

Kiosk User Guide

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Contents

1	Routine Activities	1
1.1	Startup and Shutdown	1
2	Kiosk Setup	3
2.1	Checklist	3
2.2	Kiosk Assembly Notes	7
2.2.1	Viewports and Hatch	7
2.2.2	Light Filters and Cameras	8
2.2.3	Electronics Bay Prep	9
2.2.4	Touch-Screen Tray	10
2.2.5	Fans	11
2.2.6	Air Filters	12
2.2.7	Power Bars and Shelves	13
2.2.8	Small Monitor, Keyboard, and Mouse	14
2.2.9	Wireless Gateway	15
2.2.10	Neurarduino and Pump Control Box	16
2.2.11	Unity Machine	16
2.2.12	LED Box	17
2.2.13	NeuroCam Machine	17
2.2.14	External Cabling and Pump	18

2.2.15 Camera Cover	18
2.2.16 Pump Hoses	19
3 Pump Control Box	20
3.1 Overview	20
3.2 Pump Cable Plug	23
3.3 Circuit Board	24

Chapter 1

Routine Activities

1.1 Startup and Shutdown

To power on the electronics bay equipment:

- Turn on the leftmost power bar, and check that the rightmost one (plugged into the left bar) is also turned on.
- Check that the fans have spun up. They should turn on within a few seconds of receiving power.
- Check that the wireless gateway is on (there should be visible lights blinking).

If there are no lights, check that the gateway's power button is turned on (if it has one). This is the **large, exposed** button - do not press any small or inset buttons (those either reset the gateway to default settings or tell it to use an insecure reconfiguration method - both are bad).

- Press and hold the NeuroCam machine's power button until it lights up and the machine's fan spins up.

This should only take about a second. Do not hold it for longer than 3 seconds - holding it 4 seconds or longer forces an immediate shutdown, which can cause corruption.

- Press and hold the Unity machine's power button until it lights up and the machine's fan spins up.
Per previous entry, this should only take about a second.

- Check that the small monitor and the touch screen are both showing a Windows boot or login screen.
If either one is not showing a screen, check that it's powered on.

- Check that you can access the NeuroCam gateway, and that you can access the NeuroCam's control web page.

The NeuroCam takes 30-60 seconds to boot, so be sure to leave sufficient time before accessing it.

- Once everything's running properly, close and lock the electronics bay doors.

To safely shut down the electronics bay equipment:

- Log in to the NeuroCam’s web page over the wireless network. Click the “shutdown” button.
- Check that the NeuroCam’s power light turns off. This may take several seconds.
 - If the NeuroCam does not power off, it can be forced to power down by pressing and holding the power button for 4-5 seconds.
- NOTE** - This may cause data corruption and other problems, so try to avoid this if possible.
- If the Unity machine is logged in:
 - **FIXME: key sequence for power-off goes here.**
- If the Unity machine is not logged in:
 - Press a harmless key (such as “shift”) to wake up the display.
 - Press “tab” until the power icon is highlighted (this will take multiple keystrokes).
 - Hit “enter” to expand the power menu.
 - Use the up and down cursor keys to highlight “Shut Down”.
 - Hit “enter”.
- Check that the Unity machine’s power light turns off. This may take several seconds.
 - If the Unity machine does not power off, it can be forced to shut down per above. This may cause data corruption and other problems, as noted.
- Locate the power switch on the left power bar (the one whose cord goes outside), and turn it off.
- Once everything’s shut down, close and lock the electronics bay doors.

Chapter 2

Kiosk Setup

2.1 Checklist

First-time kiosk setup involves assembling fittings on the kiosk housing and installing and cabling electronic equipment inside the electronics bay. A summary of the steps involved is shown below; photographs and additional notes are given in Section 2.2. A cabling diagram for the kiosk is shown in Figure 2.1.

Initial mechanical work:

- Separate the kiosk face from the electronics bay.
- With the kiosk face:
 - Remove the outer viewport window from ports that will have cameras installed.
 - Remove both viewport windows from the port that will have the cleaning hatch installed.
 - Remove the pump bracket from the side which has the cleaning port.
 - Install the cleaning hatch in its port.
 - Install the pump mounting plate on the remaining pump bracket. The pump is away from the face of the kiosk, towards the direction of the electronics bay.
 - Install light filter plates on the viewport windows that will have cameras. The synchronization LEDs should be close to the camera mounting arms.
- With the electronics bay:
 - Remove internal shelves.
 - Remove ventilation grilles.
 - Remove fan dummy panels from either the top level or both levels (for mounting two or four fans, respectively).
 - Remove the external wiring panel from the side nearest the pump.
 - Remove the monitor tray.
 - Seat the touch screen in the monitor tray. Annotate the back of the monitor tray to show connector locations.

- Install the monitor and tray in the electronics bay.
- Install the fans and fan guards.
- Line the ventilation grilles with HVAC tape to render them glove-safe.
- Cut filter pads and install the ventilation grilles with filters in the electronics bay.

