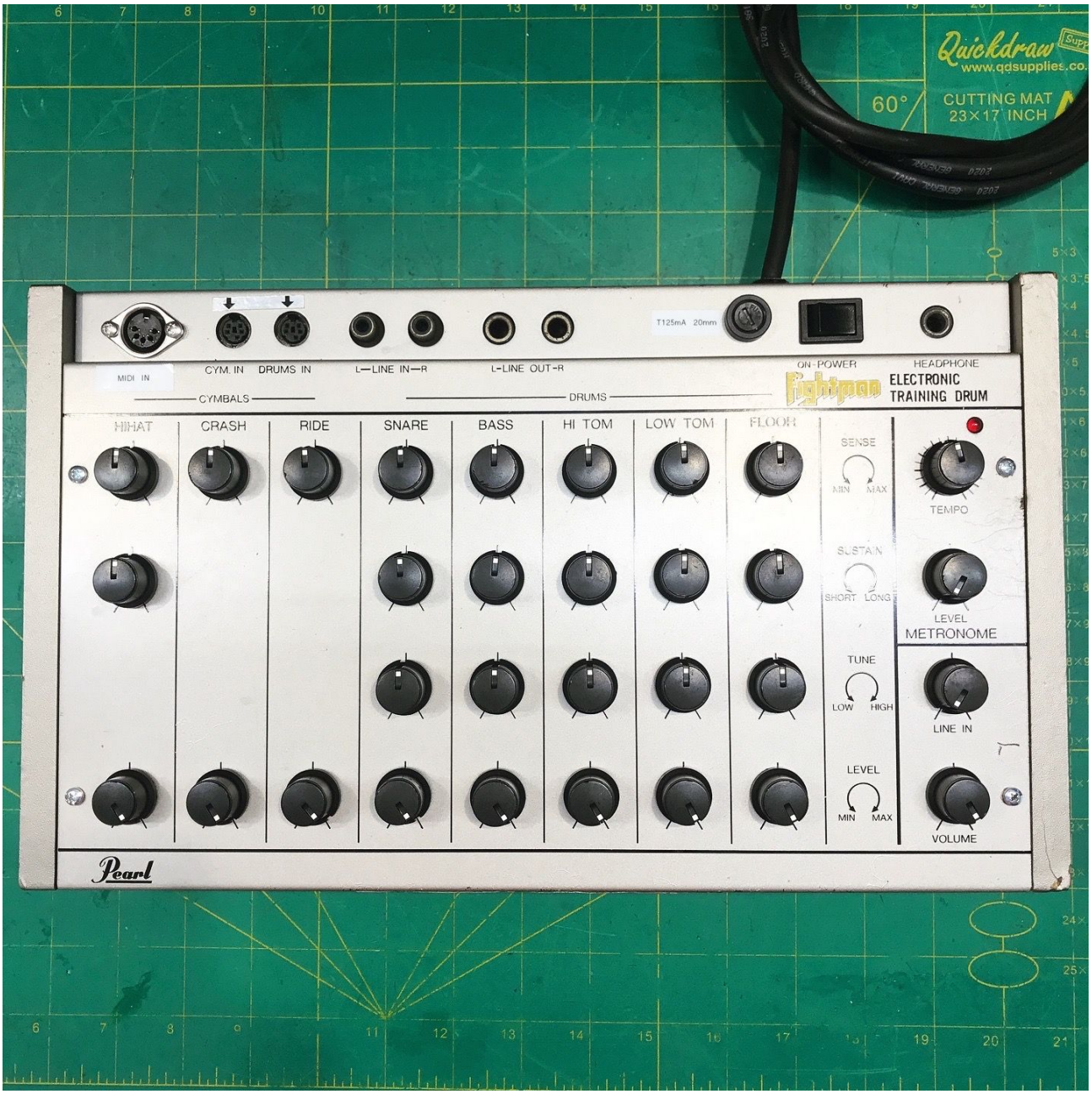
**Installing Tubbutec uniPulse Mk3 in a Pearl FM-8 Fightman Drum Module**
v1, 13th August 2024

