Notes on building the BATC v2 Minitiouner

The board should be easy to build – the components list and schematic can be found in annex A.

There is no particular need to fit components in an order – I recommend fitting in order of component height. Do not fit the tuner module, the FTDI module or the J2 jumper.

The DC-DC converter module can be fitted on PCB headers or with wire offcuts. Note the bending point for the regulator pins so that the holes in their mounting tabs align with the holes in the PCB and bend with pliers. It's best to bolt down before soldering. The headers for the FTDI module should be fitted making sure they are flat to the PCB. There is no need to fit J5 – j8 unless you intend to use them. These are for future expansion and you could always fit them later.

The result should look like figure 1. (Note I had run out of 3.3k resistors so used 3k)

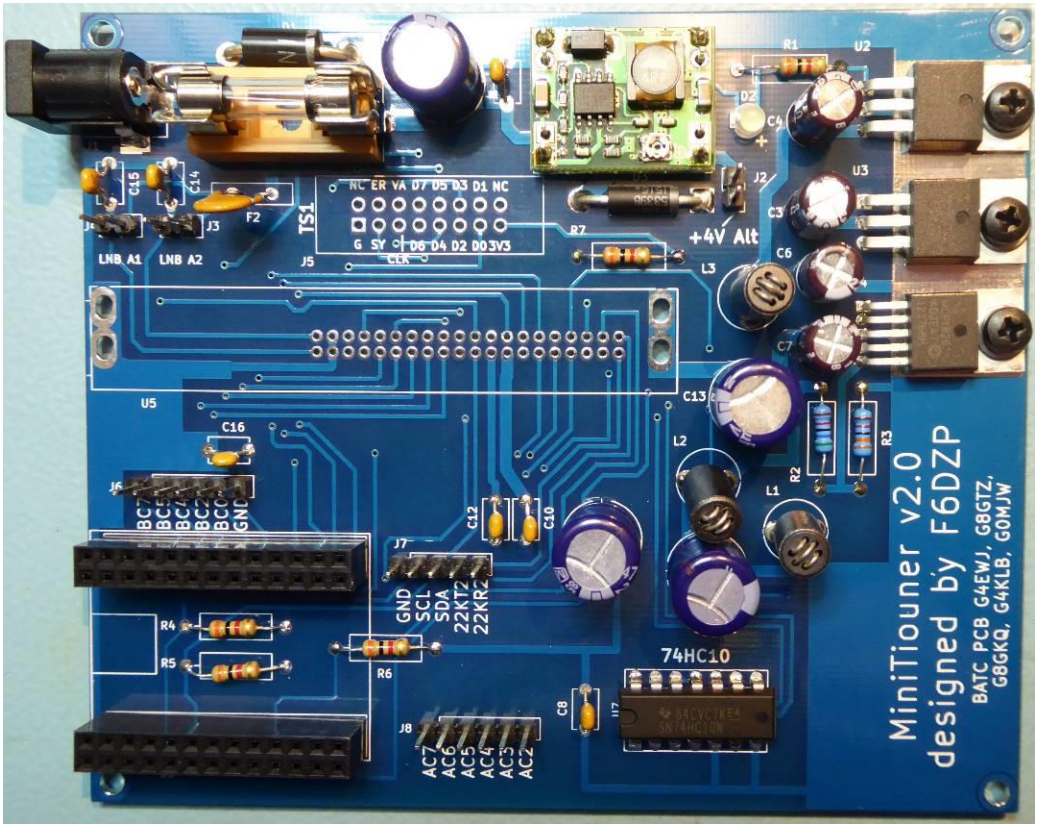


Figure 1 – BATC board ready for commissioning

Commissioning

The DC-DC module needs to be set to 3.7-4V output – you may want to do this before fitting to the board in case it doesn't work as expected. If you are not using the DC-DC you should feed 4V into J2 as indicated on the PCB abd skip the next paragraph.

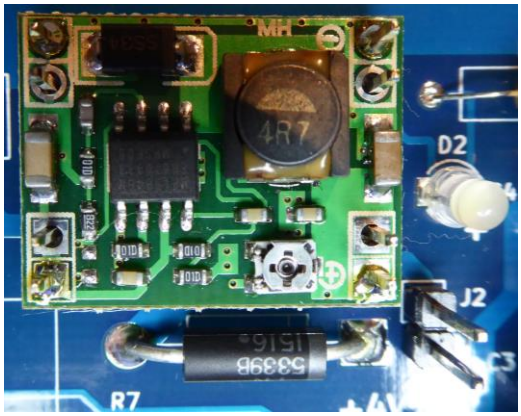


Figure 2 – DC-DC module

To set up the DC-DC, check again that the jumper on J2 is NOT fitted. Connect 6-18V supply – ideally via a regulated, current limited supply. Connect a voltmeter to the output of the DC-DC converter. Assuming no egress of smoke you will should see an output that can be adjusted with the pot to 4V – mine was originally set to 12V and needed to be turned clockwise. Once you have checked and re-checked the DC-DC output really is 4V (3.7-4.5V is OK) fit a jumber on J2.