Electronics work:

- **NOTE** - This does not include eye-tracker installation. Power cabling is placed in the eye-tracker bay.
- **NOTE** - During each cabling step, excess cable length should be coiled and zip-tied, and routed cables should be zip-tied to cable mounts where appropriate.
- Install power distribution bars at the bottom of the bay (turned off).
- Reinstall bay shelves.
- Install fan power plug and connect fans.
- Install touch screen power supply. Connect power, display, and USB cables to the touch screen.
- Install small monitor, keyboard, and mouse on the right-hand side of the middle shelf. Install monitor power supply in the bottom of the bay. Route data cables to the top shelf.
- Install router with two ethernet cables connected to LAN ports on the left-hand side of the middle shelf. Install router power supply in the bottom of the bay. Route ethernet cables to the top shelf. Ensure that the router's power switch is turned on, if it has one.
- Install Neurarduino on the top shelf, left-hand side.
- Install pump reward box on the top shelf, left-hand side. Cable the pump reward box to the Neurarduino.
- Install pump reward fob. Use hook-and-loop cable ties to hang it from the electronics bay carrying handle on the pump side of the unit. Cable the fob to the pump reward box.
- Install the Unity machine's power supply in the bottom of the bay. Route it to the left-hand side of the top shelf.
- Install Unity machine on top of the Neurarduino. Attach Unity machine cable connections (which should already be routed to the top shelf).
- Install LED box on the top shelf, right-hand side. Route BNC cables from the LED box out appropriate camera cabling ports; do not coil the LED BNC cables yet.
- Install the NeuroCam machine's power supply in the bottom of the bay. Route it to the right-hand side of the top shelf.
- Install NeuroCam and NeuroCam USB hub. Cable the LED box to the USB hub and the USB hub to the NeuroCam. Attach the NeuroCam power and ethernet cables.

Electronics tests:

- Turn on power bar. Press power switches on Unity and NeuroCam computers. Wait 60 seconds for machines to boot.
- Check that the Unity machine's login display is shown on the touch screen and on the small monitor.
- Check that an authorized machine can connect to the NeuroCam via the kiosk's router.
- Perform graceful shutdowns of the Unity machine and NeuroCam machine.
- Turn off power bar.

Final mechanical work:

- Reattach the kiosk face to the electronics bay.
- Install cameras.
- Screw pump control cable on to pump. Use pliers for this.
- Install pump.
- Connect LED BNC cables to camera port LEDs. Coil and zip-tie excess cabling *inside* the electronics bay. Do **not** zip-tie BNC cables to the kiosk face exterior frame unless this is unavoidable. If it is unavoidable, keep the zip-ties loose enough that they can be cut without damaging the BNC cables.
- Connect camera USB cables to the NeuroCam computer. Coil excess cabling *inside* the electronics bay. Zip-tie the coils, but do **not** zip-tie the coils or cables to cable mounts (it must be possible to disconnect and withdraw the camera USB cables). Exterior camera cables may be zip-tied to the kiosk face's frame.
- Connect the pump control cable to the pump box. Coil excess cabling *inside* the electronics bay. Zip-tie the coils, but do **not** zip-tie the coils or cables to cable mounts (it must be possible to disconnect and withdraw the pump control cable).
- Zip-tie cables that pass through the lower exterior cable entry port to the adjacent handle. Keep this loose enough that it can be cut without damaging the cables.
- Replace camera cover.
- Install pump hoses.
- Mount the kiosk so that the underside is accessible.
- Install sipper tube.
- Make remaining pump hose connections.

