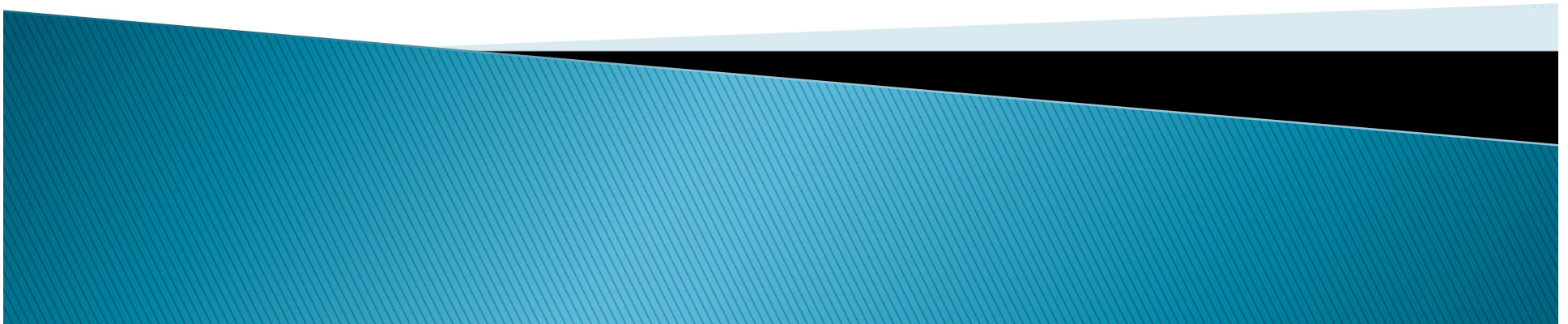


# Rig to Computer HW Interfaces

By Barry Basile KG5IRR  
For the Oak Forest Amateur Radio Club  
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# Purpose

- ▶ There has been quite an interest in ham radio digital modes and computer applications like APRS, SSTV, WSJT-X and Winlink. There seems to be plethora of presentations on the configuration and use of these applications.
- ▶ Getting your rig successfully connected to the computer is a serious stumbling block for many hams. This presentation is intended to offer some help in this regard.

