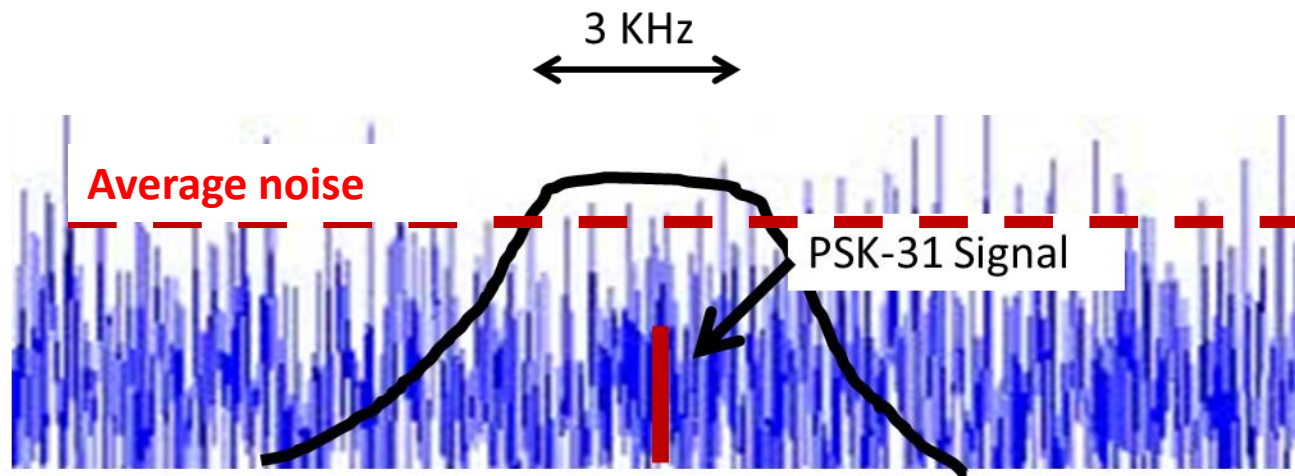# PSK-31

Presentation
to the
Inland Empire VHF club
November 10, 2011

What is PSK 31?

- **It is a digital Mode**
- **Text, ASCII transmission**
- **Narrow Bandwidth (PSK 31Hz)**
- **Low power - less than 25 watts**
- **Outperforms Teletype and Packet**
- **Low cost interface**
- **Simple to use**