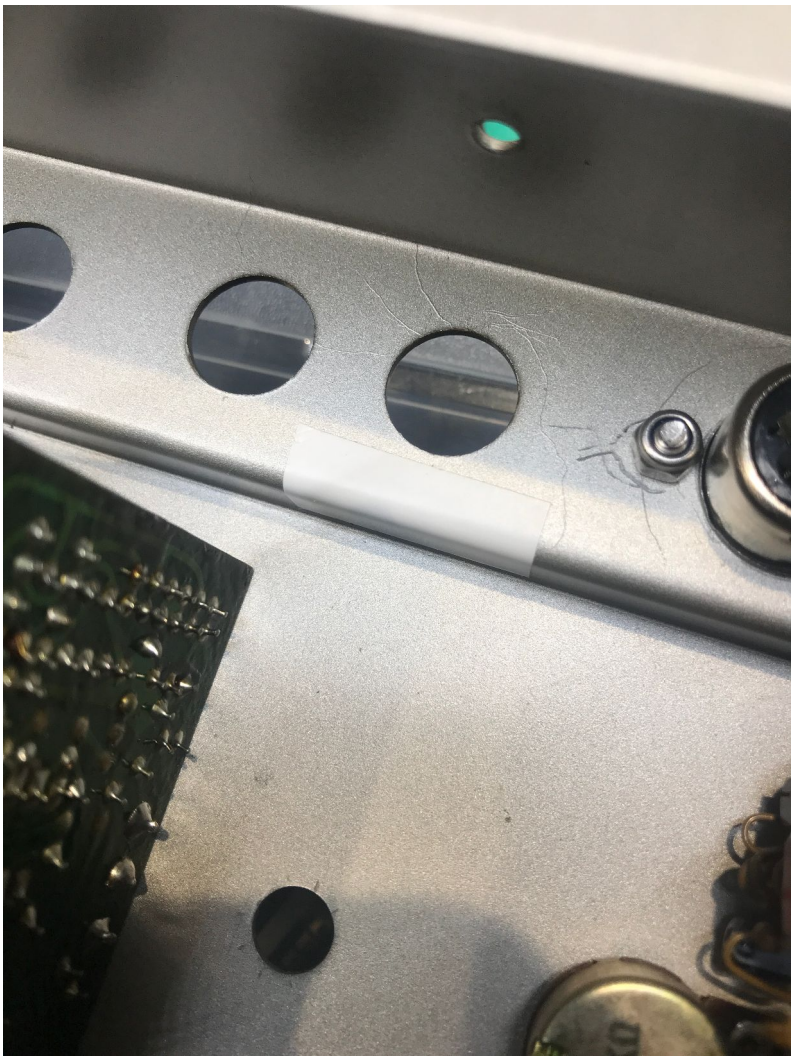
INTRODUCTION
There is JUST enough space in the Fightman to install a uniPulse board. Do note that the uniPulse must be a




Mk3 or later; the Fightman only provides +/-8V DC rails, which are insufficient for powering earlier Mk1 or Mk2 uniPulse boards. Space is tight throughout the unit, so double-check all positions and measurements before drilling or cutting!

