



Fox Delta

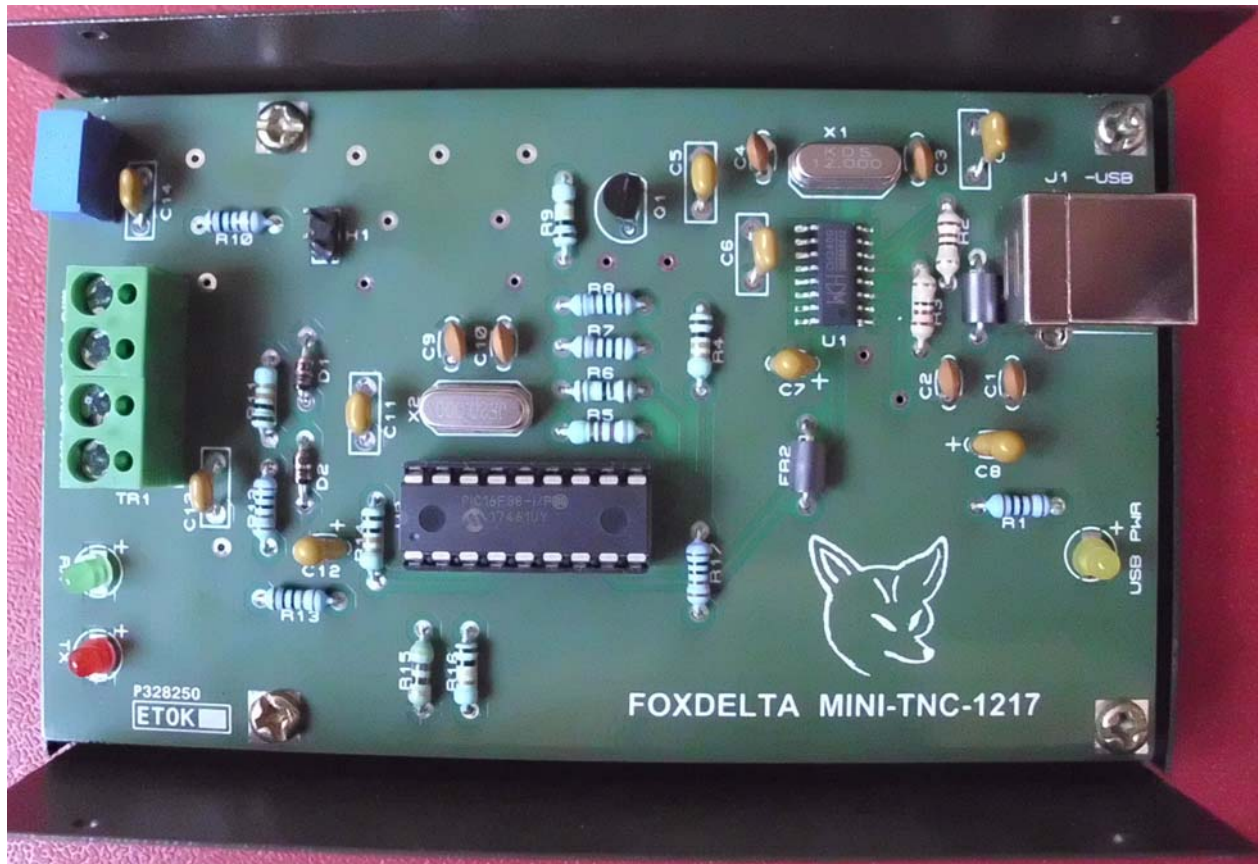
Amateur Radio Projects & Kits

Mini-TNC-1217

Technical Details and Schematic: [Mini-TNC USB](#) - A 1200-Baud Packet TNC

Mini-TNC USB Rev. 1217

Completed Mini-TNC:



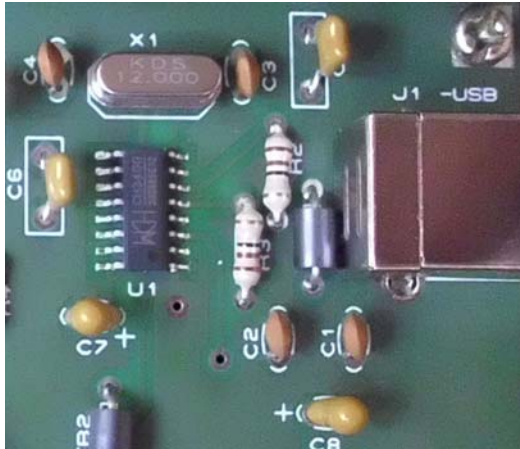
Mini-TNC Rev 1217 is designed exclusively to work as an APRS TNC.