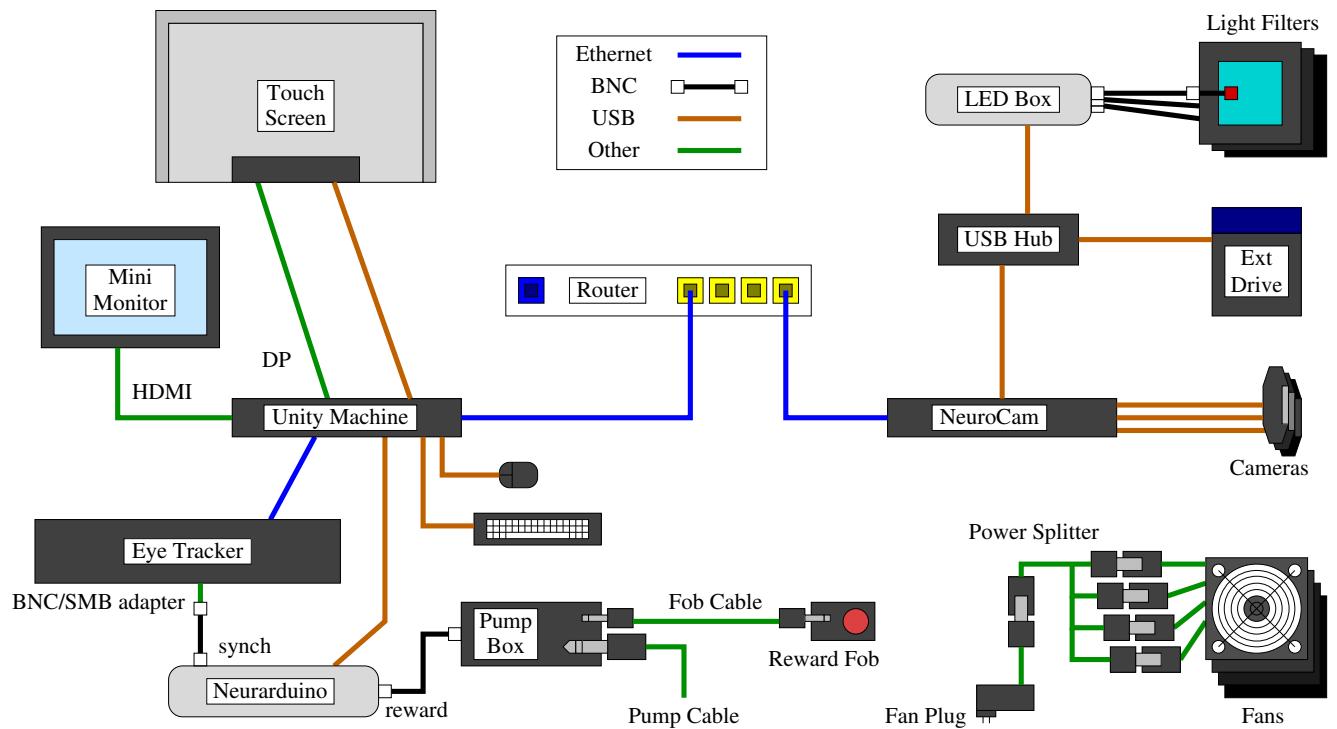


Figure 2.1: Kiosk cabling daigram.

2.2 Kiosk Assembly Notes

2.2.1 Viewports and Hatch

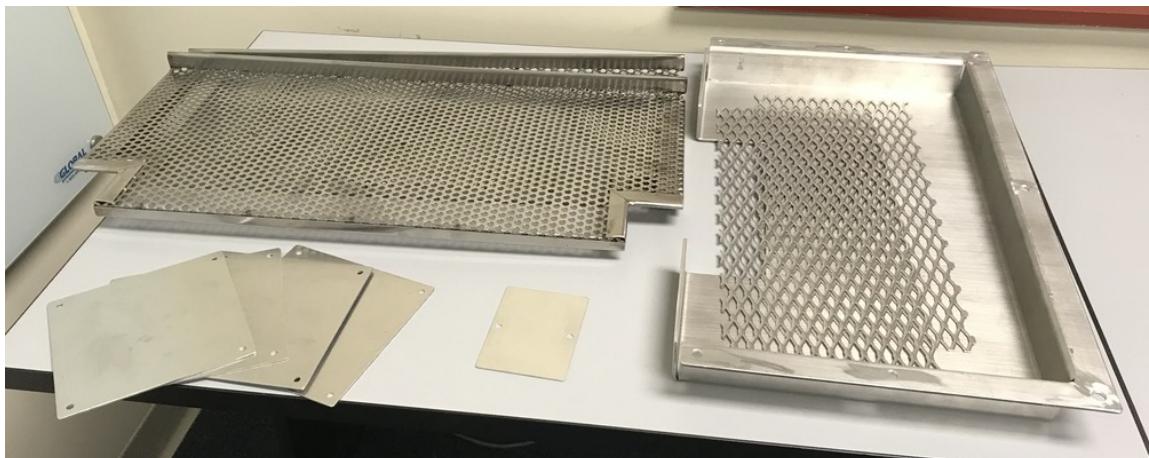


2.2.2 Light Filters and Cameras

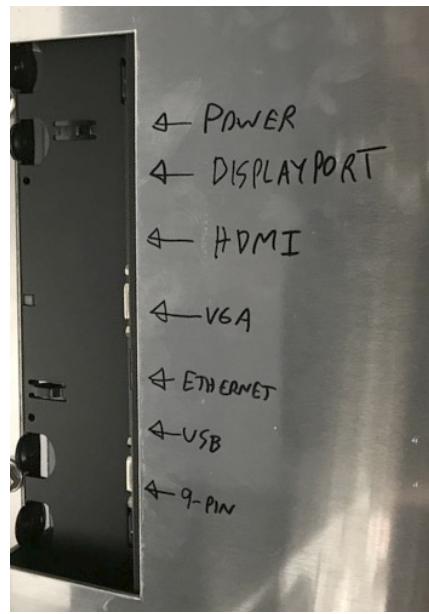
The LEDs should be as close as possible to the camera mounts. The cameras must have LEDs in their field of view when in their final positions.



