

SoundCards & Serial Ports

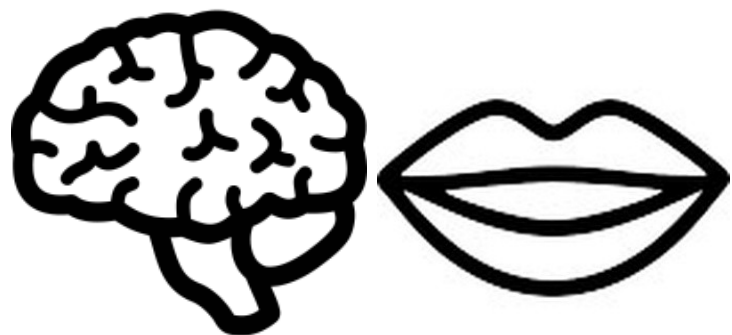
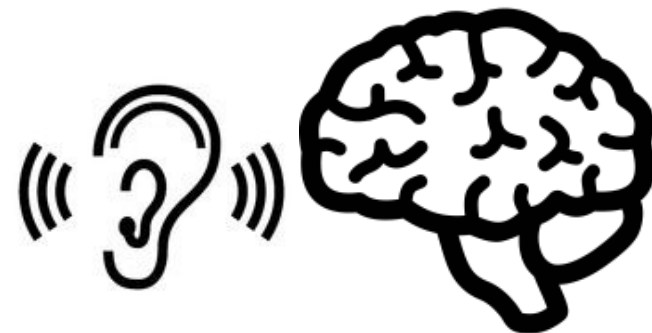
Knowledge for Digital Amateur Radio

W7OWO

Traditional Radio



Traditional Radio Breakdown



Digital Receiving



- Received signals on radio are converted from RF to AF
- Speaker on radio transmits sounds to microphone on computer
- Computer software decodes the sounds to text.

Digital Transmitting



- Computer software converts text to audio tones
- Speaker on computer transmits sounds to microphone on radio
- Radio converts audio into RF which is transmitted

Actual Equipment

- Radio and SoundCard Modem



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- Radio with Built-In SoundCard Modem



Connections

Radio and Modem

- Soundcard Modem provides the speaker and Microphone functions.
 - USB cable between SoundCard and Computer for digital connection
- Soundcard Modem converts digital to sound and also sound to digital
 - Control cable between soundcard modem and radio for audio using either:
 - microphone jack and headphone
 - microphone jack only if radio supports speaker mic
 - Data or accessory port on back of radio

Radio with Built-In Soundcard Modem

- USB connection to between radio and Computer.
 - USB connection manages the digital communications to the internal soundcard, also can provide a conduit for Radio Control Commands like Push-To-Talk
 - Can appear as both a separate SoundCard and Serial connection for the Radio Control.

Connections

- What about radio control codes for SoundCard Modem?
 - Signlink has built in VOX circuitry
 - Others may require separate Control cable.
 - Via either an USB connection that appears to the computer as a serial port.
 - Or, a true DB9/DB25 serial cable connection to a serial IO port on the computer if RIG control other than Push-to-Talk is needed.
 - Or, may replace the Microphone cable to the radio if PTT is the only Rig Control that is performed
 - Many may provide a microphone connection on the modem and allow a pass through mode when not in digital mode.

Connections- TNC's

Physical TNC

- TNC's can be combined with soundcard modems, or need to be paired with a soundcard modem.
- Provides Telnet Server for software to communicate with using serial protocols for communication.
- Also provides the Packet / PACTOR protocols of data packages.

Virtual TNC

- Software residing on PC that is paired with a soundcard on the PC.
- Provides a Telnet server for software to communicate with using TCP (KISS) protocols.
- Also provides the Packet / WINMOR / AARDOP / VARA protocols of data packages. Different Virtual TNC programs for different protocols.
 - Push-to-Talk and/or Radio control may be required for a separate connection to radio if soundcard doesn't support it via VOX.

DEMO

- **Sound Devices**

- Show Properties
 - Renaming Device
 - Levels
 - Decibals vs Percentage
 - Enhancement
 - None!
- Advanced
 - Sample Size
 - Higher sample sizes allow for more dynamic range - louder lounds and softer softs.
 - Sample Frequency
 - Higher sampling rates allow a digital recording to accurately record higher frequencies of sound
 - Spatial Sound
 - Off!

- **Serial Ports**

- Device Manager
 - Can Only Edit with Administrator Rights
- View -> Show Hidden Devices
- Ports (COM & LPT)
 - Properties
 - Port Settings
 - Only necessary if software doesn't change or over ride the current settings.

Winlink Express Configuration

- Packet Using Sound Modem

WINMOR TNC BasicSetup

Core Setup

The TCPIP port number must be set here.

Base TCPIP Port#:

TCP Address:

☐ Start WINMOR TNC Minimized

☒ Enable WM TNC debug logging

☐ Enable Command Trace

Extended Setup

These parameters are also stored in the WINMOR TNC ini file but may be changed by the host program.

My Call sign: My Grid Square:

Registration Key (optional):

Sound Card Capture Device:

Sound Card Playback Device:

WINMOR

Packet Winlink/P2P Setup

TNC Connection

Packet TNC Type:

Packet TNC Model:

Serial Port: AutoConnect Time:

TCP Host/Port:

☐ If Auto Connect is enabled, open session when Winlink Express is started

Virtual KISS TNC:

Settings

Sound Card

Output device:

Input device:

☐ Dual channel TX SampleRate:

☒ TX rotation TX corr. PPM:

☒ Single channel output RX SampleRate:

☒ Color waterfall RX corr. PPM:

☒ Stop waterfall on minimize Priority:

Server setup

AGWPE Server Port: ☐ Enabled

KISS Server Port: ☒ Enabled

PTT Port

Select PTT port: ☐ Dual PTT

☐ Swap COM pins for PTT