This version of Mini TNC has following interesting features:

1. Compact, Low power 1200 baud Modem-less TNC
2. Powered by USB (+5V)
3. CH340 USB to Serial Chip to create virtual COM PORT.
4. Firmware updated by Dennis/N5VRG V1.09
5. Screw Terminals for Radio Connections
6. Metal Case included with Kits

Design Details:

Mini-TNC input design uses simple analog input to PIC16F88's PIN17.



A CH340G is used to convert USB to Serial Communication. This chip creates a virtual COM port in your system, which is used for configuration of PIC88 and for “converse” operation.

Front panel LEDs for “RX”, “TX” on one side and LED for “USB Power” on other side of the board.

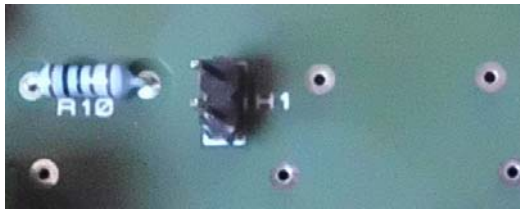


Mini-TNC takes very low current and is ideal for portable use. It is an USB powered device

USB POWER CONNECTOR AND USB +5V LED



MIC/PTT Header:



A 2pin header H1 is provided for portable radios to activate PTT thru MIC.

FREE Metal Case:

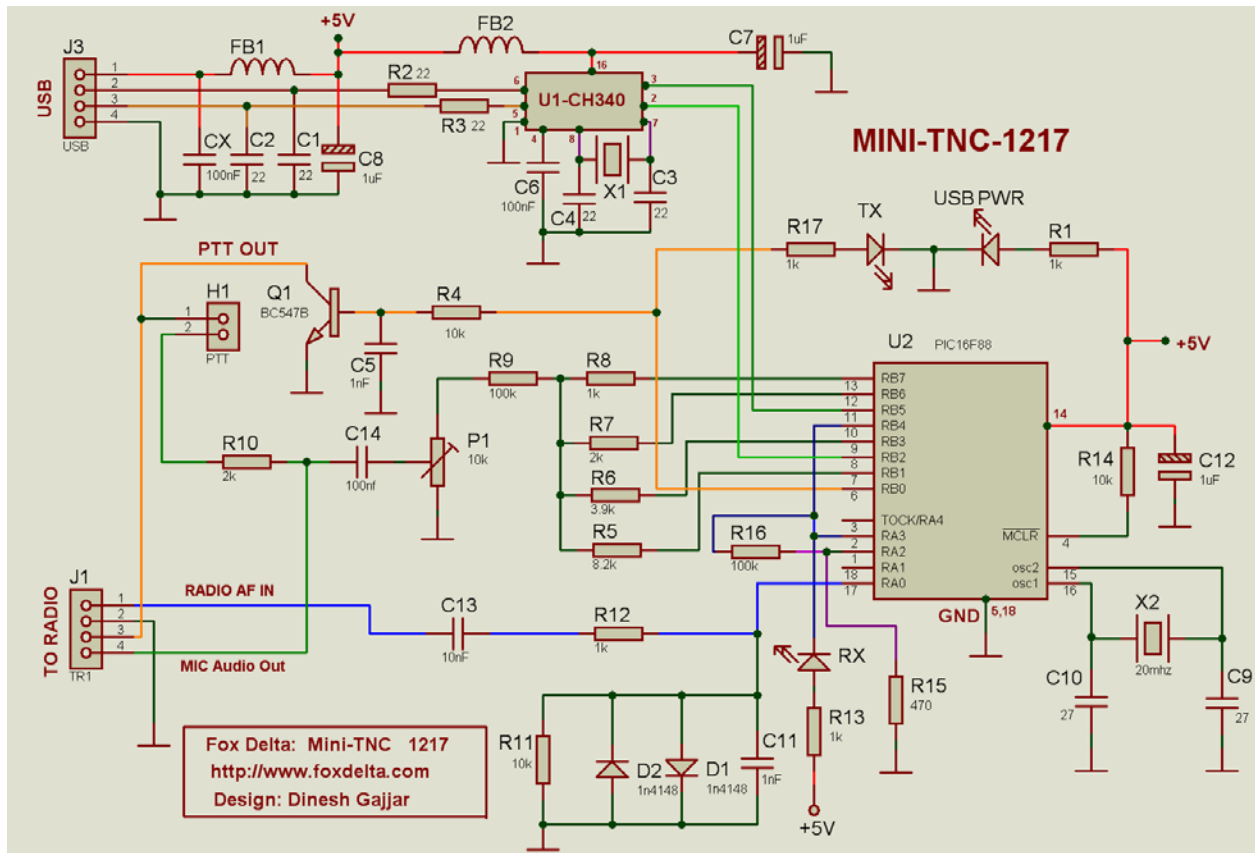
Project is designed on a Double Sided PTH board measuring 11X65cm. With this modem, you may stop worrying about hard to find, MX614s!!



