6 8 0 1 P O D A D A P T E R

U S E R M A N U A L

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1. DESCRIPTION

The 6801 Adapter allows a Fluke 9000 Microsystem Troubleshooter to interface to Motorola 6801 microcontroller based equipment.

The 6801 Adapter is a circuit card that directs the signals from the 6802 pod to the proper pins of the 6801 unit under test (UUT). The 6801 Pod Adapter consists of a PCB housed inside a pod clamshell, and is powered from the 6801 UUT.

The 6802 Pod supports the 6801 adapter and was selected because it matches the 6801 in terms of address and data bus timing. The 6801 Adapter can operate in either mode 5 or mode 7, determined by a dip switch setting.

2. GETTING STARTED

2.1 Adapter Hook-Up

The 6801 adapter uses the Fluke 9000A-6802 as the support pod, so the connections between the two are as follows.

There are two zero-insertion force (ZIF) sockets, one on the 6801 adapter, and one on the 6802 pod. The ZIF on the pod is used for 6802 pod self test. Self test should be used to insure a good working pod every time a pod is turned-on. Follow the instructions for pod self-test found in the 6802 manual in Section 2. The ZIF socket on the 6801 adapter is used to connect the two devices together.

The 6802 cable and header connect to the 6801 adapter as shown in the following figure. Pin 1 of the ZIF is in the lower left corner of the ZIF.

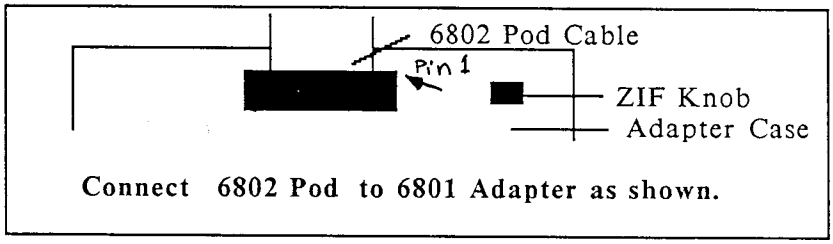


Figure 1 6802 Pod To 6801 Adapter Connection

Figure 2 Pin 1 Orientation

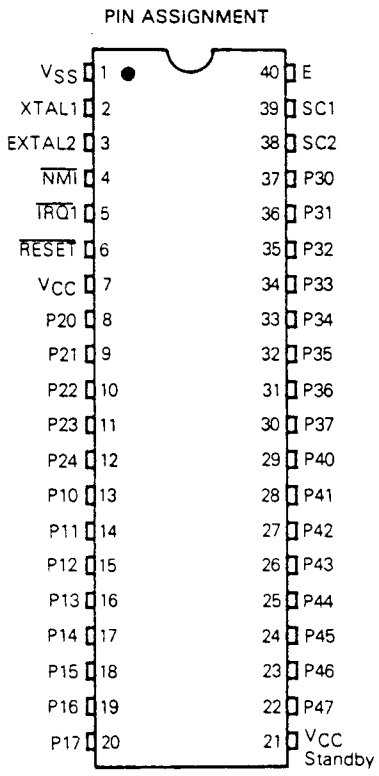


Figure 3 Pin Assignments

3. PORT IMPLEMENTATIONS

3.1 MODE 7 PORT ADDRESSES

The 6801 adapter utilizes address bits A12-A15 of the 6802 for internal decoding of the I/O ports. The port addresses are as shown in the following table:

PORT	ADDRESS (HEX)	FUNCTION
1	1XXX	Input / Output
2	2XXX	Input / Output
3	3XXX	Input / Output
4	4XXX	Input / Output

An "X" in the hex address indicates that any hex digit can be used without any operational differences. Using 1000 is the same as using 1FFF for mode 7 port addressing.

3.2 MODE 5 PORT ADDRESSES

There are two less I/O ports available in mode 5 use. The 6801 I/O port 4 is used to carry eight bits of external address. Port 3 is used for external data. When an external address is accessed, port 3 is used on the adapter, even though the eight address bits are being carried by the 6801 I/O port 4.

