BILL'S BOARDS

BusExpander

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WARNING!!

READ ENTIRE DOCUMENT
BEFORE ASSEMBLING UNIT

BusExpander Assembly Instructions

Preliminary Version

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Bill's Boards

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SECTION 1 - Specifications

Congratulations on the purchase of your Bill's Boards BusExpander! The BusExpander is intended for the Amiga 500 or 1000 owner who wishes to take advantage of the less expensive Amiga 2000 peripherals, including use of the A2088 or A2286 (when available) Bridgeboards. The BusExpander supplies the user with six (6) Amiga slots, and six (6) IBM slots, four of which are AT-type slots and two of which are XT-type slots. The user may optionally add connectors to two additional IBM slots, and may have as many as seven of the eight slots configured as AT-type slots. The Motherboard is pre-drilled to fit into an IBM Baby AT-type case, and expects an IBM-compatible power supply. A 150-watt power supply should provide sufficient power for all the peripherals which you might wish to install.

SECTION 2 - Contents of Package

This package contains the following items:

1) Motherboard (Figure 1)
2) Terminator Board (Figure 2)
3) Driver Board (Figure 3)
4) Two (2) Cables (Figure 4)
5) This Manual

The Motherboard, shown in Figure 1, has six (6) Amiga 100-pin connectors, and six (6) IBM connectors, four of which are configured as AT-type connectors and the remainder as XT-type connectors. On each side of the Motherboard, you will find a pair of IDC connectors. On the left side, they are labeled J11 and J12, and on the right side, J13 and J14. At the top right corner of the board, you will find the power connectors, labeled P8 and P9.

The Terminator Board, shown in Figure 2, ensures that proper signals are returned on the bus. The Terminator Board has two female connectors, labeled J15 and J16, which connect to J13 and J14 of the Motherboard.

The Driver Board, shown in Figure 3, buffers and drives the bus. It is enclosed in a case to further shield the board and to protect it from damage after it is attached to your Amiga. The

Driver Board has a pair of male connectors on one edge of the board and a female edge card connector on the other edge. DO NOT CONNECT THIS BOARD TO YOUR COMPUTER UNTIL YOU HAVE READ AND UNDERSTOOD THE INSTRUCTIONS FOR DOING SO.

The Cables, shown in Figure 4, connect the Driver board to the Motherboard. These are SPECIAL CABLES! If they are damaged in any way, the BusExpander may fail to perform. Contact your dealer or Bill's Boards if there is any noticeable damage to the either of the cables. DO NOT try to replace the cables with ordinary grey ribbon cable! It is extremely important that the cables are plugged in with the correct orientation and location. DO NOT ATTEMPT TO CONNECT THE CABLES UNTIL YOU HAVE READ AND UNDERSTAND THE SECTION ON CONNECTING THE CABLES.

SECTION 3 - Tools Needed

You will need the following tools and parts to assemble the BusExpander:

1) an IBM Baby AT-type case, with a single drive bay
2) an IBM-compatible power supply, that fits your case
3) a power drill with a 3/8" drill bit
4) a Radio Shack nibbler part no. RS64-823
5) a phillips-head screwdriver
6) a flat-head screwdriver
7) needle-nose pliers
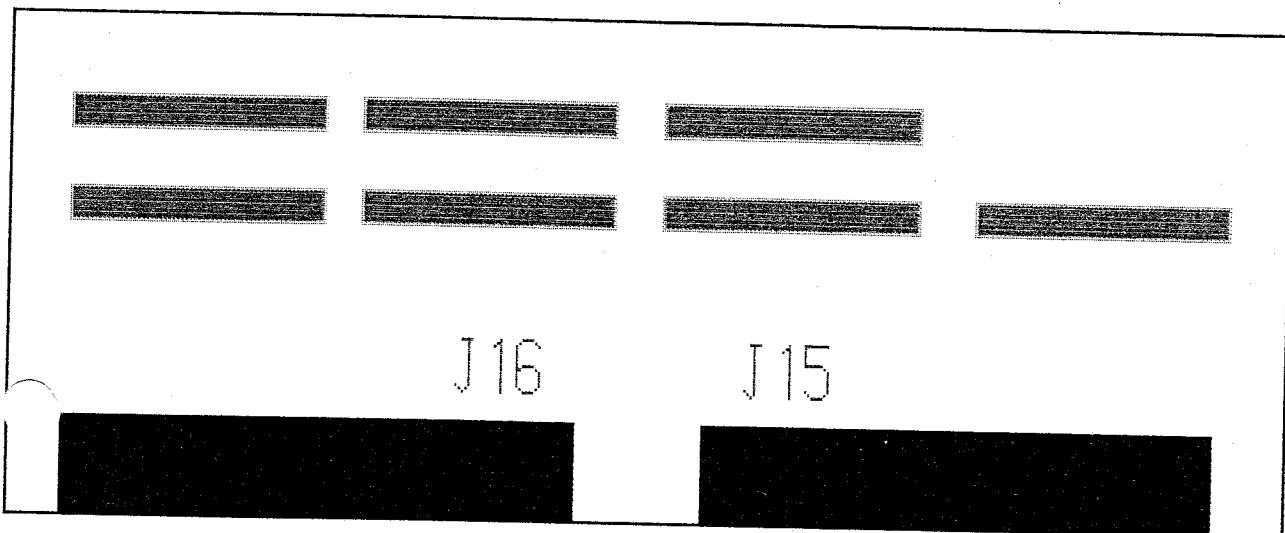8) the package of parts and mounting hardware that comes with your case.
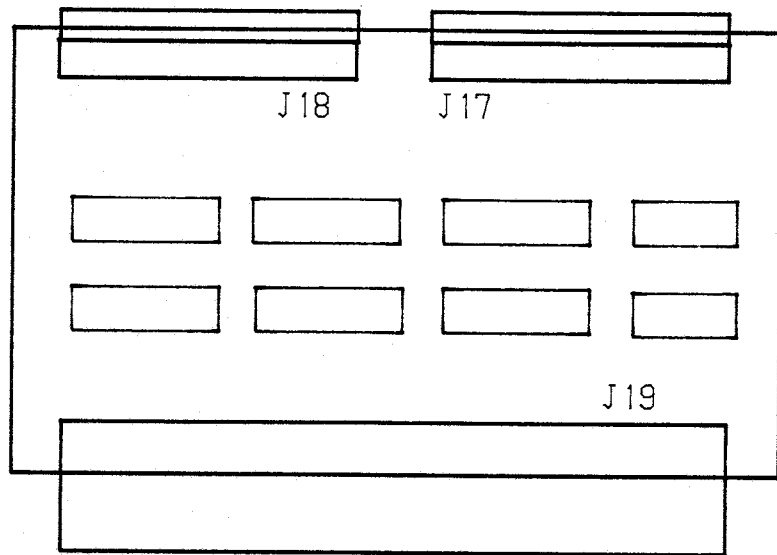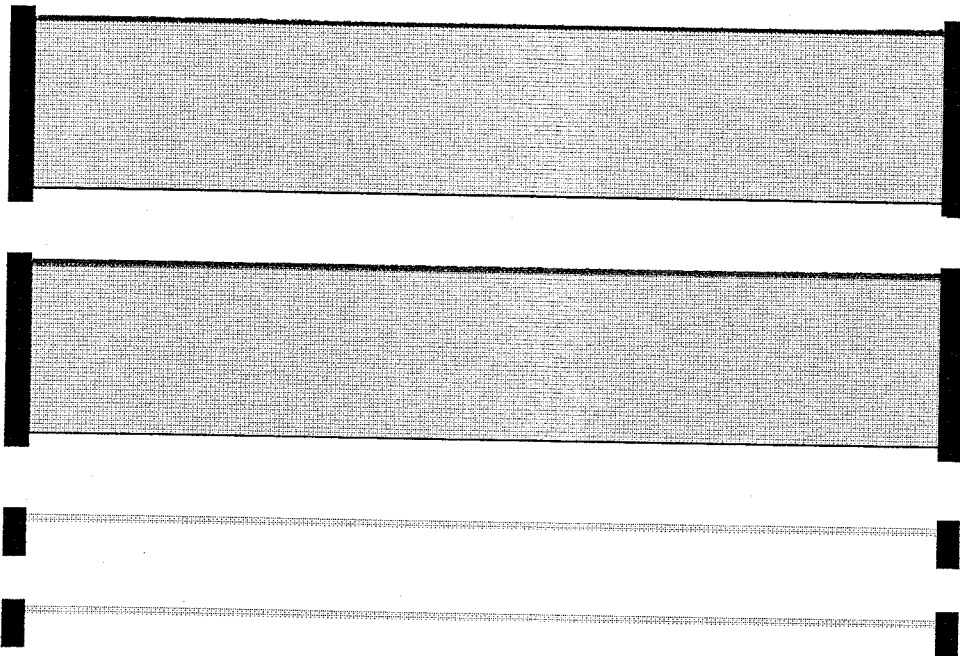
J16   J15

Figure 2, The Terminator Board

J 18   J 17

J 19

Figure 3, The Driver Board

5

Figure 4, The Cables

The following instructions assume that you are installing the Motherboard in a slide-top IBM Baby AT-type case. Follow each step carefully. If you run into problems, consult your dealer or Bill's Boards.