Completed Mini-TNC 1217 Board:



Mini-TNC 1217 Schematic:



Modem Configuration:

User data in Modem (PIC88) chip is stored by using a simple “HyperTerminal” of the windows. To enter configuration Mode:

1. Install CH340G Drivers to your PC's OS. (Can be done without connecting Mini-TNC Board)
2. Connect an USB cable to Mini-TNC Board.
3. Check your system to see which COM port is created by CH340G.
4. Create a new HyperTerminal and set COM Port as Created by CH340 USB to Serial Chip. Set Hyper-terminal baud rate to 4800 or 9600 as per your ordered PIC16F88 V109 FW.
5. Now, you may use hyper-terminal for config or communication.
6. Type: “help” to get list of commands. Type “DISP” to see your settings.

Configuration Screen:

```
GPS (gps $GPGGA or gps $GPGLL or gps $GPRMC)
TRace (tr xmit or tr rcv) - For debugging only
TXDELAY (txdelay n 0<n<201 n is number of delay flags to send)
CALIBRATE (Calibrate Mode - Testing Only)

OK
cmd: disp
ECHO ON
TXDELAY 64
GPS $GPGGA
TRace OFF
MONitor ALL
DIGIpeater ON
BEACON On EVERY 10
UNPROTO APRS-0 V WIDE1-1 V WIDE2-1
MYCALL VU2FD-2
MYALIAS WIDE1-1
BTEXT !2217.05N/07046.10E#VU2FD APRS FOXDIGI AT RAJKOT

OK
cmd: mycall VU2FD-2
OK
cmd: _
```

Connected 0:02:56 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo

Do not forget to save your settings by entering “PERM”.

