

# 20+ Years After PSK-31

*A look at PSK-31*

*How to get on*

*Radio Interfaces*

*And many other digital modes*

*Randy Hall*

*K7AGE*

# A little bit about me

I was first licensed as a Novice in 1968

I've been around video since high school

- **Built a TV camera as high school electronics project**
- **Worked on remote TV broadcast as cameraman and engineer**
- **Worked at college TV studio, Rochester Institute of Technology**

Work for broadcast equipment manufacturers

- **Grass Valley/Belden/Miranda/NVISION and Grass Valley Group**
- **Retired in 2015, moved to Gold Beach Or, built a house. Now building a new shack.**

First YouTube video in August 2006, now over 13 years

**150+ videos**

**Millions of views**

**Tens of thousands of subscribers**





# PSK31: A New Radio-Teletype Mode

By Peter Martinez, G3PLX

I have been active on RTTY since the 1960s, and was instrumental in introducing AmTOR to amateur radio at the end of the '70s. This improved the reliability of the HF radio link and paved the way to further developments which have taken this side of the hobby more into data transfer, message handling, and computer linking, but further away from the rest of amateur radio which is based on two-way contacts between operators.

There is now a gap opening up between the data transfer enthusiasts using the latest techniques and the two-way contact fans who are still using the traditional RTTY mode of the '60s, although of course using keyboard and screen rather than teleprinter. There is scope for applying the new techniques now available to bring RTTY into the 21st century.

This article discusses the specific needs of 'live QSO' operating, as opposed to just transferring chunks of error-free data, and describes the PSK31 mode which I have developed specifically for live contacts, which is now becoming popular using low-cost DSP kits, and which could become even cheaper as the art of using PC sound cards is developed by amateur radio enthusiasts.

## WHAT IS NEEDED?

I believe that it is the error-correcting process used in modern data modes which make them unsuitable for live contacts. I have identified several factors; the first revolves around the fact that all error-correcting systems introduce a time-delay into the link. In the case of an ARQ link like AmTOR or PacTOR, there is a fixed transmission cycle of 450ms or 1.25sec or more, which will delay any keypress by as much as one cycle-period, and by more if there are errors. With forward-error correction systems there is also an inevitable delay, because the information is spread out over a period of time. In a live two-way contact, the delay is doubled at the point where the transmission is handed over. I believe that these delays make such systems unpleasant to use in a two way conversation.

This is not so much a technical problem as a human one. Another factor in this category is concerned with the way that the

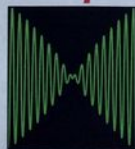
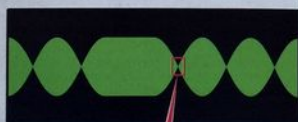


FIGURE 2: Showing the waveform of BPSK sending the Varicode 'space' symbol.

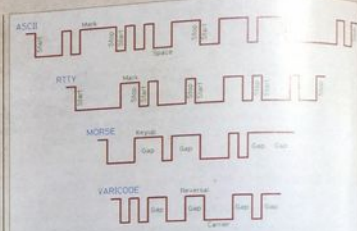


FIGURE 1: Showing the word 'ten' keyed in ASCII, RTTY, Morse and Varicode.

quality of the information content varies as the quality of the radio link varies. In an analogue transmission system such as SSB or CW, there is a linear relationship between the two. The operators are aware of this all the time and take account of it subconsciously; they change the speed and tone of voice instinctively, and even choose the topic of conversation to suit the conditions.

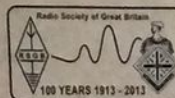
In a digital mode the relationship between the signal-to-noise ratio on the air and the error rate on the screen is not so smooth. The modern error-correcting digital modes are particularly bad at this, with copy being almost perfect while the SNR is above a certain level and stopping completely when the SNR drops below this level. The effect is of no consequence in an automatic mailbox forwarding link, but can badly inhibit the flow of a conversation.

A third factor is a social one; with error correcting modes you only get good copy when you are linked to one other station. The copy is decidedly worse when not linked, such as when calling CQ or listening to others. This makes it difficult 'getting to know' other people on the air, and there is a tendency to limit contacts to a few close friends or just mailboxes.

These factors lead me to suggest that there is a case for a transmission system that is not based on the use of error-correcting codes, when the specific application is that of live contacts. The continued popularity of traditional RTTY, using the start-stop system, is proof of this hypothesis: there is minimal delay (150ms), the flow of conversation is continuous, the error-rate is tolerable, and it is easy to listen-in and join-in.

## IMPROVING ON RTTY

How, then, do we go about using modern techniques that were not available in the '60s, to improve on traditional RTTY? First of all, since we are talking about live contacts, there is no need to discuss any system that transmits text any faster than can be typed by hand. Secondly, modern transceivers are far more stable in frequency than they were in the '60s, so we should be able to use much narrower bandwidths than in those days. Thirdly digital processors are much more powerful than the rotating cams and levers of the mechanical teleprinter, so we could use better coding. The drift-tolerant technique of frequency-shift keying, and the fixed-length five-unit start-stop code still used today for RTTY are a legacy of the limitations of technology 30 years ago. We can do better now.



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December 1998

# What is PSK-31?

What was new:

- Less bandwidth, more stations
- Works great with low power
- Used PC's sound card for interface to radio
- Software, \$\$\$ & free

PSK-31 Started the digital revolution

# Early days you built an interface

## Understanding Soundcard Interfacing

by Ernie Mills, WM2U, <http://www.qsl.net/wm2u>  
Please print this article and use it as a hand out at Club talks and lectures  
Interface (Russian) tx to Andrey Otroshenko, RA3DOA

This page is an attempt to correlate the interfacing schemes for various *Radio models*, and *Sound Card* configurations. Since 26th December 1998, when the sound card version of *PSK31* was first introduced to the Ham community, and after much dialog, experimentation and confusion, an interfacing pattern slowly emerged. I feel that an *understanding* of this pattern is valuable and can save you a lot of time and grief. Please note that each circuit references various letters which will correlate with the Radio pin-outs on the various popup tables available. Just click the manufactures button below, pick your radio and read off the hook-up points.

Kenwood Yaesu ICOM Alinco ...more

*I Urgently need other Radio hook-up info. and corrections. Please submit this Form for it's inclusion onto this page.*

**Y**ou have a *Kenwood Radio* and your hookup information is not here! Don't panic! Goto the [Kenwood](#). Amateur Radio site, then to the "Jump To" pull down menu and... hey presto! If it is not on this list, it was never made.

**I**f you can't find it here try this great [TNC to Radio page](#); [Hook-Up Magic](#)

**O**k! Ok! so you prefer to buy (that's a dirty three letter word) a ready made Computer to Radio Interface. Check out this nice package by N1ZZ and K1UHF. They call it the [RIGblaster](#)

**W**ait!!! are you hooking up a fully computer controlled Radio? One with a virtual consol? The [Kachina](#), [Pegasus](#) or whatever? Hey! first read [George's Notes](#)

**S**TOP!!! If you are a *FT1000MP* owner, look no further. [Doug McCann, VA3CR](#) has a web page dedicated solely to that fine machine. This great site is a one stop information authority and missing it will be your loss. You are warned :) Check out <http://www.va3cr.net/>.