CASEWORK

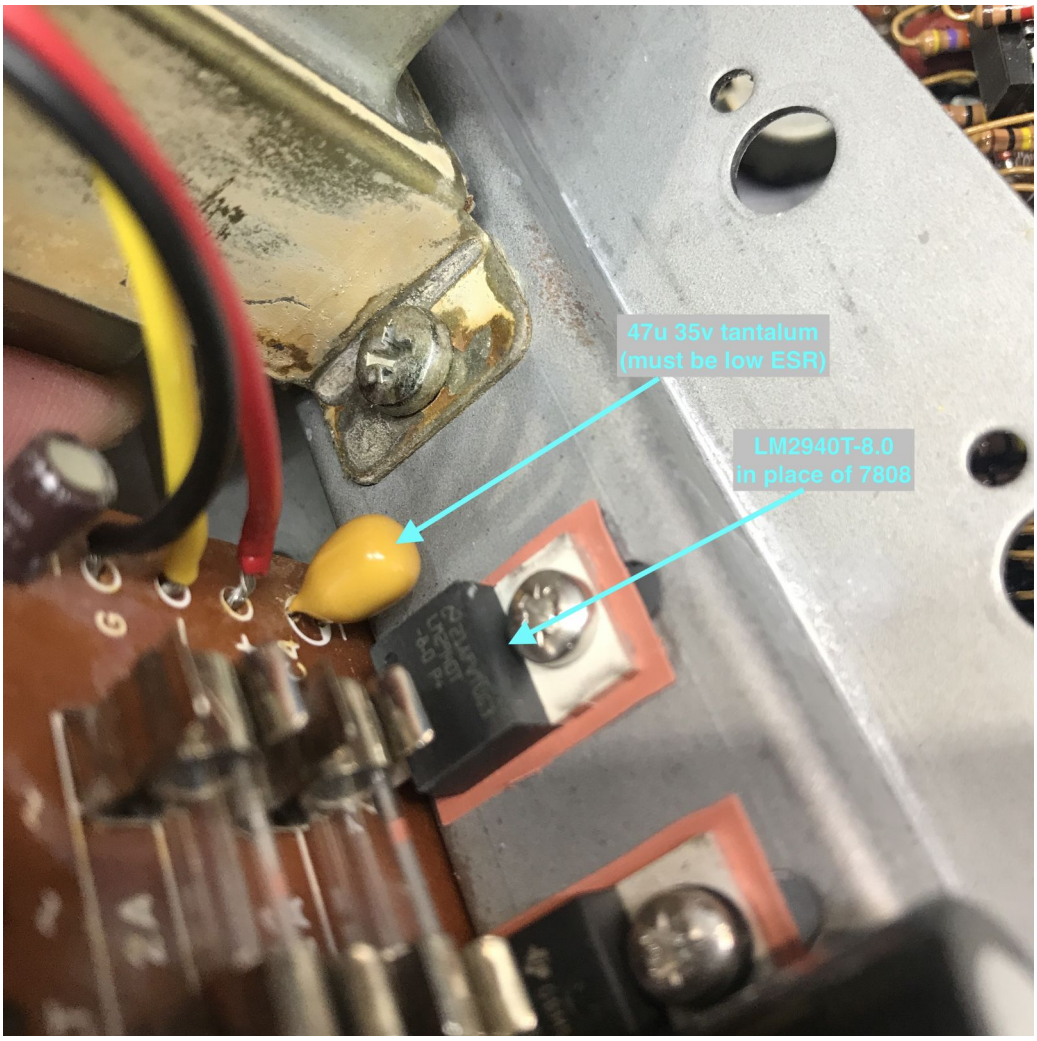
The best place for the MIDI IN socket is in the upper left corner of the panel, in line with the other connectors, just above the HIHAT channel. Make sure not to hit the bracket holding the connector PCB. Before drilling, it is a good idea to first remove all the channel PCBs and the power supply (as far as possible) to avoid damage or swarf. To do this, remove the backplane PCBs, then remove all the pot nuts. NOTE that the bracket carrying the mains transformer and power supply PCB is held in place on the pots of the FLOOR TOM and MIXER PCBs. Drill the holes for the MIDI socket, filing off any sharp edges. Clean inside the case thoroughly, then fit the MIDI socket.



Place a small piece of PVC tape on the edge of the metalwork in front of the CYMBAL IN connector (see photo). There is a risk of the uniPulse's IDC header pins shorting against the case here, particularly if the hex spacer is 5mm or less.

POWER SUPPLY

With the power supply dismounted, unbolt the two regulators from the bracket to release the PCB. The Fightman's mains transformer provides just barely enough power to clear the regulator's dropout voltage when powering the stock unit. The additional 30mA current drawn by the uniPulse will cause the transformer output voltage to droop just below the dropout threshold, resulting in a loud 100Hz hum as the +8V rail dips on every half cycle. To solve this, replace the 7808 positive regulator with a pin-compatible LDO (low dropout) type such as LM2940T-8.0. You must also replace the +8V rail output capacitor with a 22u or larger, 35V tantalum type (or one with a similar ESR figure). Check the datasheet for the LM2940T for further details. The 2940 will oscillate if the capacitor is of the wrong type!

