



Keyboarding on HF

by

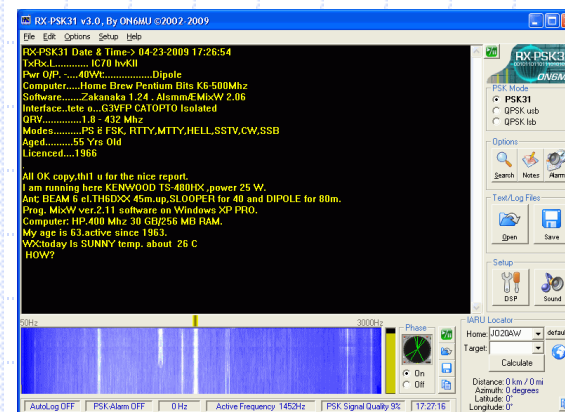
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What is it?

- ◆ Texting or IM'ing via Amateur Radio
- ◆ Utilizes Digital Signal Processing Technology
- ◆ Simple Inexpensive Interface (no TNC needed)
- ◆ Performance Similar to CW, but easier
- ◆ Usually Implemented in Software
 - Reduces Cost
 - Easy to Update
 - Most S/W is free



(*) <http://users.belgacom.net/hamradio/rxpsk31.htm>

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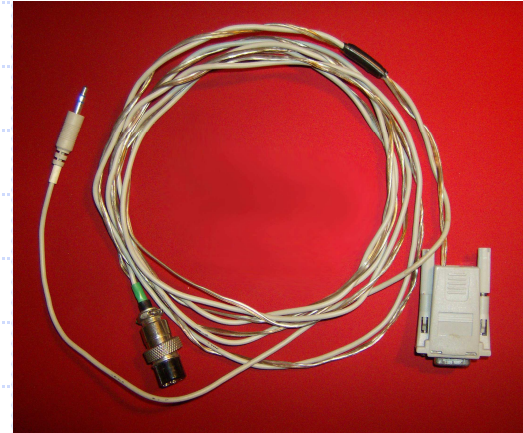
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What do you need?

- ◆ A SSB HF Transceiver
- ◆ An Interface cable
 - Simple homemade
 - Purchased, more rugged
- ◆ A Computer with a Sound Card
- ◆ Software

(1)



(2)



(1) Photo by KN6QI

(2) www.unifiedmicro.com/sci6.htm

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How does it work?



- ◆ Digital Signal Processing (DSP)
- ◆ Works with Audio Frequencies
- ◆ Encodes/Decodes
- ◆ Software

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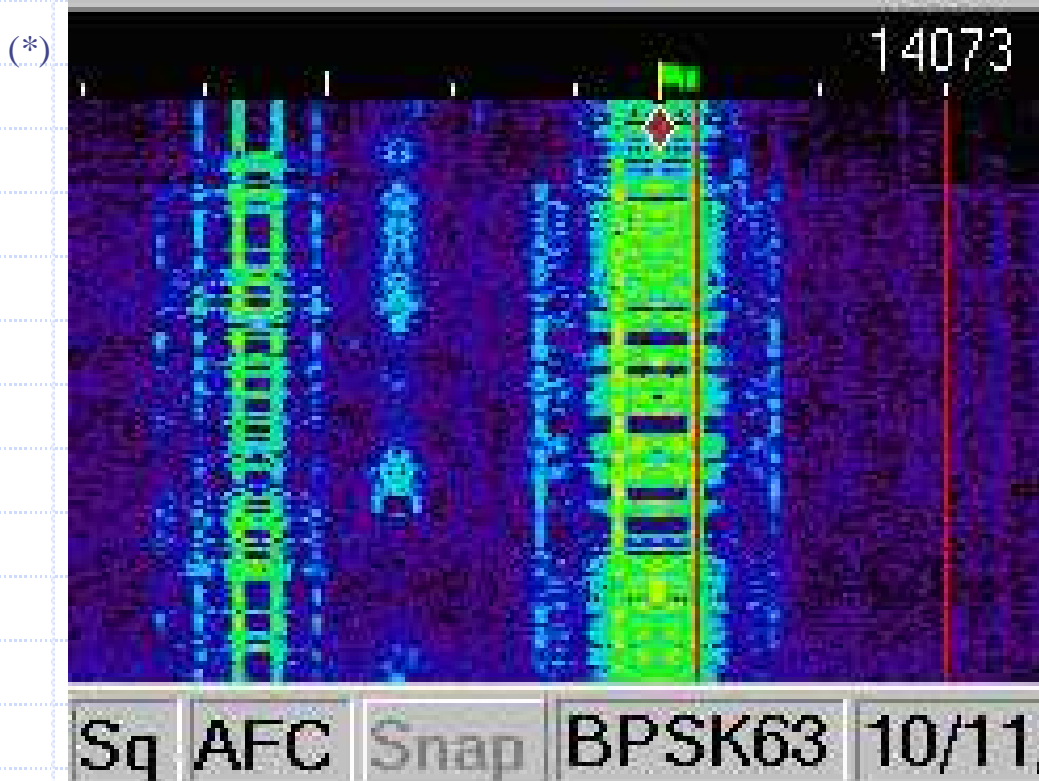


