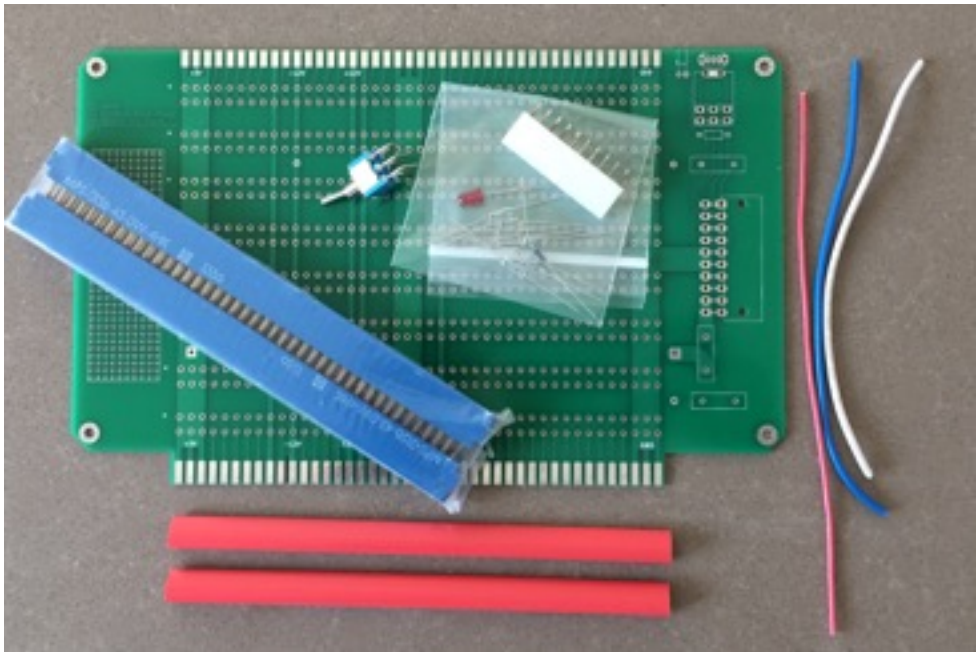
Introducing: The Multi-Plane for EXORbus!



The **Multi-Plane** for EXORbus is a backplane for Motorola EXORbus compatible computer modules, but that's not all! It also includes a fused ATX power connector with switch, can be used as a card extender, and has a small prototyping area (great for developing a small /Page Enable circuit for the Dynamic System Bus of multiple Dynamic RAM Modules).

Motorola's EXORbus is an old bus standard, pre-dating VMEbus and common ATX power supplies. It was used on the Motorola EXORciser, EXORset, a variety of "MEX" and MicroModule series boards, and "MEK" series trainers. There are also a lot of interesting third-party MC6800 and MC6809 based single-board-computers that use this form factor, which are finally affordable due to obsolescence as PLCs. However, accessories such as backplanes and power supplies are hard to find and still quite expensive. The **Multi-Plane** allows you to finally test and use these boards in a compact form factor matching the size of an EXORbus card.

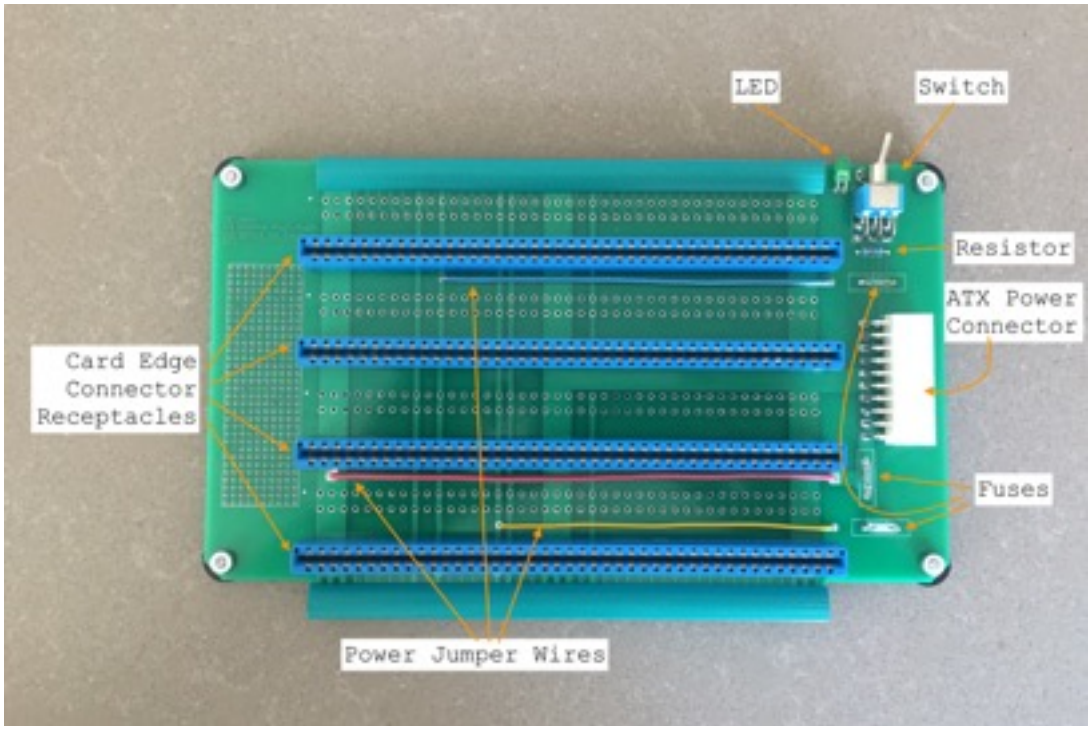
What You Get:

- EXORbus passive backplane/extender PCB expandable to 9 card slots (8 vertical + 1 horizontal extension connector)
- Two 86 pin card edge connectors (additional connectors available as option)
- Fused ATX power connections (+5V, +12V, -12V only, no -5V) + five spare fuses
- Power switch (multiple options)
- LED power indicator (multiple color options)
- Two card edge protectors to prevent spurious signals (multiple color options)
- EXORbus card form factor
- Assembly is optional and extra

What You Need to Add (Not Included):

- EXORbus compatible CPU or expansion cards
- ATX Power Supply (check Amazon)
- Your time and solder.