[Thomas Giella, KN4LF](#), has also a great web site showing hookup information for the *FT1000MP Mk5*. Check it out at ~ <http://www.kn4lf.com/kn4lf10.htm>

**O**k, Almost there, but before we get into it, please read this email I received off [Jack, K8PET](#) if you are thinking of interfacing to a [LapTop](#) computer.

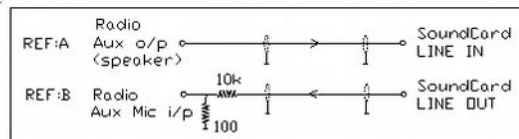
**F**irst off, *keep it as simple* as you can. This circuit shows a single connection between the Radio Audio Output and The Sound card LINE IN, and a simple 100:1 attenuated connection between the Radio Aux. Mic IN and the Sound Card LINE OUT.

**F**or SWL the fastest way to Rx is to simply let your Computer *listen* to the Radio. If you have a microphone connected to your pc, load your PSK software, and tune your rig to a PSK signal and tah-dah, PSK print on you pc screen. :)

**O**h! before we start a little word on the *component abbreviation* used on these diagrams. Since the decimal point was not



- Great Hookup Site
- Hook-it-up
- W5BBR Bill
- RIGblaster
- SignalLink
- KC7DH Chuck
- K4ABT Buck
- IMD Meter
- PSK Meter
- Navigator Interface



# Early days you used DigiPan software

The screenshot shows the 'WM2U - DigiPan' application window. The title bar includes standard window controls. The menu bar contains: File, Edit, Clear, Mode, Options, View, Channel, Lock, Configure, Help.

Below the menu bar is a row of buttons: CQ, 2 de 1, Ernie, BTU, CQ DX, QRZ, loc:10x, Brag, T/R, Clear, 070 Club, internet, and a small upward arrow button.

The main interface has a header row with labels: Call, Name, QTH, Rec'd, Sent, Band, Notes, and a small asterisk icon. Below this is a data row with the following values: DJ8RP, Harald, Germany, 599, 599, 20m, and an empty field.

The chat area contains three messages:

- NAME is Harald Harald and my QTH is Moenchweiler JN48FC Moenchweiler JN48FC south west DL, near the boe der to FRANCE and SWISS. BTU Ernie, WM2U DE DJ8RP pse K Ke o ee
- KK5LQ DE KA5FJA Ke oeeelica tael leat yol with the beaest seÄe. You are pretty wide on the signabut I thought it was the distance that was tte cause. BTU KA5FJA DE KK5LQ loes, eOK...I'mt tuning
- DJ8RP de WM2U hello name here is Ernie Ernie. QTH is Ballston Lake, NY. Saratoga County. loc: FN32cv. 10x 54583. □so btu DJ8RP DE WM2U@  
DJ8RP de WM2U hello Harald good to cu in new York today. ur 599 599 and sigs look excellent.

At the bottom of the window is a spectrum display with a frequency scale from 14070 to 14072. The display shows a blue background with yellow and green vertical bars representing signal activity. A green diamond cursor is positioned at 14071.

The status bar at the very bottom contains the following information: \* DJ8RP (Harald), TX, RX: 1402.6 Hz, Swap, IMD, Sg, AFC, Snap, BPSK, 02/24/2001, 18:14:42 z.

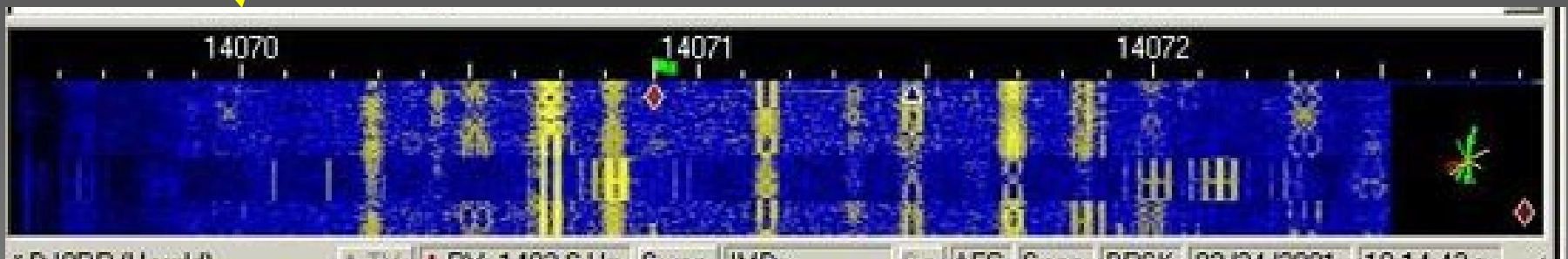
# No tuning knob needed

Tune by clicking on the waterfall

- 14.070 MHz Dial Display USB carrier

- 1 KHz tone = 14.071 MHz frequency

- 2 KHz tone = 14.072 MHz frequency



# I made a few PSK-31 Videos



## How to get started with PSK-31 Ham Radio

7 videos • 16,657 views • Last updated on Jul 18, 2016










PSK-31 is the most popular digital mode for amateur radio. This series of videos introduce PSK31 and how to get yourself on the air.



K7AGE



EDIT

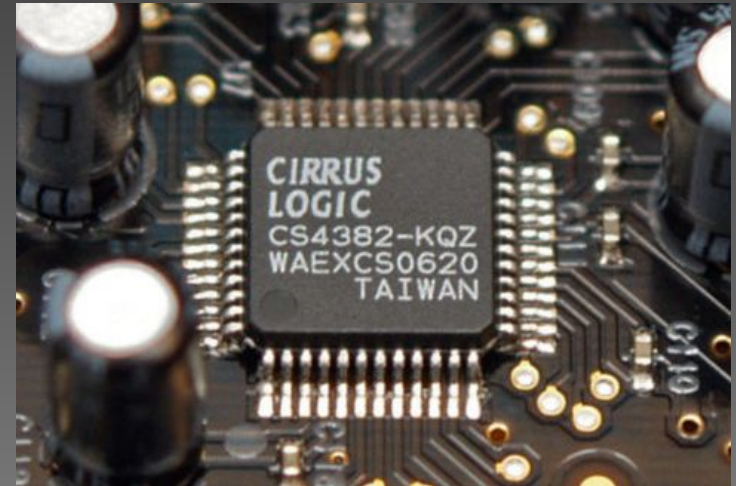
- 1 **How to receive PSK-31, Introduction**  
K7AGE  
16:26
- 2 **How to interface a sound card for Ham Radio**  
K7AGE  
10:26
- 3 **How to adjust transmitter level for PSK-31 Ham Radio**  
K7AGE  
16:37
- 4 **How to operate PSK-31 Ham Radio**  
K7AGE  
32:29
- 5 **Sample of 20 Meter Activity for PSK31 Introduction Video**  
K7AGE  
21:10
- 6 **How to Receive Ham Radio PSK-31 on an iPad**  
K7AGE  
4:16
- 7 **Ham Radio PSK-31 Presentation at SEA-PAC**  
K7AGE  
44:37