Step 1. Prepare the case for the Motherboard. If you have two drive bays in your case, you may need to remove the left drive bay if it overlaps the area for the Motherboard. The ease of accomplishing this is heavily dependent upon the style of case which you purchased.

Step 2. Check the alignment of the mounting holes. The mounting holes in the case must be aligned with the pre-drilled holes in Motherboard. The center (see Figure 5, Alignment of Mounting Holes) and rear holes **MUST BE ALIGNED CORRECTLY.** (Alignment of front holes may require modification of the case.) IMPORTANT NOTICE — DO NOT MODIFY THE MOTHERBOARD TO ALIGN FORWARD HOLES. ANY MODIFICATION OF THE MOTHERBOARD WILL VOID YOUR WARRANTY!

Step 3. Prepare the case for the cables. With the Motherboard loosely mounted in the case, mark the side of the case bottom to indicate the location of the extreme ends of connectors J11 and J12. Remove the Motherboard and, mark the location of the hole to be cut in the bottom of the case one inch in from the left side using a copy of the template in Figure 6, Mounting Hole Template. Drill a 3/8" hole at one end of the marking. Using a nibbler (Radio Shack part no. RS64-823) extend the hole to the opposite end of the mark. File the edges of the hole smooth, removing any burrs, and install grommet in the hole or pad the hole with electrical tape to prevent damage to the cables. Note the location of pin 1 before routing the cables through hole without twisting them.

Step 4. Place the Motherboard in the case. Install the Motherboard in the case with power connector to the rear of the case. Use plastic standoffs for installing the Motherboard if at all possible. If you use metal standoffs, you MUST use plastic insulators on BOTH SIDES of the Motherboard. Do not tighten Motherboard in place as you will need to route the cables later.
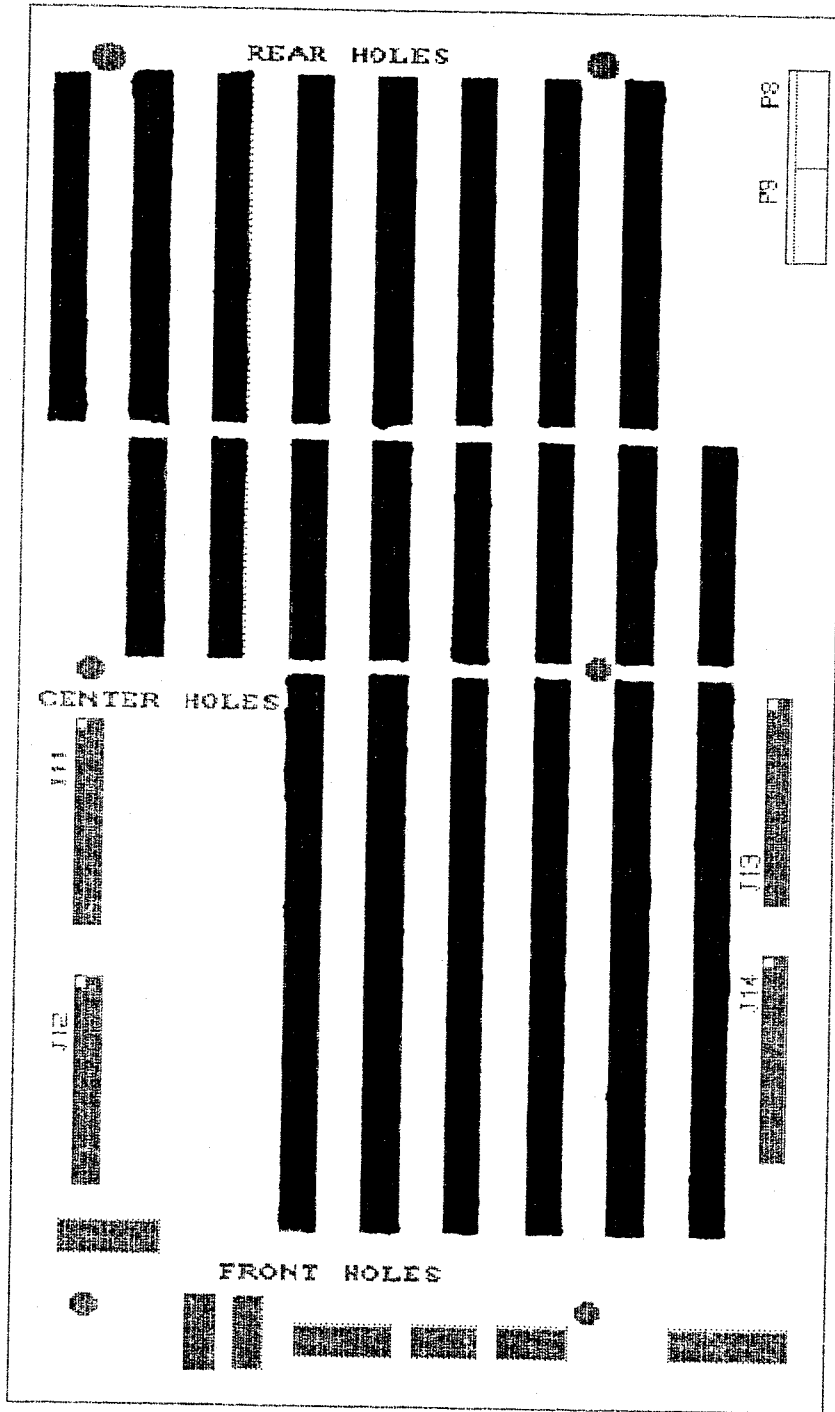
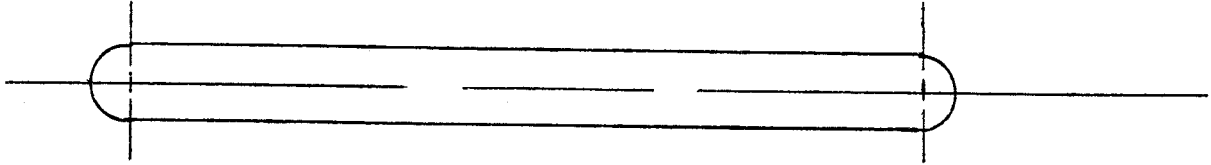Figure 5, Alignment of Mounting Holes

