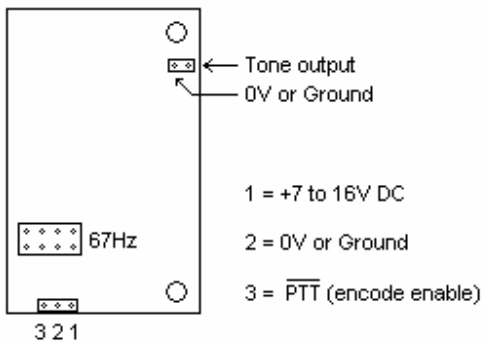


Programmable crystal controlled CTCSS tone encoder kit

It can encode the 10 UK CTCSS tones listed below and generates a sign wave of approx 2V p-p. The tone is selected by the combination of jumpers in 4 positions, and the module is only 29 x 49mm in size. It's powered by 7 to 16V DC and draws only a few mA.

There is an encode enable input that connects to the radio's PTT line (active low), and the tone select inputs are constantly read so you could change tone with a switch if desired*. You can tie the encode enable input to ground for continuous encode.

Fit the 3 supplied jumpers in the following combinations to select the desired tone frequency.



71.9Hz

77Hz

82.5Hz

88.5Hz

94.8Hz

100Hz

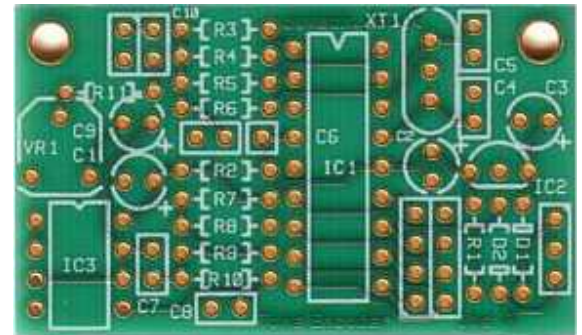
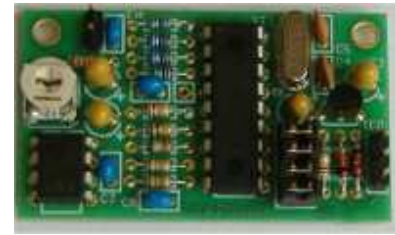
103.5Hz

110.9Hz

118.8Hz

When connecting to a radio transceiver the tone should be fed into the TX modulator after the microphone amplifier/filter/limiter and usually after the TX audio deviation control.

*note that PIC pins 10,11,12 & 13 are the actual tone select inputs and if using an external switch you only need to switch some or all of these inputs to 0V (PIC pins 7, 8 & 9 are programmed to be 0V at all times).



Parts list:-

R1, 2, 11 10K
R9, 10 15K
R4, 5 62K 1%
R8 68K
R7 100K
R3, 6 150K 1%
VR1 10K variable

C1, 2, 3, 9 1uF tant.
C4, 5 33pf
C8 47nf (marked 473)
C6, 7 100nf (marked 104)
C10 470nf (marked 474)

D1, 2 1N4148
IC1 PIC16F627A programmed with CTCSS code
IC2 78L05
IC3 LM358N

XT1 10MHz crystal

CN1, 2 4+4 pins
CN4 2 pins
CN5 3 pins

PCB cstech.co.uk Tone Encoder Issue A

Also supplied:-

Crystal insulator pad
3 x Jumpers

Keep any wiring from a switch to the input(s) short, it is also advisable to fit a 100 ohm resistor in series with each wire at the module end (this limits current into the PIC chips input protection circuits from static).

A full circuit diagram follows on the next page.

When building the kit fit the resistors and diodes first, note that C6 is between R2 and R6 on the PCB although it's ident is under IC1 due to space restrictions. CN3 isn't supplied or fitted.

Observe polarity of the 1uf tant. capacitors and orientation of the IC's and diodes.