You should now measure the 3 supply rails. The easiest place to measure is on the top of the ferrite RFCs, L1 = 3.3V, L2 = 1.2V, L3 = 3.3V. If any of these are outside specification find out why and fix it. The tolerable range for the 1.2V supply is 1.1-1.25V. The actual value will depend on the tolerance of the regulator R2 and R3 and should be about 1.2V with the values suggested.

The Serit module can now be fitted. It should snap in reasonably easily. Making sure it is sitting properly on the PCB solder the end tabs to hold it in position. Recheck it is correctly aligned and then solder the 40 pins – taking care not to overheat.

Fit the FTDI module making sure its lines up and there are no bent pins. It can be a little reluctant to push down into the socket. Result should look like Figure 3.

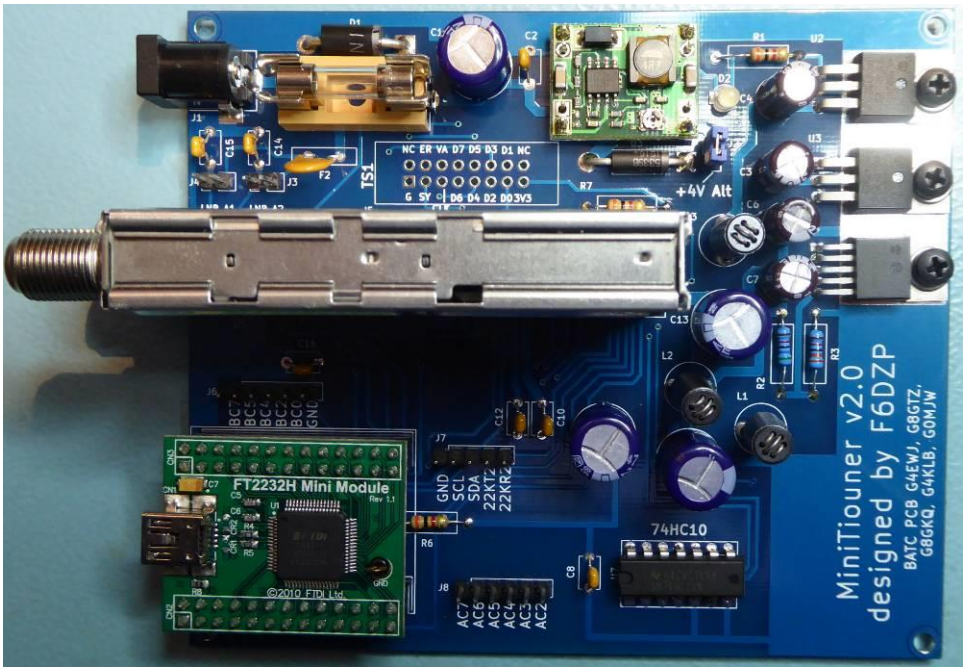
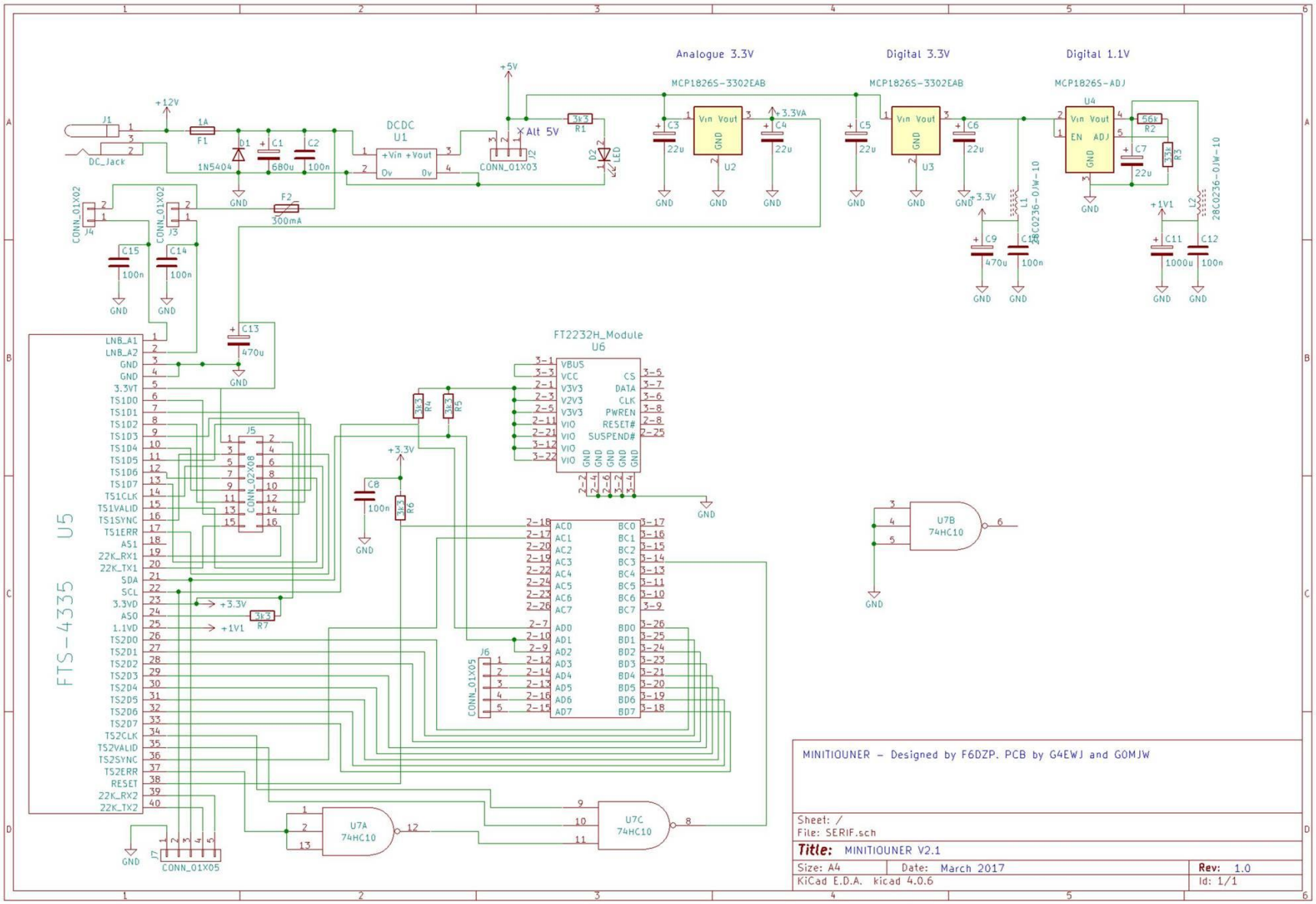