Figure 6, Mounting Hole Template

Step 5. Install the power supply in the case. Connect power supply connectors P8 and P9 to the corresponding connectors on the Motherboard. (If there are no clearly marked P8 and P9 cables on the power supply, look for two six-wire connectors. On P9, the first two wires will be the same color, usually black, and the last three wires will be the same color, usually red. On P8, the last two wires will be the same color as the first two wires on P9, these are the ground wires.) Connect P9 with the last three wires towards the front of the case. Connect P8 so the two ground wires are adjacent to the P9's two ground wires. (See Figure 7, Installing the Power Supply.)

Step 6. Install the Terminator board. Turn the Terminator board so that the components are on the side facing the power supply and J15 and J16 plug onto connectors J13 and J14 on the Motherboard. Make sure the board fits snugly on the connectors. (See Figure 8, Installing the Terminator Board.)

If you are installing the BusExpander on an **Amiga 500, go to Step 11.**

If you are installing the BusExpander on an **Amiga 1000, continue with Step 7.**
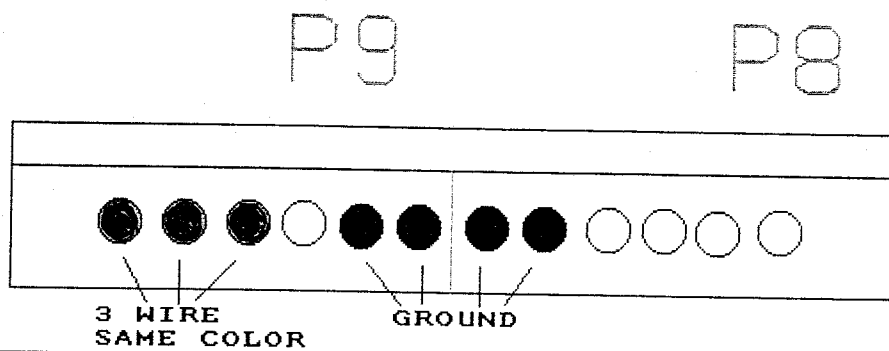
P9   P8