Keyboard Modes

- ◆ PSK 31 – Two Phases, 31Hz (most popular)
 - QPSK, PSK63, PSK125, etc. 
- ◆ MFSK 16 – Sixteen FSK Channels
 - MFSK 8, MFSK 32 
- ◆ More Modes:
 - RTTY 
 - MFSK 8, MFSK 16



PSK31 and PSK63 Comparison



(*) www.mymorninglight.org/ham/psk.htm

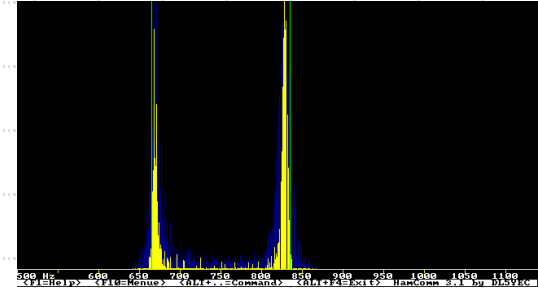
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RTTY

(*)



- ◆ Devised for hardware filters and detectors
- ◆ Encoded as two tones (Mark/Space)
- ◆ Tones are 170Hz apart
- ◆ Data Rate is 45 baud
- ◆ Uses 250-300Hz of bandwidth

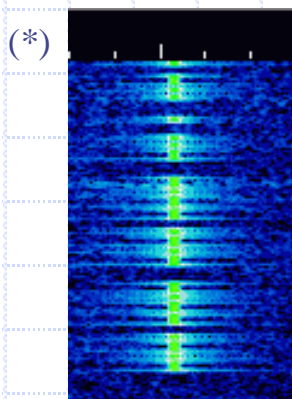
(*) www.valbrembanaweb.it/gor/IZ2DPZ/HC31/hc1.htm

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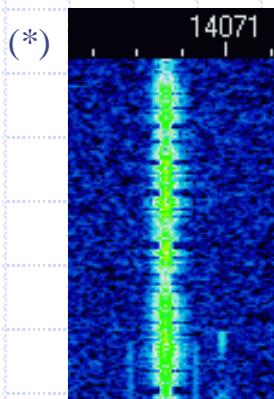
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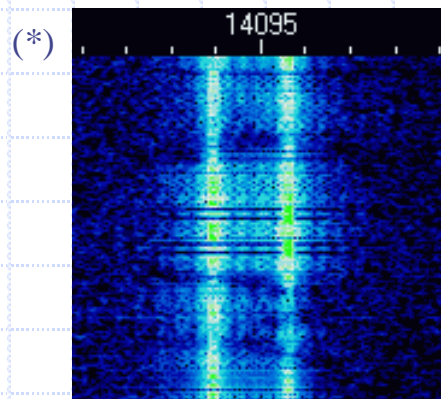
CW vs. PSK31 vs. RTTY