The narrowest SSB Signal

The normal SSBsignal bandwidth compareds to a PSK-31 signal
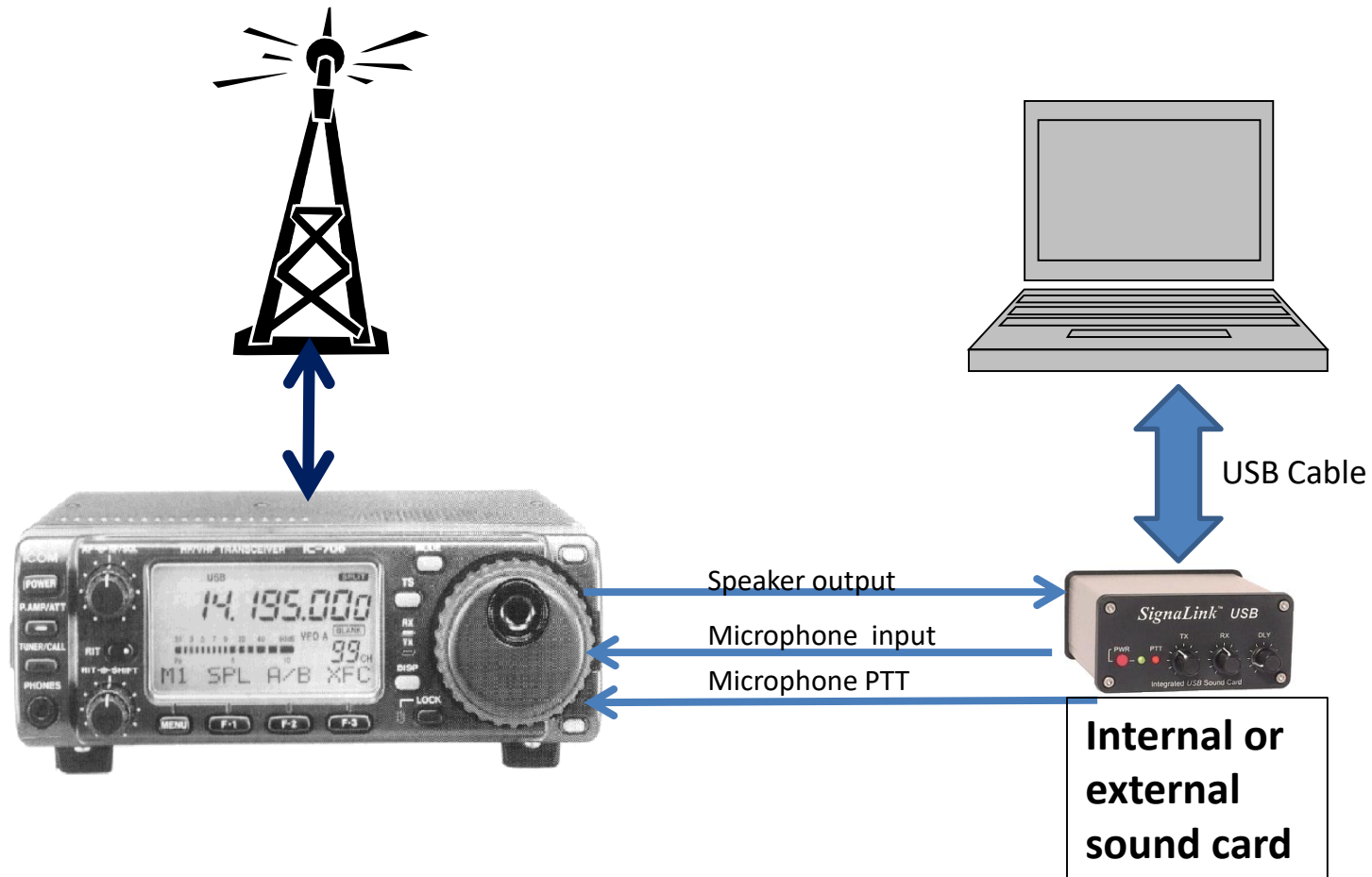
Bandwidth vs. Signal to Noise

- **Using a narrow bandwidth removes un wanted signals an noise**
- **This allows for improved (higher) signal to noise ratio on the received signal.**
- **Because of the narrow bandwidth signals that would normally be lost in the noise can be received clearly.**
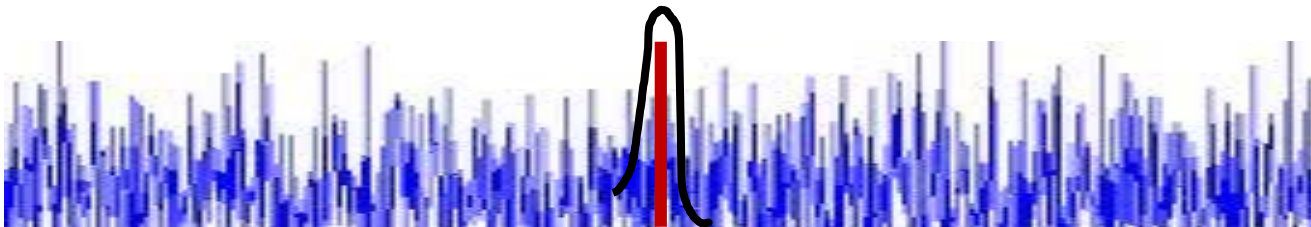
Why use PSK-31

- **Useable well into the noise of SSB.**
- **Use an available radio and any computer.**
- **Use low power and normal antenna.**
- **Uses very little bandwidth.**
- **Free software on the internet.**
- **Can be used on all bands and satellite.**
- **Simple setup and operation.**

Simple to Set Up And Use

Speaker output

Microphone input

Microphone PTT

USB Cable

SignaLink™ USB

Internal or external sound card

What Kind of Signal is it?