3 WIRE   GROUND
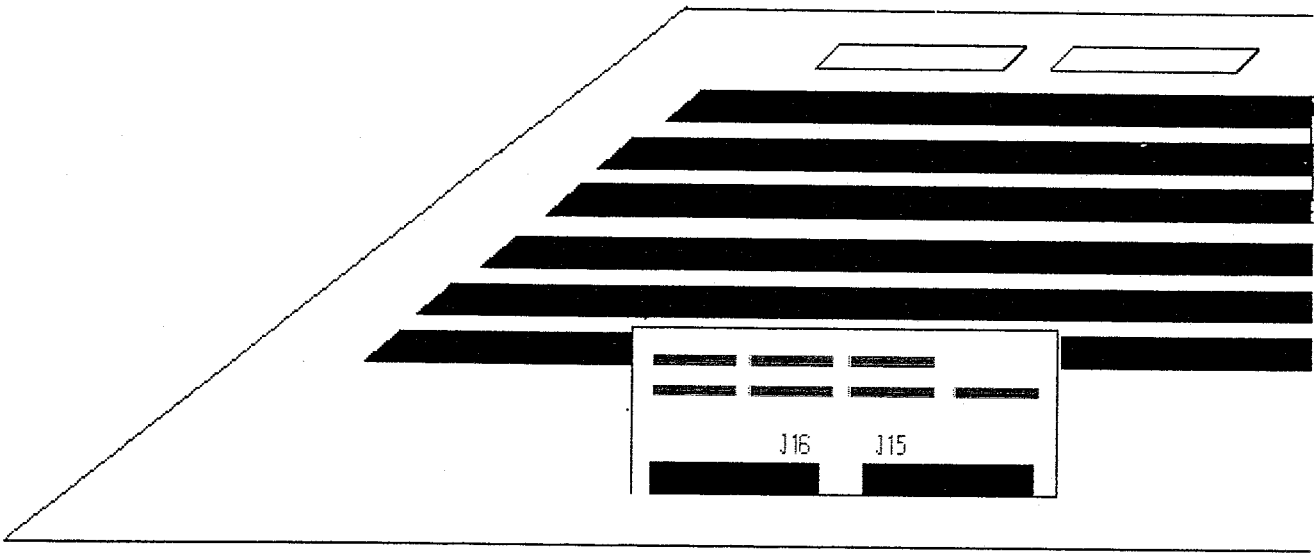SAME COLOR

Figure 7, Installing the Power Supply

Figure 8, Installing the Terminator Board

Step 7. Install the cables. This can be tricky on an Amiga 1000. The two cables supplied are identical. The cables have special shielding and signal transmission properties that use certain pins for their function. IT IS IMPORTANT TO MAKE SURE THE CABLES ARE PLUGGED IN CORRECTLY. FOLLOW THESE INSTRUCTIONS CAREFULLY. The cables have red stripe identifying pin 1. Both connectors on a cable face the same direction. (See Figure 4, The Cables.)

7-1) Connect the J11 cable to the Motherboard. Take one of the cables and with the red stripe facing towards the rear of the case, connectors facing down, plug the left end of the cable into connector J11 on the Motherboard. Using a piece of masking tape, mark the unconnected end of the cable "J11". Make a 90 degree fold in the cable near the J11 Motherboard connector so that the unconnected end of the cable is brought toward the front of the case. Now make another 90 degree fold in the cable so that the unconnected end is to the left of the board. (See Figure 9, J11 Cable Folds for the Amiga 1000.)

7-2) Connect the J12 cable to the Motherboard. Take the other cable with the red stripe facing towards the rear of the case, connectors facing down, and plug the left end of the cable into connector J12 on the Motherboard. Make a 90 degree fold in the cable near J12 Motherboard connector so that the unconnected end of the cable is brought toward the rear of the case. Now make another 90 degree fold in the cable so that the loose connector is to the left of the board. (See Figure 10, J12 Cable Folds for the Amiga 1000.) At this point, the cables should be side by side to the left of the case and the red stripes are now towards the front of the case. If you have done this correctly, the cables will be crossed neatly, so that the unconnected end of J11 cable is over the J12 Motherboard connector, while the J12 cable is over the J11 Motherboard connector. (See Figure 11, Amiga 1000 Connection of Cables to Motherboard Connectors J11 and J12.)

7-3) Complete Motherboard installation. Route the cables beneath the Motherboard and through the hole cut in the case in Step 3. Tighten down the Motherboard snugly.

