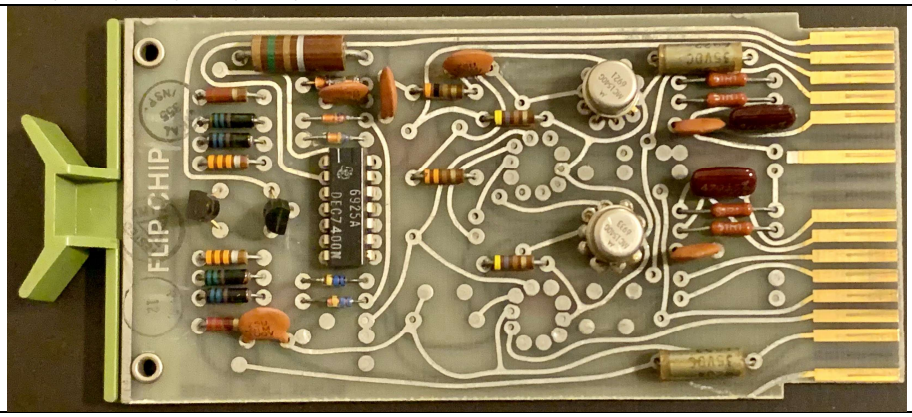
Test Data Sheet, G020, Sense Amp

Updated: 16-Sep-2022, test data sheet version v00

Test File	G020v2.TST (1-Sep-2022)
Tester Notes	This is an automatic test. The tester will report the proper pass/fail status. This is an updated version of the original G020 test. It verifies more combinations of data toggling and gating. The original file is named G021.TST.
PCB Rev	G021E
Board Rev	?
PDP-8/L slots	A18, A19, A20, B18, B19, B20
Photo	

Test Procedure:

1. Setup:
   a. Turn off the UUT power switch on the tester, insert the board into the tester UUT socket.
   b. Remove the four shorting jumper bridge plugs from the Tester board test header at positions: AD2, AE2, AL1 and AM1. Install four 8.2k resistor jumpers (***Figure 1***) in their place as shown in ***Figure 2***. This connects an 8.2k resistor between the MCP23S17 GPIO Expander and the sense amplifier inputs on the G020.
   c. Remove the shorting jumper bridge plug from the Tester board test header at position AB2. Connect a -15V (negative 15 volt) power supply to the side of AB2 that is connected to the UUT. This is the "Ax2" side, not the "AX2" side. Be careful not to connect the -15V supply to the side of AB2 that connects to the MCP23S17 GPIO Expander. The orange jumper connected to the red clip lead in ***Figure 2*** is connected to the proper side of AB2. Close-up detail of the -15V connection at AB2 is shown in ***Figure 3***.
   d. Load the test file as follows: From the tester main menu enter "1" to read test file, enter the test file name, "G020V2.TST" and ENTER.
2. Run the test:
   a. Turn on the UUT power switch on the tester. Turn on the -15V supply connected through AB2.
   b. From the tester main menu enter "4" and then "O" to run the test once to see any errors that are displayed. Alternatively, enter "S" instead of "O" to run the scope loop test mode.

Photos of the Tester with Jumpers:

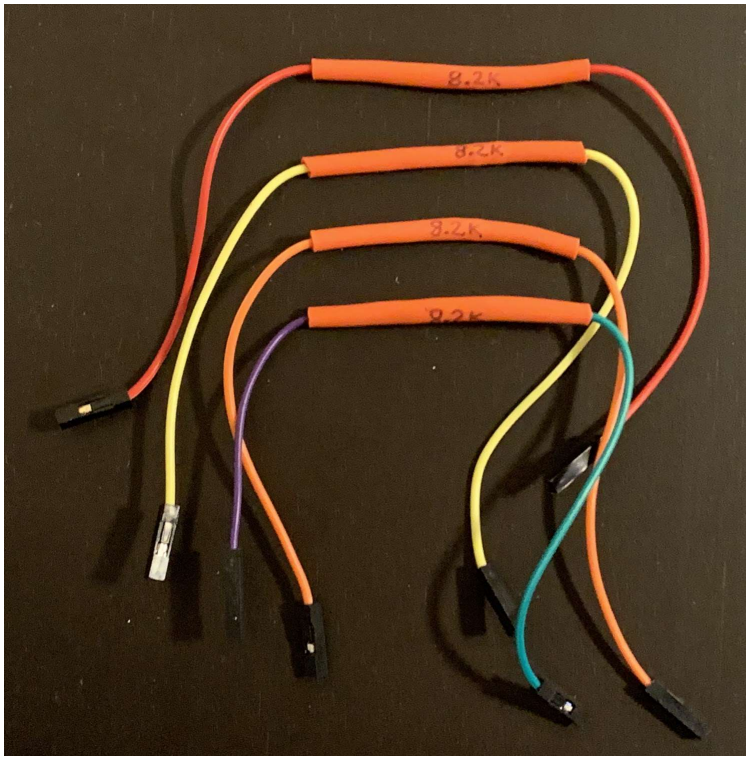


Figure 1, Jumpers with 8.2K series resistors

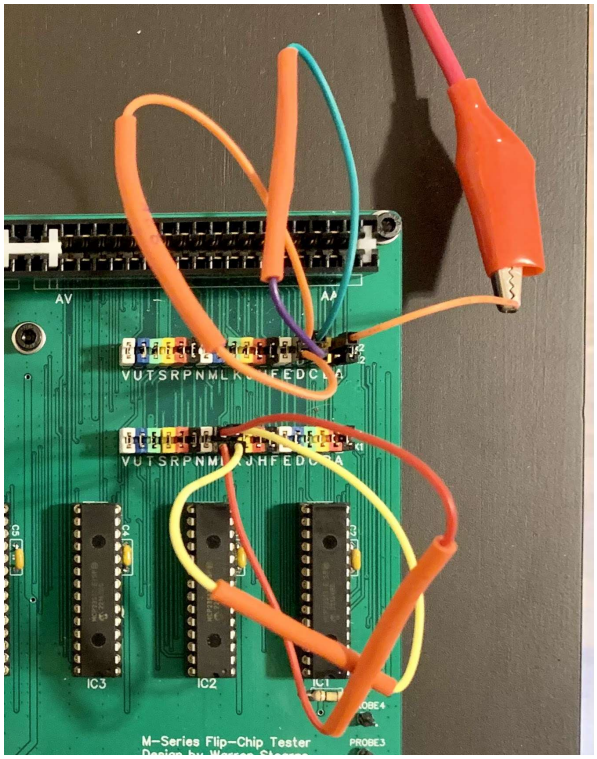


Figure 2, 8.2K Jumpers Installed in Tester

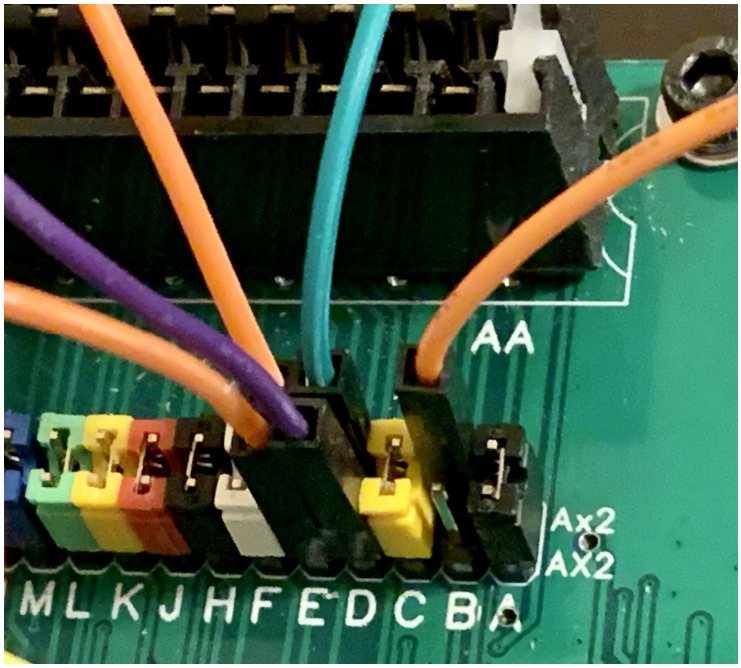


Figure 3, Detail of Negative 15 volt connection at AB2

Test File:

```
G020 REV D SCHEMATIC    REV E PCB    SENSE AMP
updated: 1-Sep-2022

NOTE:  Install 8.2K resistors on 4 inputs.  If not installed,
       test will work, but the 4 inputs will fail (always LOW).


NOTES: disconnect AB2 from tester and attach -15V to UUT.
       "P" for PULLUP OUTPUTS on the open collector outputs;


PINS
 1 I AD1  STROBE FIELD 0
 2 I AD2  E1-4  INPUT 1 BIT 0 FIELD 0
 3 I AE2  E1-3  INPUT 2 BIT 0 FIELD 0
 4 I AL1  E4-4  INPUT 1 BIT 1 FIELD 0
 5 I AM1  E4-3  INPUT 2 BIT 1 FIELD 0
 6 I AB1  CLEAR-N
 7 I AT2  ENABLE
 8 O AC1  BIT 0-N
 9 P AA1  OUTPUT 0-N
10 O AS1  BIT 1-N
11 P AU2  OUTPUT 1-N

IIIIIIIOPOP
00000001111
; remove CLEAR-N
     1
; ENABLE on
      1 0 0
; BIT 0 test, turn on Strobe first, then pulse INPUT 1 on pin 4
10
11      1
10
; check ENABLE
;2345678901
0     0 1 1
      1 1 0
; check CLEAR-N, then pulse ENABLE
     0  0 0
     1
      0 1 1
      1 0 0
; BIT 0 test, turn on Strobe first, then pulse INPUT 2 on pin 3
