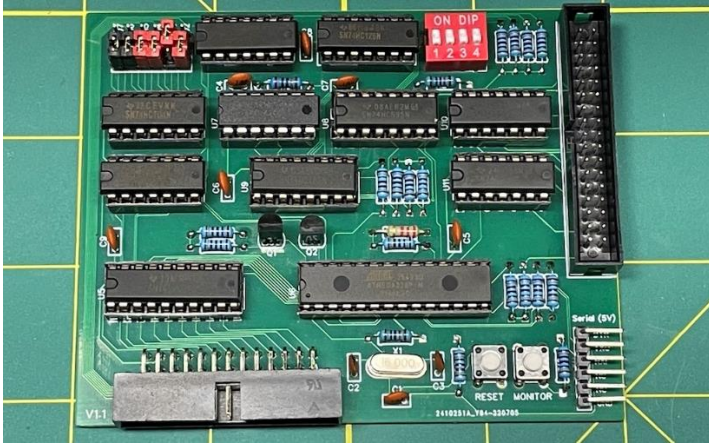


Altair-Duino Disk Controller



Parts List

I would strongly suggest comparing the parts you received with the list below. Let me know if you are missing anything and I will send a replacement.

Bag #1

- 7 x 100nF Capacitors
- 2 x 22pF Capacitors
- 17 x 1k Resistors
- 1 x 2.2k Resistors
- 2 x 10k Resistors
- 1 x 100k Resistors
- 2 x 2N7000 Transistors
- 1 x 16MHz Crystal

Bag #2

- 1 x 34 Pin Male Header

- 1 x 26 Pin Male Header
- 1 x 12 Pin Double Male Header
- 1 x 6 Pin Male Header
- 1 x 6 Pin Angle Male Header
- 6 x Jumpers

Bag #3

- 1 x CD4068BE
- 1 x 74HC126N
- 1 x 74LVC245AN

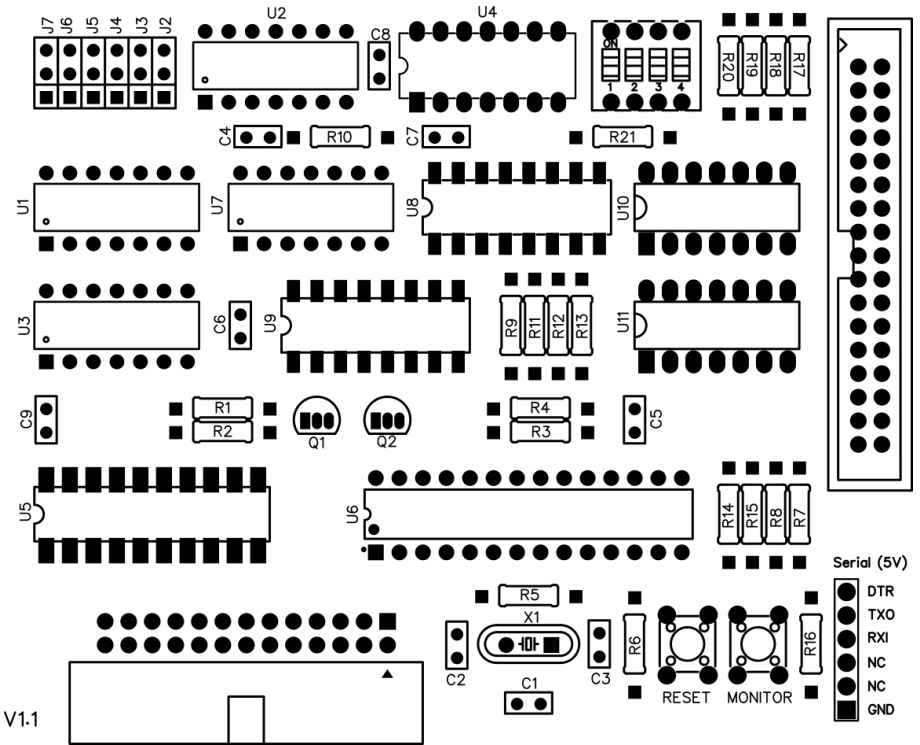
- 1 x ATMEGA328P
- 1 x 74HC595N
- 1 x 74HC165N
- 1 x 74HC04N
- 1 x 74HC00
- 1 x 74HC74
- 2 x 74LS07
- 6 x 14 Pin DIP Socket
- 2 x 16 Pin DIP Socket