CW



PSK31



RTTY

<http://www.k7ea.com/psk232r.html>

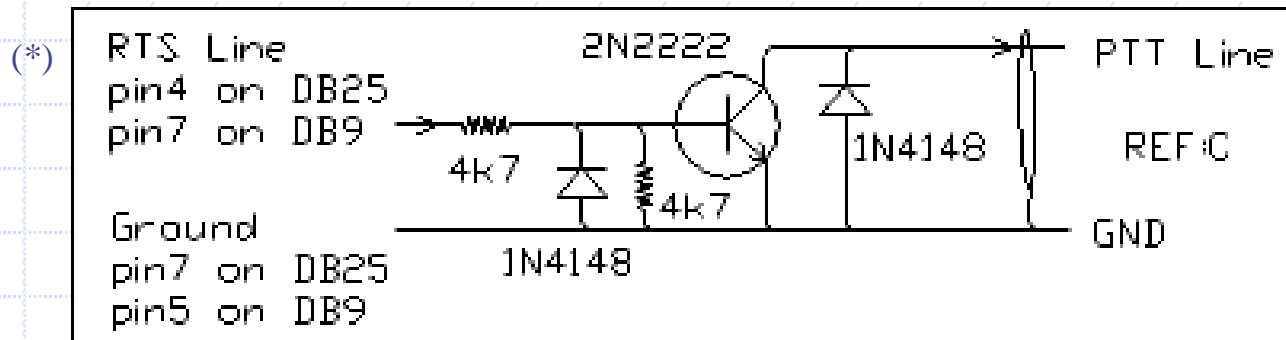
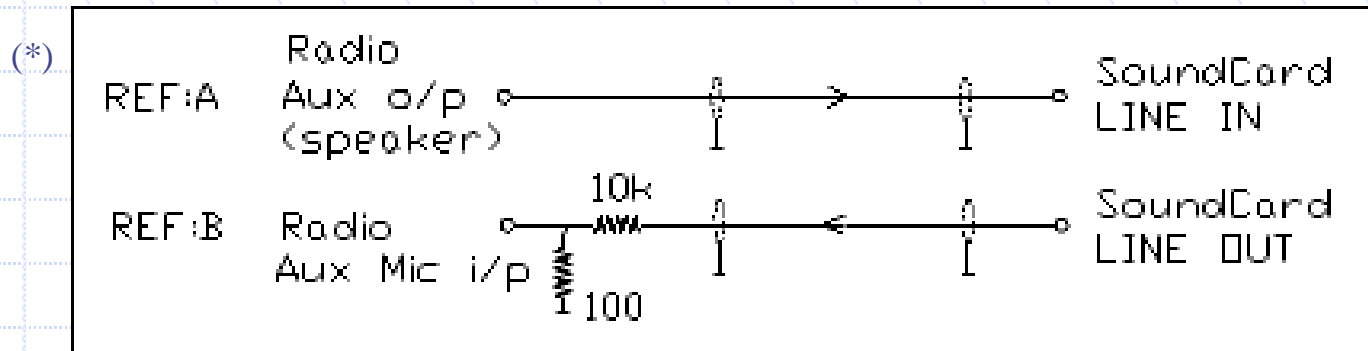
(*) www.k7ea.com/psk232r.html