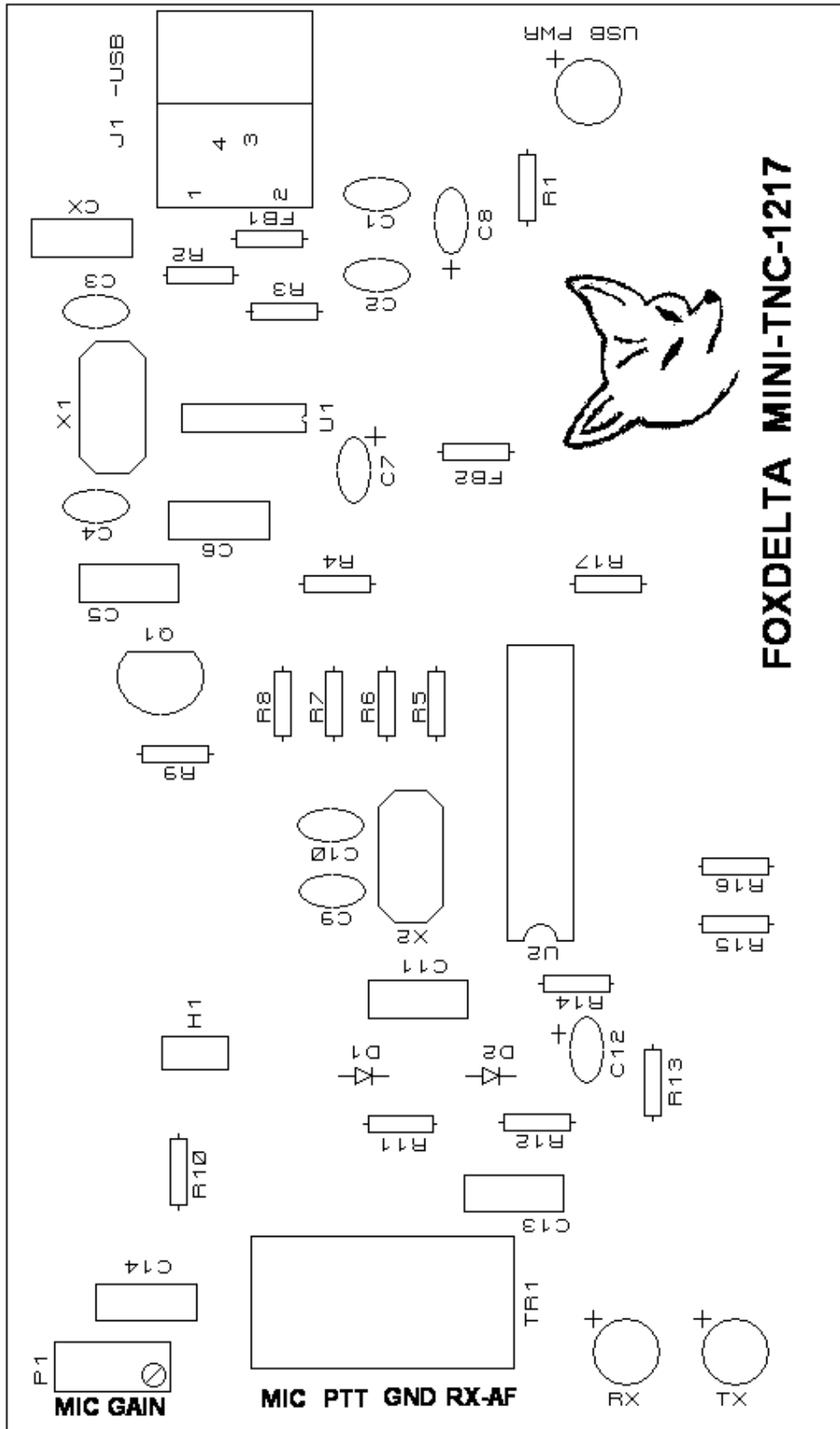
External Connections:

User is required to prepare a cable for Radio Connection.

TR1 is 4 Screw Terminals:

1. Receiver Audio Input (PIN 1 is next to silk mark “TR1”)
2. Ground
3. PTT to Transceiver
4. Audio Out to MIC





Mini TNC REV 1217 Parts List:

Qty	ID	Details
1	U2	PIC16F88, Pre-Programmed With Firmware V1.09
1	U1	CH340G SO16 (Pre-Soldered on board)
1	PCB	Mini-TNC Double Sided PTH Board Rev1217
1	Q1	BC547B, PTT Switch
3	LED	3mm: RX, TX & Power
1	X1	Crystal 12MHZ HC49US
1	X2	Crystal 20MHZ HC49US
1	P1	Preset Bourns 10K, PCB/RA
1	H1	2pin header/Shorting Pin
1	J1	USB Connector
1	TR1	4PIN Screw Terminal (2+2)
2	FB1, 2	Ferrite Bead Inductors
2	D1, D2	1N4148 Diodes
1	DIP18	IC Socket for U2
1	Case	Powder Coated Metal Case
Qty	ID	Details
3	C8, 12, 7	1uf 35V Tantalum
4	CX, 13, 6, 14	100nf Poly
2	C5, 11,	1nf Poly
6	C3, 4, 9, 10, 1, 2	22pf Ceramic
5	R8, 17, 1, 13, 12	1K
2	R7, 10	2K
2	R2, 3	22 ohms
3	R4, 14, 11	10K
1	R6	3.9K
1	R5	8.2K
2	R9, 16	100K
1	R15	470 Ohms

Notes:

1. **U1: CH340G is SMT device and its supplied pre-soldered on board.**
2. **P1 is right angle bourns preset. It can be adjusted easily when board is housed in metal case.**
3. **H1: Use a supplied shorting pin to activate PTT thru MIC press. (Kenwood type Radios)**
4. **Set Receiver audio carefully for good detected packets.**
5. **MIC audio to Radio is set by P1**

Dinesh Gajjar / 6th January 2018

Please visit <http://www.foxdelta.com> for more information on this project.