# Computer sound card interfaces



# Then, interfaces with USB sound chip

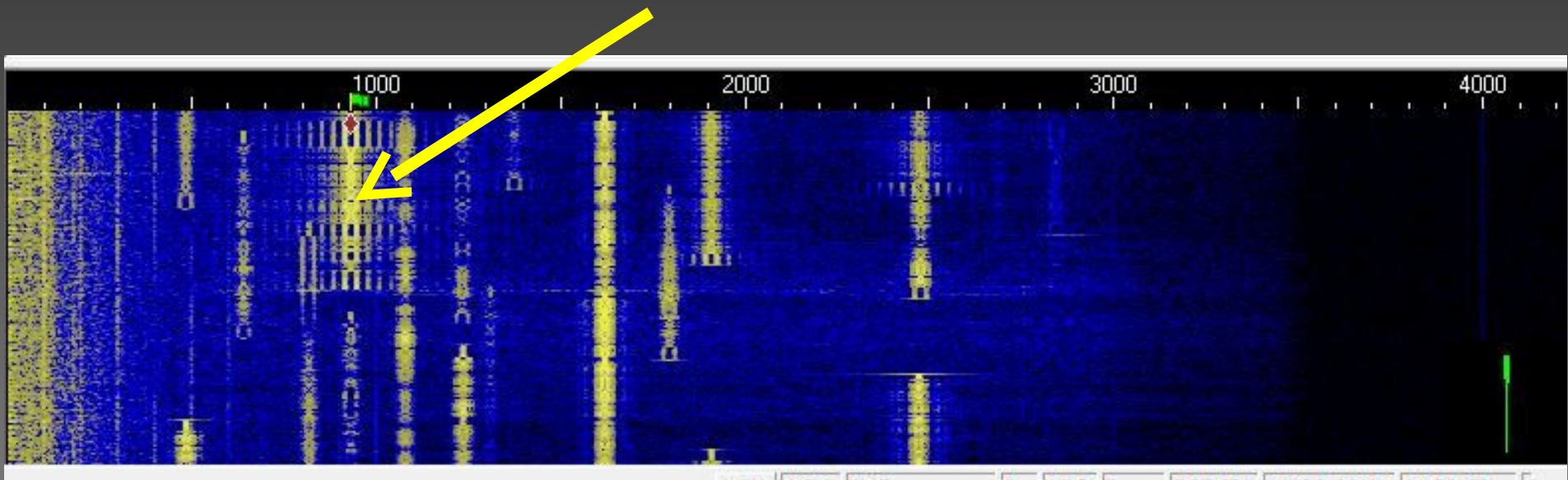
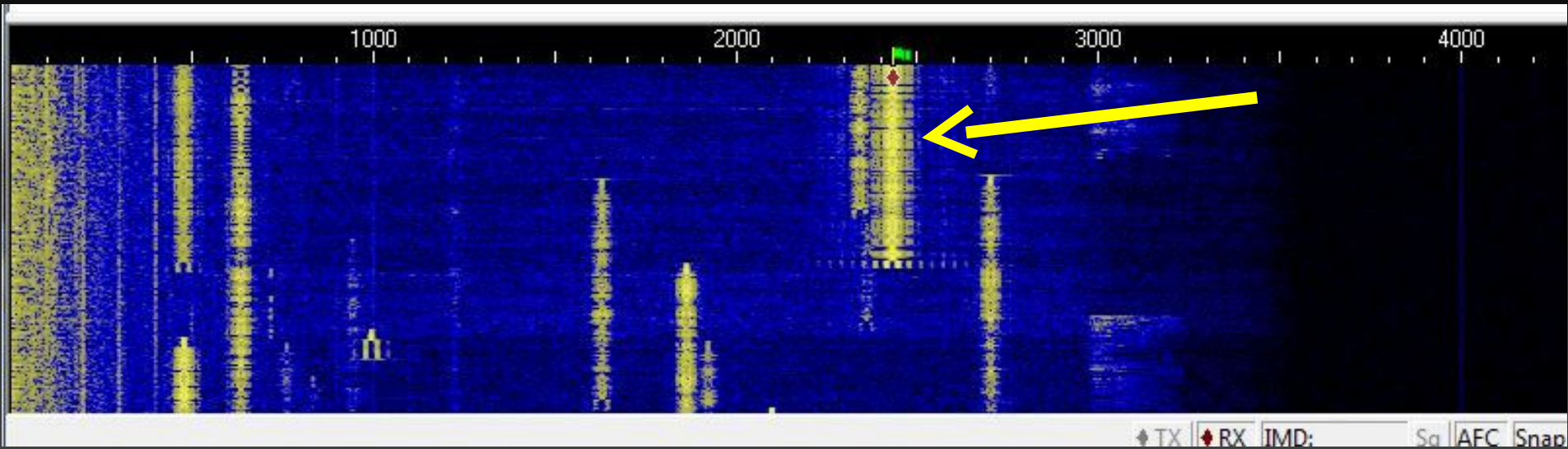


# And now, Radios with DSP sound function

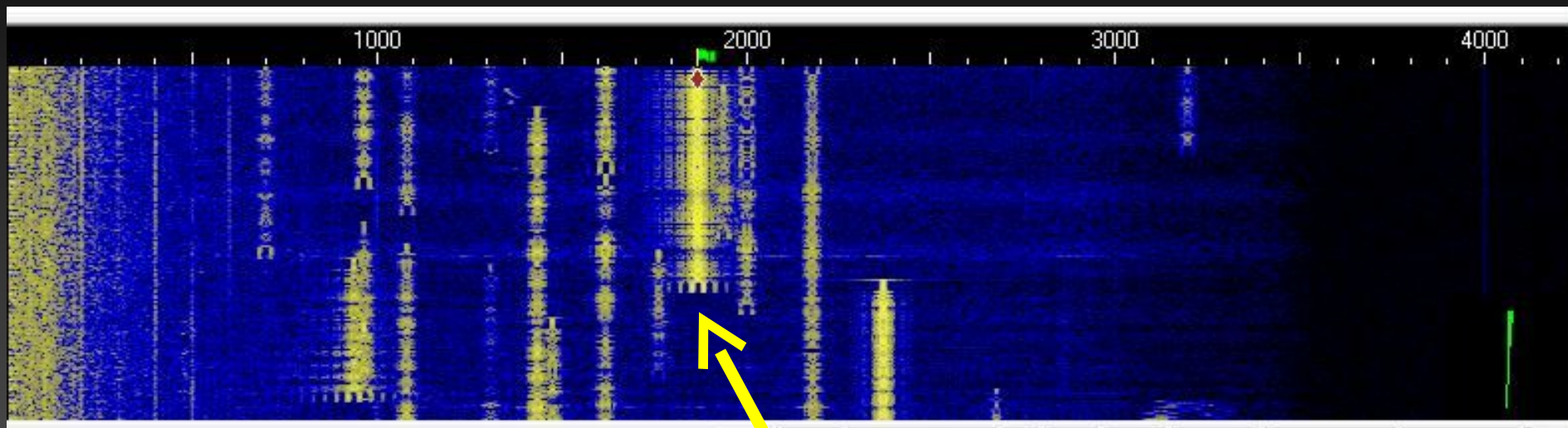
	USB Connection		
	Control	Sound	
<b>Yaesu</b>			
FT-818	N	N	
FT-450D	N	N	
FT-857	N	N	
FT-891	Y	N	
FT-991A	Y	Y	
FT-DX1200	N	N	SCU-17
FT-2000	N	N	
FT-DX3000	Y	Y	
FT-DX5000MP	N	N	
FTDX101D	Y	Y	
<b>Kenwood</b>			
TS-480HX/SAT	N	N	
TS-590SG	Y	N	
TS-890S	Y	Y	
TS-990S	Y	Y	
<b>Icom</b>			
IC-718	N	N	
IC-7100	Y	Y	
IC-7200	N	Y	
IC-7300	Y	Y	
IC-7600	N	Y	
IC-7610	Y	Y	2 cables
IC-7700	N	N	
IC-7851	Y	Y	
<b>Elecraft</b>			
K3S K103B	Y	Y	
K4	Y	Y	
05/01/19			