- 1 x 20 Pin DIP Socket
- 1 x 28 Pin DIP Socket
- 2 x 6mm Tactile Switch
- 1 x 4 Position DIP Switch

Unbagged Parts

- Circuit Board
- CP2102 USB to UART

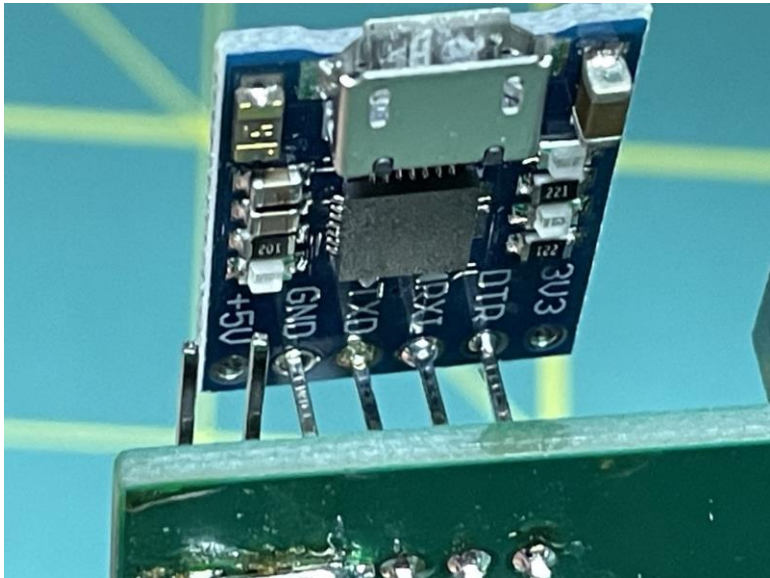
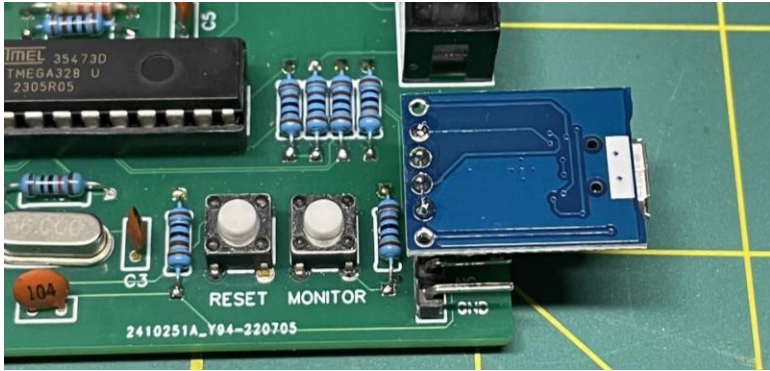
Visit <https://github.com/dhansel/Altair8800-IOBus> for the designer David Hansel's original documentation.



Install the components as shown in the BOM:

Name	Designator	Quantity
100nF	C1,C4,C5,C6,C7,C8,C9	7
22pF	C2,C3	2
FLOPPY_IDC_34P	IDC_34P	1
CON_HEADER_1X03-PTH	J2,J3,J4,J5,J6,J7	6
TS-1095-A2B2-D1	MONITOR,RESET	2
SBH11-PBPC-D13-RA-BK	P1	1
Serial	P2	1
2N7000	Q1,Q2	2
1k	R1,R2,R3,R6,R7,R8,R9,R11,R12,R13, R14,R15,R16,R17,R18,R19,R20	17
2.2k	R4	1
10k	R5,R21	2
100k	R10	1
TA-04	SW1	1
CD4068BE	U2	1
SN74HC126N	U4	1
SN74LVC245AN	U5	1
ATMEGA328P-PU	U6	1
74HC595N	U8	1
74HC165N	U9	1
16MHz	X1	1
MC74HC04AN	U1	1
74HC00	U3	1
74HC74	U7	1
74LS07	U10,U11	2

You will also want to add the CP2102 UART module to the serial pin headers. You will only connect the DTR, TXD, RXD, and GND pins. DO NOT connect the 5v or 3v pin of the UART module. 5v will be provided by the USB connection. Attach the modules as pictured:



You'll notice the RXD on the module connects to TXD on the disk controller card, and likewise TXD on the module connects to RXD on the controller card. This is correct. You will also notice that GND on the module connects to one of the NC (no connection) pins on the disk controller.