7-4) Connect cables to the Driver board. With the Driver board face up, extend the cables out the left side of the case. Take the connector that you marked "J11" in Step 7-1 and connect it to J17 on the Driver board. Take the connector on the unmarked cable and attach it to J18 on the Driver board.
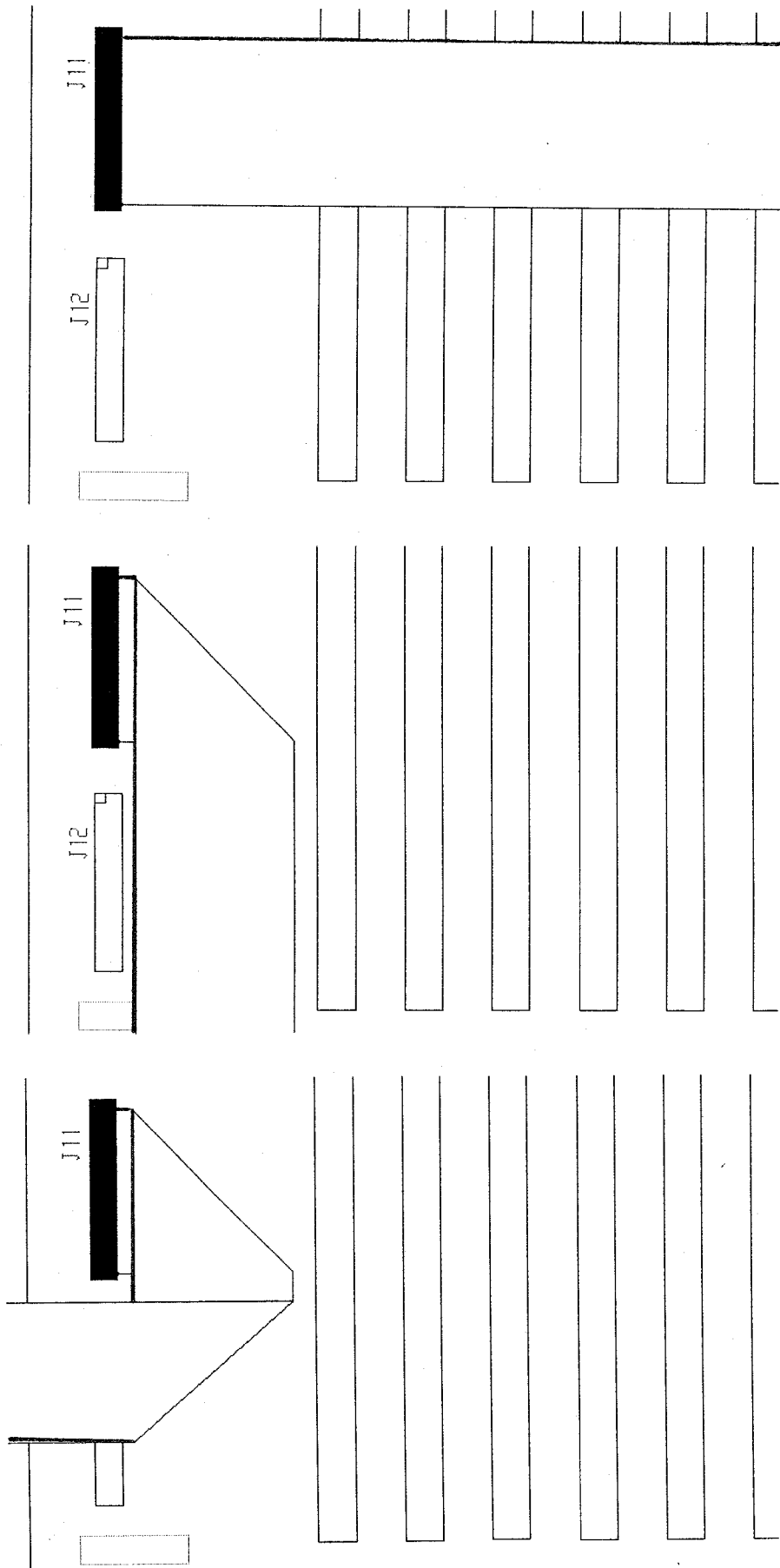
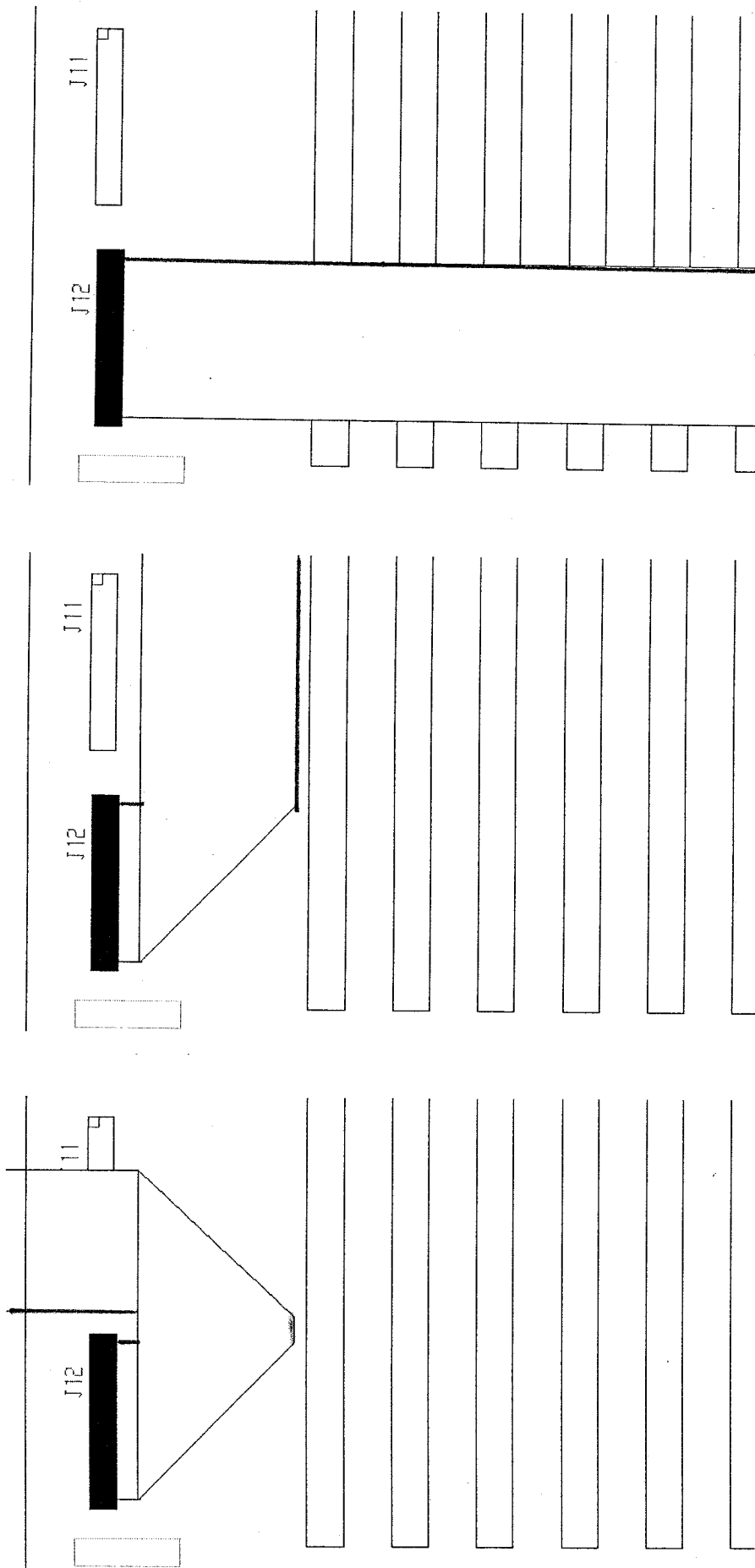Figure 9, J11 Cable Folds for the Amiga 1000