2.2.3 Electronics Bay Prep



2.2.4 Touch-Screen Tray



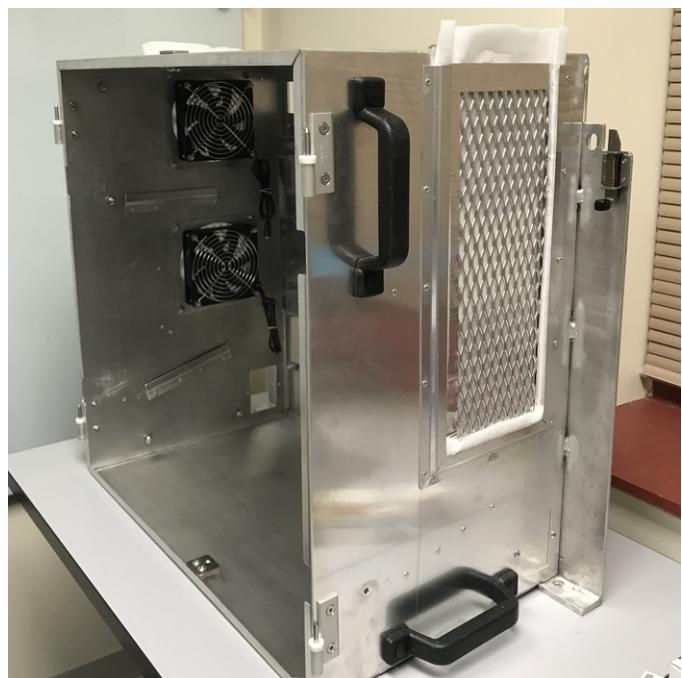
2.2.5 Fans

The photographed version of the kiosk needed adapter plates to mount the fans. Later versions mount the fans directly to the electronics cabinet.

NOTE - Fans on one side blow into the electronics bay (intake fans), and fans on the other side blow out of the electronics bay (exhaust fans). One pair of fans has the stickers facing in and one pair has the stickers facing out.



2.2.6 Air Filters



2.2.7 Power Bars and Shelves

NOTE - The eye-tracker is not installed in the photographed version of the kiosk. Power cabling is placed in the eye-tracker bay.



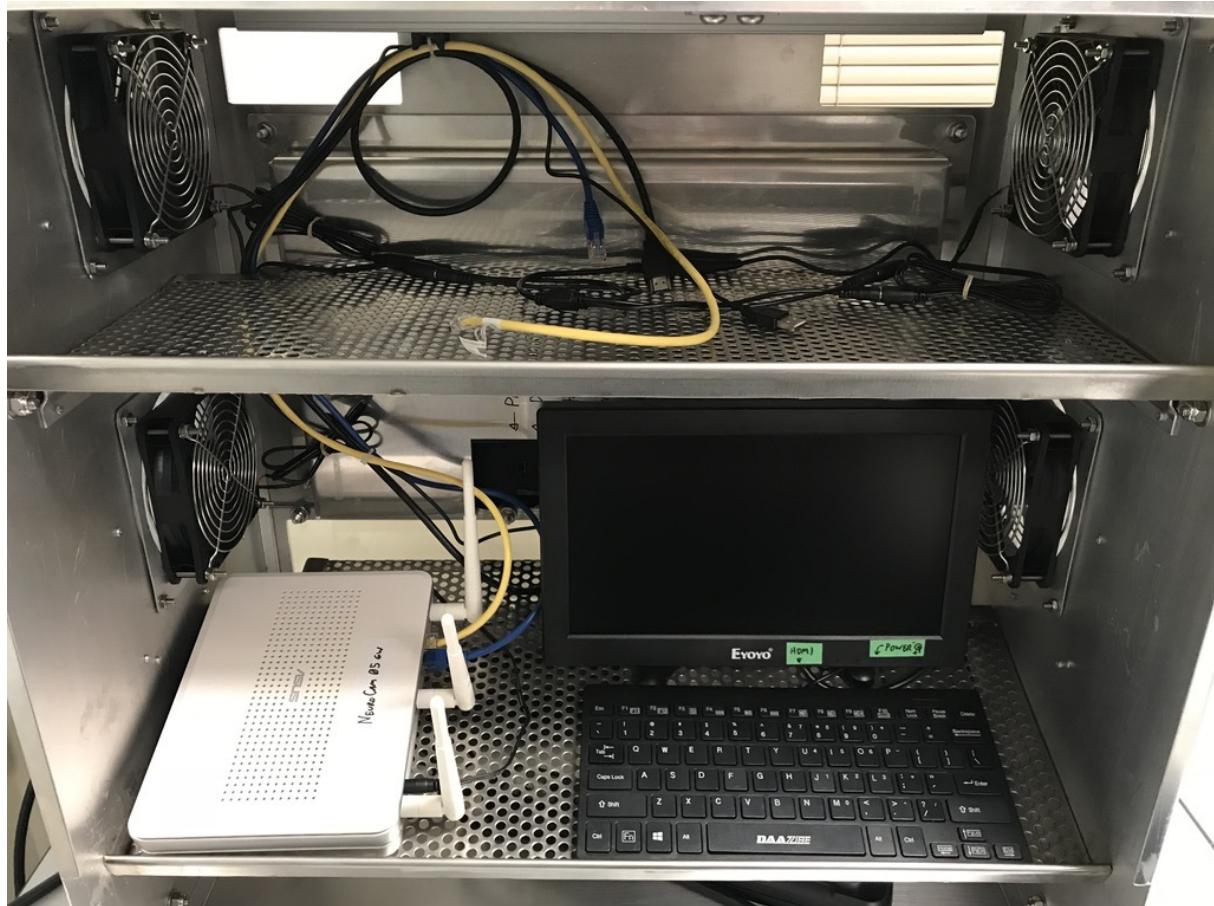
2.2.8 Small Monitor, Keyboard, and Mouse

