

Connections

A possible mechanical setup is described in the chapter “Construction”. This chapter shows the needed interconnections between the Core, I/O and the Tester Board. As the Tester is based on the “Real Console” Core and I/O Board, you must make a few modifications.

1. You must solder 2 wires directly on the 74LS138 decoder IC on the Core Board.
2. You must remove the connection of pin #1 of *all* output latches on the I/O Board and connect all these eight pins together and solder a wire onto them.
3. Make sure that the trace is cut on the I/O Board, as described in the I/O Board assembly.

The end of this chapter describes the power supply connections to all boards and the connection to the Connector Board.

Core Board

Connect the 20-conductor flat cable to the Core-I/O header on the Core Board (goes to the I/O Board). The addition to the flat cable are 2 wires, directly soldered on the 74LS138 decoder IC.

- Solder a blue wire onto pin #15 of the 74LS138
- Solder a green wire onto pin #14 of the 74LS138

You can of course use any colored wire, but I used these. It is OK as long as the other end of the wire goes to the correct pin of the 5-pin header on the Tester Board.

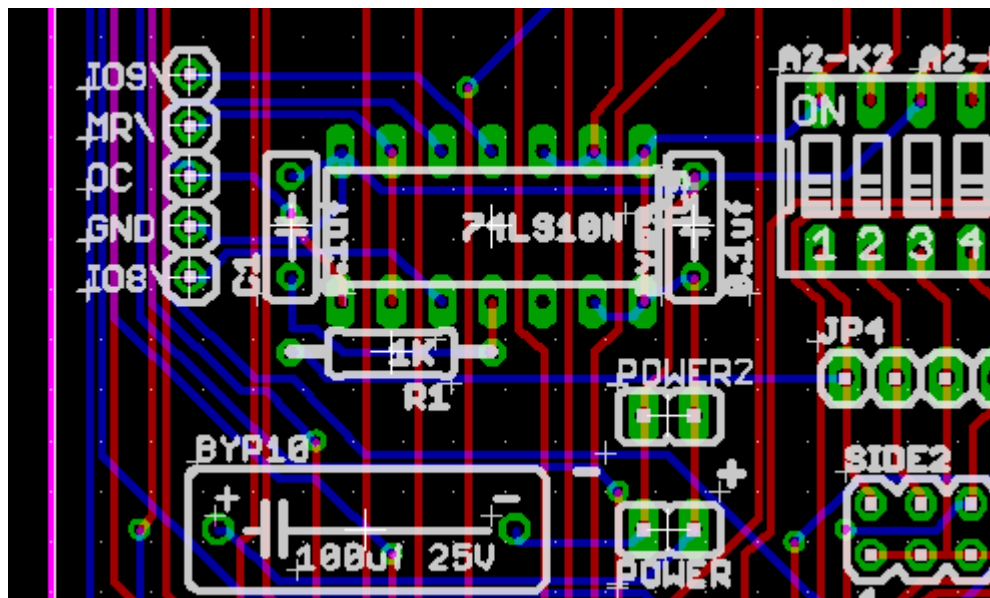
I/O Board

Connect the 20-conductor flat cable to the Core-I/O header on the I/O Board (comes from the Core Board).

Connect a pink wire to pin #1 of the output latch near the header IN1-2 and the edge of the I/O Board. (This pin #1 is connected to all other pin #1 of the output latches!) You can use any other color for this wire. The wire goes to OC pin of the 5-pin header on the Tester Board.

Tester Board

The Tester Board (connected to I/O Board #0) has a 5-pin header at one side, near the 74LS10 IC.



- Connect the blue wire (from pin #15, Core Board 74LS138) to the header pin “IO8V”.
- Connect the pink wire (from pin #1, output latches I/O Board) to the header pin “OC”.
- Connect the green wire (from pin #15, Core Board 74LS138) to the header pin “IO9V”.

Power supply connections

You must connect +5V/GND power supply to all 3 boards (single-height FlipChip Tester), or all 5 boards if you build the double-height FlipChip Tester. As the Tester Board has two 2-pin headers for connection of the power supply (see picture in the “Tester Board” paragraph), and the I/O Board and the Tester Board are ‘piggy-back’ connected, you can do the following.