Assembly Instructions



Soldering the large edge connectors on the board can be time consuming and requires a decent quality soldering station for best results. Do not attempt this kit as your first soldering project.

Note that the back side of the board is labeled “BACK” on the top left side near the switch pads. The front of the board contains the logo, product name, and model number.

Assembly is easiest by starting with the shortest components, working your way up to the tallest. This allows you to keep even pressure on the components on your work surface while soldering the back side of the board.

1) Visually inspect the PCB to make sure that it was not damaged during shipment.
2) Strip a small amount of insulation from one end of each of the power strap jumper wires.
3) Place the stripped end of one of the wires into the jumper pads to the left of the the fuse boxes and solder it on the back. Repeat for each wire.
4) Pull the wire tight horizontally across the board to the power jumper pad directly across from it and mark the wire where it meets the hole.
5) Strip the wire at your mark and bend a right angle in the wire with the tip pointing to the board.

6) Insert the free end of the wire into the jumper pad, pulling it tight from the back side and solder the end of the wire on the back of the PCB.
7) Select 3 glass fuses and test them with a multi-meter to verify continuity.
8) Bend the fuse leads very close to the body and insert them into the front side of the board in the boxed areas. Bend the leads on the back of the board to retain them.
9) Select the blue resistor and insert it in to the small boxed area beneath the switch pads. Bend the leads on the back of the board to retain it.
10) Flip the board over and hold it against your work surface while soldering. Solder the 6 fuse pads and the 2 resistor pads.
11) Insert the LED into its location near the top front of the board, with the longer positive lead in the round pad (on the left) and the shorter negative lead in the square pad (on the right). Verify that the flatter negative side of the LED body is in the hole of the squared pad.
12) Bend the leads of the LED at a right angle close to the plastic body. Bend the leads on the back of the board to retain it.
13) Flip the board over and hold it against your work surface while soldering. Solder the 2 LED pads.
14) Clip all leads and excess wires close to the solder point.
15) Place the switch into the pads on the front of the board near the LED. The pads you use depend on the kind of switch you received with your order.
16) Flip the board over and hold it against your work surface while soldering. Solder the 5 (small slider switch) or 8 (large paddle switch) pins. Note that 2 of the pads are mechanical connections to the body of the switch and may require a lot of heat to ensure a good physical bond.
17) Install the large ATX power connector on the front of the board.
18) Flip the board over, press it down so that the connector is fully seated and solder into place on the back of the board. These large pins may need a high temperature setting to ensure that the solder can fuse with the pins before the heat dissipates, melting the plastic housing.
19) Plug in your ATX power supply and verify that the switch works and the LED lights up. Test the voltages at the end of the fuses with a voltage meter to ensure that they are correct, then turn off and disconnect the power supply.
20) Install one edge connector on the front of the board with the corner having the square hole near the square square silk-screened indicator.
21) Verify that the edge connector is fully seated on the PCB and that no pins were pushed up or out during the installation process.
22) Flip the board over and hold it against your work surface while soldering. Solder the 86 pins. Tips:
    - Set the soldering station at about 750 °F for low-lead solder. This setting depends on the type of solder you are using.
    - For the zig-zag bus pins:
        1. Place the point of the soldering tip on the pad, with the side of the tip on the pin
        2. Count to 10
        3. Apply solder to the opposite side of the pin as the soldering tip
        4. Count to 10 while verifying that the solder “slumps” onto the pad, completely covering it, and that there is enough solder to also peak about 1mm up the pin. Add more solder if necessary.
        5. Remove the soldering tip and move to the next pin.
    - For the straight bus power pins, follow the same instructions as above, but count to 20 when initially heating before applying solder.

- For the very wide +5V and ground power bus pins, you may need a higher heat level to get a good bond. You will probably need to count up to 30 during the initial heating, and to 20 after soldering, to ensure pad coverage and bonding. Solder all 6 pins that connect to the same power bus at the same time to keep the heat high.

23) Perform continuity testing on the connector pads to the fingers of the board.
24) Wash off any residual flux using a soft brush and isopropyl alcohol. Allow the board to dry thoroughly.

Use Instructions

1) Verify that the power to the ATX power supply or the backplane is off and the LED on the backplane is not lit.
2) **Make sure that the card you are inserting has components facing the fingers of the backplane, with the backplane switch to the solder side of the inserted card.** The sides of the card should align with the sides of the backplane. Note that there is not a locator guide to match the cut-out on the card edge of the EXORbus card, so **insertion the wrong way is possible and would likely damage the card you are inserting if powered on.**
3) Firmly seat the card into the back plane by pushing it straight down into the receptacle. It may require some force.
4) Flip the power switch on the back plane and verify that the power light is on.
5) Verify that there are no unusual noises or smoke.
6) Retro-Compute!