NOTE - The setup photographed did not have a mouse at the time of installation. A keyboard with integrated touchpad or other pointing device may be preferable.



2.2.9 Wireless Gateway

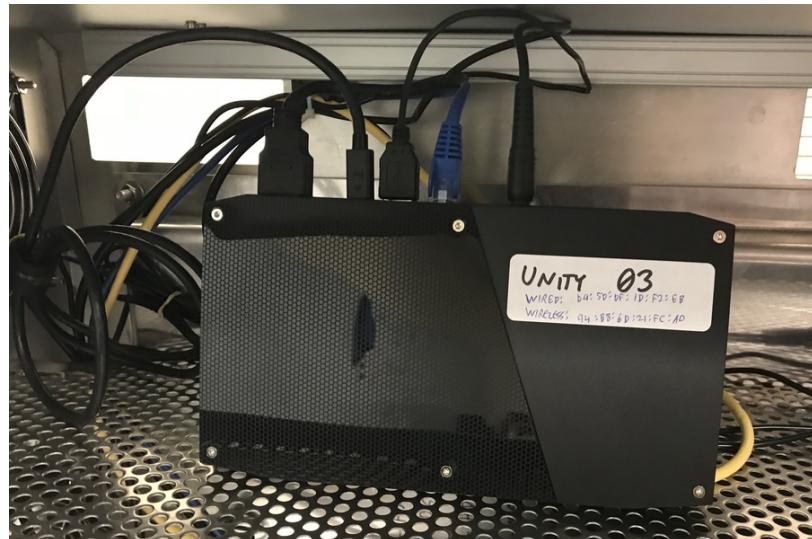
NOTE - The antennae for the wireless gateway should be far away from the metal walls, and nearby cabling should never run parallel to the antennae.



2.2.10 Neurarduino and Pump Control Box



2.2.11 Unity Machine



2.2.12 LED Box



2.2.13 NeuroCam Machine



2.2.14 External Cabling and Pump



2.2.15 Camera Cover



2.2.16 Pump Hoses

FIXME: Need photos for this.

Chapter 3

Pump Control Box

3.1 Overview

The pump control box allows the reward pump to be controlled by a 5V active-high signal over BNC for automated rewards and by pressing a button on a fob for manual rewards. A schematic for the pump control box is shown in Figure 3.1.

NOTE – While a similar 1/4” plug is used for old and new boxes, cable plugs wired for old control boxes are **NOT** compatible with the current control box, and vice versa. New cables use a stereo plug with +15 V on the ring.

A diagram of box cutouts is shown in Figure 3.2. A bill of materials is given in Table 3.1.

