

Make your own Tektronix TM-500 extender using the Jamma Board JB-3.

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This document details how to make your own Tektronix TM-500 extender. Such an extender allows you to operate a TM-500 plug-in outside of the cabinet, which is necessary when you are doing measurements on a plug-in, e.g., for repairs.

The extender consists of the JB-3 Jamma Board, a 56-pin 0.156" pitch edge connector with solder eyelets, and wires between them, about 3 feet (Figure 1). The goal is to provide the same signals present on the edge connector inside the TM-500 frame to the extender connector.



Figure 1: Sample TM-500 extender

The TM-500 interface consists of 56 pins divided into two sections: the Power Supply section and the I/O assignment section. The Power Supply section consists of the lower 26 pins of the connector. Because pin B6 is not connected and some of the pins carry the same signal, only 20 wires are needed to connect the Power Supply section (the minimum number of wires needed is actually 19, but I used two 10-wire flat ribbon cables).

Tektronix decided to number the pins inside the connector from the bottom to the top, using an A side (left) and a B side (right) when you are facing the front of the connector. Figure 2 shows the pin numbering. Unfortunately, the edge connectors I have seen use a somewhat different numbering system, as does the JB-3 Jamma Board, so we need to be prepared for some mental mapping.

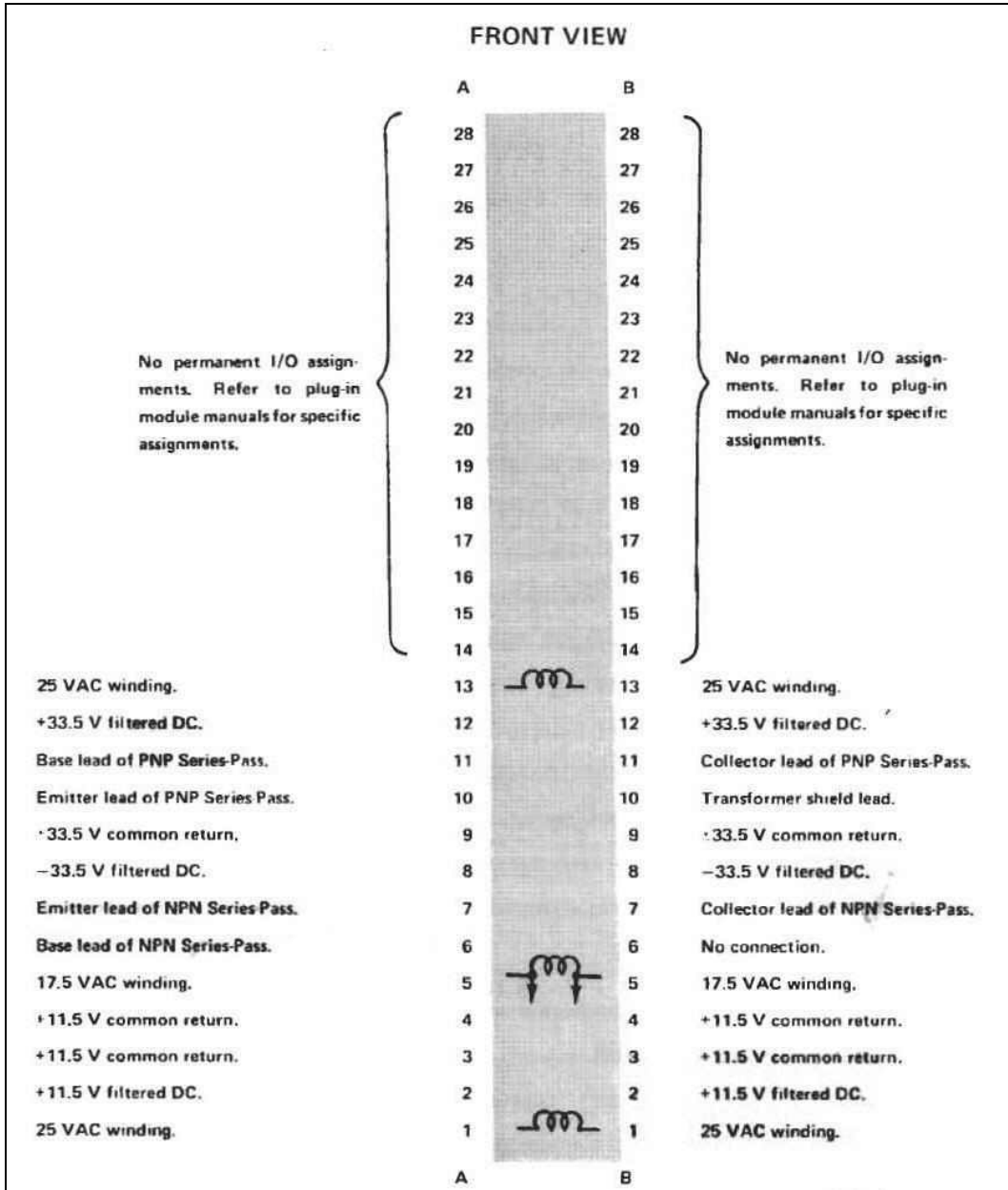


Figure 2: TM-500 Power Module Interface Pin Assignment