# TNC Evolution – a little history

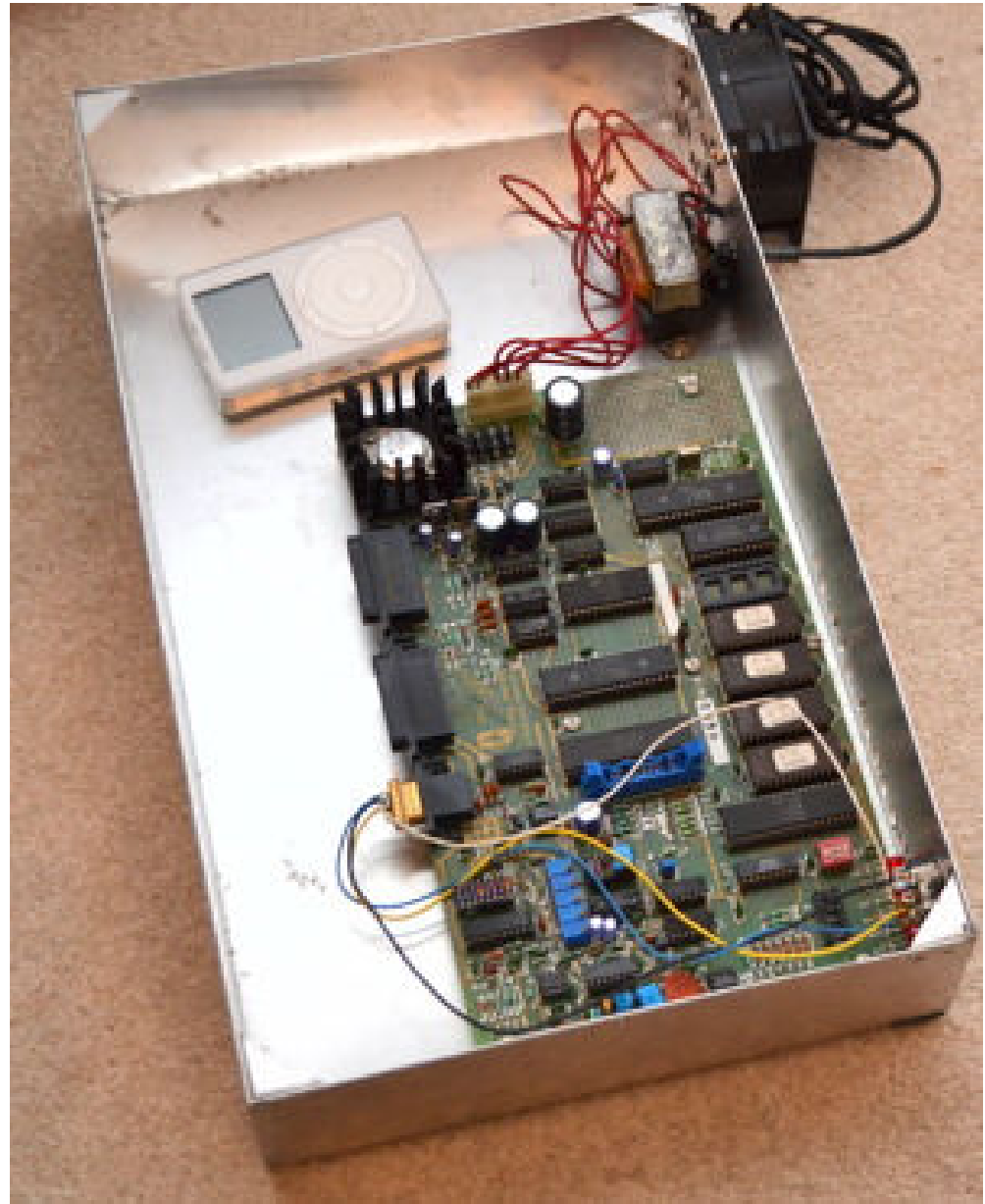
- ▶ Amateur Radio Terminal Node Controllers (TNCs) were first developed around 1978, in Canada, by the Montreal Amateur Radio Club
- ▶ TAPR picked up the torch in 1983 and created the TNC-1 and TNC-2 designs.
- ▶ Today, TNCs are most often implemented in software using standard sound card chips to implement a major portion of the modem function.

# What does a TNC do?

- ▶ Implements the AX.25 protocol using a microprocessor
- ▶ User interaction is via a dumb terminal
- ▶ Supports a text-only bulletin board system
- ▶ The microprocessor formats the messages into packets, serializes them and passes them through a modulator (AFSK) to be sent to a transceiver
- ▶ Received signals are demodulated, the data unformatted, and the output sent to the terminal for display

# The TNC-1

- ▶ Sold as a kit in 1983
- ▶ \$350 without chassis
- ▶ Sold by Heathkit initially
- ▶ Later marketed by Kantronics called the KPC



# The TNC-2

- ▶ Sold as a kit in 1985
- ▶ \$250 with enclosure
- ▶ Was licensed to AEA, MFJ, DRSI, and PacComm
- ▶ Sold for \$130 in 1990