# This is what over driving looks like



This is what over driving looks like



Even QRP can be wide  
5 watts from a KX3 station

File Edit Clear Mode Options View Lock Configure Help

Lookup CQ Call 3 Call BTU Signoff File Brag T/R Squelch Clear Multi ^

Call: Name: QTH: Rec'd: Sent: Band: Notes: \* [Save] [Print] [Refresh]

[ ] [ ] [ ] [ ] [ ] 20m [v] [ ]

RP KC0TRK QRP  
 CQ CQ CQ de KC0TRK QRP KC0TRK QRP  
 PSE K e e s CQ CQ CQ de KC0TRK QRP KC0TRK QRP  
 CQ CQ CQ de KC0TRK QRP KC0TRK QRP  
 PSE K eet t  
 KC0TRK KC0TRK KC0TRK DE KB7V KB7V KB7V K  
 Ü KB7V KB7V KB7V de KC0TRK KC0TRK KC0TRK pse kn Rc  
 KC0TRK DE KB7V  
 ur 599 in CA. Name Paul Paul. DM13ep. Hw Cpy? BTU KC0TRK DE KB7V K  
 -- KBeIV de KC0TRK

Hi Paul ,  
 REPORT : 599 599  
 NAME : Jim Jim  
 QTH Littleton CO LOC DM79lo DM79lo  
 COUNTY: Jefferson  
 RIG : Elecraft KX3 at 5W into EARC Sloper ←  
 QSL via QRZ.com; eQSL.cc or direct.  
 How copy? BTU Paul, KB7V de KC0TRK pse kn eo do oaK DE KB7V  
 fb Jim and copy OK. QTH is Mission Viejo, CA in Orange county south of LA. Ur 5W doing fb here. BTU KC0TRK DE  
 KB7V K  
 liE hde o aet KB7V de KC0TRK ...can't believe band is holding up this well-yes, I graduated from Oceanside in '66...73  
 Paul and thanks for this BPSK-31 QSO on 2190m 01:43:57 10/9/2013, good DX in 201nf sl e  
 e  
 KC0TRK DE KB7V  
 fb Jim and tnx BPSK QSO. QSL Oceanside grad - not far from here. Have a good night in CO and best 73...  
 KC0TRK DE KB7V  
 sk t



# Where to hear PSK-31?

PSK-31 activity is concentrated around the following frequencies:

## DIAL Display

## USB Mode

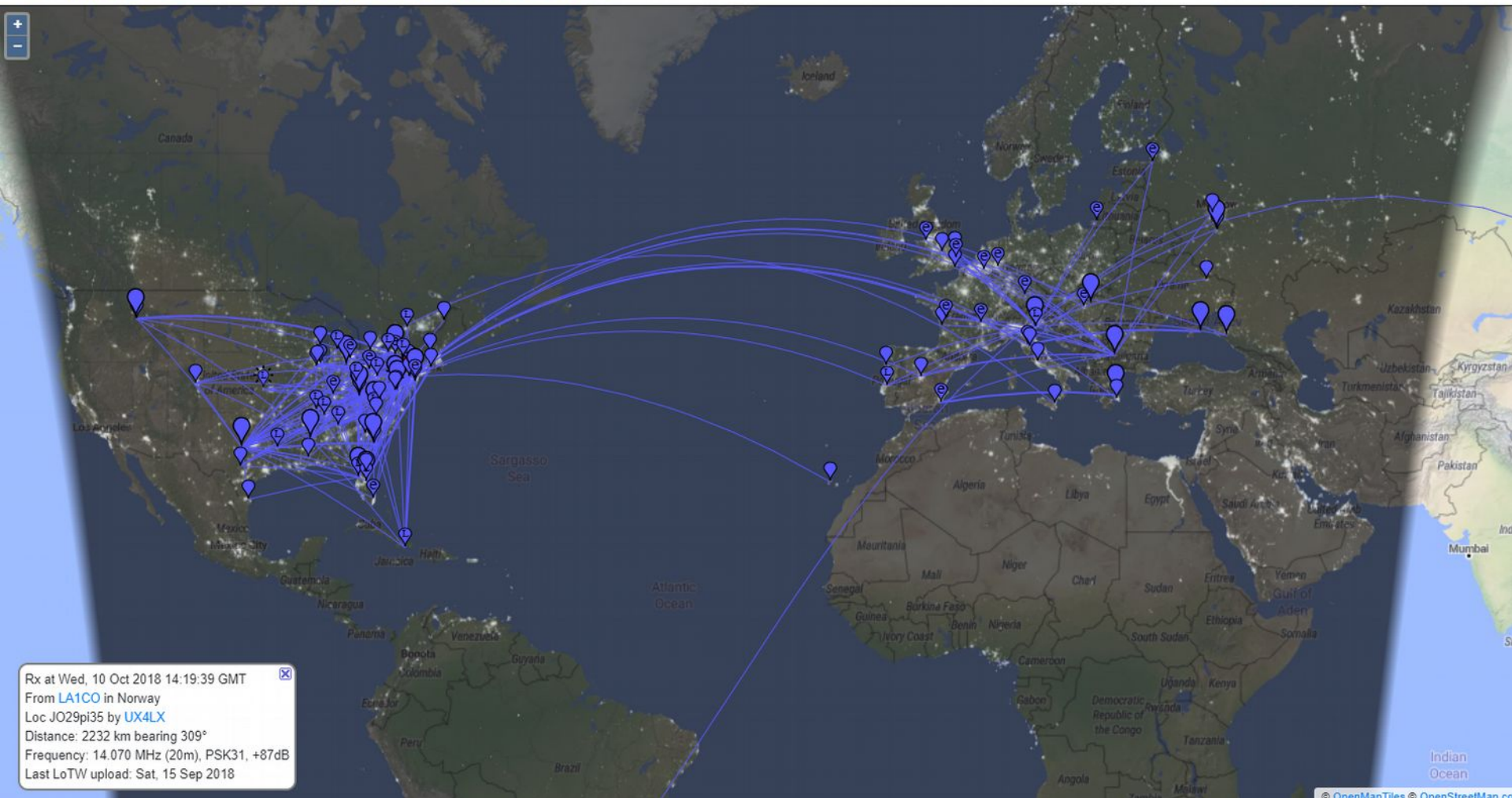
- 1.83815 MHz
- 3.580 MHz
- 7.035 MHz
- **14.070 MHz, most popular**
- 18.100 MHz
- 21.070 MHz
- 24.920 MHz
- 28.120 MHz
- 50.290 MHz

# Use PSK Reporter, PSK 31, 40M, 6 Hours

On **40m** show **signals** sent/rcvd by **anyone** using **PSK31** over the last **6 hours** **Go!** [Display options](#) [Permalink](#)

Automatic refresh in 5 minutes. Large markers are monitors. [Display all reports.](#)

There are **9 active PSK31 monitors** on 40m. [Show all PSK31 on all bands.](#) [Show all on all bands.](#) [Legend](#)





# FLDigi is now the GO-TO digital software, free

The screenshot shows the fldigi software interface. The title bar reads "fldigi - YT1DL/QRP". The menu bar includes "File", "Op Mode", "Configure", "View", and "Help". There are also buttons for "Spot", "RxID", "TxID", and "TUNE".

