

WIRELESS INTERFACE TO FT-847- GENERAL CONSIDERATIONS

This document discusses the general method used to interface between a wireless headset and an FT-847 transceiver.

CONNECTIONS

As the connection to be made is an audio connection for providing two-way voice signals to and from the FT-847 we find we have two methods that can be used.

1. Front Panel - the microphone connector can be used to provide both transmit audio and PTT control. The receive audio can be derived from the headphone socket. Both of these connections are on the front panel of the FT-847 and have front panel controls that alter the level. This is the obvious route.
2. Rear Panel - not so obvious is the fact that the rear panel 'data' connection can be used for voice audio. The levels here are fixed. However, there are some special considerations that need to be addressed for this method as will be discussed below.

The method used will be the rear panel 'data' connection. There are a number of advantages of this approach:

- The levels are fixed for both transmit and receive audio levels. Alteration of the front panel level controls do not alter the data levels.
- It is possible to use the microphone + PTT and the headphone or external speakers inputs and outputs without disconnecting the headset interface. The reverse is not true (using the front panel connectors for the headset interface would require disconnecting the headset interface and connecting the microphone).
- The rear panel data input/output connection has an integrated PTT control which automatically cuts off the microphone on transmit.

DATA INPUT/OUTPUT PTT

The data connection has an integrated PTT control which shares the connection

for data transmit line (audio going into the FT-847). Basically, if you connect a 2.2k ohms resistor between the data transmit line and ground the transmitter will be activated. To prevent the audio source providing an unwanted permanent connection to ground a capacitor is placed in series on the audio source side of the PTT resistor (see FT-847 manual for details).

I found a few issues with this connection:

1. The recommended value of the series capacitor (10uF) is too high and takes too long to charge when releasing the PTT. This results in too long a delay after releasing the PTT for the transceiver to return to receive mode. Also, because the DC level decays slowly, any high level of transmit audio (which shares the line) causes the level to return above the PTT threshold level for a short time resulting in a chattering of the transceiver relays. I have changed this value to 1uF which largely eliminates this problem. I have experimented with a lower value (100n) and found that the required lower voice audio frequencies are still passed. This will be the value used.
2. Unlike the microphone audio input where excessive level causes clipping and/or distortion, too high a level of transmit audio into the data input causes the transceiver to oscillate between TX and RX states. This sounds very much like RF feedback and it took a while before the penny dropped on this. Only after dressing and filtering of leads and looking at the audio lines with an oscilloscope and noting a complete absence of RF did I realise it was **not** RF feedback.

UPSTREAM AUDIO CONNECTION

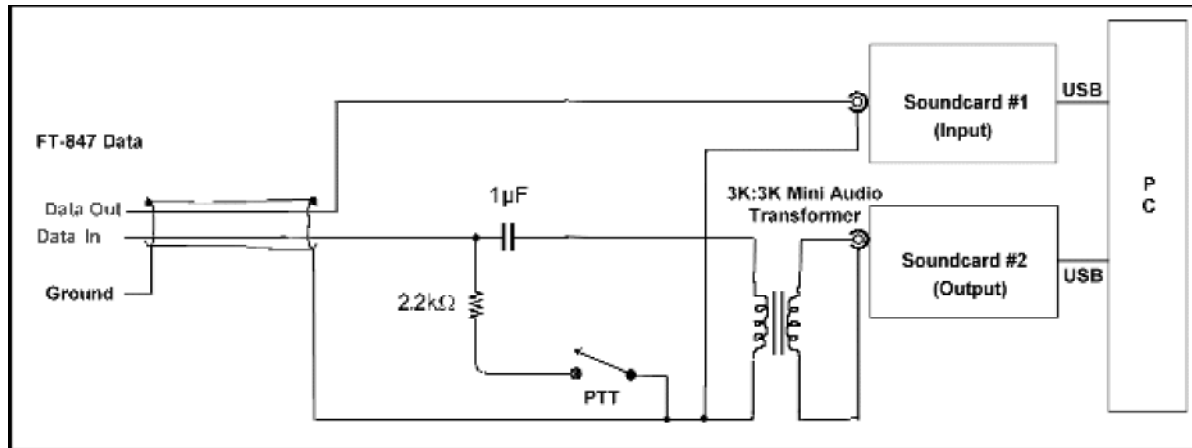
In addition to the wireless headset interface I wanted a PC to have access to the audio (both transmit and receive) in order to provide the following facilities:

- Provide an interface for SSB data modes (PSK31, SSTV, Domino, Jason, etc).
- Allow recording of on-air and off-air signals (voice, data, etc). Of particular importance is the ability to record the 'monitor' audio output of the transceiver for evaluating transmit audio levels and quality of various headsets.
- Allow playing of **voice** audio files through the transmitter (i.e., CQ calls).

This points to integrating the wireless headset connection with a PC soundcard connection.

To allow easy switching between recording and playing of the various sound sources, two separate USB soundcards are used - one for recording/monitoring and one for playing/voice transmit audio.

The following rough sketch shows the general arrangement.



The two soundcards I use are Edirol UA-1EX run in **non**-advanced driver mode (uses XP drivers). Note that I can plug a **wired** headset into this arrangement - the microphone into Soundcard #2 and the headphones into Soundcard #1.

The above arrangement allows the use of SSB digital modes on the PC (need to remember that output and inputs are on separate cards in the digital software set up...).

Now we are ready to try and connect a wireless headset into this arrangement.

This discussed in another document (Configuration #1).