

INSTALLATION OF DMA STYLE CORE MEMORY LOADER FOR 1130

A small header PCB is mounted on the top of gate B at compartments B1. It holds pins for wire wrap connections and a socket for a cable. Wire wrap is connected between selected pins of the backplane in that compartment and the header PCB on top.



A second type of header PCB is mounted on top of gate B at compartment A1. It also has pins for wire wrap connections and a small connector to attach to the main component of the loader, an Arduino Mega 2560 sandwich that has a shield PCB which implements the logic of the loader.



The use of a header PCB protects the delicate wires from stress when the main loader has to be moved or detached. A cable from each header PCB is connected to the Arduino Mega 2560 sandwich. It is intended that the header PCBs are installed and the wires connected between it and the backplane as the first step of installation.

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Step 1 - Install compartment B1 header

Remove the top metal plate protection the backplane pins from falling objects. Position the larger header just to the right of where the metal plate will have its mounting screw. Mark the location of two holes and drill them out with a 1/8" bit.

Use 1/2" 4-40 screws and 4-40 nuts. Put a screw through the bottom of the metal plate and fasten one nut on the top side. Tighten well. Repeat for the other hole that will hold the header board.

Drop the header board over the two screws and hold it down with another set of 4-40 nuts. Replace the top metal plate above the backplane. Make sure that the text can be read by someone standing behind the backplane looking down at the header board.



The wire connections from the backplane to the header PCBs are, from left to right of the lower row of pins on the header board:

- D0 - card N5 pin B02
- D1 - card N5 pin D02
- D2 - card N5 pin B03
- D3 - card N5 pin D04
- D4 - card N5 pin B04
- D5 - card N5 pin D05
- D6 - card N5 pin B05
- D7 - card N5 pin D06
- D8 - card N5 pin B07
- D9 - card N5 pin D07
- D10 - card N5 pin B08
- D11 - card N5 pin D09

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D12 - card N5 pin B09
D13 - card N5 pin D10
D14 - card N5 pin B10
D15 - card N5 pin D11

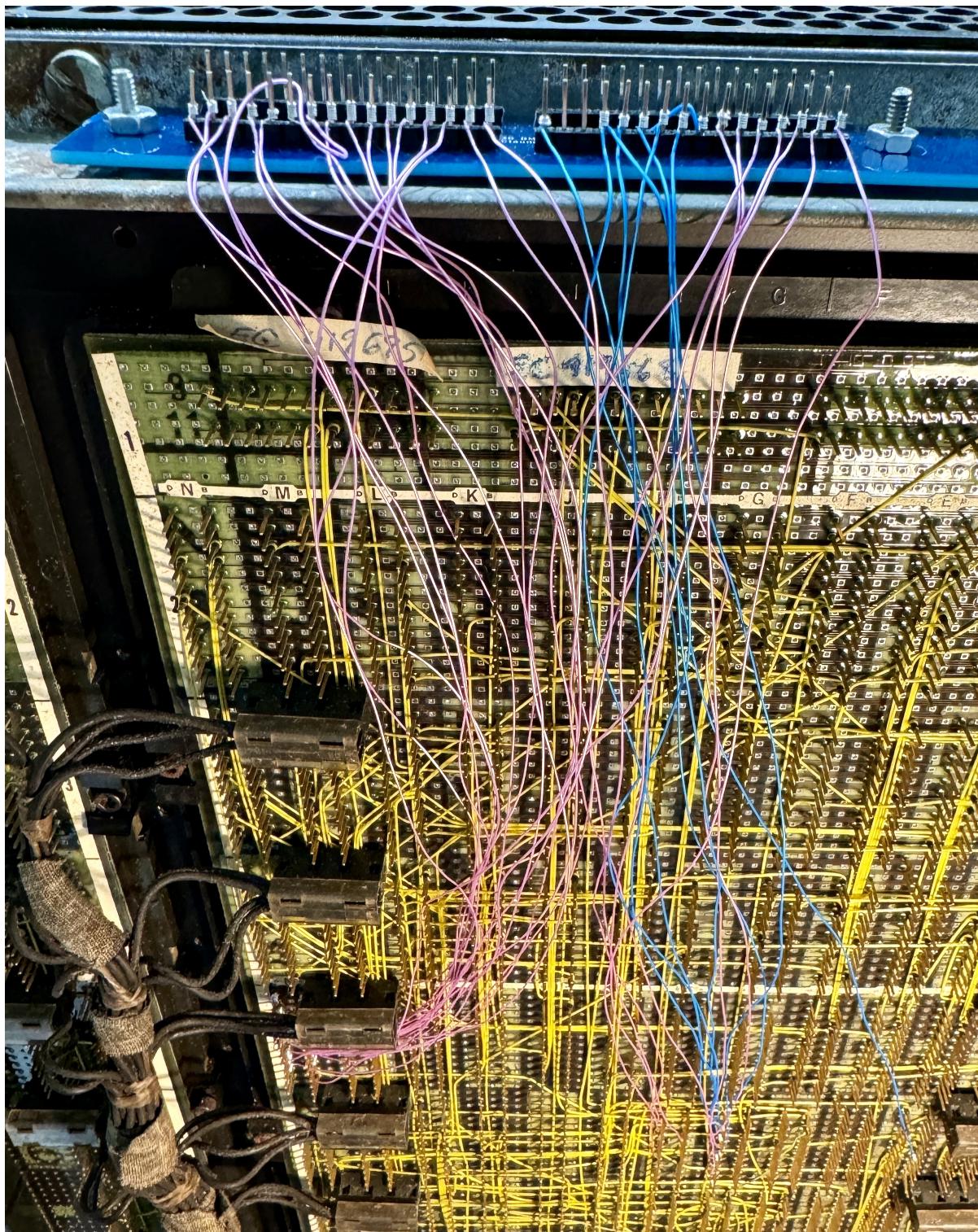
This completes the first side of the header board. Now start on the right side, again connecting from the leftmost pin to the rightmost:

-IO Entry Sample - card C7 pin B10

A1 - card H1 pin E09
A2 - card J1 pin B09
A3 - card F6 pin D02
A4 - card F6 pin D05
A5 - card F6 pin D06
A6 - card F6 pin D09
A7 - card F6 pin D11
A8 - card F6 pin D04
A9 - card F6 pin D13
A10 - card F6 pin D10
A11 - card F6 pin D07
A12 - card G6 pin D10
A13 - card G6 pin B07
A14 - card G6 pin D04
A15 - card G6 pin D06

NOTE - for an 8K machine, signals A1 and A2 are not needed. For a 16K machine, only signal A2 is necessary. It is only for a 32K configuration that both A1 and A2 should be connected.

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Step 2 - Install compartment A1 header

Position the board approximately over column E of the backplane, mark the two holes so they can be drilled. Remove the top metal plate that protects the backplane, just as you did for the B1 compartment.

Drill the holes with a 1/8" drill. Use 4-40 metal screws and nuts. The screw is 1/2" long and is inserted from the underside of the metal plate and a nut on the top of the plate should be fastened tightly. Repeat for the other mounting hole.

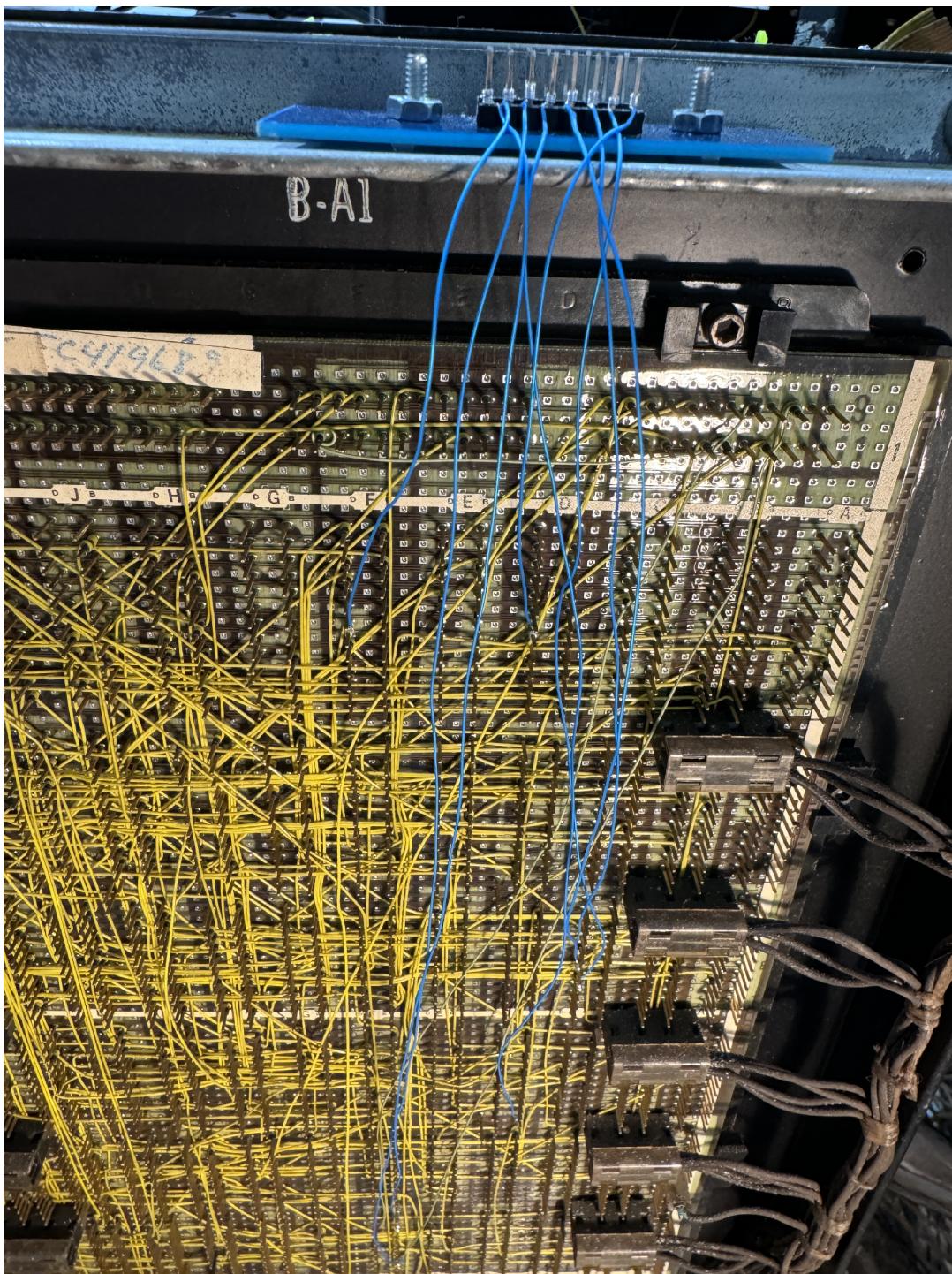
Drop the header board over the screws and fasten it down with 4-40 nuts. Reinstall the top metal plate over the backplane and verify that the text on the header board can be read by someone standing behind the backplane looking down.



The wire connections from the backplane to the header PCBs are:

- CS Lvl 1 Req - card F7 pin D05
remove jumper B B1 B7 D12 to ground
- +X3 - card D5 pin B09
- CS Level 1 - card F7 pin D12
- X6 - card D5 pin B13
ground wire to F7 D08
- DC Reset - card C4 pin D07
- Run - card C4 pin B09
ground wire to D2 D08

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Step 3 - Install Arduino sandwich

Two 18 gauge wires are connected to ring terminals on one side and to the screw terminal block on the shield atop the Arduino. The ring terminals are connected to the main DC distribution terminal blocks that are behind the voltage regulators, reached from the rear of the machine. +12V hooks to terminal block TB6 screws 8, 9 or 10 depending on which is easiest to connect. Ground attaches to terminal block TB5 screws 1, 2, 3, 4, 5, 6, 7, 8 or 9 depending on which is easiest.