The main display area is divided into several sections:

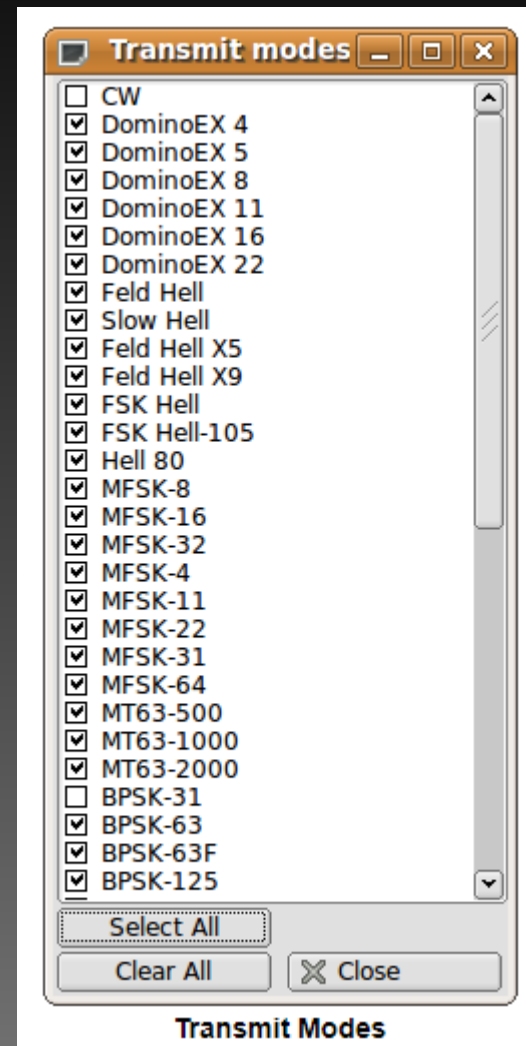
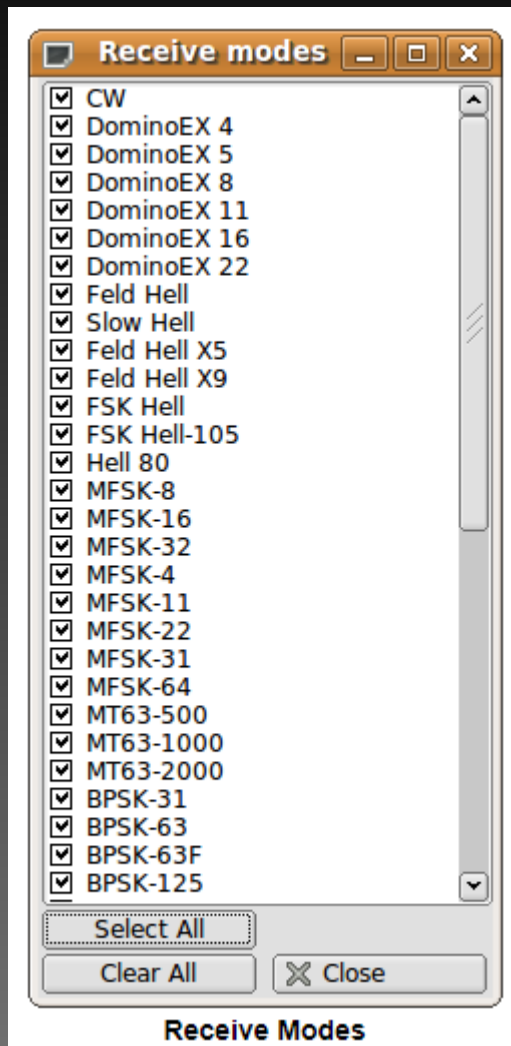
- Control - FlexRadio PowerSI**: A section with a globe icon and a frequency display showing "7035.000".
- QSO Log**: A table with columns for "QSO Freq", "On", "Off", "Call", "Name", "In", "Out", and "Notes". The current entry shows "7036.837", "2035", "2035", "SA2AXJ", and empty fields for Name, In, Out, and Notes.
- QTH**: A section with a dropdown menu showing "DIGU", "ter 2-3", and "QTH" fields for "St", "Pr", "Cnty", "Loc", and "Az".
- Text Area**: A large text area containing a QSO log entry for SA2AXJ. The text includes: "Well reviewed on my screen", "Report : 599 599", "Name : Bo Bo", "QTH : Abborrtrask 20 km to border of Lappland SWEDEN", "LOC : JP94QL JP94QL", "Operator : Created Age 46 licenced 2008 and Temperature -12° degrees Celsius", "How copy? BTU", and "UR5MID de SA2AXJ pse kn".

Below the text area is a control bar with buttons for "CQ", "ANS", "QSO", "KN", "SK", "Me/Qth", "Brag", "T/R", "Tx", "Rx", and "TX".

The bottom section features a waterfall display showing frequency in kHz (500, 1000, 1500, 2000) and a spectrum plot. Below the waterfall are buttons for "WF", "-20", "70", "x1", "NORM", "1837", "QSY", "Store", "Lk", "Rv", and "T/R".

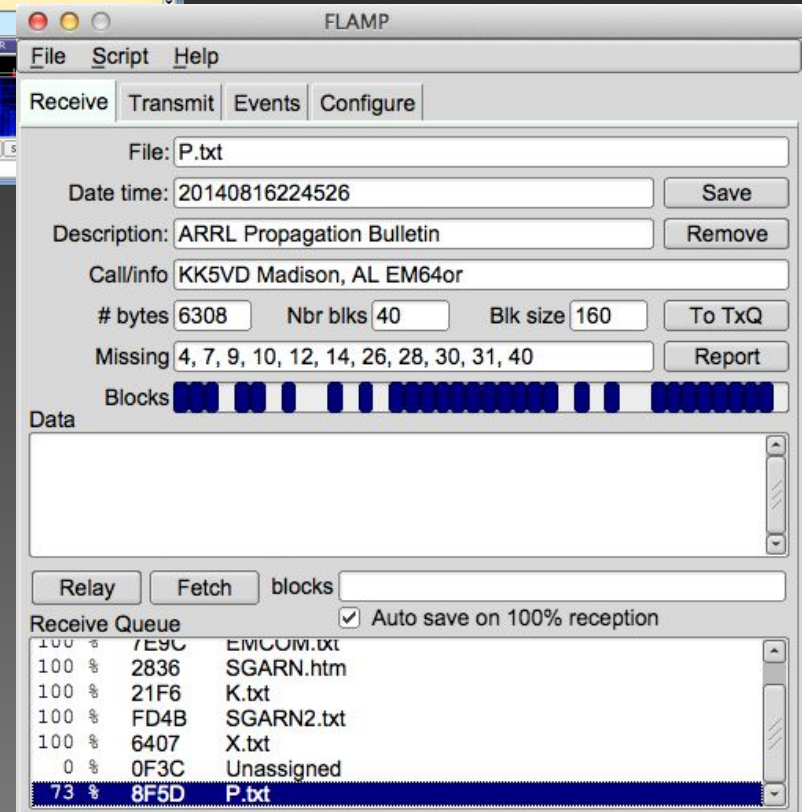
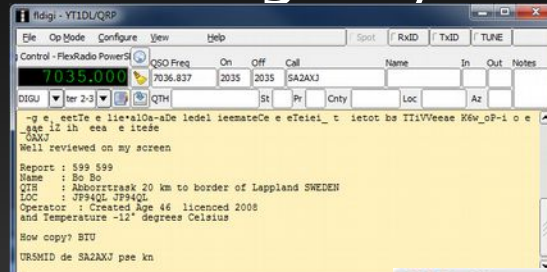
The bottom status bar shows "BPSK31", "s/n 24 dB", "imd -31 dB", and "AFC" and "SQL" indicators.

