IOMBX Parts List (in order of recommended assembly)

Qnty.	Symbol	Description
2	J1,J2	Jumpers, make from no. 22 bus wire (Belden no. 8022 or equivalent)
19	R1-R19	2.2KΩ resistors [red-red-red]
15	H1-H15	24-pin straight headers (Mouser 538-26-48-1241)
2	-	4-40 x ¼" long pan head machine screws (Digi-Key H142)
2	-	4-40 hex nuts (Digi-Key H216)

Author's recommendations for suppliers given in parentheses above with part numbers where applicable. Equivalent parts may be substituted. Resistors are 1/4W, 5 percent and color codes are given in brackets.

General Information:

Assembly, testing and using the IOMBX card follows the same basic steps as the IOMB card covered in the Second Edition Build Your Own Universal Computer Interface book and in the C/MRI User's Handbook. The major differences being that the IOMBX includes 2 additional card slots in place of the IOMBs provision for the 40-pin header required for connecting to IBEC.

When assembling and installing the IOMBX always keep it oriented the same way as all the drawings of the IOMB. This means the wider ground trace should always be at the top of the board and the +5Vdc trace with all its common resistor connections should be at the bottom – or toward you when working on the bench.

Always mounting the IOMBX, as well as all IOMBs, in this identical arrangement – ground trace at the top and +5Vdc trace at the bottom keeps everyone's card orientation the same as in all published C/MRI documents and articles and leads to less communication errors and less power connection errors that can seriously damage electronic components.

With the IOMB, as well as all IOMBs, mounted this way all the I/O cards, and the serial USIC and SUSIC, plug into the motherboard with their component side facing to the right. This level of consistency is vital to protect your cards from damage caused by reversed power supply hookup. The JLC WEB site jlcenterprises.net shows how to add the arrow to the card direction label to help ensure that the I/O cards are always inserted correctly.

With the card oriented as defined above, note that there are 15 sets of vertically aligned 24 holes. These form the 15 card slots. We will number these slot from left to right as slot 1, 2, 3 and so on up through slot 15.

Also, note that there is a set of 19 holes at the far left and at the far right. We can ignore these holes during card assembly. They are used only if you decide to connect one IOMBX to another IOMBX for nodes requiring more than 15 I/O cards.

Information notes on card assembly:

1. Form a straight, taut jumper (J1) from no. 22 solid bus wire so that it fits between the small hole in the ground trace and trace about two-thirds the distance down the card – i.e. between headers 7 and 8.

2. Form a second straight, taut jumper (J2) from no. 22 solid bus wire so that it fits between the small hole in the 5 Volt trace and the corresponding hole in the trace about two-thirds the distance up the card – i.e. between headers 6 and 7.

3. Beginning with the space between headers 8 and 9 and working your way to the right, install resistors R1 up through R19. For resistors R12-R19, the resistor leads themselves are too short to reach bus lines 3 through 9. Extend the bottom end of each resistor lead, using a piece of the bus wire, to reach the corresponding hole in the +5Vdc trace. Solder the splice-hook joint between the bus wire and the resistor lead, then solder and trim the connections on the solder side of the board. Following this modified procedure, from that documented for the IOMB, keeps all the resistor extensions at the same +5Vdc polarity.

4. Install a 24-pin straight header, in each of the card's 15 I/O card slots. Push each header tight against the card as you solder. It's best to first solder only one pin located about one-third in from each end. Then place the board and header over a screwdriver clamped in a vice with the blade protruding up. Lay the board's solder side up with the plastic part of the header resting on the screwdriver blade next to a soldered pin. Reheat the pin while pressing firmly down on the board and the header will tend to "snap" in place. Repeat for the second pin. Once verified that the header's bottom surface is pressed flat and tight against the board, with the pins straight up, and then solder the remaining pins.

5. Insert the three 4-40 machine screws from the component side of the board into the holes that are part of the +5Vdc trace and the ground trace. Secure by attaching nuts on the solder side of the board. Tighten firmly then solder the nuts to the pad.

6. Cut out one set of the "+5VDC" and "GND" labels provided below and glue them next to the power terminals. Make sure the GND label is next to the screw that is part of ground trace and the +5VDC label is next to the screw that is part of the somewhat narrower +5Vdc trace. This documentation step is extremely important. A future mistake hooking up your supply backwards can do severe damage to the electronic parts on your I/O cards as well as on the USIC and SUSIC.

+5VDC **GND**

+5VDC **GND**

Cards face this direction

Cards face this direction