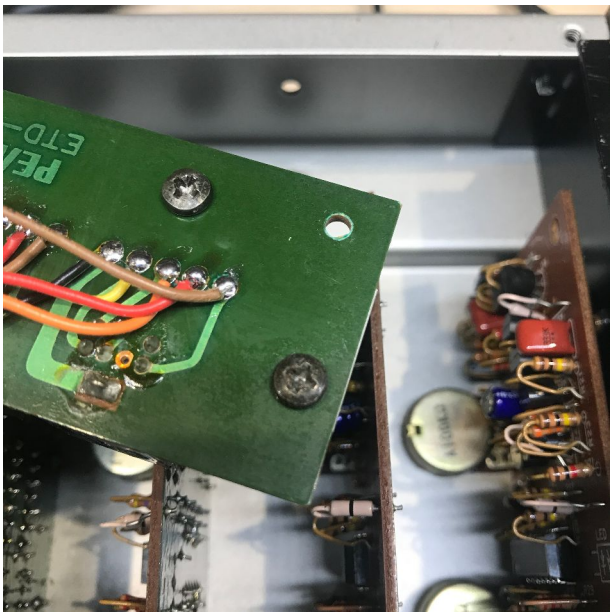


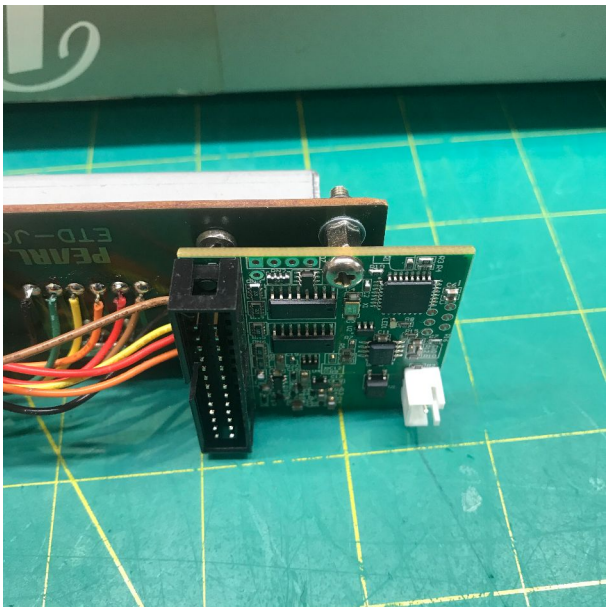

Once the regulator is changed, remount the regulators to the bracket, ensuring that you use proper insulated mounting kits. Note that the 7908 -8V negative regulator's fixing bolt MUST be insulated from the regulator; see the photo.

With the PSU work done, remount the power supply along with the FLOOR TOM and MIXER channels. You may need to slot the MIXER channel into the power supply bracket before fitting them in the case as it is very fiddly to get in position otherwise.

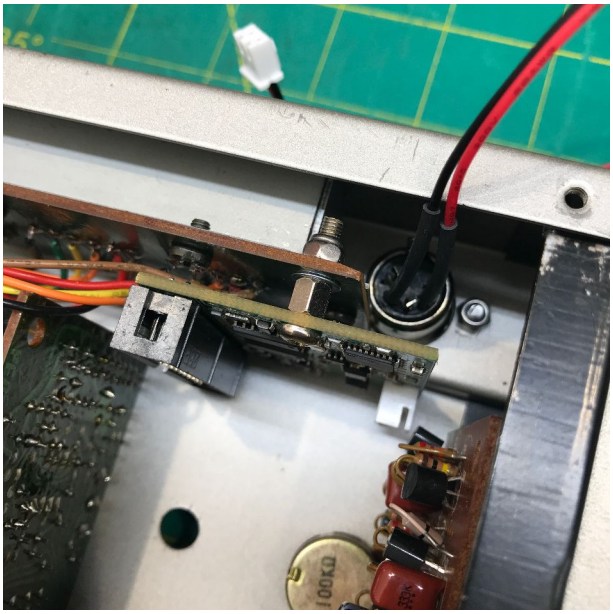
FITTING THE UNIPULSE

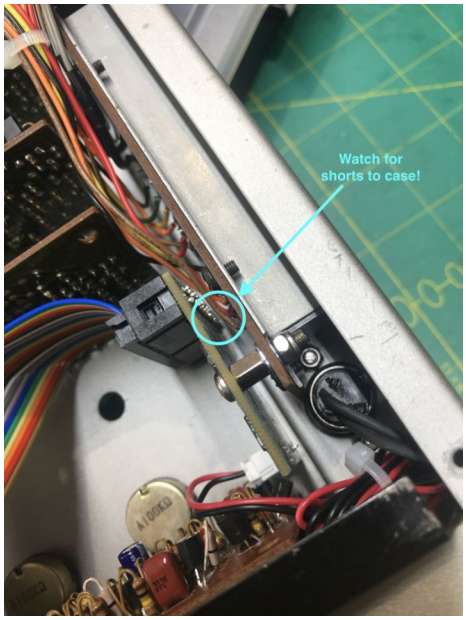
Remove the connector bracket (two screws on the rear panel). On the upper right corner of the connectors PCB, carefully drill an M3 hole; you may see a small alignment hole here which you can use as a centre.