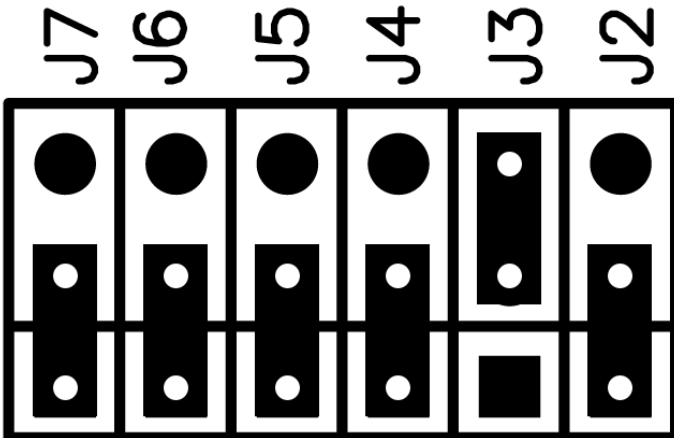
You will need to modify the disk controller card to connect that pin to ground. I did this by soldering a jumper pin across the bottom three pins:



This will allow you to connect via USB serial connection to the disk controller card for various monitoring and disk creation utilities.

To enter the monitor, connect a terminal to the serial port at 115200 baud, then press and hold the MONITOR button on the board and briefly press RESET. Hold the MONITOR button until the monitor prompt can be seen on the terminal. Enter 'h' at the monitor prompt for information about valid commands.

The MITS boot ROM and software expect the disk drive at I/O address 08h-0Ah so jumper J3 should be set "up", all other address jumpers should be set "down".



Altair-Duino Disk Case



Parts List

I would strongly suggest comparing the parts you received with the list below. Let me know if you are missing anything and I will send a replacement.

- 4 x 16mm M3 Screw
- 8 x 14mm M3 Screw
- 8 x 8mm M3 Screw
- 12 x M3 Square Nut
- 8 x M3 Hex Nut
- 10 x 6mm M3 Nylon Screw
- 8 x M3 Nylon Hex Nut
- 4 x 8mm Hex Standoff
- 4 x 40mm Hex Standoff
- 12 x Laser Cut Acrylic Pieces
- 1 x Altair Disk Metallic Sticker
- 4 x Adhesive Feet

Parts you will need to provide:

- TEAC FD-55GFR 5.25" drive
or TEAC FD-235HG 3.5" drive (with 5.25" adapter sled)
- Mean Well RD-35A power supply
- AC power cord
- (Optional) Nylon strain relief bushing
- Floppy drive power cable
- Floppy drive data cable
- 5.5mm x 2.1mm barrel connector pig tail
- (4) #6-32UNC mounting bolts

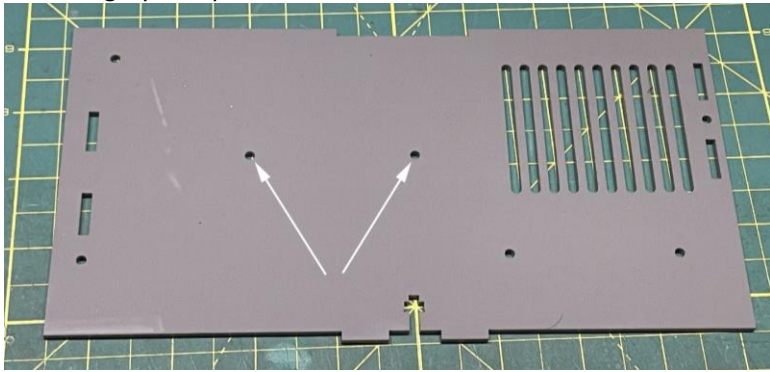
Start by sorting your hardware. Be very careful to separate the 16mm screws from the 14mm screws. They are very close in size and easily mistaken during construction.



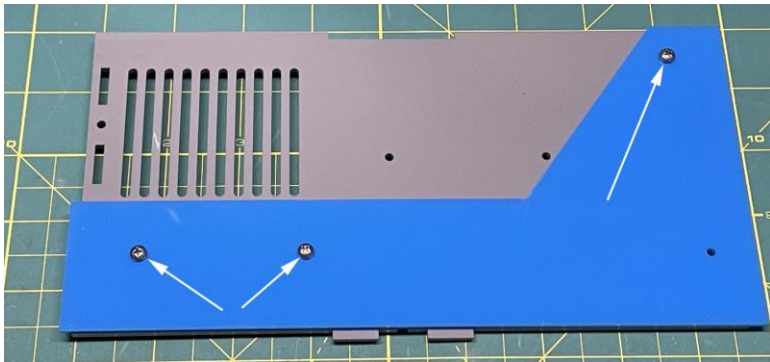
Peel the protective paper/plastic from the acrylic pieces.