# FLDigi, lots of modes, here are few



# Fldigi NBEMS

## Narrow Band Emergency Messaging System



# Other Sound Card Modes

- *WSPR*
- *JT9/65*
- *SSTV*
- *Digital SSTV*
- *Free DV*
- *Hellschreiber*
- *FT8*
- *SC8Call*

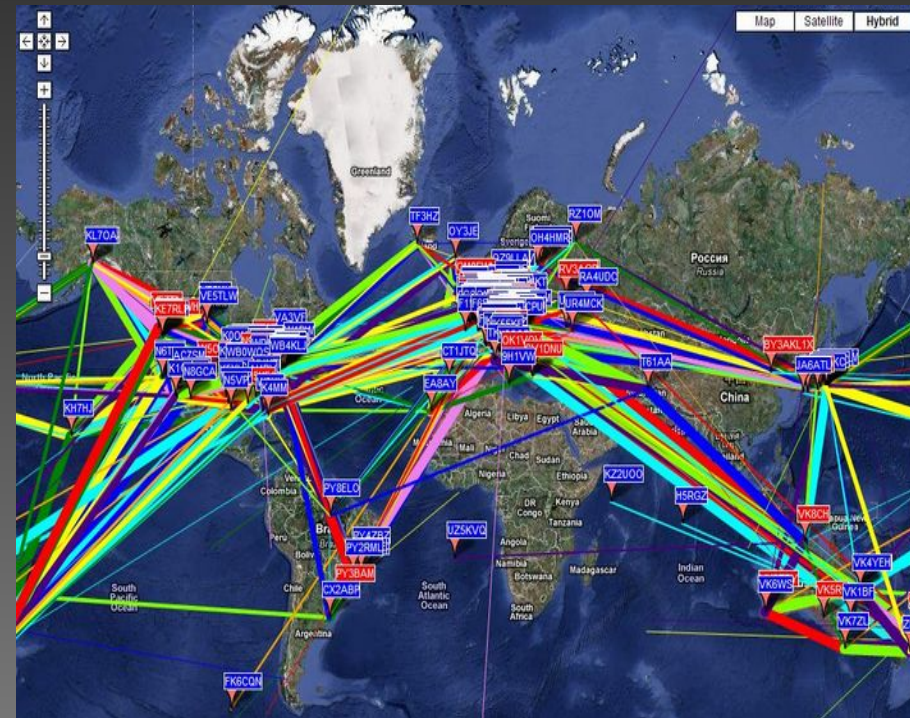
# WSPR, WSJT-X

- *Weak Signal Propagation Reporter, beacon only*

*WSPR implements a protocol designed for probing potential propagation paths with low-power transmissions. Normal transmissions carry a station's callsign, Maidenhead grid locator, and transmitter power in dBm. The program can decode signals with S/N as low as -28 dB in a 2500 Hz bandwidth. Stations with internet access can automatically upload their reception reports to a central database called WSPRnet, which includes a mapping facility. 20 Meters 14.0956*

The screenshot shows the WSPR software interface. At the top, it says "WSPR by K1JT". Below that is a menu bar with "File", "Setup", "View", "Save", and "Help". The main area is a waterfall plot showing frequency (MHz) on the vertical axis (100 to 300) and time on the horizontal axis. A list of received stations is shown on the right side of the plot, including VE1VDM, KS7S, VE1RG, W6SZ, VE3CDX, N2JR, and KOOG. Below the plot, there are controls for "Upload spots" (checked), "Band Map", "Frequencies (MHz)" (Dial freq: 10.1387, Tx freq: 10.140207), and "T/R cycle" (Idle, Rx, 20%, 25%, 33%, Tx). At the bottom, there is a table of received spots with columns for DATE, UTC, dB, DT, Freq, and Drift. A large digital display shows the date and time: "2008 Apr 14 19:34:14".

DATE	UTC	dB	DT	Freq	Drift	Station
080406	1312	-5	1.9	10.140225	-2	VE1RG FN76 30
080406	1312	1	0.8	10.140246	-1	VE1VDM FN85 25
080406	1318	8	2.0	10.140225	-1	VE1RG FN76 30
080406	1318	-3	0.9	10.140246	-1	VE1VDM FN85 25
080406	1320	-26	1.2	10.140198	1	N2JR FM18 37
080406	1320	-3	0.7	10.140246	-1	VE1VDM FN85 25
080406	1322	-7	0.7	10.140246	0	VE1VDM FN85 25
080406	1326	5	0.6	10.140246	0	VE1VDM FN85 25
080406	1328	-16	2.0	10.140201	1	VE3CDX DM26 30
080406	1336	2	4.3	10.140195	1	KOOG EM47 30



# WSPR



WSPR by K1JT

File Setup View Save Help

Upload spots **78 Hz** Band Map

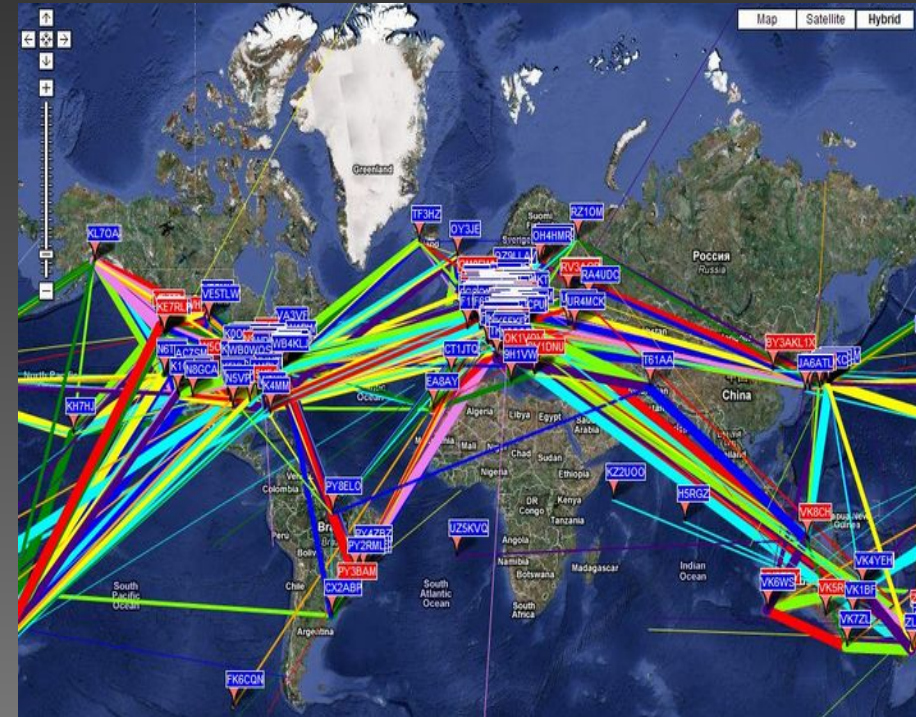
Frequencies (MHz)  
Dial freq: 10.1387 Tx freq: 10.140207