- **PSK-31 uses special CW characters.**
- **Most used letters have the shortest code.**
- **Lower case letters type faster.**
- **Frequency shift keying (FSK) is used.**
- **Signal uses about 15 Hz of bandwidth.**
- **Communication rate is about 3 characters per second.**

What Does it Sound Like?

- Each signal sounds like a single tone.

- Each tone warbles $\pm$ 15 Hz.

- Your SSB Receiver can receive many PSK-31 stations at the same time.

- You will hear all the stations at once if you turn op the receive volume.

- The computer and software pick out the station you want to work

Set & Forget Your Radio

- Set your radio to the established frequency

- Use USB regardless of band

- Turn off all filters, compression and DSP functions and let the computer and software do these functions.

- PSK-31 software acts like a digital signal processor(DSP)

Digital frequencies

BAND	PSK-31	SSTV	RTTY	ASCII	MFSK
160 Meters	1.812	1.981	1.812	1.812	1.812
80 Meters	3.580	3.845	3.580	3.580	3.580
40 Meters	7.070	7.228	7.080	7.080	7.073
30 Meters	10.137	-----------	10.130	10.130	10.130
20 Meters	14.070	14.230	14.080	14.080	14.073
17 Meters	18.100	-----------	18.100	18.100	18.104
15 Meters	21.070	21.340	21.080	21.080	21.073
12 Meters	24.925	-----------	24.920	24.920	24.925
10 Meters	27.120	28.680	28.080	28.080	28.080

How is PSK 31 Tuned

- **PSK-31 is a continuous carrier signal.**
- **Use spectrum/waterfall display for tuning.**
- **Left mouse click sets receiving frequency.**
- **Right mouse click sets transmit frequency.**
- **Computer displays frequency above transceiver setting.**
- **Listening is unnecessary.**

The PSK-31 Screen

The Receive Text Area

The Transmit Text Area

The Control and Mode Setting Area

The Spectrum Display Area

The Waterfall Display Area

How many stations at once?

- **All within a 3000Hz Bandwidth**
- **Each PSK-31 signal requires about 100Hz allowing for ample signal separation**
- **30 stations visible (3000/100= 30)**

How is the TX Signal Generated?

- **The Computer generates an audio tone using its sound card (or external modem).**

- **The audio tone is sent to the SSB transmitters microphone input.**

- **The transmitter output frequency is the carrier frequency setting + the audio tone frequency.**

- **Microphone gain is adjusted down for a maximum of 25 watts output.**

Why Such Low Power?