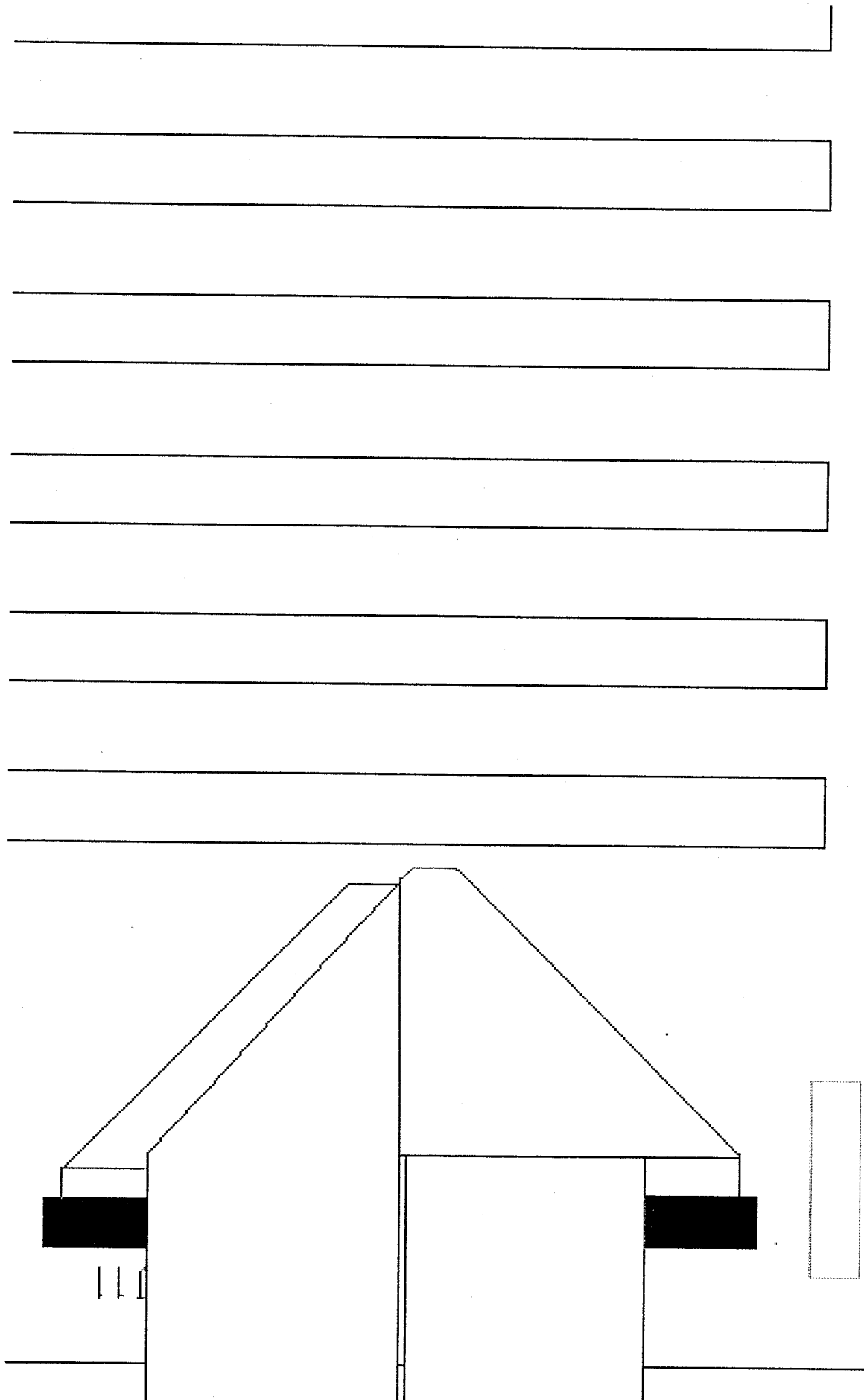Figure 10, J12 Cable Folds for the Amiga 1000