The port addresses are as shown in the following table:

PORT	ADDRESS (HEX)	FUNCTION
1	1XXX	Input / Output
2	2XXX	Input / Output
3	3XAA	AA = Memory Addresses 00-FF

4. STATUS AND CONTROL LINES

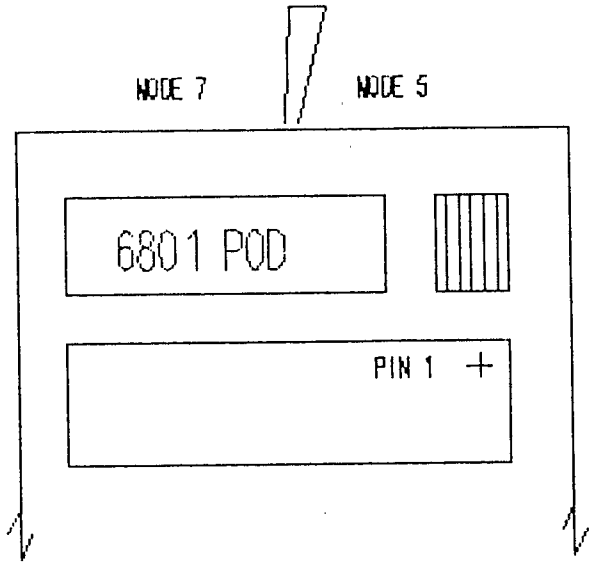
The 6801 status and control lines are given in the following table.

	STATUS LINES		CONTROL LINES
7	POWER FAIL	7	not used
6	-	6	-
5	-	5	-
4	RESET	4	SC2 (R/W)
3	IRQ	3	-
2	NMI	2	-
1	1	1	-
0	1	0	not used

5. ADAPTER SWITCH SETTINGS

A SPDT switch is used on the adapter PCB to switch from mode 5 to mode 7 use.

Figure 4 Adapter Switch Settings



6. APPLICATIONS FOR CAROLINA POWER & LIGHT

6.1 MCT-200 Display Board

The MCT-200 display board contains an eight character display. The display is driven from a latch U7, and two drivers U1 & U2. The MCT-200 display board runs in 6801 mode 7.

The following 9010 program shows how the 6801 adapter can access the display of the MCT-200. Each digit segment is turned on in sequence from left to right. The leftmost digit is address 7, the rightmost is address 0.

```
PROGRAM 0   89 BYTES

   REG0 = 7              ! set digit counter = 7
1: LABEL 1
   WRITE @ 1000 = REG0   ! write digit # to latch U7
   WRITE @ 2000 = 0      ! strobe REG0 into U7
   WRITE @ 1000 = FF     ! write to light all segments
   REG1 = 20
2: LABEL 2               ! delay loop stars here
   DEC REG1
   IF REG1 = 0 GOTO 3    ! exit here after delay
   GOTO 2
3: LABEL 3
   IF REG0 = 0 GOTO 4    ! goto stop after all segments are don
   DEC REG0
   GOTO 1                ! repeat for next digit
4: LABEL 4
   WRITE @ 1000 = 00     ! write 0's to blank the segment
   STOP
```

6.2 MCT-200 Logic Board

The MCT-200 Logic Board runs in 6801 mode 5. Mode 5 allows for 256 bytes of external memory.

The logic board contains two non-volatile RAM's U2 and U3. They are connected to the 256 byte external address space, but are enabled from the custom reciever chip, U1 via U7. As a test aid, a special RAM ciruit board is used to replace the NVRAM.

If U2 and U3 are replaced by the RAM test board, a RAM short test can be used to test the address and data lines going to the U2, U3 sockets. A RAM SHORT test can be performed:

RAM SHORT @ 3000-30FF

will test the RAM board and associated lines used by U2 and U3.

9010 READ and WRITES can be performed on the NVRAM, but the NVRAM is slow and needs lots of set-up time in order to retain data. Several 9010 WRITE operations will be needed to store data in the NVRAM.

W A R N I N G

NVRAM has a limited amount of write cycles. Performing looping WRITE's on NVRAM will use up the 10,000 useable cycles. Use the RAM test board during 9010 program testing and debugging.

7. ABOUT RUN UUT

The 9000 series RUN UUT command does not operate with the 6801 Pod Adapter because the 6802 instruction set is different from the instruction set of the Motorola 6801.

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