

# Yaesu FT-8x7 DIY Bluetooth-CAT micro-miniature interface

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With a very small material investment (around \$15) and some components which can be easily found at any HAM you can have a full Bluetooth CAT interface with the following main features:

- Bluetooth Spec v2.0 compliant;
- Class 2 Type output power;
- 3.3V Operation;
- No external power required (powered from the transceiver CAT connector );
- The following parameters can be programmed from a PC:
  - o Baudrate: 1200-115200
  - o Device name
  - o Pairing PIN
- Automatically connects to the PC when the application (ex. Hamradio Deluxe) is started;
- A single blue LED to indicate power/pairing/connect;
- Very small size: only 40mm x 13mm x 13/6mm

The final product will look like in the following pictures.



## The components

First let's see where we can find the main components at the cheapest price.

1. **High Quality Wireless Bluetooth Transceiver Module RS232 TTL** (£4.68) at:  
<http://www.ebay.co.uk/itm/New-High-Quality-Wireless-Bluetooth-Transceiver-Module-RS232-TTL-Antenna-/110769655360? trksid=p5197.m185& trkparms=algo%3DSIC.NPJS%26itu%3DI%252BUA%26otn%3D12%26pm>

[od%3D200651092652%252B270844619774%252B170753376515%26po%3DLVI%26ps%3D63%26clid%3D5402339510617190632#ht\\_4087wt\\_1163](http://www.ebay.co.uk/itm/150716721925?ssPageName=STRK:MEW NX:IT&_trksid=p3984.m1439.l2649#ht_2186wt_1163) .



2. **3mm Ultra Bright Blue 8000 mcd LED Bulb Light** (£0.1):

[http://www.ebay.co.uk/itm/150716721925?ssPageName=STRK:MEW NX:IT&\\_trksid=p3984.m1439.l2649#ht\\_2186wt\\_1163](http://www.ebay.co.uk/itm/150716721925?ssPageName=STRK:MEW NX:IT&_trksid=p3984.m1439.l2649#ht_2186wt_1163)



3. **L78L33ACZ V REG +3.3V** (~£ 1) at:

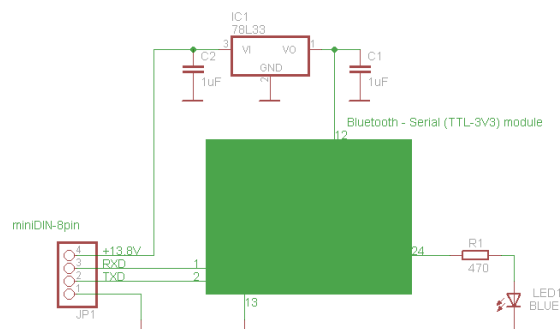
[http://www.ebay.co.uk/itm/L78L33ACZ-V-REG-3-3V-78L33-TO-92-Pack-10-/230684354418?pt=UK\\_BOI\\_Electrical\\_Components\\_Supplies\\_ET&hash=item35b5dbe772#ht\\_500wt\\_1156](http://www.ebay.co.uk/itm/L78L33ACZ-V-REG-3-3V-78L33-TO-92-Pack-10-/230684354418?pt=UK_BOI_Electrical_Components_Supplies_ET&hash=item35b5dbe772#ht_500wt_1156)



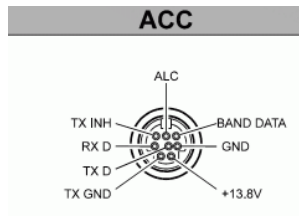
Then we will need some small electronic components (SMD version):

- R1 - 470ohm 1/8W
- C1, C2 – 1uF (ceramic)
- mini DIN (8 pin) connector (male)