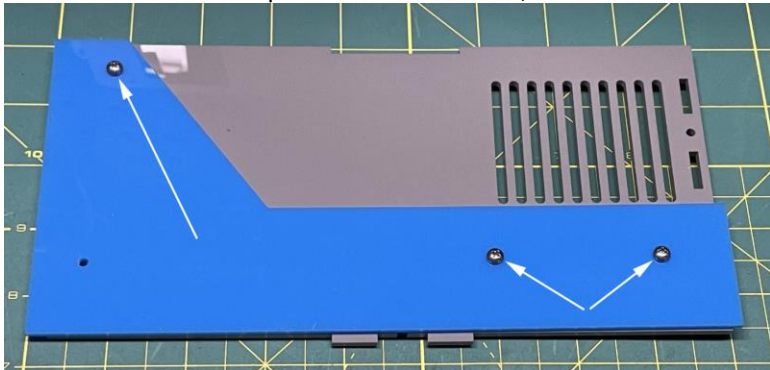
Find the gray side piece with two holes in the center:



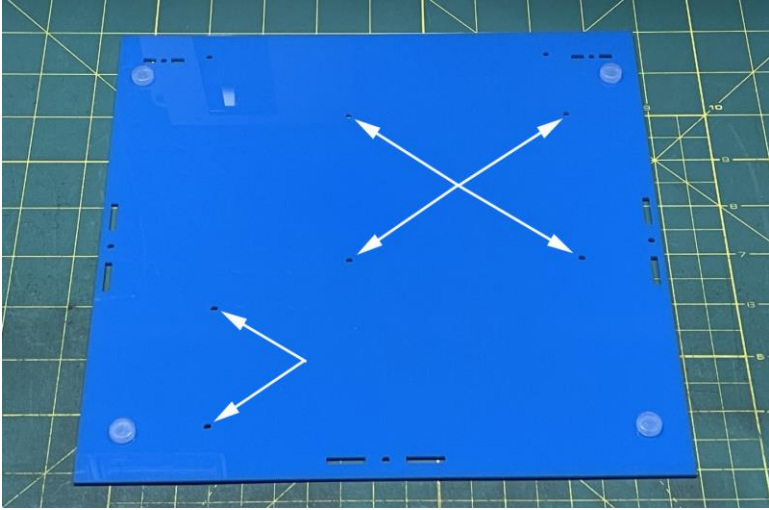
Place the blue side piece on it like this and fasten with three 8mm screws and three hex nuts in the locations shown:



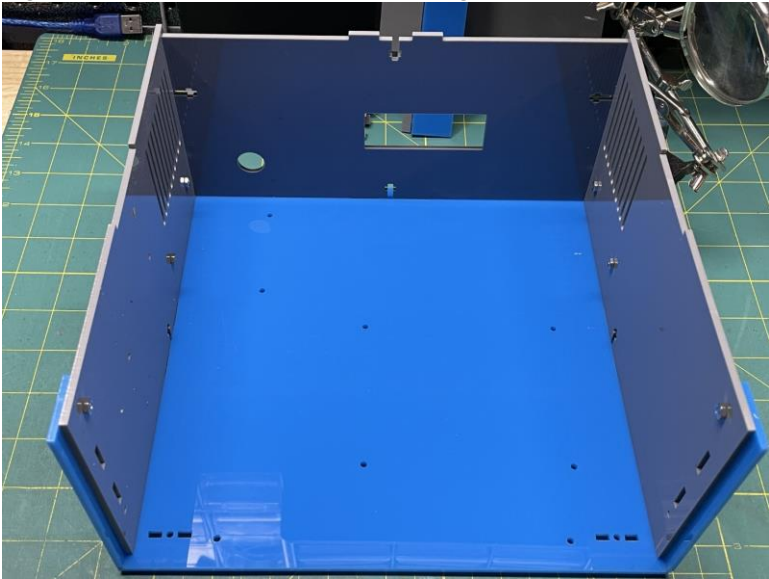
Get the other two side pieces and do likewise, as shown:



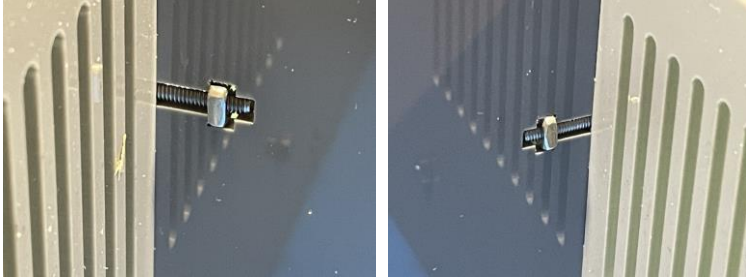
Peel the adhesive backing from the rubber feet and place them on this side of the blue bottom acrylic piece (important: note the location of the mounting holes).