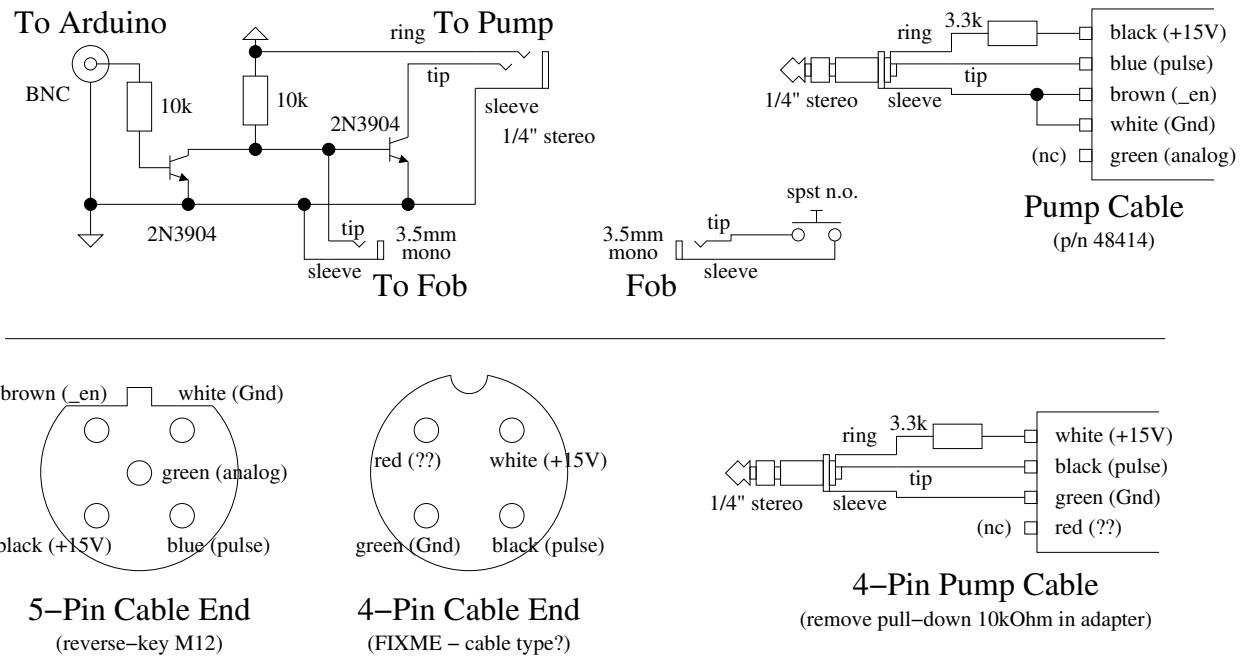


Figure 3.1: Pump control box schematic.

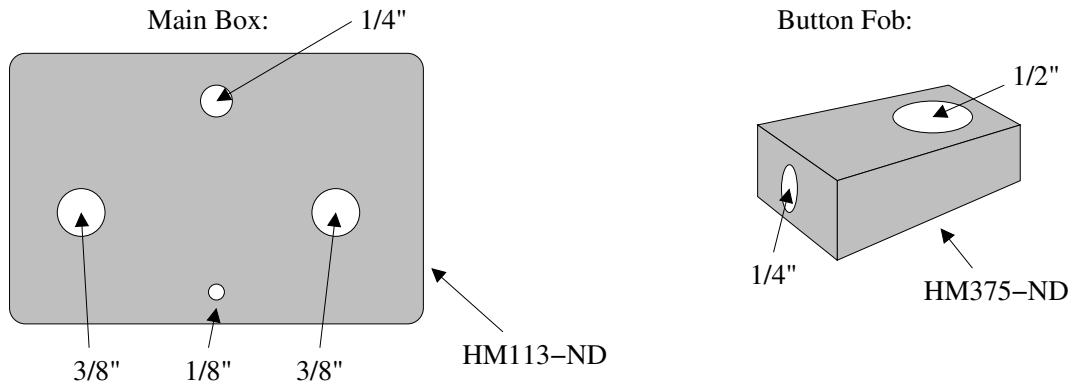


Figure 3.2: Pump control box cutouts.

Item	Digikey p/n	Quantity
box 3.25x2.25x1.5”	HM113-ND	1
box 2x1.5.0.75”	HM375-ND	1
transistor NPN TO-92	2N3904FS-ND	2
resistor 1/4 W 10 kohm	10.0KXBK-ND	2
resistor 1/4 W 3.3 kohm	3.3KXBK-ND	1
proto board 1x1”	1568-1652-ND	1
screw 4-40 nylon 1/4”	H542-ND	1
standoff nylon 4-40 F/F 1/2”	36-1902C-ND	1
screw metal 4-40 3/8”	HM1456-ND	1
jack BNC panel mount	ARFX1064-ND	1
jack audio 1/4” stereo panel	SC1563-ND	1
plug audio 1/4” stereo	SC1081-ND	1
jack audio 3.5mm mono panel	SC1455-ND	2
cable audio 3.5mm M/M 10’	TL634-ND	1
button spst-no panel mount	CW158-ND	1
cable M12 rev key to wire	†	1

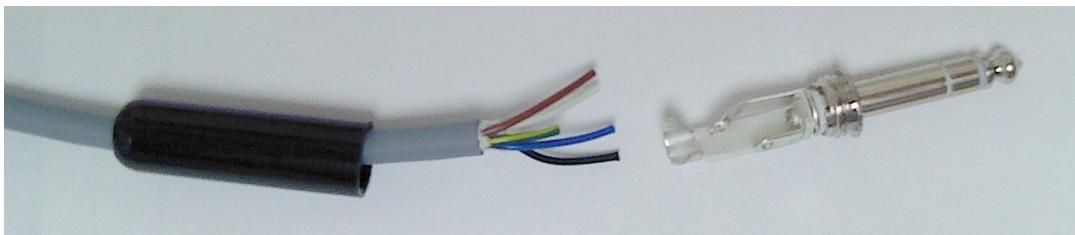
†Sold by LMI as part number 48414; may be sourced more cheaply as MEC-5FP-2M from www.mencom.com. These have a “5 pole reverse-keyed” M12 connector.

Table 3.1: Pump control box bill of materials.