Be careful. TB-5 is the upper terminal block and TB-6 is the lower one. Thus the red wire should be on the lower block while the black ground wire connects up on the upper terminal block.

The physical mount of the Arduino Sandwich is at the level of the top of the swing out gates, so that it sits between the two gates when they are closed. It is physically mounted to gate B.

A plastic bottom for the Arduino stack should be produced or purchased, then secured to the cable routing metal tabs on the top of B gate, on the SLT card side. This allows the gates to be swung together or pulled apart, plus the stack can swing inside the 1130 cabinet when closed up.

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Hook up the wires that bring +12V and ground from the main DC terminal blocks to the Arduino sandwich screw terminal. The positive lead is marked on the PCB.

Two 16 pin cables are connected between the B1 compartment header and the Arduino shield. A shorter 8 pin cable is connected between the A1 compartment header and the Arduino shield.

The USB connector points towards the hinge that the logic gates swing from. Attach a long USB cable to the Arduino sandwich and route the other end up and out of the machine to be accessible when the machine covers are closed.

Test the loader by powering up the 1130, left in normal Run mode, and connecting the USB cable to a serial terminal emulator. First set the address where data will start loading to some desired address using the @ prefix, for example @01AF will put the next data word typed into location 01AF and then advance the address to 01B0 for the ensuing word.

Type in a hex value and it should be loaded into memory by the loader. For example, if I type in AA55 then I should see the SBR register displaying AA55. Use Display mode to see if that value was placed in the address you selected (or defaulted to 0000 if you didn't issue a @ command first).