Turn that piece over and assemble the back and two sides as shown (again, note the location of the mounting holes)



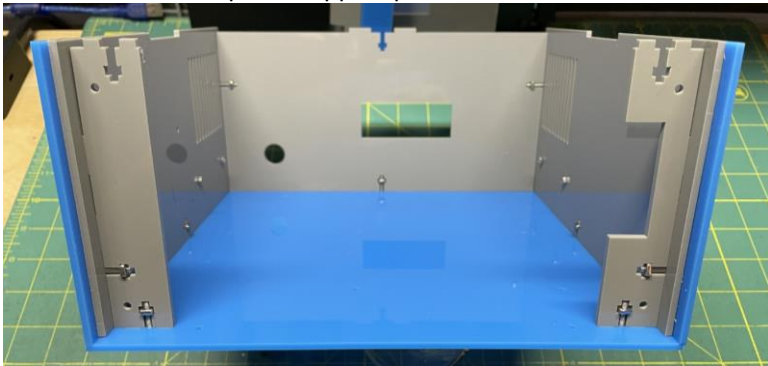
Affix the side pieces to the back piece with two 14mm screws and two square nuts. Only tighten snugly **do not overtighten!**



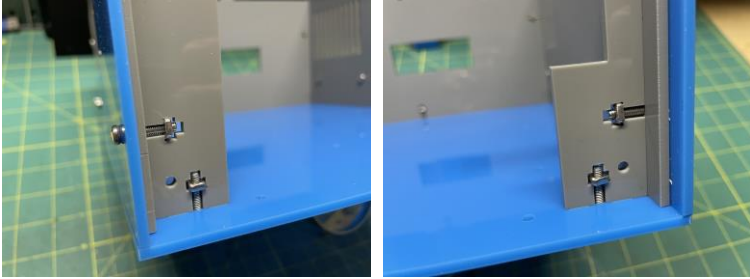
Affix the sides and back to the bottom with three 14mm screws and three square nuts:



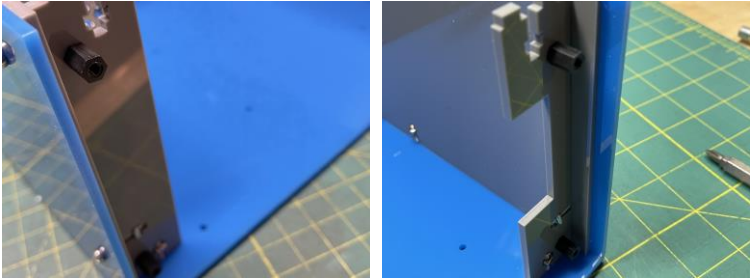
Place the two front panel support pieces as shown:



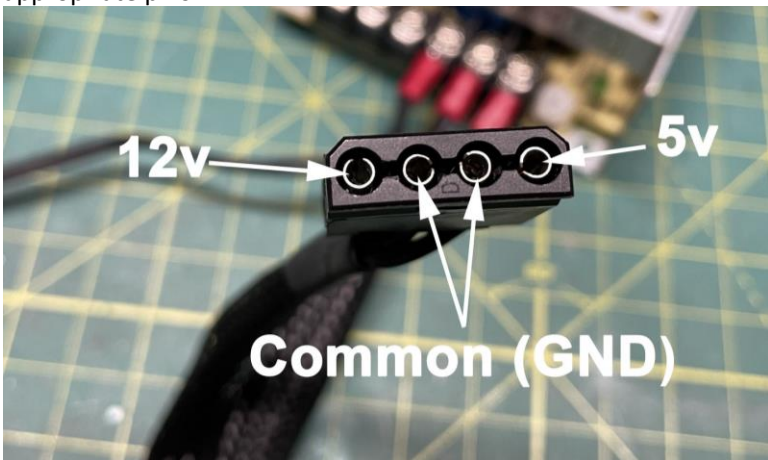
Secure the supports to the sides with two **16mm screws** and two square nuts, and secure to the bottom with two 14mm screws and two square nuts:



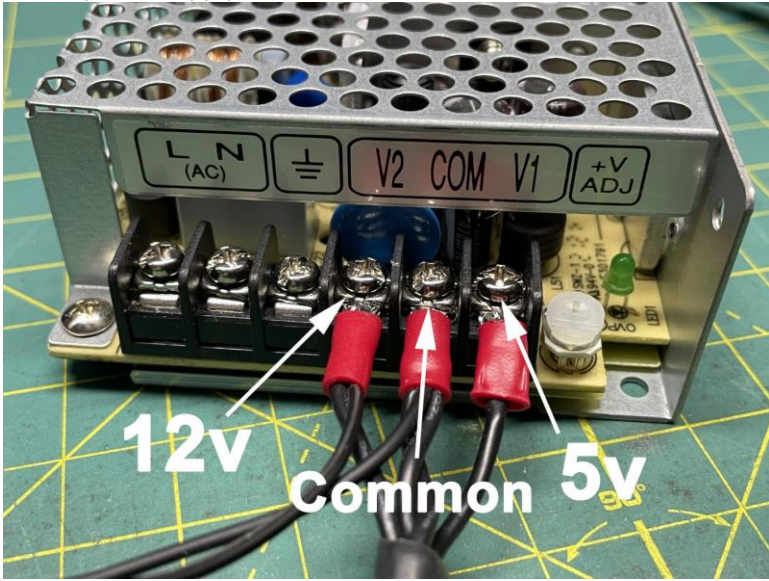
Attach two 8mm nylon standoffs with two nylon hex nuts to each support:



Now you can start wiring up your power supply. Take your floppy drive power connector and identify the leads going to the appropriate pins:



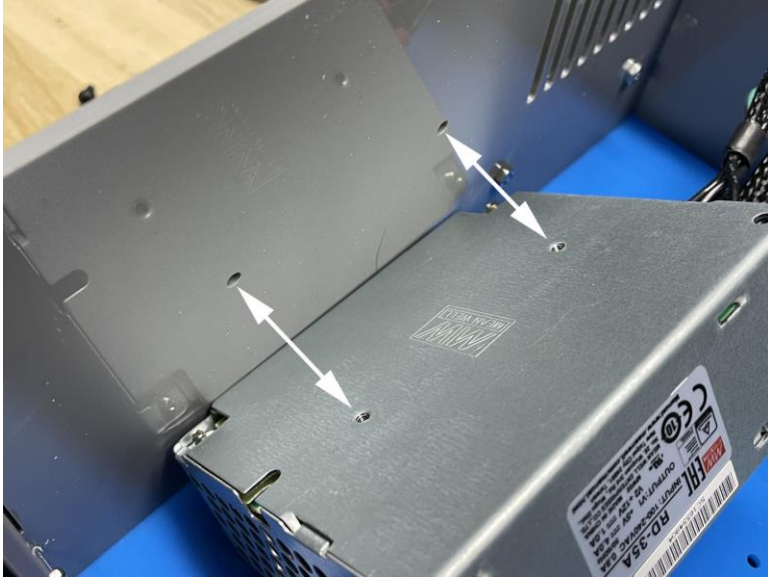
Attach those leads to the 5v, 12v, and common (GND) connectors on the power supply:



I also like to add a 5.5mm x 2.1mm barrel connector to the 12v power supply. This can be used to power the Altair-Duino, so you don't need to use the “wall wart” power supply:



You can mount the power supply in the case. You can see how the threaded mounting holes on the bottom of the power supply align with the holes provided on the left side of the acrylic case:



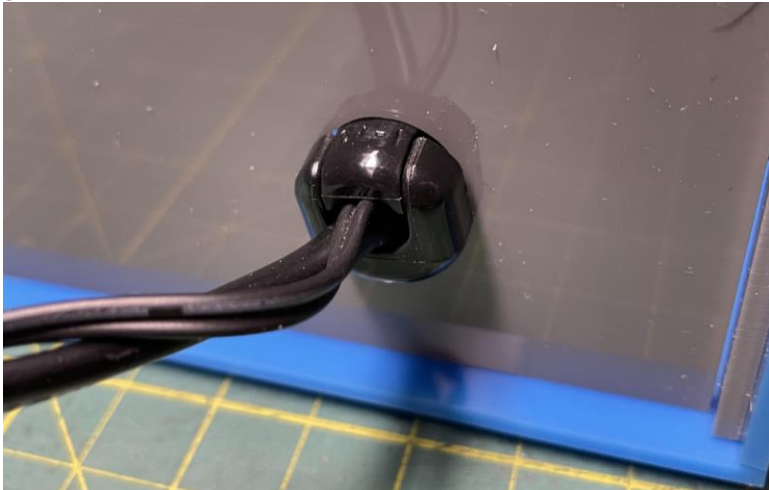
Secure the power supply to the case with two 6mm nylon screws. Make sure you only use 6mm nylon screws. Longer metal bolts may cause shorts or damage the circuit board inside the power supply.



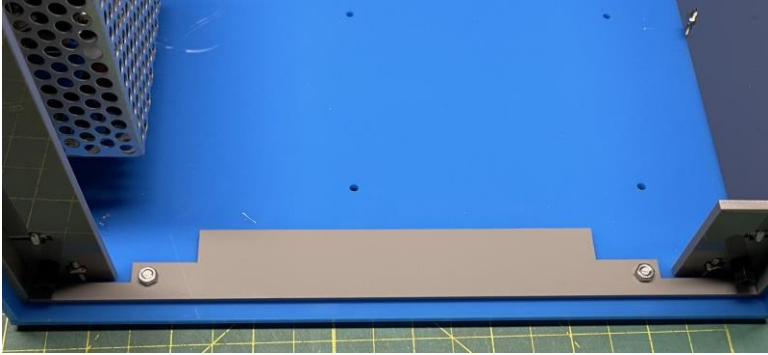
Pass your AC power cable through the hole in the back and attach it to the “L” (load) and “N” (neutral) connections. Also pass the barrel connector out through the hole (if being used).



I recommend securing the wires with a 15mm x 13mm strain relief grommet.



Add the small front panel support piece to the bottom and secure as shown with two 8mm screws and two hex nuts:



Take the front panel piece and the metallic sticker.



Apply the sticker the matte side as shown:



Use a small screwdriver or awl to poke holes for the front panel screws.



Next you'll assemble the drive support.

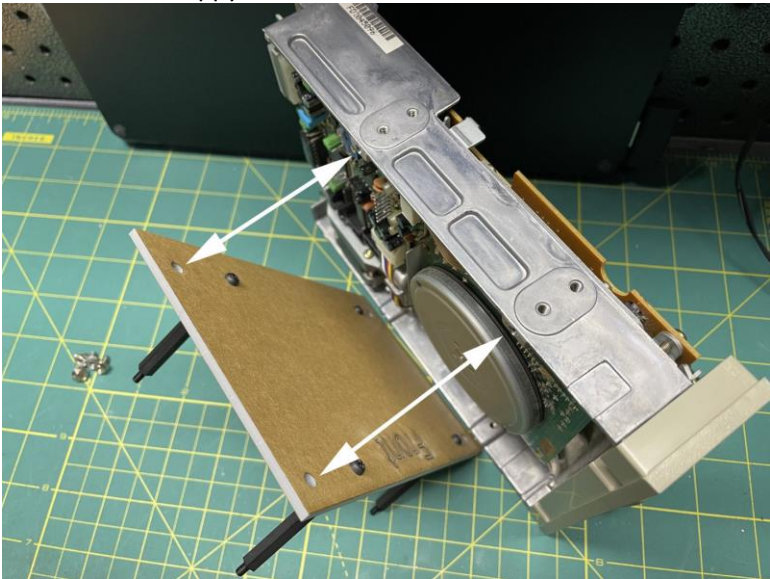


Attach the 40mm standoffs with four 6mm screws as shown, making sure "Front" is on top:





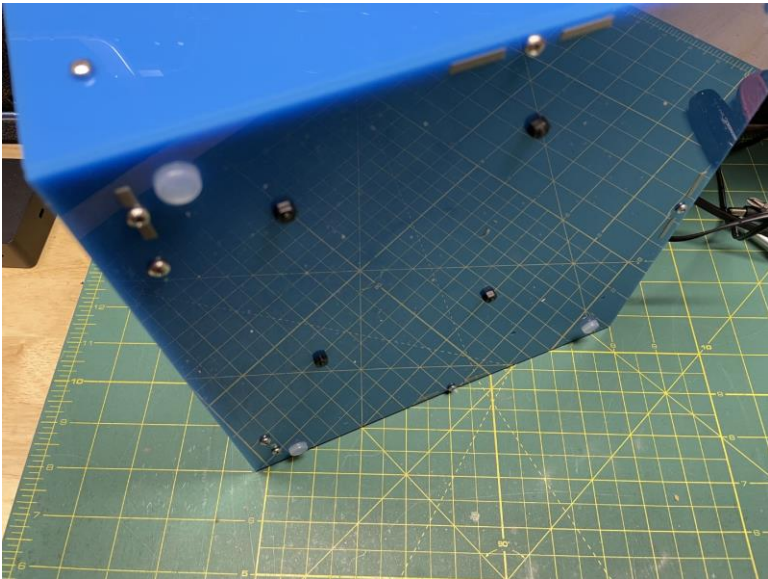
The outside holes will line up with the mounting holes on the bottom of the floppy drive.



Slide the front panel over the drive and attach the drive support to the floppy drive with four #6-32 screws, making sure "Front" faces the front of the floppy drive.



Put the drive/front panel assembly in place and direct the male bottom parts of the standoffs through the holes on the bottom of the case:

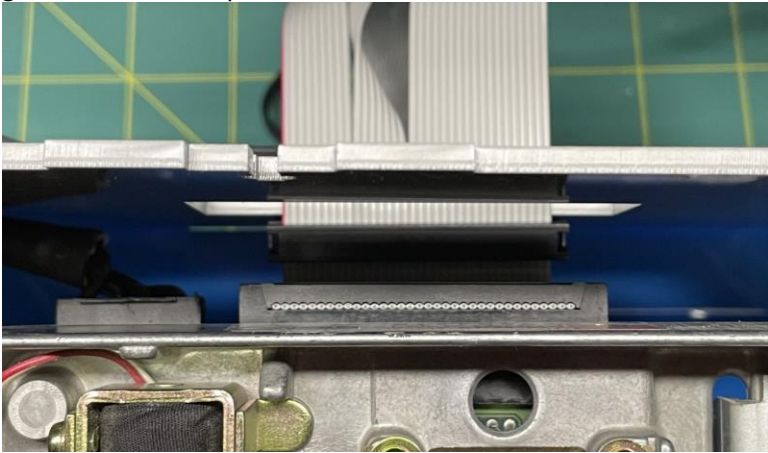


Secure them with four nylon hex nuts.

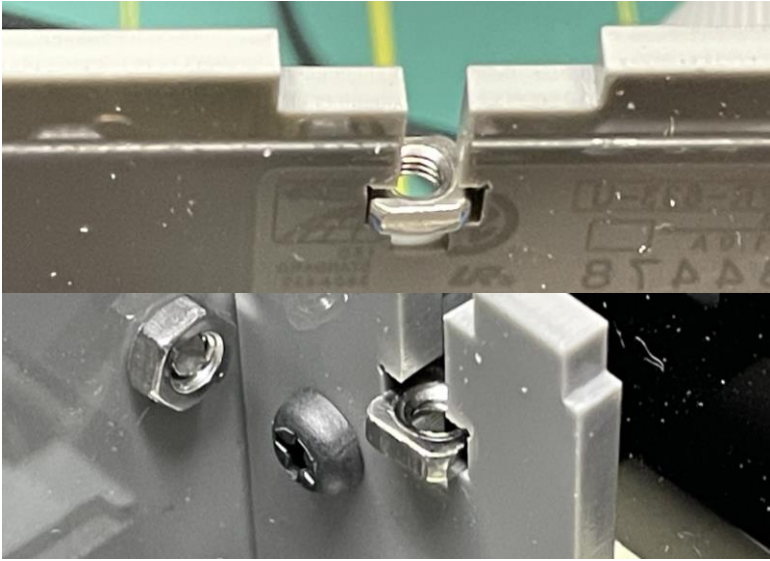
Secure the front panel to the supports with four 6mm nylon screws.



Pass the floppy drive cable through the rectangular hole in the rear panel and attach the “twist end” to the floppy drive. There should be notch/key combination to ensure proper orientation, but in general, the red stripe should face left.



To attach the top cover, you will need to have a somewhat delicate hand. Place three square nuts in place (one in back, two on the side supports) as shown:



Carefully place the cover on the case and place the blue front trim in place. Then gently drop two 16mm screws in the front holes, and one 14mm screw in the back center. Tighten the screws with a screwdriver.



Your case is finished. Plug in your drive controller, power everything up and give it a go!