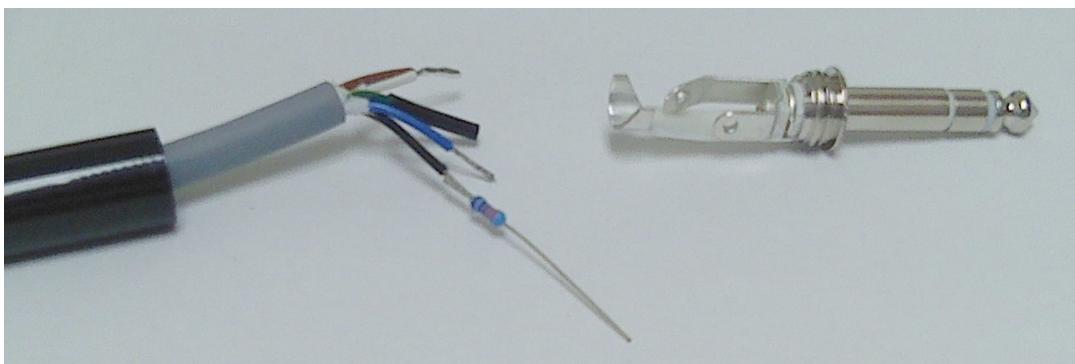
3.2 Pump Cable Plug

Assembly steps for the pump cable plug are shown below. Use of $\frac{1}{8}$ " heat shrink tubing is strongly recommended to avoid shorts within the plug housing.

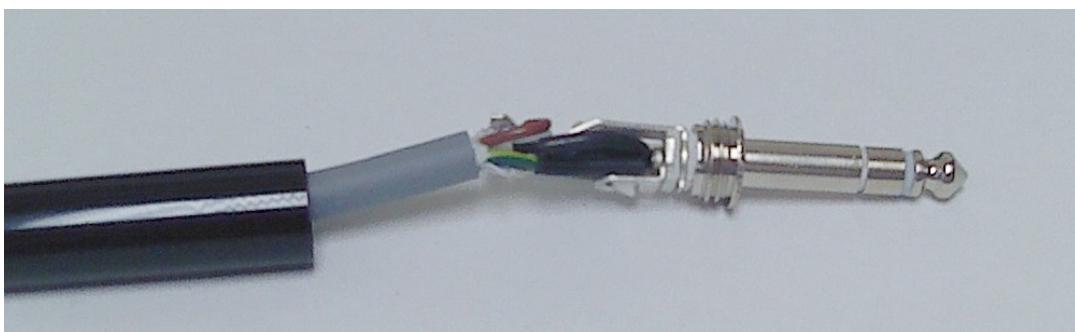
- Trim wires to appropriate lengths, and feed cable through backshell.



- Cap green wire with heat shrink, twist brown and white wires together and tin, tin blue wire, solder resistor to black wire.



- Cover resistor connection with heat shrink, solder blue wire, resistor lead, and brown/white wire pair to appropriate lugs.



- Crimp collar around wires and screw backshell on to plug.

NOTE - ideally the wires would be short enough that the collar is crimped to the jacket rather than to the wire bundle.

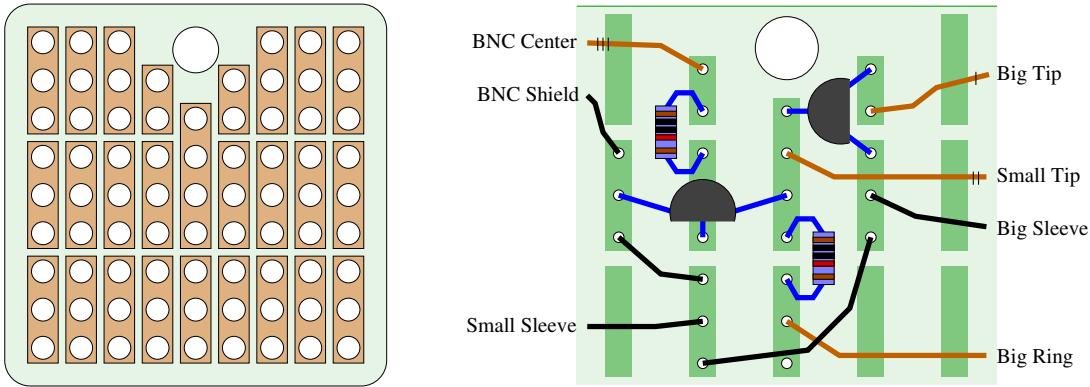
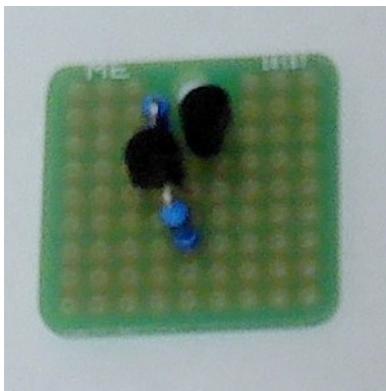


Figure 3.3: Prototyping board and one possible pump control circuit layout.