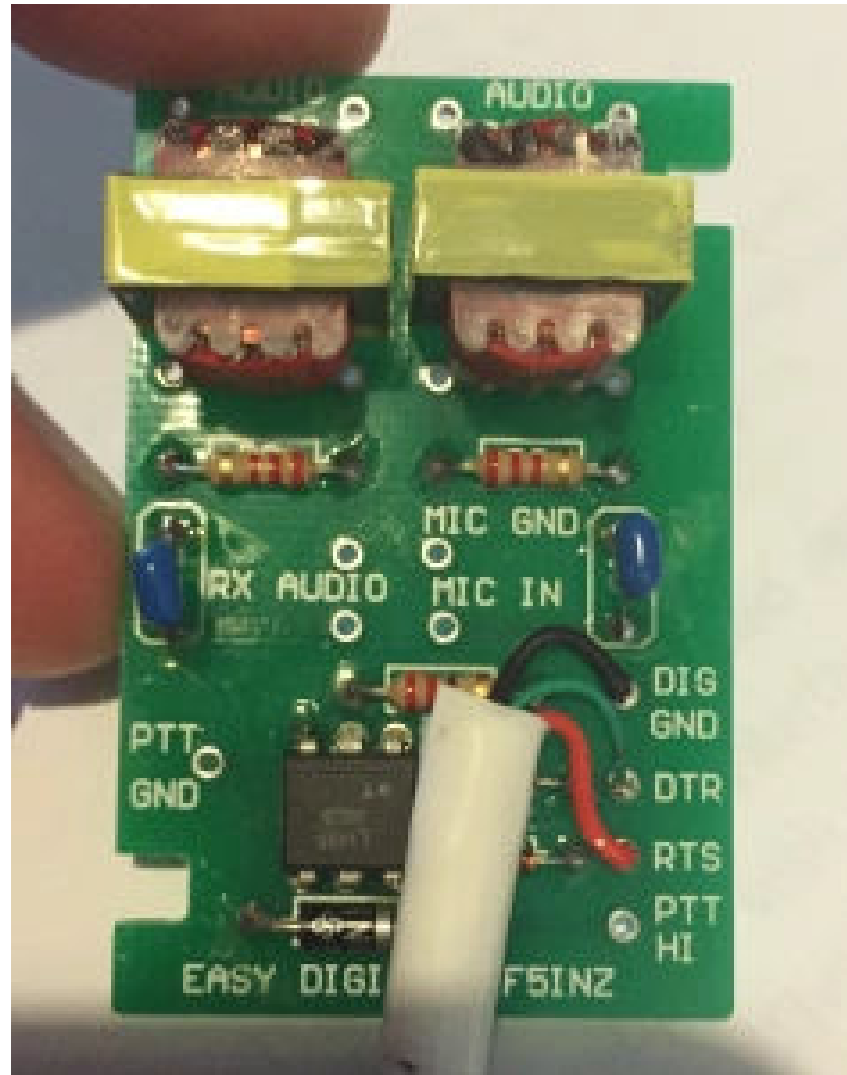
# The Modern Implementation

## What you'll need...

- ▶ Isolation between Rig and computer
- ▶ Sound card
- ▶ Some way to control Push-To-Talk (PTT) signal
- ▶ Cables with appropriate connectors