Then thread an M3 x 16 bolt through the uniPulse and tighten a 6mm hex spacer on the other side (see photos). Place a washer on either side of the connector PCB and secure it all with a nylock nut (again, see photos). Ensure the uniPulse is square with the connector PCB.

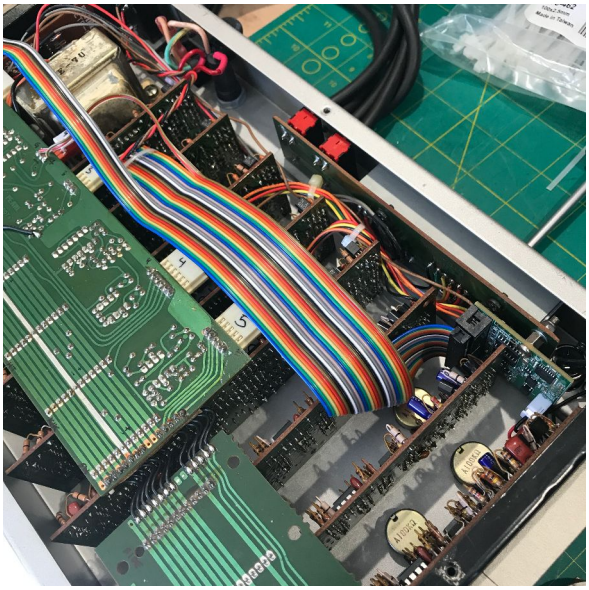


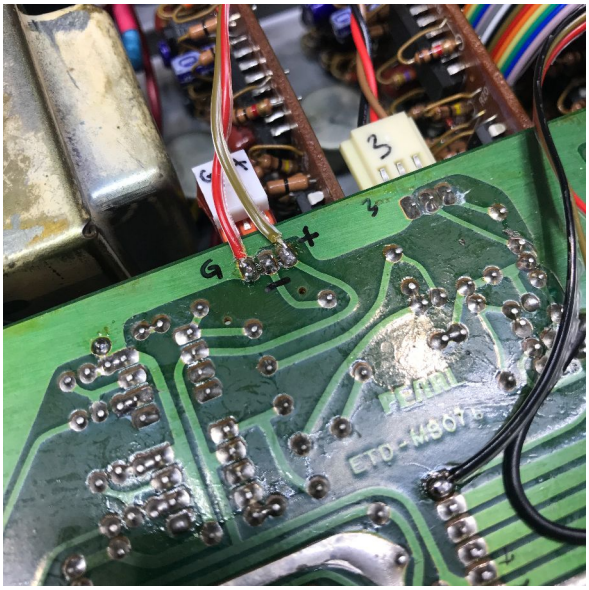



Now refit the connector PCB in the case, and attach the MIDI cable to the uniPulse, tucking the surplus wire well into the corner. You can now remount the remaining drum channel PCBs and the backplane PCBs, taking to care to align all the edge connectors. It’s all pretty cosy.

