – D7	PROBED	BY ROM
AØ – A15	PROBED	AØ-A12 BY ROM A13-A15 PROBED
RESET	PULSED HIGH STATUS READ	PULSED HIGH A13-A15 READ
INT	PULSED HIGH STATUS READ	PULSED HIGH A13-A15 READ
HOLD	PULSED HIGH STATUS READ	PULSED HIGH VERIFY A13-A15 NOT ACTIVE
READY	PULSED HIGH STATUS READ	PROBED
SYNC	PROBED	PROBED
INTE	WRITTEN FROM WRITE CTRL	PROBED DURING INT
WAIT	WRITTEN FROM WRITE CTRL	PULSED HIGH VERIFY A13-A15 NOT ACTIVE
HOLDA	WRITTEN FROM WRITE CTRL	PROBED DURING HOLD
DBIN	PROBED	PROBED
$\overline{WR}$	PROBED	PROBED
Φ 1	PROBED	—
Φ 2	PROBED	—
+ 5 V	PUSH BUTTON TO FALL.	—
− 5 V	PUSH BUTTON TO FALL.	—
+ 12 V	PUSH BUTTON TO FALL	—

QTY	ITEM	PART NO	DRAWING NO	DESCRIPTION	REF

PARTS LIST

BASIC	9000A-8080-1073	540245
DWG NO SUFFIX	DRAWING NO	PART NO.
	FIRST USED ON	
	APPLICATION	

PROPRIETARY NOTICE

FLUKE

89536

JOHN FLUKE MFG. CO., INC.
P.O. BOX 43210
MOUNTLAKE TERRACE, WA 98043

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED

TOLERANCE

DIMENSIONS IN INCHES

DWN	B. BIANA C	9-2-81
CHK	M. [illegible]	12-2-81
PROJ ENGR	[illegible]	[illegible]
MFG ENGR		
FINISH		

SCHEMATIC
CUSTUMER SERVICE
TEST FIXTURE

PART NO.	SIZE	DRAWING NO
	D	9000A-8080-1073

SCALE SH 1 OF 1 REV