# FT-817(ND) DIY Data Modes miniature USB interface

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With a very small investment (around $30) and some components which can be easily found at any HAM you can have a full USB interface for digital modes with the following features:

- Use a single USB port from the PC/notebook (for sound, PTT and CAT)
- Integrated soundcard (does not use PC/notebook internal soundcard)
- No external adjustments (only through software volume sliders)
- PTT control for the transceiver
- Compatible with all digital modes software (used by myself with HRD)
- Powered by the USB port
- Provides 2 supplemental USB ports for other usage (ex. a flash memory, etc.)
- Extremely compact (only 40mm x 35mm x 20mm)
- Uses a single standard mini USB to USB cable

The final product will look like in the following picture.



## The components

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

1. **Trust HU-3340m 4 Port Mini USB 2.0 Design Hub** (~ $12) at:
   http://www.amazon.co.uk/dp/B0007YBFJ4/ref=asc_df_B0007YBFJ45?smid=A1XASWTIU8FRI5&tag=ciaouk-ce-mp-21&linkCode=asn&creative=22218&creativeASIN=B0007YBFJ4.

2. **USB sound card** ( ~ $1.6) at:
   http://www.ebay.co.uk/itm/USB-2-0-3D-AUDIO-SOUND-CARD-ADAPTER-VIRTUAL-5-1-ch-
   /260513194910?pt=LH_DefaultDomain_0&hash=item3ca7cbe39e#ht_3520wt_1023



3. **USB CAT cable** ($16) at:
   http://www.ebay.co.uk/itm/NEW-USB-program-cable-Yaesu-FT-100-FT-817-FT-857-
   /180617305877?pt=LH_DefaultDomain_0&hash=item2a0da15f15#ht_3569wt_1023



Then we will need some small electronic components:

- R1 - 390ohm 1/8W
- R2 - 1K2 1/8W
- R3 - 3K3 1/8W
- R4 - 100ohm 1/8W
- C1 - 4.7uF/6.3V
- C2 - 10uF/16V
- D1,D2 - 1N5710 (or any other small signal Shottky diode)
- Q1 - BC171 (or any other small NPN transistor in plastic case)
- X1 - mini DIN (8 pin) connector (male) – this comes with the USB CAT cable so you already have it
- X2 - mini DIN (6 pin) connector (male) – the same connector used for a PS2 mouse or keyboard. Unfortunately I
  was not able to find a mouse/keyboard with a cable using all pins, so I just use a new connector.

# The schematic
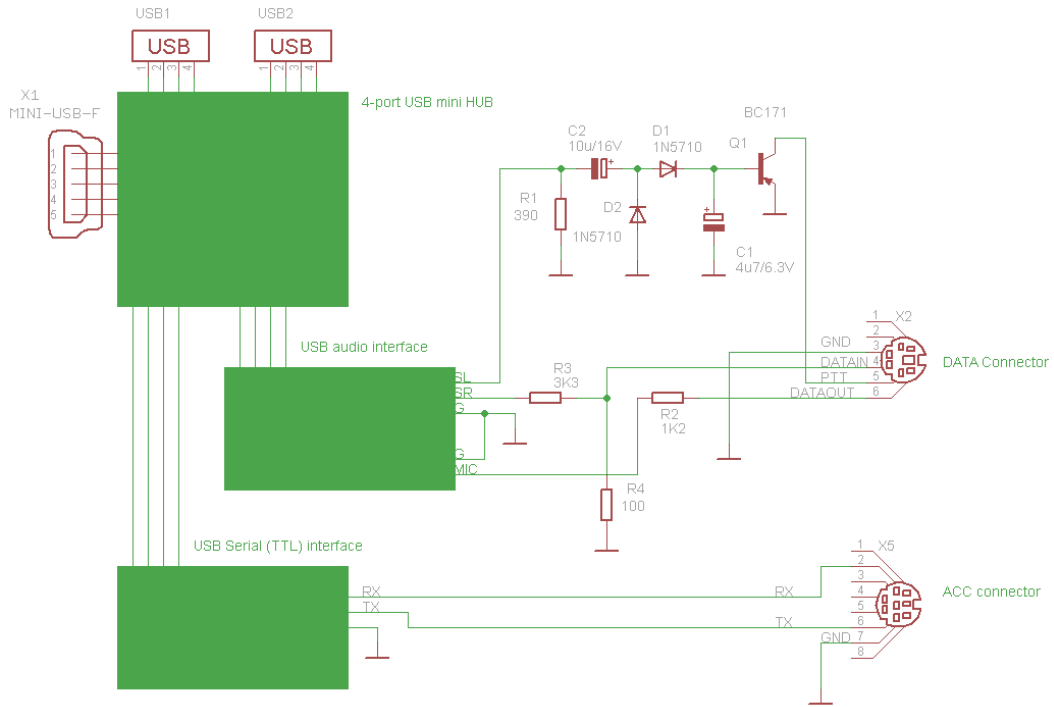


The pin-out for the two connectors can be found in the FT817(ND) user manual. A small extract below:



## How to build

Unfortunately I forgot to take pictures during the build so I will try to explain by words all the steps. In order to reduce the size of the final product at minimum, some of the connectors from the original modules will need to be removed. You need basic soldering/desoldering skills to do that.