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Simple PSK 31 Interface



(*) www.w5bbr.com/soundbd.html

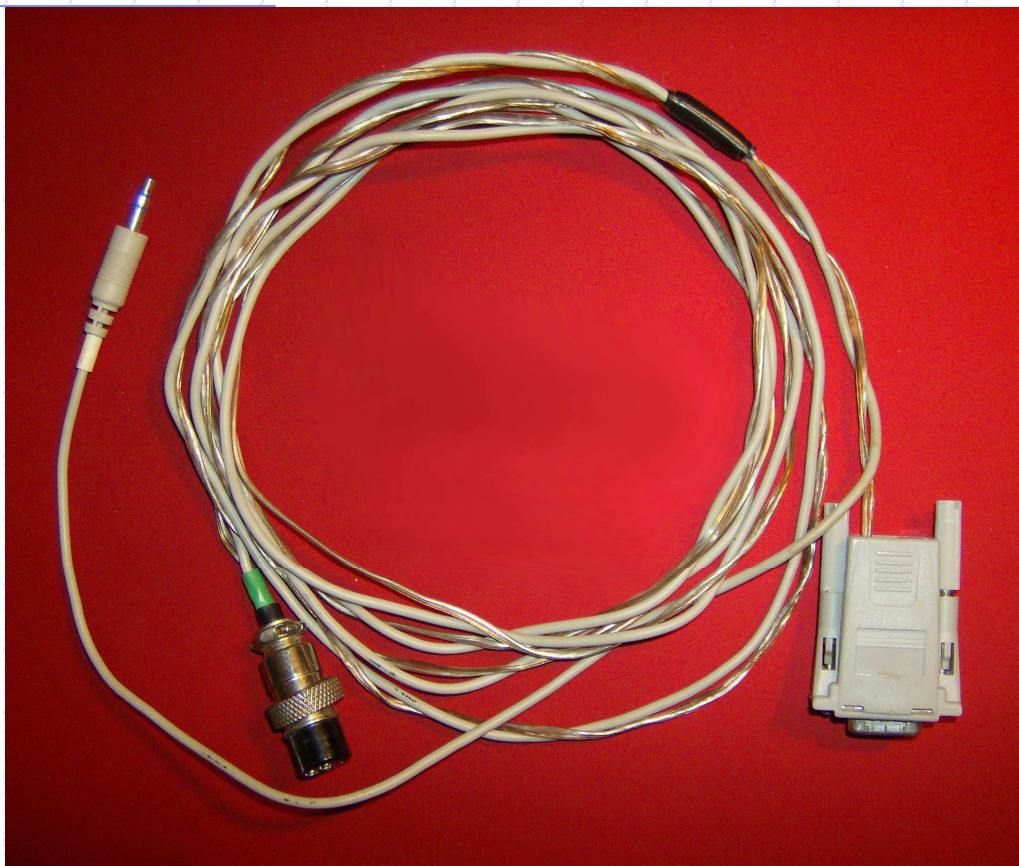
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PSK31 Interface Photo (1a)

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(*) Photo by KN6QI

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PSK31 Interface Photo (1b)

(*)