The edge connectors seem to number the pins by using letters on the left side and numbers on the right side, again, when you are facing the connector. When the Jamma Fingerboard is properly installed in the TM-500 frame (insert the "NON-JAMMA PCB/Device side into the connector inside the frame), the connectors to the pins on the left side are labeled 1 to 28 and the connectors to the pins on the right side are labeled A..f. Table 1 shows the mapping between all three references.

Table 1: Mapping between Edge Connector and JB-3 Jamma board

Tektronix Interface	Edge Connector	JB-3 Jamma board
A1	A	1
B1	1	A
A2	B	2
B2	2	B
A3	C	3
B3	3	C
A4	D	4
B4	4	D
A5	E	5
B5	5	E
A6	F	6
B6	6	F
A7	H	7
B7	7	H
A8	J	8
B8	8	J
A9	K	9
B9	9	K
A10	L	10
B10	10	L
A11	M	11
B11	11	M
A12	N	12
B12	12	N
A13	P	13
B13	13	P
A14	R	14
B14	14	R
A15	S	15
B15	15	S
A16	T	16
B16	16	T
A17	U	17
B17	17	U
A18	V	18
B18	18	V
A19	W	19
B19	19	W
A20	X	20
B20	20	X
A21	Y	21
B21	21	Y
A22	Z	22
B22	22	Z
A23	A	23
B23	23	a
A24	B	24
B24	24	b
A25	C	25
B25	25	c
A26	D	26
B26	26	d
A27	E	27
B27	27	e
A28	F	28
B28	28	f

The Power Supply section signals can be extended from the TM-500 frame connector to the extender connector with 20 wires. This can be done by using one wire for the pairs of pins listed in Table 2. Since pin B6 (6 on the Edge Connector, F on the JB-3 board) is not connected, we save a total of six wires this way, reducing the number of wires needed from 26 to 20. Figure 3 shows the shared pins/wires. Note that the labelling in this figure matches the labelling on the Edge Connector.