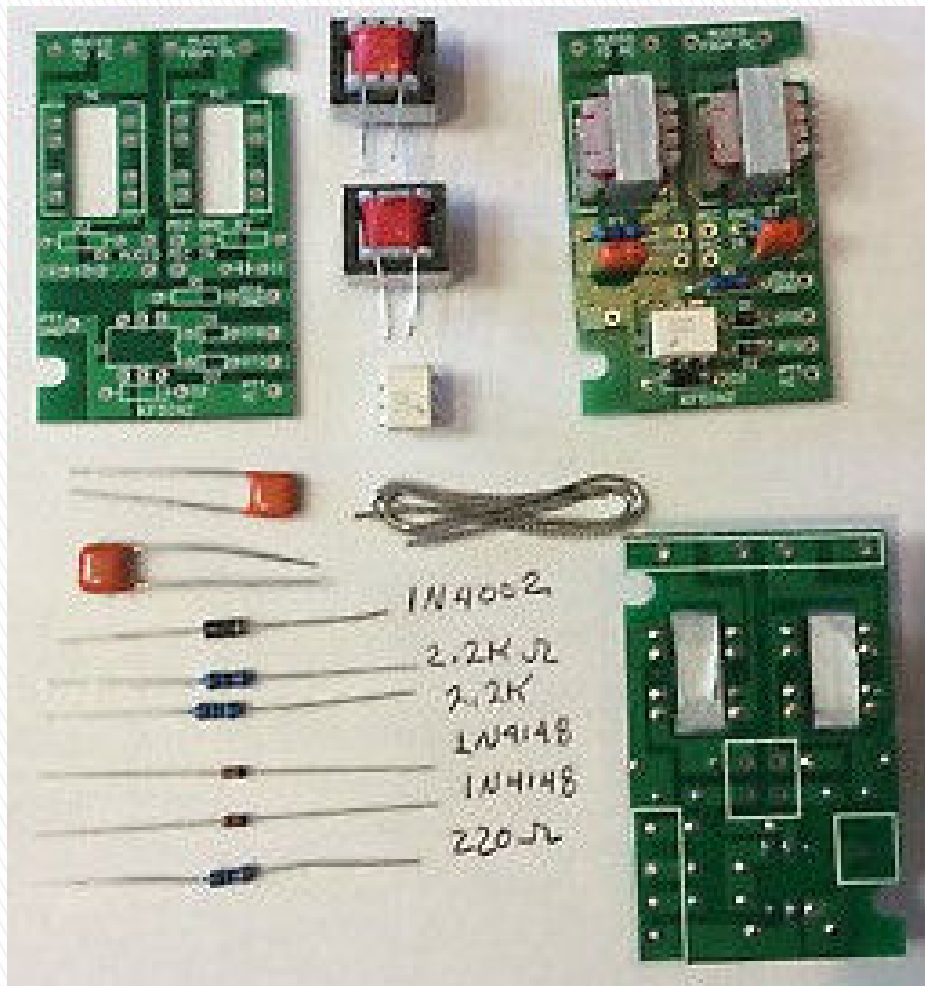
# Easy-Digi by KF5INZ

- ▶ Does the isolation part
- ▶ Available assembled (\$10) and in kit form (\$7.50)





# Easy-Digi - 2 pak as kit



- ▶ Available on ebay, goes for ~\$15
- ▶ Should be about 15 minutes of soldering

# The Sound Card

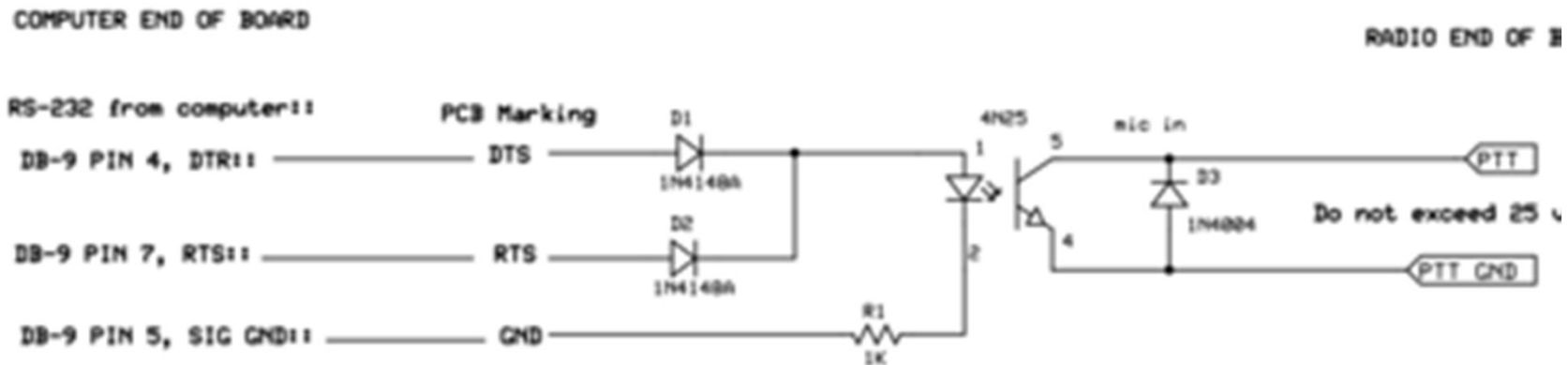
- ▶ Ex. Syba external USB Stereo Sound Adapter for Windows, Mac, Linux (\$11)