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(*) Photos by KN6QI

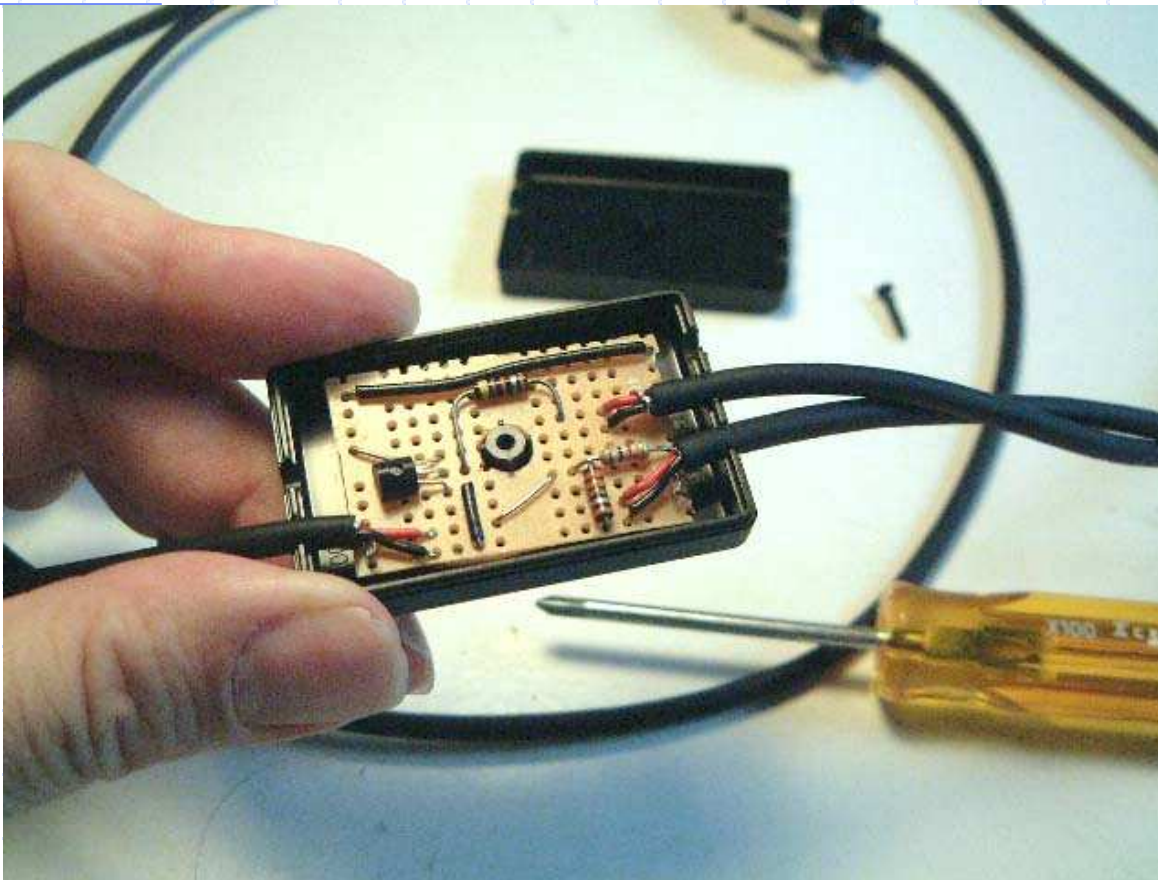
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PSK31 Interface Photo (2)

(*)



(*) c2.com/~ward/morse/psk31

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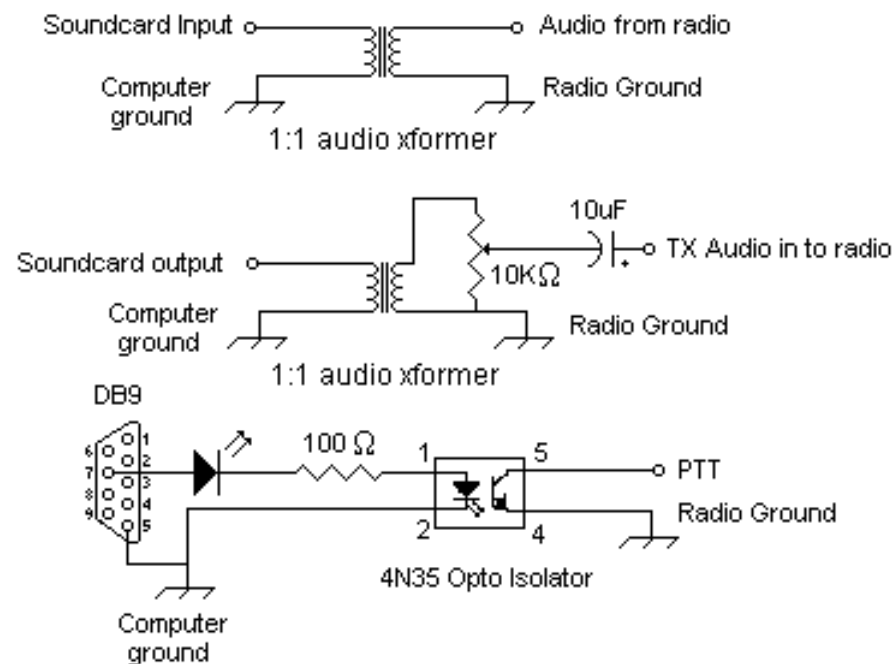
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Better PSK 31 Interface

(*)

PSK Interface



(*) www.geocities.com/n2uhc/interface.html

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Software

- ◆ HamScope (1.56)
- ◆ Digipan (2.0)
- ◆ Stream (1.2)
- ◆ PSK31SBW (?)
- ◆ WinPSK (2.13)
- ◆ gMFSK (for Linux, etc.)
- ◆ KPSK (Linux, etc.)
- ◆ Much more...