- Make a 2-wire (red/black) cable with the connector at both ends.
- Plug one connector on the POWER (JP2) connector on the I/O Board. **Notice the polarity!**
- Lead the cable between the IN1-2 and IN3-4 connectors between the I/O and the Tester Board.
- Plug the other connector on the POWER2 connector on the Tester Board. **Notice the polarity!**

Now you can connect the I/O-Tester Board assembly with a single power supply cable to the connector POWER on the Tester Board.

Connector Board connection

The connections between the Tester Board and the Connector Board are two 34-conductor flat cables. Make these two flat cables of sufficient length, because you need good access to the Connector Board, but do not make these cables longer than necessary.

The Connector Board has eight 34-pin headers that connect to the connector block as follows:

- A1A2SIDE1 and A1A2SIDE2 connects row A, slot 1 and slot 2 of the connector block
- A3A4SIDE1 and A3A4SIDE2 connects row A, slot 3 and slot 4 of the connector block
- B1B2SIDE1 and B1B2SIDE2 connects row B, slot 1 and slot 2 of the connector block
- B3B4SIDE1 and B3B4SIDE2 connects row B, slot 3 and slot 4 of the connector block

If you have a cut-in-half Connector Board, 2 slots and 2 rows are not connected to the Connector Board. The Tester Board has two 34-pin headers, marked SIDE1 and SIDE2. The connections between the Tester Board(s) and the Connector Board are given in the table. You use slot 1 and 2 or slot 3 and 4 of the Connector Board.

Tester Board and connector		Connector Board – slot 1 & 2	Connector Board – slot 3 & 4
# 0	SIDE1	A1A2SIDE1	A3A4SIDE1
	SIDE2	A1A2SIDE2	A3A4SIDE2
# 1	SIDE1	B1B2SIDE1	B3B4SIDE1
	SIDE2	B1B2SIDE2	B3B4SIDE2

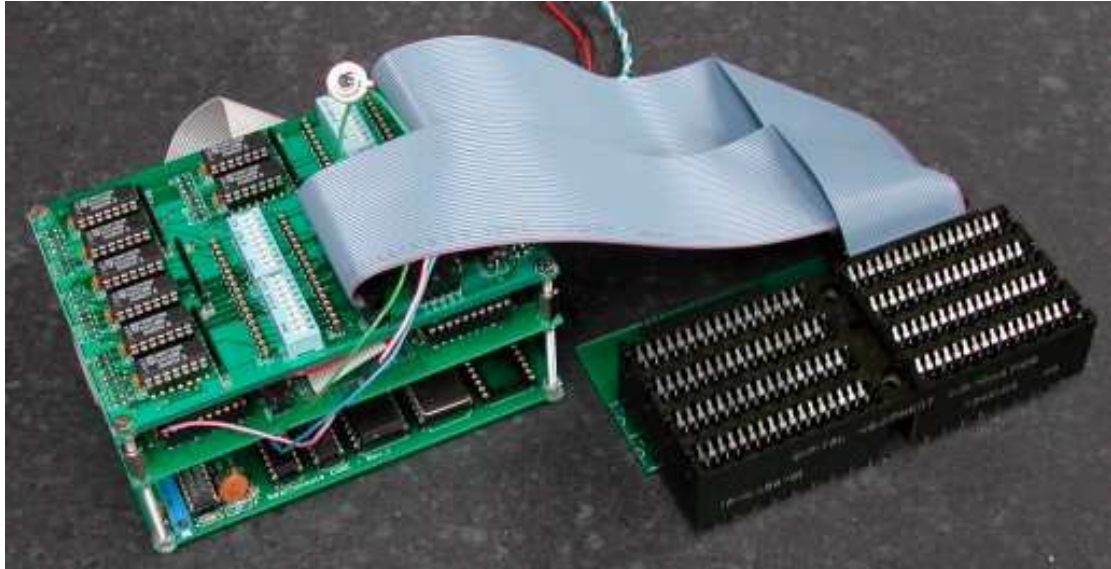
When you put a FlipChip in the connector block and you look at the component side of the FlipChip, the slots 1 and 2 of the connector block are at the front side, and the slots 3 and 4 are at the rear side of the connector block. Likewise, the headers A1A2SIDE1, A1A2SIDE2, B1B2SIDE1 and B1B2SIDE2 are at the front side of the Connector Board, and the headers A3A4SIDE1, A3A4SIDE2, B3B4SIDE1 and B3B4SIDE2 are at the rear side of the Connector Board.