Figure 3 – Completed board

The board is designed to fit into a standard Hammond 1455N1201 Metal Enclosure. I went for black (1455N1201BK) – Digikey part noHM1614-ND, Farnell part no 9287876. Figure 4 shows how it fits

Figure 4 – Mounting in box

Annex A – Schematic and parts list



Designator	Qty	Value	Digikey	Notes
C1	1	680u	493-1829-ND	25V if you intend to feed with 18V
C11	1	1000u	493-1497-ND	>6V
C2,C8,C10,C12,C14,C15,C16	7	100n	BC2665CT-ND	5mm spacing
C3,C4,C6,C7	4	22u	493-11627-1-ND	>6V – must be low ESR < 1OHM
C9,C13	2	470u	493-15716-ND	>6V
D1	1	1N5404	1N5404DICT-ND	
D2	1	LED 3mm	1080-1113-ND	Any 3mm LED is fine, I used a white one.
D3	1	5.6V Zener	1N5339BTPMSCT-ND	Could also be 5.1V
F1	1	PCB Fuseholder	F6245-ND	
F2	1	500mA	MF-R050-ND	Choice here – 300mA to 1A.
J1	1	DC_Jack	EJ508A-ND	
J3,J4,J2	3	CONN_01X02	952-2262-ND	
J5	1	CONN_02X08	A33163-ND	Only needed for 2nd Tuner
J6,J8	2	CONN_01X06	A31116-ND	
J7	1	CONN_01X05	A31115-ND	
L1,L2,L3	3	28C0236-0JW-10	240-2493-ND	
R1,R4,R5,R6,R7	5	3k3	PPC3.3KBCT-ND	Anything will do
R2	1	56k	PPC56.2KXCT-ND	Use 1% or select on test
R3	1	33k	PPC33.2KXCT-ND	Use 1% or select on test
U1	1	DC-DC Converter		EBAY - Note – must be set to under 5V – ideally about 3.7V
U3,U2	2	MCP1826S-3302EAB	MCP1826S-3302E/AB-ND	
U4	1	MCP1826S-ADJ		BATC Shop
U5	1	FTS-4335		BATC Shop
U6	1	FT2232H_Module	768-1030-ND	BATC Shop – needs programming
U7	1	74HC10	296-12774-5-ND	
Headers for FTDI Module	2	CONN_02X13	S7116-ND	Not strictly necessary but advisable
Fuse 1A 5x20mm	1	1A Fuse	F2392-ND	Higher value if higher LNB current