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HamScope 1.56

- ◆ Supports BPSK, QPSK, MFSK, and RTTY
- ◆ Spectrum & Standard Waterfall Displays
- ◆ Phase Meter (for tuning & quality)
- ◆ Integrates w/ MMTTY for RTTY

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Hamscope 1.56

The screenshot shows the HamScope software interface. At the top, there is a menu bar with options: File, Edit, View, Settings, Rig Control, Clear Rcv, Clear Xmit, DemoMode, and Help. Below the menu bar is a control panel with various buttons for call, name, RST, and other functions. The main display area is divided into several sections:

- A log window showing the following text:

```
W6WLB W6WLB W6WLB de KD5HIO KD5HIO KD5HIO kn
W6WLB W6WLB W6WLB de KD5HIO KD5HIO KD5HIO kn
<<TX Ended - Sound Freq 1364 Hz - 08 May 2001 04:17:04 UTC>>
```
- A status line: `on 20m PSK.`
- A log entry: `73 George KF6VSG DE WB0TRA SK Logged off at 8 May 2001 04:i:50z`
- A message: `Good evening Bill and tnx fer call...`

At the bottom of the interface is a spectrum display. The frequency is set to 1362 Hz. The display shows a spectrum plot with a prominent peak at approximately 1364 Hz. The status bar at the bottom indicates: `Receiving CPU = 32% Clk ppm = 0 8 May 2001 4:20:22 UTC`.