Notice that the length of the 2 flat cables is not the same. The 2 headers on the Connector Board are quite close to each other, but the SIDE1 and SIDE2 headers on the Tester Board are approximately 5 cm (2 inches) apart, and they are not in-line. Do the following steps to make the 2 flat cables:

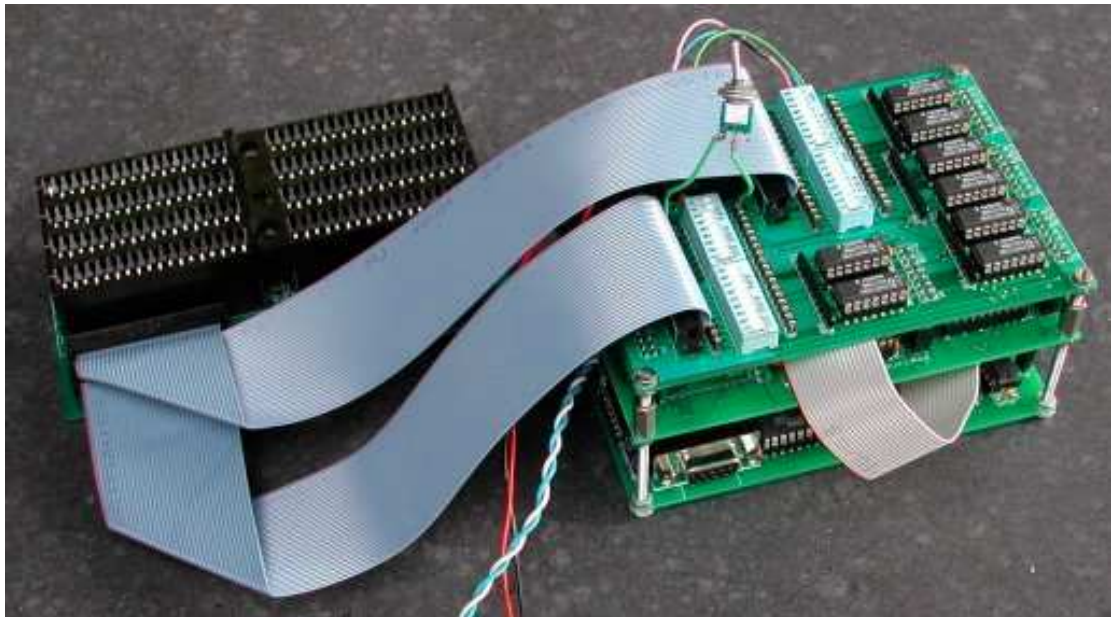
1. Install the IDC header at one side of the flat cable. The flat cable has a marked (colored) trace at one side. Make sure that the marked side aligns with pin #1 of the IDC header. Pin #1 of an IDC header is often indicated by a small “triangle”.
2. Put the 2 IDC headers on the connectors SIDE1 and SIDE2 of the Tester Board. Make sure that pin #1 of the IDC header is at the same side where pin #1 of the header on the Tester Board is.
3. Route the 2 flat cables to the Connector Board. Make sure that the marked side of the flat cables is at the same side where pin #1 of the headers on the Connector Board is.
4. Use a pencil to make a mark on the 2 flat cables at the position where the other IDC header must be installed.
5. Install the other IDC header on the flat cables. Make sure that the marked side aligns with pin #1 of the IDC header. Also, take care which way the connector points, as you can install the connector either pointing down or up (with a particular ribbon cable orientation), and sometimes one orientation makes for a neater cable arrangement than the other orientation.
6. Put the 2 IDC headers on the connector xxxxSIDE1 and xxxxSIDE2 of the Connector Board. Make sure that pin #1 of the IDC header is at the same side where pin #1 of the header on the Connector Board is.

The following pictures show the connection between the Tester Board and the Connector Board.
(The white and blue twisted wires are connected to a reset button for the Core Board).

- **“Front” view**



- **“Rear” view**



- And finally, the complete Tester with a FlipChip installed, ready to be tested

