

## DTMF Encoder kit with single tone option and TX keying.

Our DTMF encoder can encode all 16 DTMF tone pairs directly from a keypad as well as 8 single tones.

Tones are generated for as long as a key is pressed, and the tone audio output from the HT9200 encoder IC is amplified, buffered and filtered before the output level control, improving the overall quality of the generated signal.

A transmit keying open collector output (active low) is provided which activates on first key press, an inter-digit holding time of 1 or 1.5 seconds is included to keep the transmitter on between key presses. Fit the jumper to CN4 to reduce the delay to 1 second, otherwise 1.5 seconds is used.

There is also the option of grounding the function input (see circuit), the encoder then encodes the 8 tones used in DTMF as single tones when pressing buttons 1 to 8. This is useful for checking the frequency response of connected audio paths or transmitters/receivers etc.

Complete kit of parts including pre-programmed PIC micro and gold plated PCB.

The use of this **keypad is optional** as this kit will work with most matrix keypads. The order of pin out varies between keypads and this should be checked if using a different keypad (see circuit). The keypad can be connected via wires if desired, often necessary with other keypads, keep them short.

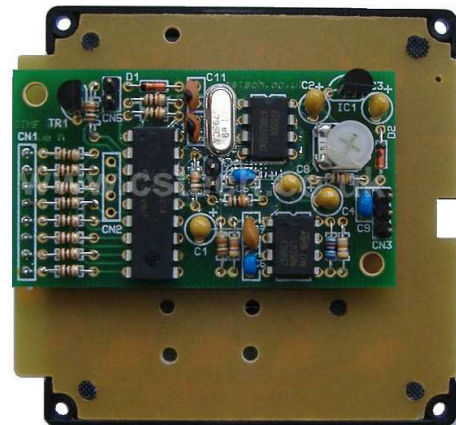
The PCB has been designed with component pads on the back for 1nF or 10nf 0805 ceramic capacitors for RF decoupling on all inputs and outputs if needed, these are not supplied and not expected to be needed except in high level RF environments.

Runs from 7 to 16V DC at a few mA.

Once assembled we suggest you test by using a piece of wire to link between row and column pads of CN1 simulating the keypad action, before fitting to the back of the keypad.

There may be a slight bow in the brown PCB on the back of the keypad, this is normal.

## DTMF Keypad Encoder



All parts shown in the assembled photo are included in the kit except the keypad which is optional.

[A circuit diagram is on the last page of this document.](#)

## DTMF Keypad Encoder Parts List

IC1	78L05
IC2	PIC16F627A (programmed)
IC3	HT9200A
IC4	LM358N
TR1	BC184L
D1, 2	1N4148
XT1	3.579MHz crystal
R1, 2, 3, 4, 5, 6, 7, 8	100R
R9, 10, 11, 15, 17, 18	10K
R12	68K
R13	15K
R14,16	47K
VR1	10K variable
C1, 2, 3, 4, 8	1uF observe polarity
C5	47nF (marked 473)
C6	100nF (marked 104)
C7	1nF (marked 102)
C9	470nF (marked 474)
C10, 11	22pf
CN1	8 pins
CN2	Not fitted
CN3	3 pins
CN4, 5	2 pins

Also supplied:-

DTMF encoder PCB Issue A  
Crystal insulator pad  
Jumper

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