Figure 11, Amiga 1000 Connection of Cables to Motherboard Connectors J11 and J12

Step 8. Connect the Driver board. WARNING: MAKE SURE THAT POWER IS DISCONNECTED FOR BOTH THE COMPUTER AND THE BUSEXPANDER BEFORE CONNECTING THE DRIVER BOARD. Now connect the Driver board's edge card connector to the expansion port on the Amiga 1000.

Step 9. Test the BusExpander. Before installing any peripheral cards, let's test the BusExpander by applying power. TURN ON THE POWER TO THE BUSEXPANDER BEFORE POWERING UP THE AMIGA! Your Amiga 1000 should boot up normally if everything is connected correctly.

Step 10. With the power off, install your peripherals and test them according to the instructions provided by the manufacturer. If you are planning to use the case in a "tower" configuration, install rubber feet where appropriate.

Go to Step 15.

Step 11. Install the cables. The two cables supplied are identical. The cables have special shielding and signal transmission properties that use certain pins for their function. IT IS IMPORTANT TO MAKE SURE THE CABLES ARE PLUGGED IN CORRECTLY. FOLLOW THESE INSTRUCTIONS CAREFULLY. The cables have a red stripe identifying pin 1. Both connectors on a cable face the same direction. (See Figure 4, The Cables.)

11-1) Connect the J11 cable to the Motherboard. Take one of the cables and with the red stripe facing towards the rear of the case, connectors facing down, plug the connector on the right end of the cable into connector J11 on the Motherboard.

11-2) Connect the J11 cable to the Driver board. With Driver board laying face down on the left side of the case (J17 towards the rear of the case), route the cable through the hole cut in the case in Step 3. Extend the J11 cable to left of case and plug the unconnected end into J17 on the Driver board.

11-3) Connect the J12 cable to the Motherboard. Take the other cable with the red stripe facing towards the rear of the case, and plug the connector on the right end of the cable into connector J12 on the Motherboard.

11-4) Connect the J12 cable to the Driver board. Route the J12 cable through the hole in the case and plug the loose connector into J18 on the Driver board. Slide the top onto the case and set the Amiga 500 on top of the case.

Step 12. **Connect the Driver board.** WARNING: MAKE SURE THAT POWER IS DISCONNECTED FOR BOTH THE COMPUTER AND THE BUSEXPANDER BEFORE CONNECTING THE DRIVER BOARD. Now connect the Driver board edge card connector, Driver board FACE UP, to the expansion port on the Amiga 500.

Step 13. **Test the BusExpander.** Before installing any peripheral cards, let's test the BusExpander by applying power. TURN ON THE POWER TO BUSEXPANDER BEFORE POWERING UP THE AMIGA! Your Amiga 500 should boot up normally if everything is connected correctly.

Step 14. **Complete installation of other parts.** Install your peripherals with the power off and test them according to the instructions provided by the manufacturer. If you are planning to use the case in a "tower" configuration, install rubber feet where appropriate.

Step 15. **Complete the warranty card.** Now that you have completed the assembly of your BusExpander, complete the warranty card and return it to Bill's Boards. Enjoy the added power and capability provided by Bill's Boards BusExpander and tell a friend!