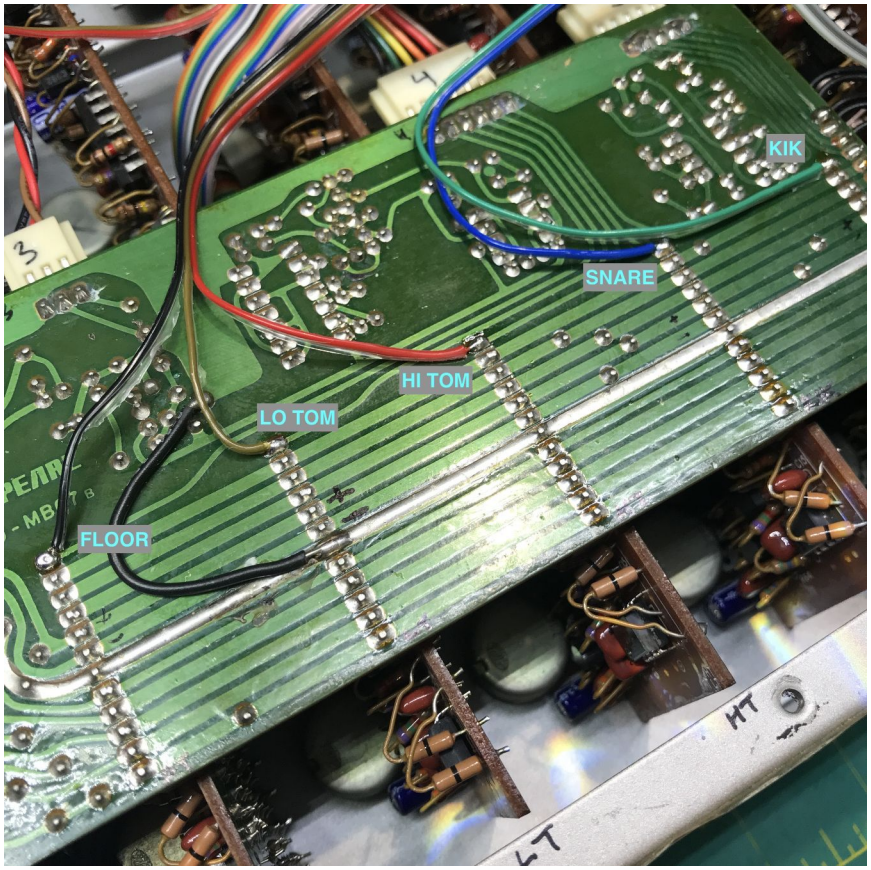
WIRING THE UNIPULSE

Attach the ribbon cable and dress it as shown in the photo so that it runs across the top of the channel PCBs.





DC power is taken from the connector near the mains transformer, as shown in the picture. Ensure that RED goes to Ground, and BROWN goes to +8V. CHECK VOLTAGES FIRST! Trim the wiring neatly; there is very little free space inside the case with the baseplate fitted. Note that the baseplate has a foam cushion that bears against the backplane PCB to prevent shorts.




Next, attach the five drum trigger wires as shown. Note the labels on the drum channels. All the trigger connections are to pin 1 of each channel's edge connector. The curved black wire in the photo is a ground strap on this particular unit.

Then attach the three cymbal triggers as shown: White for RIDE, Grey for CRASH, Yellow for HAT, again all to pin 1 of the relevant edge connector.

Lastly there is a PEDAL wire to attach to pin 3 of the HAT edge connector. This controls whether the HAT trigger will produce an Open or Closed hat sound. It acts as a high/low switch, so we need to use DIGITAL


OUTPUT ONE (the next White wire) to control it. Although it is not shown in the photo, you will need to fit a BAT85 diode between the White wire and pin 3, with the cathode (ring) of the diode attached to the wire and its anode attached to pin 3. This ensures that the control line interfaces with the internal switching logic properly.

**NOTE:** If you are also planning to use the Fightman's own drum triggers alongside MIDI, please read the footnote at the bottom of these guidelines.

FINISHING UP
Carefully roll the unused ribbon wiring into a coil, secure it with a cable tie, and tuck the coil down between the FLOOR TOM and LOW TOM channels out of the way.

Double-check all your wiring and soldering, checking for shorts. If all looks good, carefully power up the unit. You should see a red LED illuminate on the uniPulse.

Upload the supplied configuration file to the uniPulse using the Configurator Tool, and test the triggers. As currently configured, MIDI Note Numbers from 36 to 44 on MIDI channel 10 will trigger sounds, as follows:
36: Kick
37: Snare
38: Hat
39: Hat Pedal (off: closed; on: open) *
40: High Tom
41: Low Tom
42: Floor Tom
43: Crash
44: Ride

Note that to achieve an Open Hat, the 'Hat Pedal' note must be held down while the 'Hat' note is played.

Enjoy!

## USING THE FIGHTMAN'S OWN TRIGGERS ALONGSIDE MIDI

If you are lucky enough to have the original Fightman pads or are using some other external analogue triggering alongside the MIDI, you may need to modify the analogue PEDAL trigger by installing a BAT85 diode in the line between the pedal and the Fightman (you could also do this on the connector PCB if you are comfortable cutting PCB traces). The diode must be oriented so that its cathode (ring) faces the trigger source and its anode faces the Fightman input. Even with this in place, you will need to ensure that the MIDI "pedal' note is HELD DOWN while using external triggers; this will ensure that the external 'pedal' switch works properly. This is a consequence of the Fightman's internal circuitry.
Further, if you experience problems with the other external triggers then it may be necessary to add BAT85 diodes in each trigger line. In these instances the diodes must face the other way from the 'pedal' diode; their anodes must face the trigger sources and their cathodes (rings) must face the Fightman inputs.