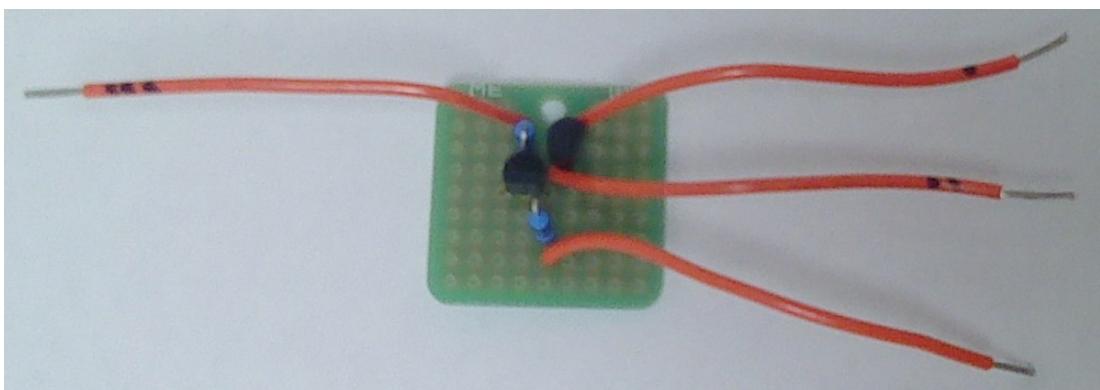
3.3 Circuit Board

Assembly steps for the circuit board are shown below. The prototyping board trace pattern and one possible layout are shown in Figure 3.3.

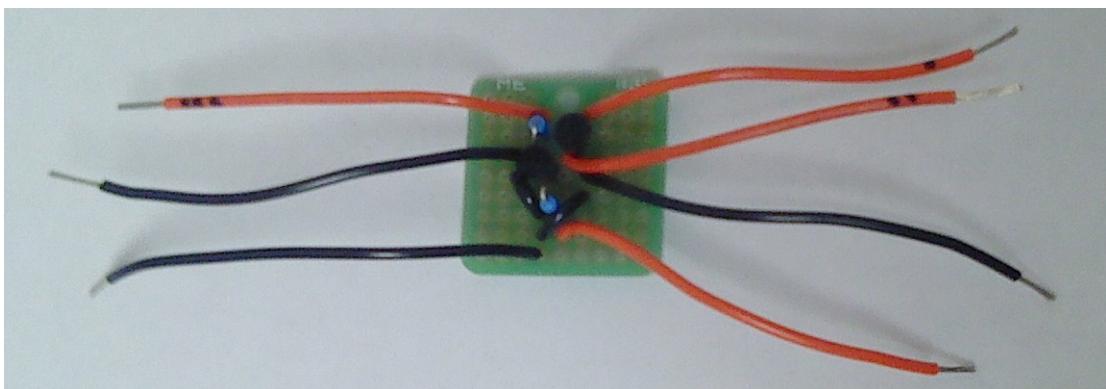
- Solder transistors and resistors.



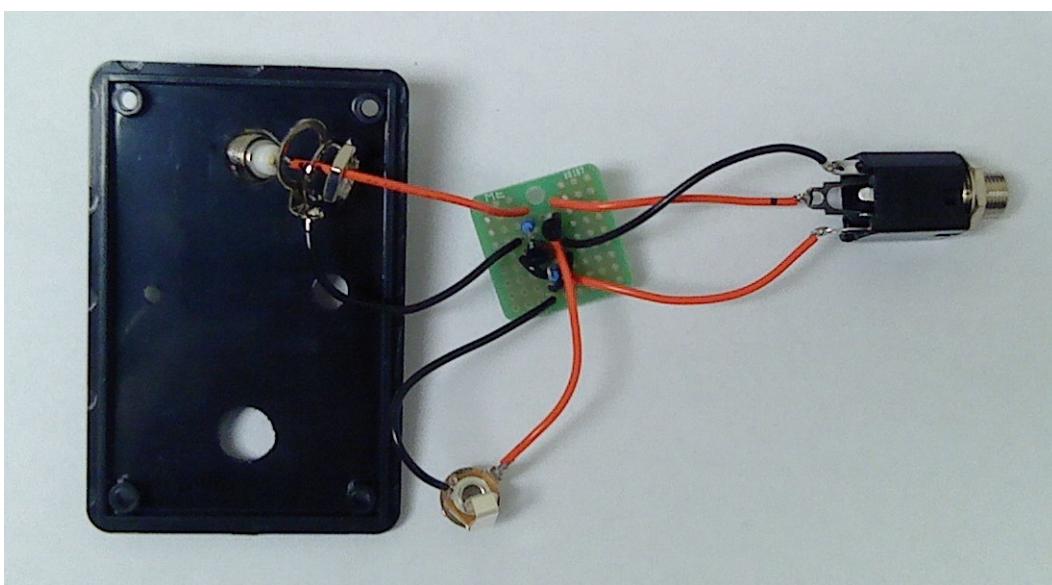
- Solder signal and power wires. Marking is encouraged to keep track of which are which.



- Solder ground wires.



- Solder jacks to wires. Make sure to thread BNC hardware over the BNC signal wire and to insert the BNC connector in the faceplate before soldering.



- Screw circuit board to faceplate.

