A home brew interface with hardware PTT using a USB to serial adapter

This interface was built with the goal of using a Baofeng or Anytone HT with the "Kenwood style" speaker/mic connection to send email using Winlink and VARA FM. Speed was not a concern so isolation transformers were used. An optoisolator is used for the PTT signal so the computer is completely isolated from the radio.
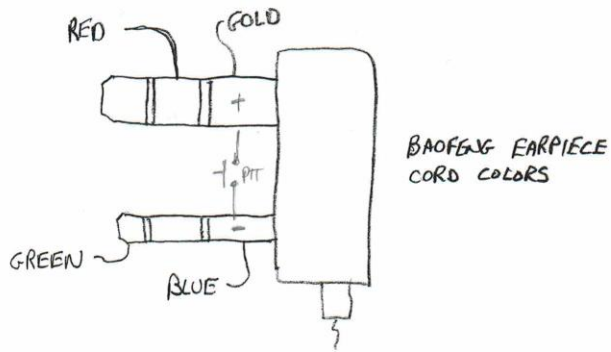
The biggest challenge was dealing with the fact that the speaker and mic for the HT's do not use a common ground. In fact, connecting the speaker and mic grounds together is actually what keys the transmitter. (See the connector diagram) The second challenge is that when VARA FM is configured to use a COM port to trigger PTT, the USB to serial converter signal is inverted (high, low) from what is needed to drive a simple optoisolator. This means something like the low cost Easy Digi interface can't be used right out of the box. So it was time to modify the wheel…. This is my result.

The interface uses two 1:1 isolation transformers for the audio in and out. A super cheap USB sound card is used as an extra level of protection. The PTT signal comes from an FTDI USB to serial converter connected to a second USB port. The converter's VCC jumper is set to 5V. The converter's RTS signal is supplied to a 2N2222 transistor to invert the logic signal to the optoisolator. +5V is supplied by the USB to serial converter to use in the inverter. A 4 pin optoisolator is used but the 6 pin one used in the Easy Digi will also work.
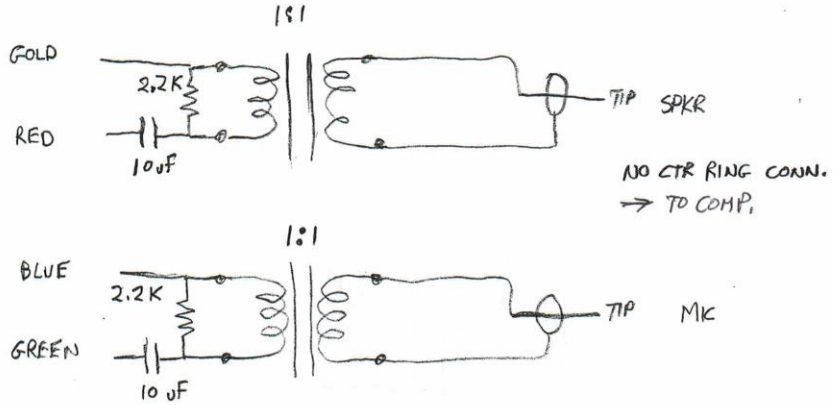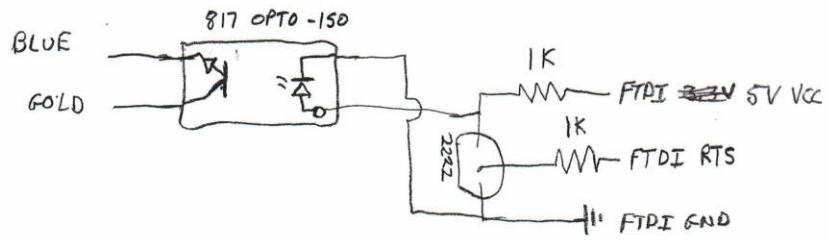
For the dual pin HT connector, an earpiece supplied with a Baofeng was sacrificed. (Pretty useless anyway). The colors on the diagram match the colors of the super fine wires used in the earpiece. The wires are enamel coated extremely fine braids. The enamel burns off easily with a soldering iron. To make them easier to handle and connect, they can be soldered to a 4 pin header. Double check any cable you use and determine its color code! Separate plugs and wires can also be used.
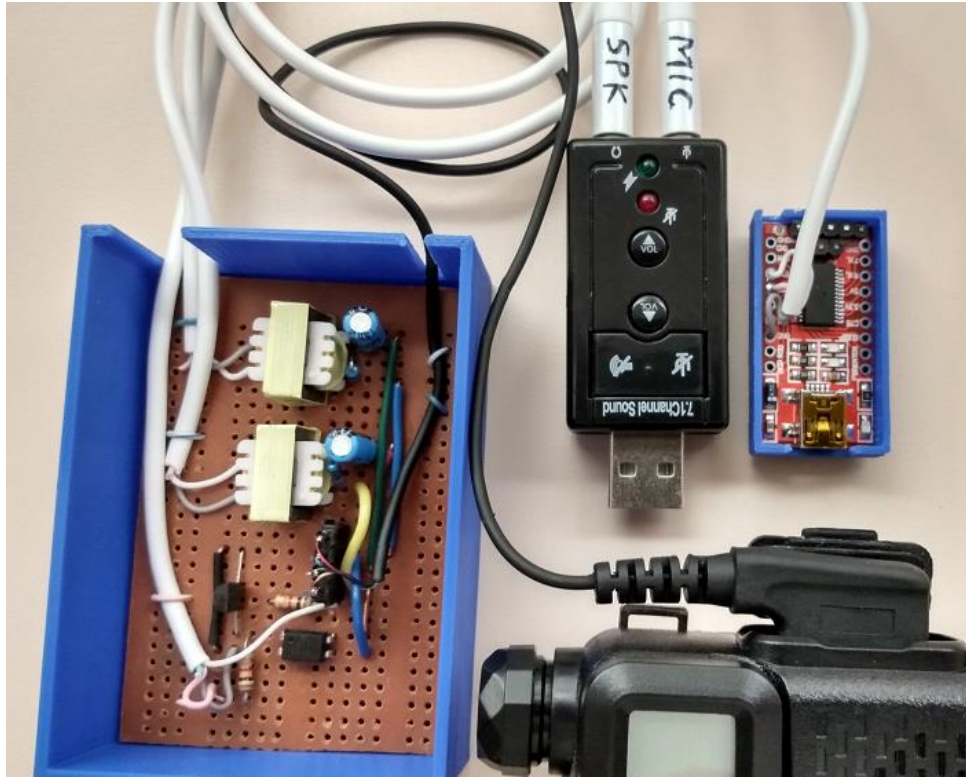
MIC –
Rx Data
PTT