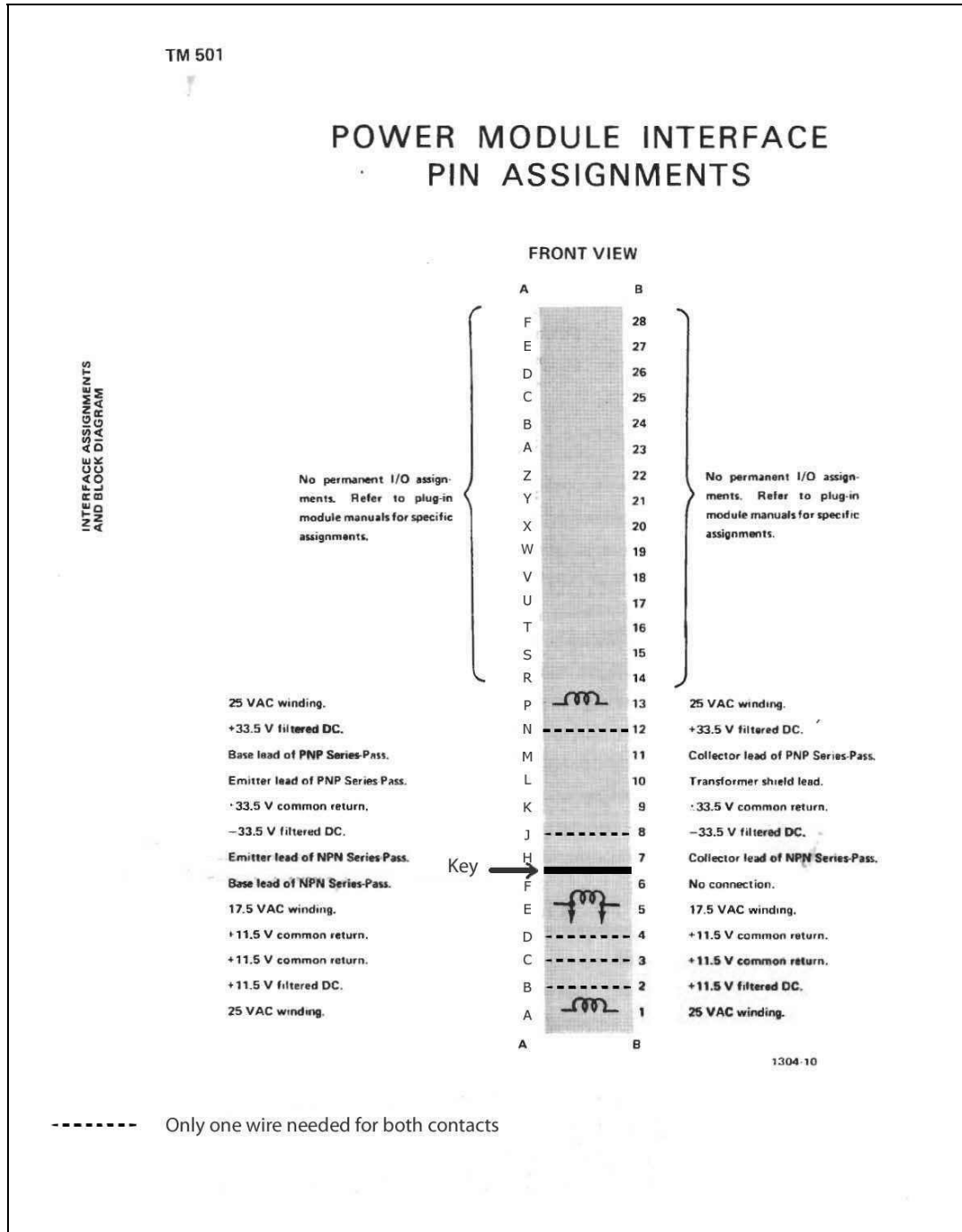


Figure 3: Shared pins in the Power Supply Section

Table 2: Pin pairs using just one wire

Tektronix Interface	Edge Connector	JB-3 Jamma board
A2-B2	B-2	2-B
A3-B3	C-3	3-C
A4-B4	D-4	4-D
A8-B8	J-8	8-J
A12-B12	N-12	12-N

Because these wires may carry significant current, it is not a good idea to use standard AWG-28 flat ribbon cable. I have used AWG-24 ribbon cable with good success, but even thicker wires may be needed for some plug-ins.

Please be very careful with the AC lines shown in figures 1 and 2. If there is a short between those pins, the TM-500 frame fuse will blow immediately.

The I/O assignment section is optional and is only used when two or more plug-ins talk together (or with a wide plug-in). This section consists of 30 pins, and 30 wires need to be soldered between the JB-3 Jamma board and the Edge Connector solder eyelets. Keep in mind that, with the Power Supply section, the identifications on the Edge Connector and the JB-3 Jamma board are reversed, so make sure to solder Connector 'R' to Jamma '14', etc. Standard AWG-28 flat ribbon cable is adequate for these lines.

The JB-3 Jamma board may be purchased from www.jammaboards.com. The Edge Connector (56 pins, 0.156" pitch) is available from multiple sources, including jammaboards. Any wire AWG-24 or thicker can be used. I strongly suggest using stranded wire. 10-wire AWG-24 flat ribbon cable works like a charm; if you want a 3 feet extender, you'll need 6 feet (2 * 3 feet).

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