100
101     1
100
; check ENABLE
;2345678901
0     0 1 1
```

```
      1 1 0
; check CLEAR-N, then pulse ENABLE
     0  0 0
     1
      0 1 1
      1 0 0
; BIT 1 test, turn on Strobe first, then pulse INPUT 1 on pin 4
1  0
1  1      1
1  0
; check ENABLE
;2345678901
0     0 1 1
      1 0 1
; check CLEAR-N, then pulse ENABLE
     0  0 0
     1
      0 1 1
      1 0 0
; BIT 1 test, turn on Strobe first, then pulse INPUT 2 on pin 3
1   0
1   1     1
1   0
; check ENABLE
;2345678901
0     0 1 1
      1 0 1
; check CLEAR-N, then pulse ENABLE
     0  0 0
     1
      0 1 1
      1 0 0
; BIT 0 & 1 test, turn on Strobes first, then pulse both INPUT 1's
; on pin 4 of the BIT 0 and BIT 1 sense amplifiers
;2345678901
1
11      1
10
1  1      1
1  0
0       1 1
; check ENABLE
;2345678901
      0 1 1
      1 1 1
; check CLEAR-N, then pulse ENABLE
     0  0 0
     1
      0 1 1
      1 0 0
; BIT 0 & 1 test, turn on Strobes first, then pulse both INPUT 2's
; on pin 3 of the BIT 0 and BIT 1 sense amplifiers. BIT 1 first this time.
```

```
;2345678901
1
1   1     1
1   0
1 1     1
1 0
0       1 1
; check ENABLE
;2345678901
      0 1 1
      1 1 1
; check CLEAR-N, then pulse ENABLE
     0  0 0
     1
      0 1 1
      1 0 0
END
```