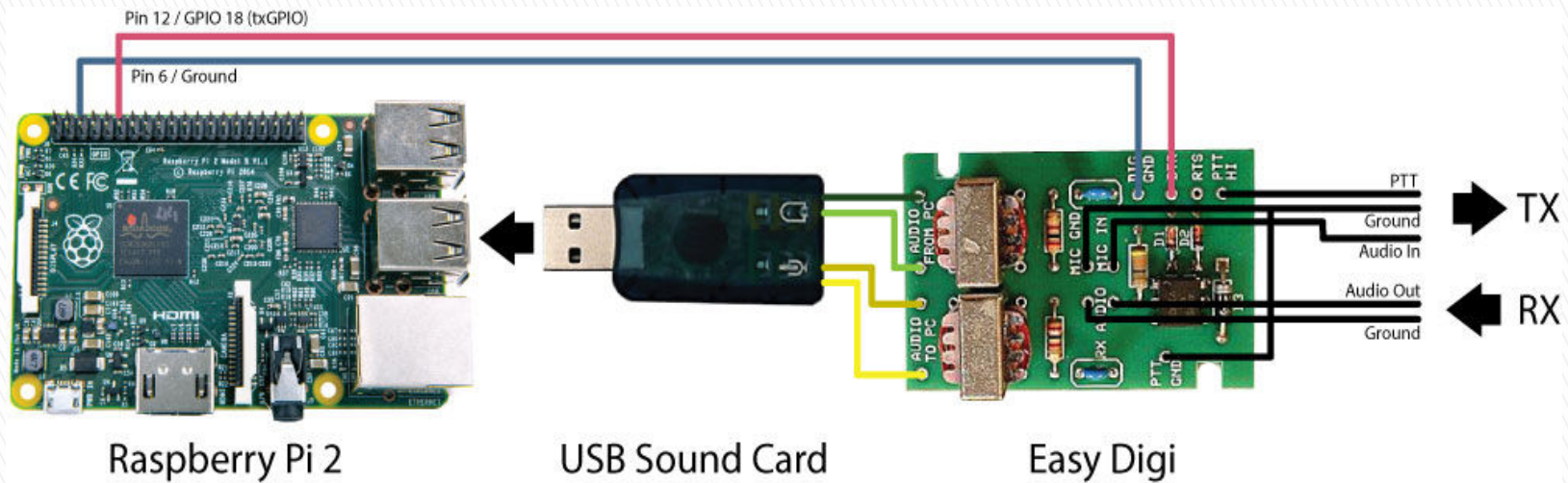
“This is a Superb solution for a sound card for Ham Radio software/projects either in Windows or Linux.”  
Hasan al-Basri – NOAN

# PTT interface

- ▶ Will need an extra port on your computer
- ▶ Can be a native GPIO or RS232 port
- ▶ Expensive way - use an USB to RS232 adapter (~\$20)
- ▶ Easy-Digi circuit expects 5V levels
- ▶ Use speaker wire for hookup if needed



# Basic Interface to RPI

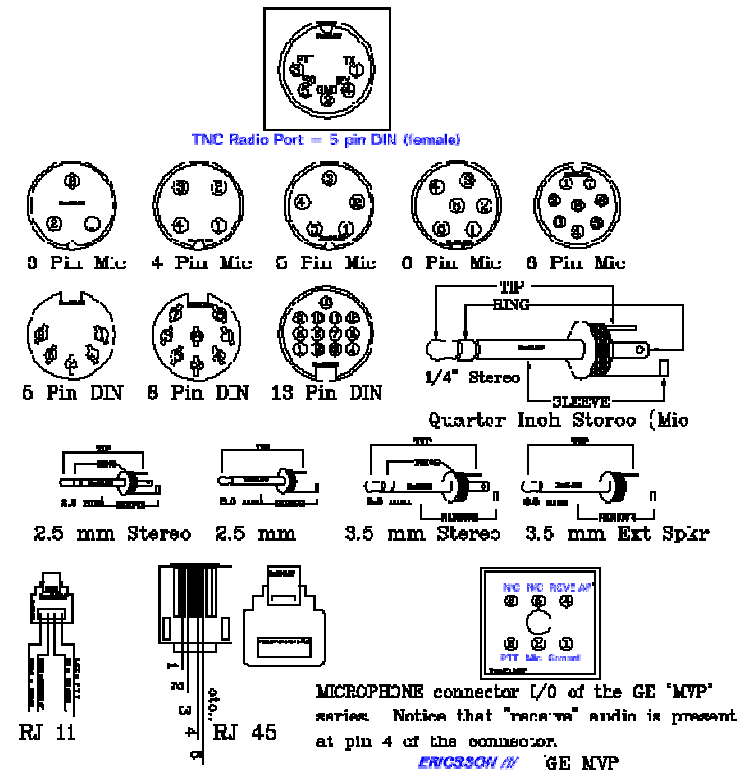


# Cables for Audio

- ▶ For audio interfaces to sound card, buy a 3 foot stereo 3.5 mm male to male cable
- ▶ Cut it in half
- ▶ Strip the wires to make connections to easy-digi
- ▶ Available from Walmart for \$2.00
- ▶ Search for: SF Cable 3.5mm M/M Slim Stereo Audio Cable, 3 feet