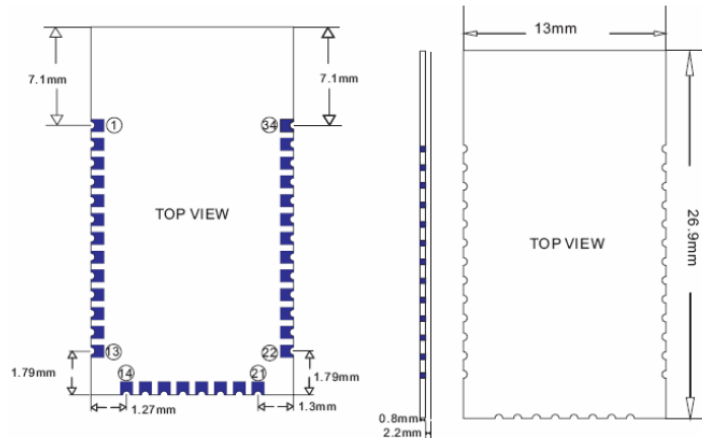
## The schematic



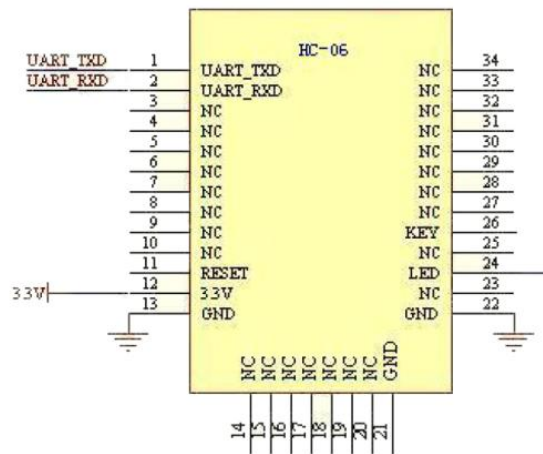
The pin-out for the 8-pin connector can be found in the FT817(ND) user manual. A small extract below:



The Bluetooth module has the following dimensions:



... and the following pinout:



## How to build

Unfortunately (again) I forgot to take pictures during the build so I will try to explain by words all the steps.

1. Prepare a small piece of thin PCB (single side) with the width of the Bluetooth module and longer with aprox.5mm;
2. Cut with an abrasive disc the 8-pin male connector as in the pictures;
3. Design the PCB according with the schematic (a very simple one) and consider the PCB to enter with one end between the pins of the connector in order to solder TX, RX and GND pins directly to the PCB without needing wires;
4. Solder the small electronic components only on the metallic side of the PCB;

5. Using a drop of glue fix the Bluetooth module on the isolated side of the PCB and then using very small pieces of thin wire solder only the relevant pins of the module to the PCB;
6. Use another very small piece of wire to connect pin +13.8V to the PCB.

Now you are ready to test the module. After you confirm that everything is ok, you can put some POXI POL between the connector pins soldered to the PCB in order to increase the reliability. At the end you can cover everything using a piece of thermo shrinking tube.

## Programming the interface

If you are satisfied with the default values (Baudrate 9600, pin 1234 and some arbitrary name) then you can skip this chapter.

To program the interface you need an USB/Serial (TTL) interface like the following:

**USB 2.0 to UART TTL 6PIN Connector Module Serial Converter CP2102 (~£ 2) at:**

[http://www.ebay.co.uk/itm/USB-2-0-UART-TTL-6PIN-Connector-Module-Serial-Converter-CP2102-New-/110760144325?pt=LH\\_DefaultDomain\\_3&hash=item19c9d1adc5#ht\\_3467wt\\_1163](http://www.ebay.co.uk/itm/USB-2-0-UART-TTL-6PIN-Connector-Module-Serial-Converter-CP2102-New-/110760144325?pt=LH_DefaultDomain_3&hash=item19c9d1adc5#ht_3467wt_1163)



Build a small cable like in the following picture in order to connect RX,TX,GND and +5V from the USB/Serial module to the RX,TX,GND and +13.8V from the Bluetooth-CAT interface.



You need a piece of software to send commands to the Bluetooth interface, for example SPCA – Serial Port Communication Analyzer available on my web site:

<http://www.yo3ggx.ro/spca/spca.html>

At first use set the application for 9600,8,N,1.

The following AT command set is available to program the interface.

1. Testing the connection

Before sending a AT command to the Bluetooth module, you will need to check the connection between the terminal software and the module.

Format: Send : AT // Note: Capital letter Return: OK

2. Changing the default baud rate

Format: Send: AT+BAUD1 //change baud rate to 1200

Return: OK1200

Available values for baudrate are presented in the following picture.

1	1200	5	19200
2	2400	6	38400
3	4800	7	57600
4	9600	8	115200

3. Changing default name

Format: Send AT+NAME*yourname* //yourname: lowercase

Return: OK*yourname*

4. Changing default password

Format: Send AT+PINxxxx //xxxx: your new password

Return: OKsetpin

## Using the interface

I will not detail here because there many possible applications to manage Bluetooth devices depending on the OS, type of Bluetooth interface on the PC, etc.

You just need to follow the generic steps below:

- Connect the new build interface to the transceiver;
- Configure the right baudrate;
- Make the pairing with the Bluetooth interface;
- Check which COM port was allocated for the Bluetooth virtual serial port and set this port in the CAT application (ex. HRD);

Good Luck!

If you need support please do not hesitate to send me a mail.