T/R cycle  
 Idle  Rx  20%  25%  33%  Tx

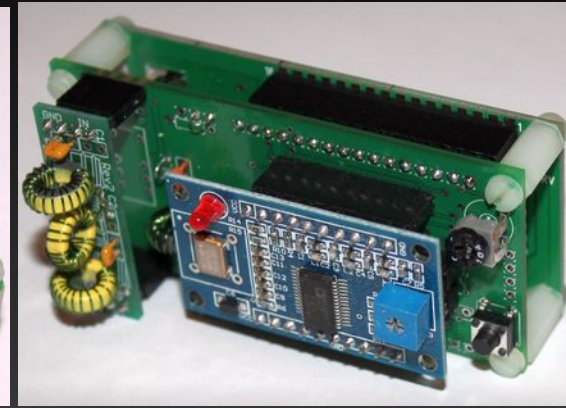
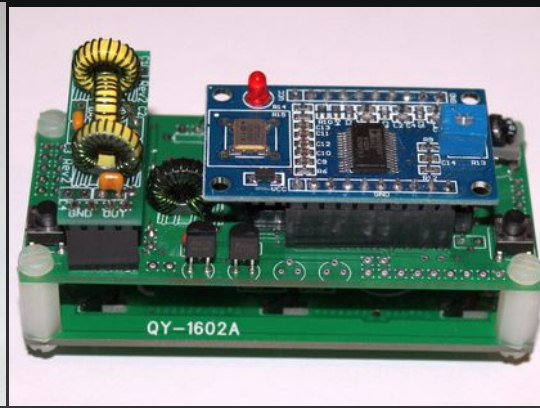
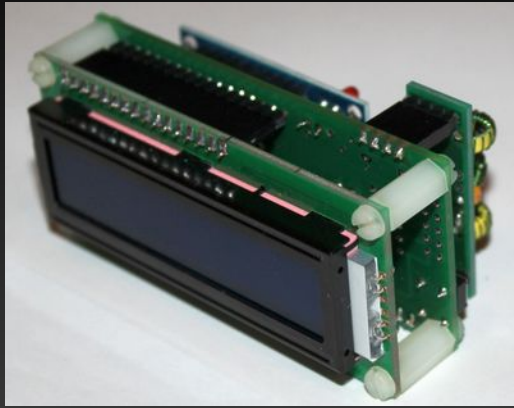
DATE	UTC	dB	DT	Freq	Drift	
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080406	1312	1	0.8	10.140246	-1	VE1VDM FN85 25
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080406	1318	-3	0.9	10.140246	-1	VE1VDM FN85 25
080406	1320	-26	1.2	10.140198	1	N2JR FM18 37
080406	1320	-3	0.7	10.140246	-1	VE1VDM FN85 25
080406	1322	-7	0.7	10.140246	0	VE1VDM FN85 25
080406	1326	5	0.6	10.140246	0	VE1VDM FN85 25
080406	1328	-16	2.0	10.140201	1	VE3CDX DM26 30
080406	1336	2	4.3	10.140195	1	KOOG EM47 30

2008 Apr 14 19:34:14

Dsec 0.0



•QRP-LABs Ultimate3S kit, \$33



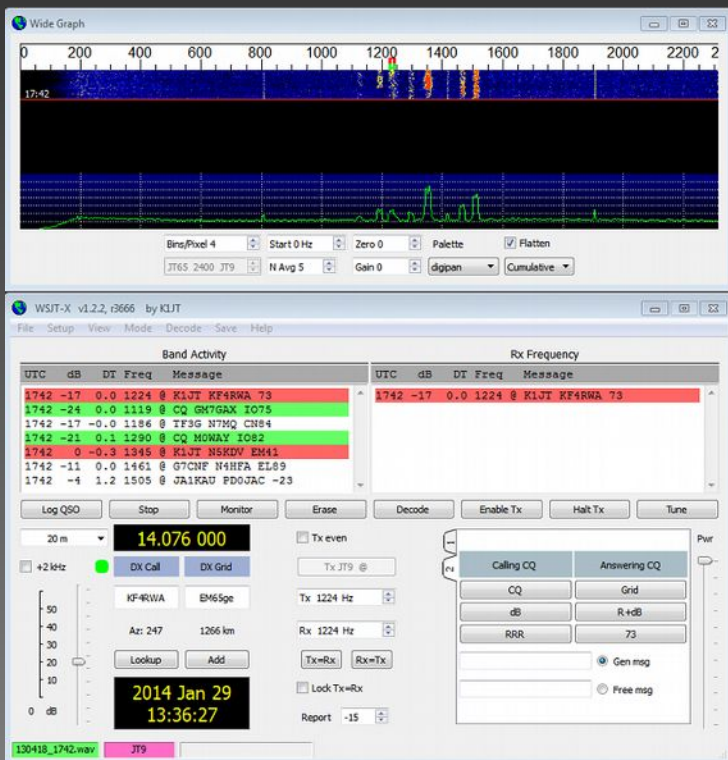
•SOTABEAMS WSPRlite, \$80



# JT-65/9HF WSJT-X

## Weak Signal Communication, by K1JT

WSJT offers specific digital protocols optimized for EME (moonbounce), meteor scatter, and ionospheric scatter, at VHF/UHF, as well as for HF skywave propagation. The program can decode fraction-of-a-second signals reflected from ionized meteor trails and steady signals 10 dB below the audible threshold. Check the WSJT page and links therein for details about modes JTMS, FSK441, ISCAT, JT6M, JT65, and JT4. 20 Meters: 14.076





# JT-65HF



**Wide Graph**

0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2

17:42

Bits/Pixel 4 Start 0 Hz Zero 0 Palette Flatten  
JT65 2400 JT9 N Avg 5 Gain 0 dppm Cumulative

**WSJT-X v1.2.2, r3666 by K1JT**

Band Activity				Rx Frequency					
UTC	dB	DI	Freq	Message	UTC	dB	DI	Freq	Message
1742	-17	0.0	1224	K1JT KF4RRA 73	1742	-17	0.0	1224	K1JT KF4RRA 73
1742	-24	0.0	1119	CQ GM7GAX IO75					
1742	-17	-0.0	1186	IF9G N7MQ CN84					
1742	-21	0.1	1290	CQ MONAY IO82					
1742	0	-0.3	1345	K1JT MS8DV EM42					
1742	-11	0.0	1461	G7CHP W4HFA EL69					
1742	-4	1.2	1505	JR1KAU PD0JAC -23					

Log QSO Stop Monitor Erase Decode Enable Tx Halt Tx Tune

20 m **14.076 000** Tx even  
+2 kHz DX Call DX Grd Tx JT9  
KF4RWA BM65pe Tx 1224 Hz  
Ar: 247 1266 km Rx 1224 Hz  
Tx=Rx Rx=Tx  
Lock Tx=Rx Report -15

Calling CQ Answering CQ  
CQ Grid  
dB R +dB  
RRR 73  
Gen msg  
Free msg

130418\_1742.wav JT9

On 20m show signals rcvd by the callsign K7AGE using JT65 over the last 1 hour

No recent reception reports. Automatic refresh in 5 minutes. Large markers are monitors.  
There are 256 active JT65 monitors on 20m. Show all JT65 on all bands Legend

Monitor: ER1LG Loc KM46px in Moldova  
Receiving: JT65 on 14.079 MHz (20m)  
Using: WSJT-X v1.6.0-devel r5210  
Show all seen by ER1LG

# PSK Reporter

# SSTV

## Slow Scan TV

Developed back in the 50s, provides sending and receiving still picture over a voice circuit.