MIC+   +V

SPK+

TX Data

SPK –
PTT
GND Data

Miklor.com

Kenwood style speaker/mic pinout

RED   GOLD

\+

PTT

GREEN

BLUE

BAOFENG EARPIECE
CORD COLORS

GOLD
GREEN
BLUE
RED

817 OPTO -150

BLUE

GOLD

1K
FTDI 3.3V 5V Vcc

1K
FTDI RTS

2.2K

FTDI GND

1:1

GOLD

2.2K

RED

10 uf

TIP SPKR

NO CTR RING CONN.
→ TO COMP.

1:1

BLUE

2.2K

GREEN

10 uF

TIP   MK
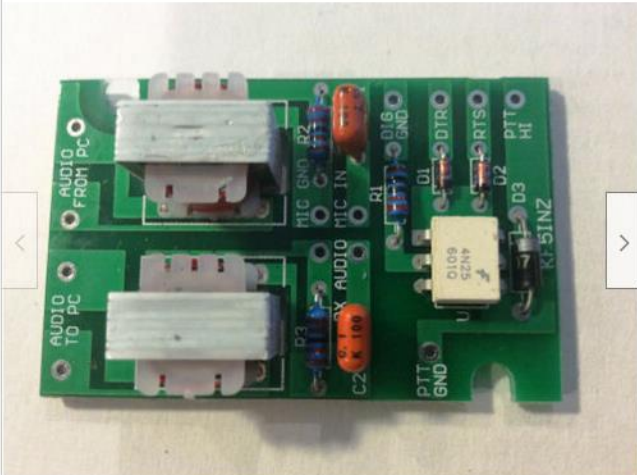
Interface circuit diagram

Completed interface

The Easy Digi kit as sold on eBay. The kit can be used with the addition of the transistor circuit to invert the PTT signal.