# Cables for Your Rig

- ▶ This might be challenging...
- ▶ You might want to start here:
- ▶ [http://ohiopacket.org/files/wiring\\_diagrams/web.archive.org/web/20000902104029/www.packetradio.org/tnc2rad.htm](http://ohiopacket.org/files/wiring_diagrams/web.archive.org/web/20000902104029/www.packetradio.org/tnc2rad.htm)

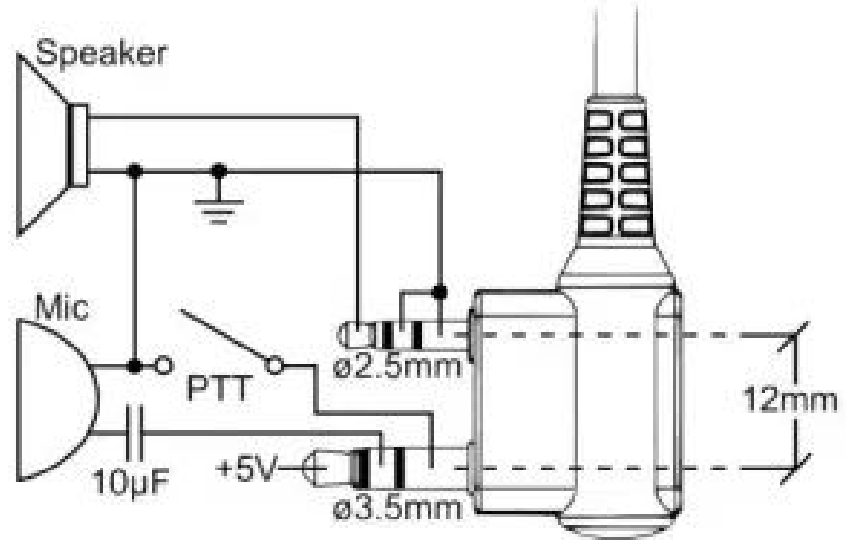


# Many of us have HTs that use a “Kenwood” Interface

## Accessory jack

The accessory jack on the Baofeng UV-5R is a Kenwood compatible two(2)-pin design.

Figure 2.4. Typical 2 pin Kenwood headset configuration.



The Kenwood 2-pin connector has one 3.5mm TRS plug, and one 2.5mm TS plug, spaced 12mm apart.