1. Extract the USB hub PCB board from the metallic case (using a screwdriver)
2. Desoldering two of the USB female connectors (on the same side)
3. Desoldering the power jack.
4. Extract the soundcard from the plastic case. You can easily do this as the plastic case is not very well attached.
5. Desoldering the two audio jack (Mic and Headphones)
6. Desoldering the USB connector (male)
7. Cut the cable from the USB CAT interface at around 300mm from the miniDIN connector.
8. Extract the CAT USB/serial interface from the plastic case
9. Desoldering the cable from the pins marked GND, RX, TX
10. Desoldering the USB connector (male)

11. Build a small case from a piece of PCB (single side copper) with the appropriate size (according with the way you intend to arrange the modules). In my situation, the size was 40x35x20mm.
12. Using thin isolated stranded wire make the connections between the 3 modules for the 2 USB ports (from HUB to audio and from HUB to CAT interface)
13. Fix the USB hub in the base of the case using POXIPOL (www.poxipol.com) or similar adhesive.
14. Fix the two other modules on top (with adhesive), taking care that the TX/RX/GND pins for the CAT module and the audio pins from the soundcard to be accessible.
15. Build the PTT circuit using a small piece of PCB for some of the points.
16. Connect the two miniDIN connectors (HINT: use the remaining half of the CAT cable for the DATA connector)
17. After checking that everything works as expected, you can fill empty spaces with POXIPOL. You will not be able to make any repair in the future, but the device will be less exposed to mechanical shocks.

The interface will look like in the following picture.



## Using the interface

You need to connect the interface to the PC/notebook using a standard USB(male)/miniUSB(male) cable. Wait for the drivers for the USB/serial module to be installed. If necessary, use the CD provided together with the CAT cable. Check in Computer Management / Device Manager / Ports (Windows XP) to see which port was allocated for the new interface. In the following example is port COM6.

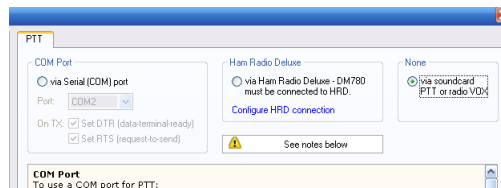Check that the USB sound interface driver is installed too.
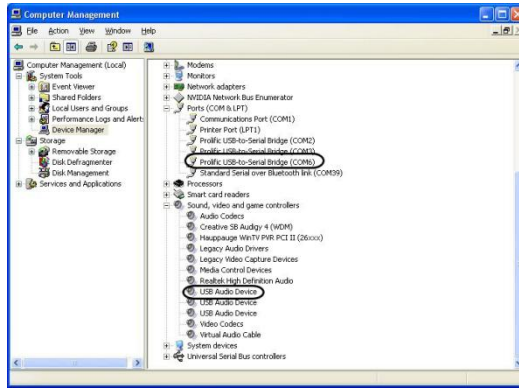
Set in the program of choice for CAT the right COM port for CAT.

Example for Ham Radio Deluxe:
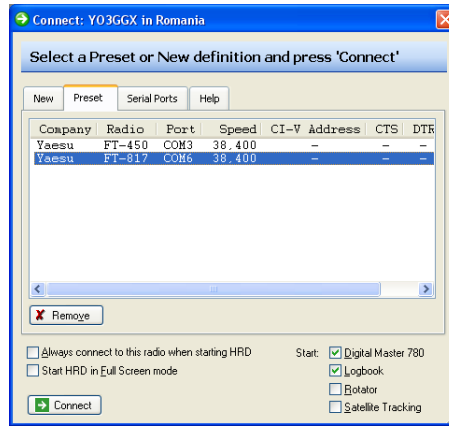


Select in the program of choice for digital modes the right soundcard and the right PTT mode.

Example for Digital Master 780 (Tools > Program Options > PTT):



You are now ready to use your new interface even in portable mode with the little transceiver.

**FT817_DIY_data_modes_interface_v1.0.pdf     -  Bucharest, Nov 17th 2011 – © Dan Toma – YO3GGX – yo3ggx@gmail.com**