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Digipan 2.0

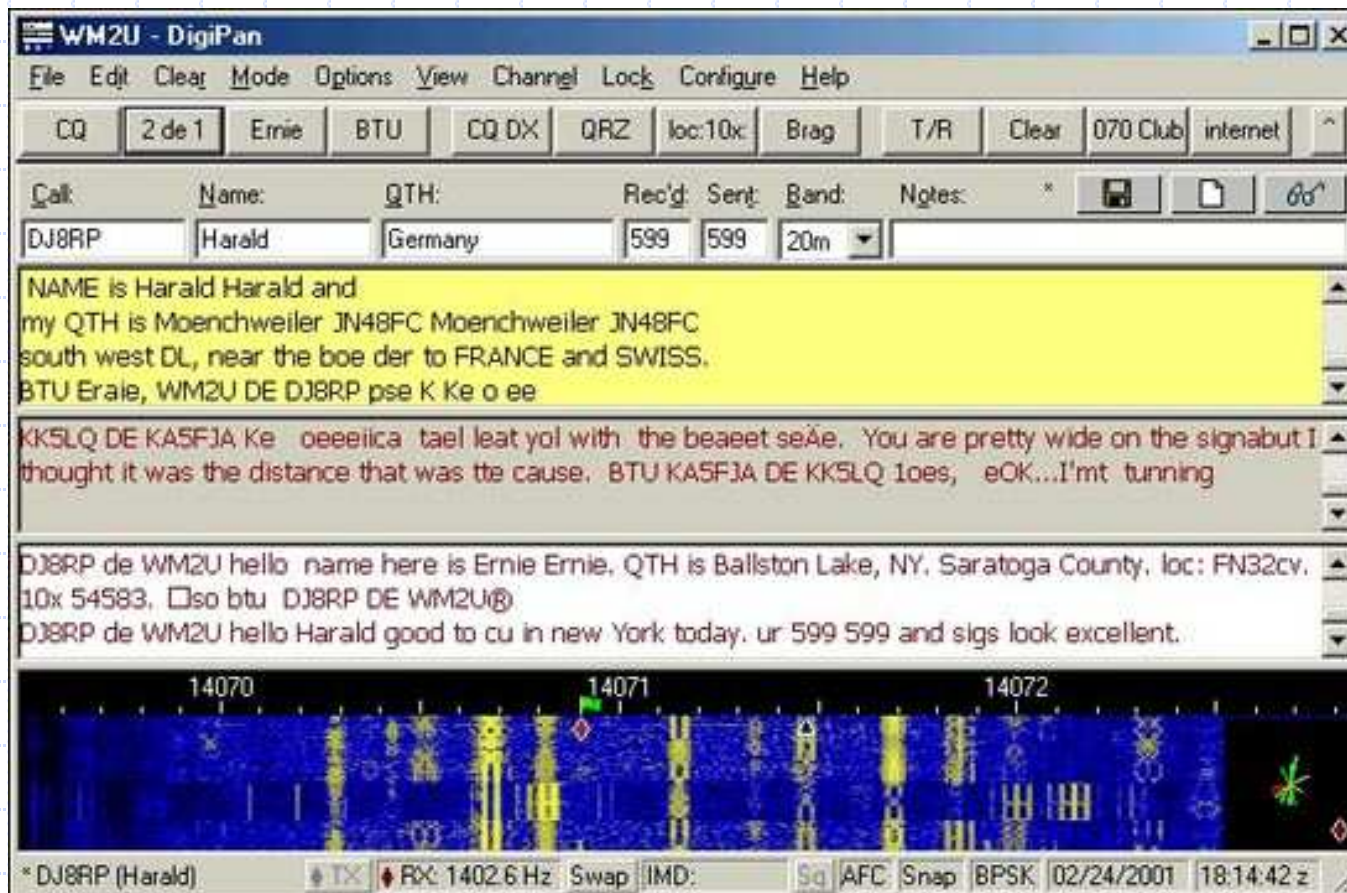
- ◆ Supports BPSK & QPSK
- ◆ Supports Dual Receive Channels
- ◆ Full Spectrum Display (find signals)
- ◆ Phase Meter (for tuning & quality)

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Digipan 2.0



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Operating

- ◆ Use USB
- ◆ Can use SSB or CW Filters for Contesting
- ◆ For PSK, lower case is FASTER (varicode)
- ◆ Adjust Audio & Power Levels
 - Avoid Hum and Noise
 - Don't Overdrive
 - Use PROC as an XMIT ALC
- ◆ Use Software for Fine Tuning

(*)



(*) www.hamhelpdesk.com/youth/young-attracted-to-psk31.html

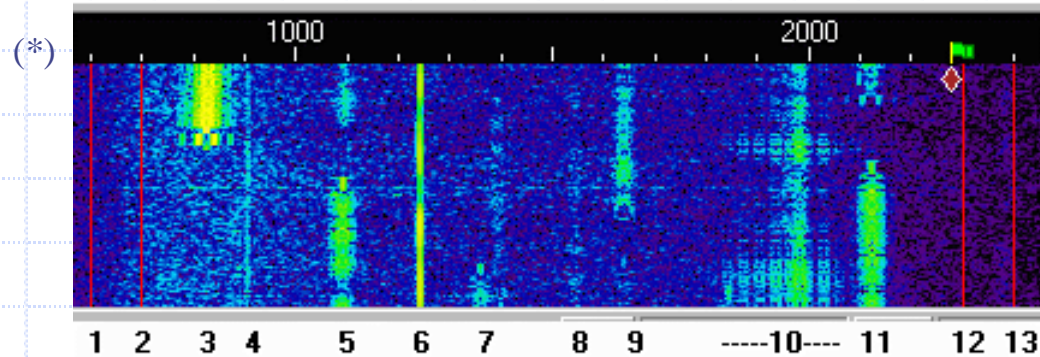
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Find a Signal