# A Speaker Mic Accessory Hack

BAOFENG Speaker MIC for  
BAOFENG UV-5R 5RA 5RB  
5RC 5RD 5RE 5REPLUS  
3R+ 5R EX, 5RX3

~\$9 amazon prime

- Cut off the speaker mic,
- Strip wires and
- Hook up to easy-digi transformers



Roll over image to zoom in



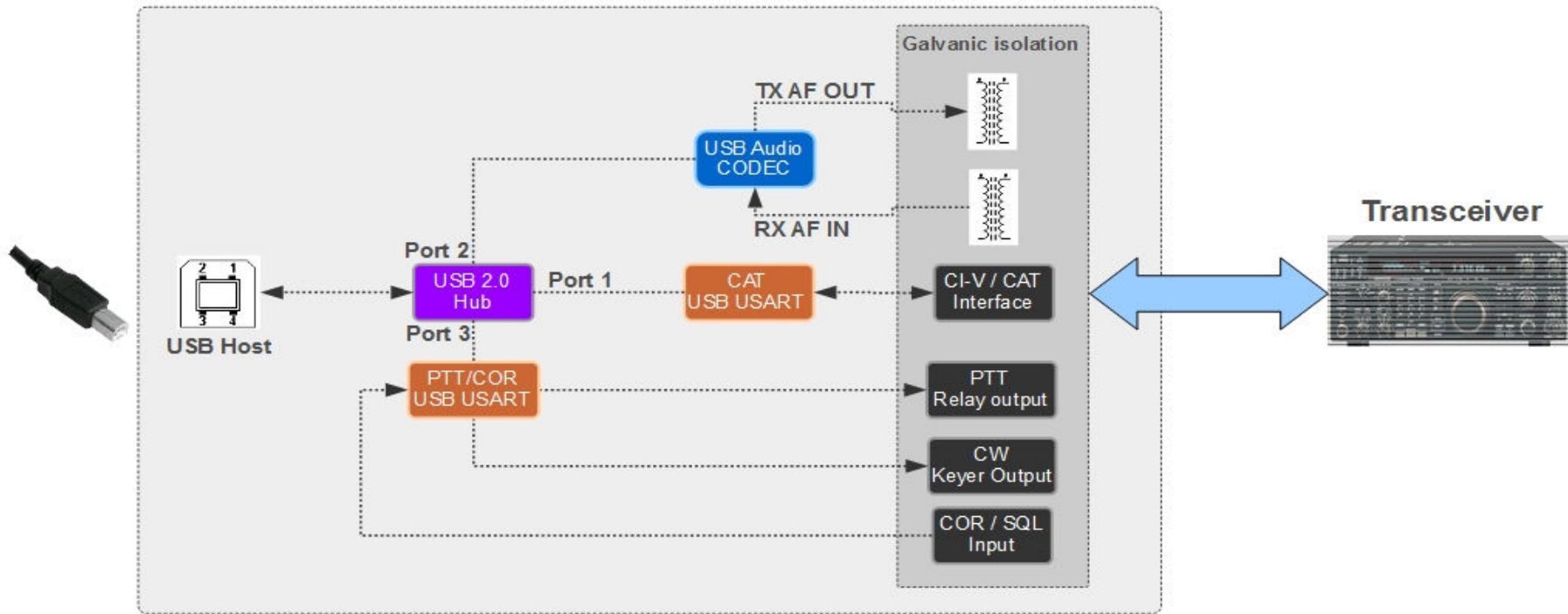
# Signalink Overview



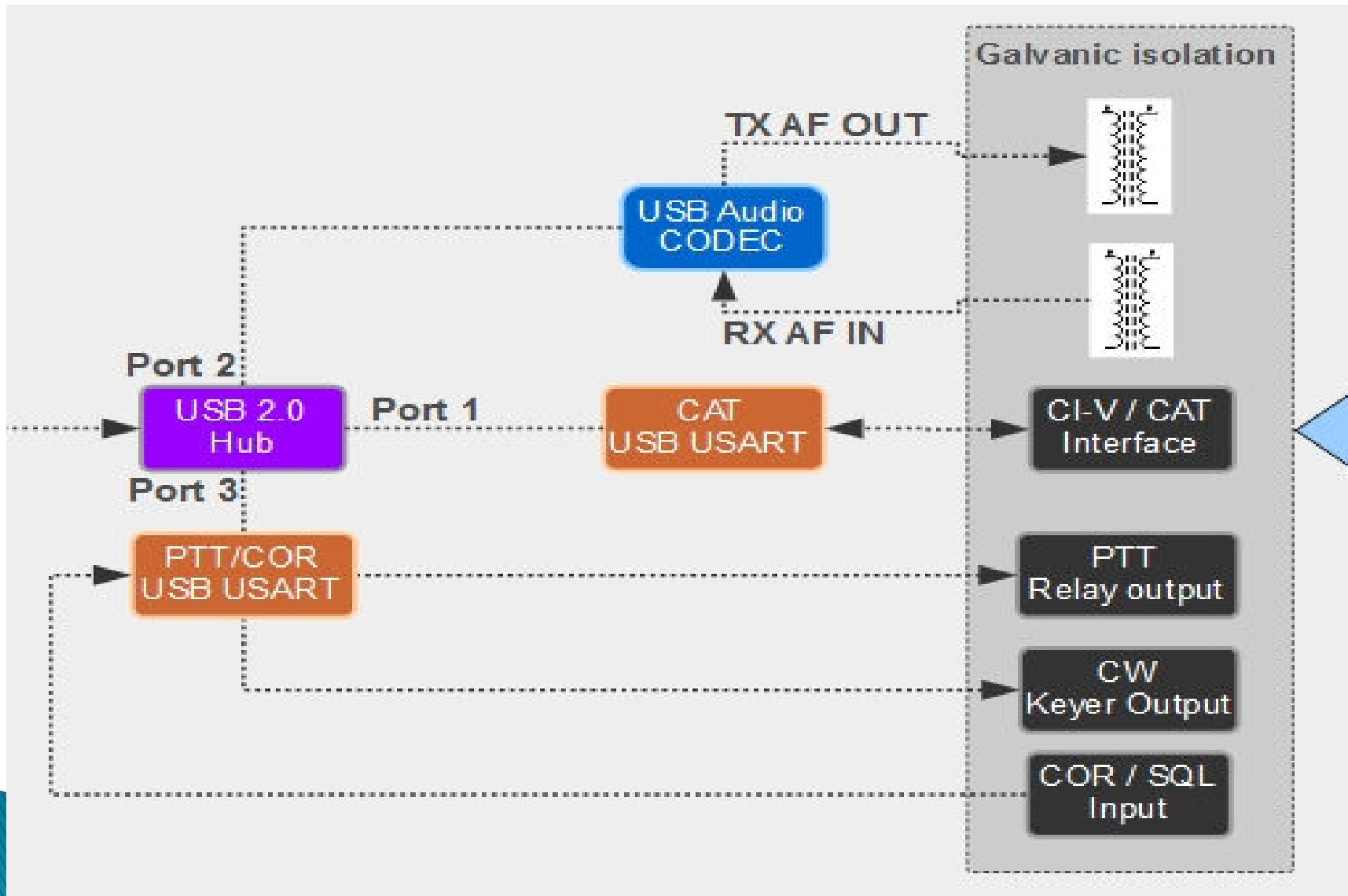
- Is fundamentally a sound card connected to computer over USB
- Provides isolation
- Uses a VOX circuit to control Rig PTT switch
- Rig interface is through RJ45 connector
- Uses 16-pin socket for configuring/wiring
- Cost ~\$120
- Plenty of pre-wired cables available for popular Rigs ~\$25

# TinyGate Architecture





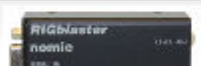

*TinyGate - USB Interface for Digital Modes*



# TinyGate Architecture (2)



# West Mountain Radio Offerings

Model		Radio Compatibility <sup>?</sup>	Digital Sound Source <sup>?</sup>	Computer Interface <sup>?</sup>	Built-in Rig Control <sup>?</sup>	True Keyed CW <sup>?</sup>	Price	Buy
RIGblaster Advantage		All Manufacturers	RIGblaster	USB	CIV, CAT or RS232	<input checked="" type="checkbox"/>	\$209.95	<a href="#">Pre-Order</a>
RIGblaster DXpro		All Manufacturers	RIGblaster (Dual RX Codecs)	USB	CIV, CAT or RS232	<input checked="" type="checkbox"/>	\$299.95	<a href="#">Buy Now</a>
RIGblaster Blue with Bluetooth® Wireless Technology		All Manufacturers	Bluetooth® Wireless Technology	Bluetooth® Wireless Technology	CIV, CAT or RS232		\$229.95	<a href="#">Buy Now</a>
RIGblaster Plug & Play		Specific Models	PC	USB	CIV or CAT	<input checked="" type="checkbox"/>	\$119.95	<a href="#">Buy Now</a>
RIGblaster Nomic		All Manufacturers	PC	USB or RS232			\$69.95	<a href="#">Buy Now</a>
RIGtalk (rig control only)		Specific Models	None	USB	<input checked="" type="checkbox"/>		\$34.95	<a href="#">Buy Now</a>

I think Ralph was describing the “Nomic” which is functionally equivalent to easy-digi but includes cables  
-KG5IRR