- **You are transmitting a CW carrier signal full time.**

- **The narrow band signal has to be low distortion.**

- **The use of high power produces distortion and Spurious over entire band**
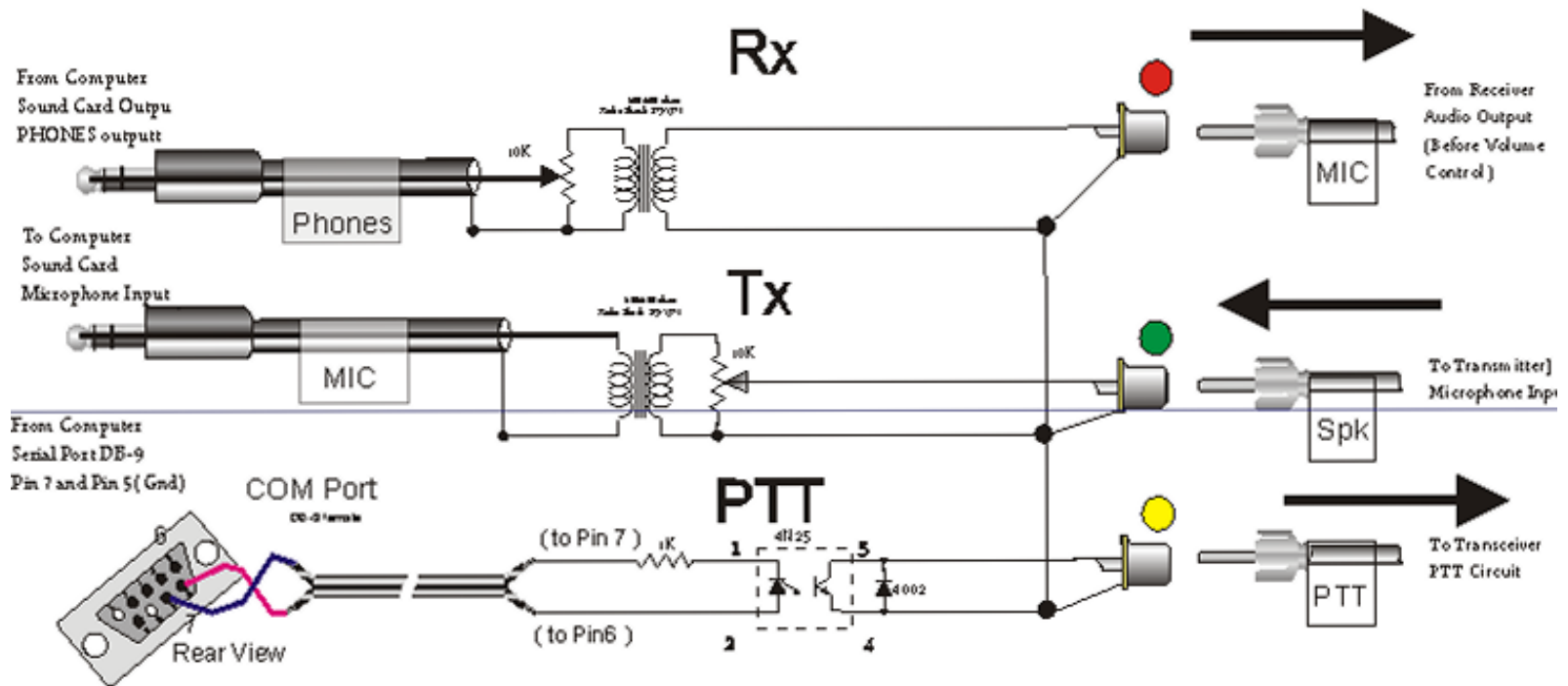
The PSK-31 Display

- **Requires Pentium II or better with color VGA Monitor.**

- **Standard sound card (or modem).**

- **A mouse.**

- **Software (available free)**
  - **DigiPan**
  - **HamScope**
  - **WINPSK**
  - **W1SQLPSK**

Sound Card Adapter

Available from

- **Home Brew**
- **Rigbladster**
- **Tigertronics**
- **MFJ**

Home Brew Wiring Diagram

HF Rig Requirements

- **160 thru 10 Meters (or the bands you want to work).**

- **Always use USB, even below 10 MHz.**

- **Use under 25 watt (on a 100watt transceiver).**

- **Digital tuning (preferably synthesized) tuning necessary for frequency stability.**

- **On VHF and UHF Audio Frequency Shift Keying (AFSK) is used.**

Other Digital Modes

- **QPSK, BPSK, MFSK**

- **PSK-64**

- **RTTY, MMTY**

- **SSTV, MMSSTV**

- **Hellscreiber**

- **CW**

- **Packet**

On The Web

Free Software down load sites:

www.qsl.net/hamscope

www.digipan.net

http://hamsoft.ca/

Questions?