- ◆ Look for vertical streams
- ◆ Click on a stream to select



(*) www.mymorninglight.org/ham/psk.htm

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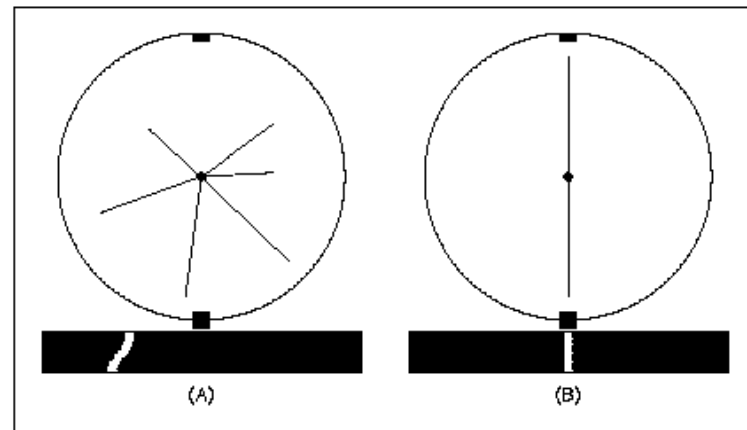
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Phase Lock Indicator

- ◆ Phase Lock indicated by vertical bar
- ◆ If mode is correct, begins decoding

(*)



(*) www.arrl.org/tis/info/HTML/psk31

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Receiving PSK31

◆ Receiving PSK31 Transmission

```
RX-PSK31 v3.0, By ON6MU ©2002-2009
File Edit Options Setup Help
RX-PSK31 Date & Time-> 04-23-2009 17:26:54
TxRx.L..... IC70 hvKII
Pwr O/P. -....40Wt:.....Dipole
Computer.....Home Brew Pentium Bits K6-500Mhz
Software.....Zakanaka 1.24 . AlsmmEMixW 2.06
Interface..tete o...G3VFP CATOPTO Isolated
QRV.....1.8 - 432 Mhz
Modes.....PS & FSK, RTTY,MTTY,HELL,SSTV,CW,SSB
Aged.....55 Yrs Old
Licenced....1966
.
(*)
All OK copy,th1 u for the nice report.
I am running here KENWOOD TS-480HX ,power 25 W.
Ant; BEAM 6 el.TH6DXX 45m.up,SLOOPER for 40 and DIPOLE for 80m.
Prog. MixW ver.2.11 software on Windows XP PRO.
Computer: HP.400 Mhz 30 GB/256 MB RAM.
My age is 63.active since 1963.
WX:today Is SUNNY temp. about 26 C
HOW?
```

(*) <http://users.belgacom.net/hamradio/rxpsk31.htm>

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References

◆ Web Sites

- www.fars.k6ya.org/docs/digital (Links)
- aintel.bi.ehu.es/psk31.html (official site)
- www.psk31.com (general information)
- www.w5bbr.com/soundbd.html (interfaces)
- www.qsl.net/wm2u/psk31.html (general)
- www.mymorninglight.org/ham/psk.htm (Elmer)
- www.qsl.net/zl1bpu/MFSK (MFSK article)



HF Frequencies

- ◆ 160 m @ 1838 KHz
- ◆ 80 m @ 3.580 MHz
- ◆ 40 m @ 7.070 MHz (region 1 7.035 MHz)
- ◆ 30 m @ 10.142 MHz
- ◆ 20 m @ 14.070 MHz
- ◆ 17 m @ 18.100 MHz
- ◆ 15 m @ 21.070 MHz (official 21.080)
- ◆ 18 m @ 24.920 MHz
- ◆ 10 m @ 28.120 MHz

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VHF Frequencies

- ◆ 6 m @ 50.290 MHz
- ◆ 2 m @ 144.144 MHz
- ◆ 1.25 m @ 222.07 MHz
- ◆ 70 cm @ 432.2 MHz
- ◆ 33 cm @ 909 MHz

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Conclusions

- ◆ New Modes Bring Vitality to the Hobby
- ◆ Easy and Inexpensive to get Started
- ◆ Encourages Experimentation

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