MMSSTV, free and popular, 20 Meters 14.230

SSTV from the ISS, 145.800 MHz

The screenshot shows the MMSSTV software interface. The main window is titled "HZ1SK (HZ1SK.MDT) - MMSSTV Ver 1.12 [based on 8000Hz]". The interface includes a menu bar (File, Edit, View, Option, Profiles, Program, Help), a toolbar with buttons for Sync, RX, History, TX, and Template. The main display area is divided into several sections:

- TX Mode:** A list of modes including Auto, Robot 36, Robot 72, AVT 90, Scottie 1, Scottie 2, ScottieDX, Martin 1, Martin 2, and SC2 180.
- Log:** Fields for Call (His 595), Name (Qth), Note, and QSL (RxID, TxID, ABC).
- DSP:** A digital signal processor section with buttons for AFC, LMS, QSO, Data, Find, Clear, and List. The frequency is set to 14.230.
- Video Feed:** A large window showing a live video feed of a building with the call sign "HZ1SK" and "CQ de HZ1SK" overlaid.
- Frequency Spectrum:** A graph showing a signal spectrum with a peak around 14.230 MHz.
- Template Selection:** A row of buttons for S.pix, S.templates 1, 2, 3, and 4.
- Thumbnail Gallery:** A grid of small images at the bottom, including a building, a person, and various scenes.



# SSTV



HZ1SK (HZ1SK.MDT) - MMSSTV Ver 1.12 [based on 8000Hz]

File Edit View Option Profiles Program Help

Sync RX History TX **Template**

TX Mode  
Auto  
Robot 36  
Robot 72  
AVT 90  
Scottie 1  
Scottie 2  
ScottieDX  
Martin 1  
Martin 2  
SC2 180

1200 1500 1900 2300



Log  
Call His 595 My  
Name Qth  
Note  
QSL RxID TxID RBC

DSP  
AFC LMS QSO Data Find Clear List 14.230

Show with template  Draft 1/25

S.pix S.templates 1 2 3 4



**CQ de HZ1SK**

# Digital SSTV

*Digital picture file transfer*

*EasyPal, free and popular, 20 Meters 14.233*

The screenshot displays the EasyPal software interface, version 06/JAN/2014, running on a Windows operating system. The window title is "EasyPal - GØHWC - Ver:06/JAN/2014". The interface is divided into several sections:

- Menu Bar:** Setup, Hybrid, Action, LoadPic, LoadAny, Copy, Paste, WFPic, WFTxt, Rptr, FTP, Clear, About.
- Mode Selection:** TX (selected), RX, Sync.
- Parameters:**
  - Mode: E
  - Width: 2.4
  - ErrFix: HI
  - QAM: 4
  - LeadIn: 12
  - R/N: R/N
  - Sync: MSC, FAC, Frame, Time, IO
- TX/RX Status:** RX 38Hz, SNR 12dB.
- Position:** - remaining segments.
- Buttons:** TRANSMIT, Replay RX, FIX, BSR, TUNE, ID, Send Text, WAV, Pic/QSL,  RS2, M, EmbedTxt, Station Log, Session.
- Frequency Spectrum:** A graph showing the signal spectrum with a frequency range from 500 Hz to 2500 Hz.
- Image Transfer:** A large window displaying a digital picture of a Mars rover. The image is titled "VE1HBV Harry Bible Hill NS" and the file name is "de\_VE1HBV-4-mars2003\_rover.jpg". The image shows a rover on a reddish, rocky terrain with mountains in the background.
- Meta-Information:** de VE1HBV Mon-06Jan14 16:06 UTC E/2.4/Hi/4/Lng 14.233 @ www.g0hwc.com
- Gamma Control:** Gamma < >

# Digital SSTV



EasyPal - GØHWC - Ver:06/JAN/2014

Setup Hybrid Action LoadPic LoadAny Copy Paste WFPic WFTxt Rptr FTP Clear About

RX TX View Edit MSC Mov

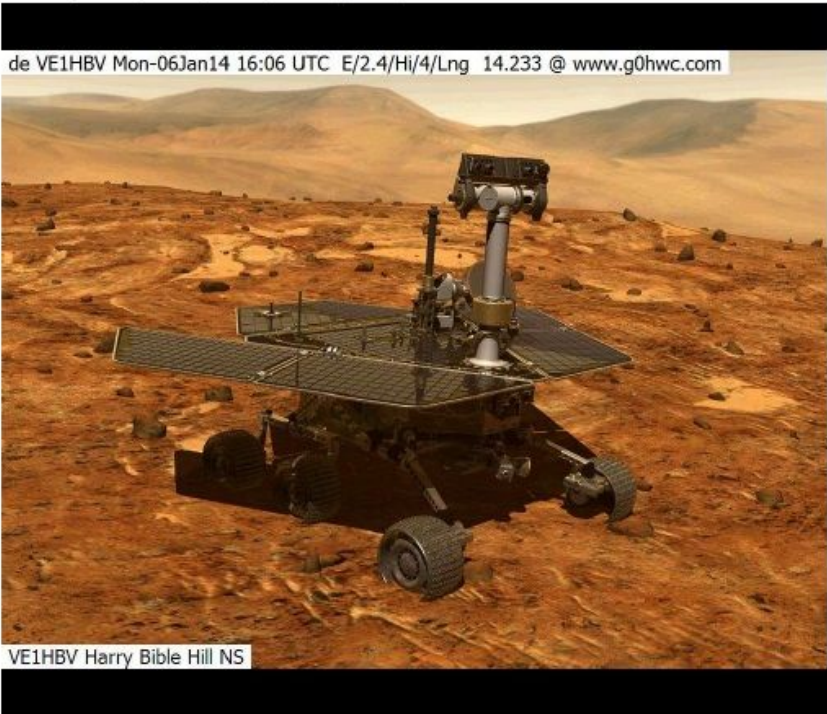
**VE1HBV** Mode E E **Sync** MSC  
RX 38Hz Width 2.4 2.4 FAC  
SNR 12dB ErrFix HI HI Frame  
Total - QAM 4 4 Time  
OK Segs - LeadIn 12 R/N IO  
Position - - remaining segments

TRANSMIT	Replay RX	FIX	BSR	
TUNE	ID	Send Text	WAV	Pic/QSL
<input checked="" type="checkbox"/> RS2	M	EmbedTxt	Station Log	Session

Hz> 500 1000 1500 2000 2500

5  
10  
15  
20  
25

de VE1HBV Mon-06Jan14 16:06 UTC E/2.4/Hi/4/Lng 14.233 @ www.g0hwc.com



VE1HBV Harry Bible Hill NS

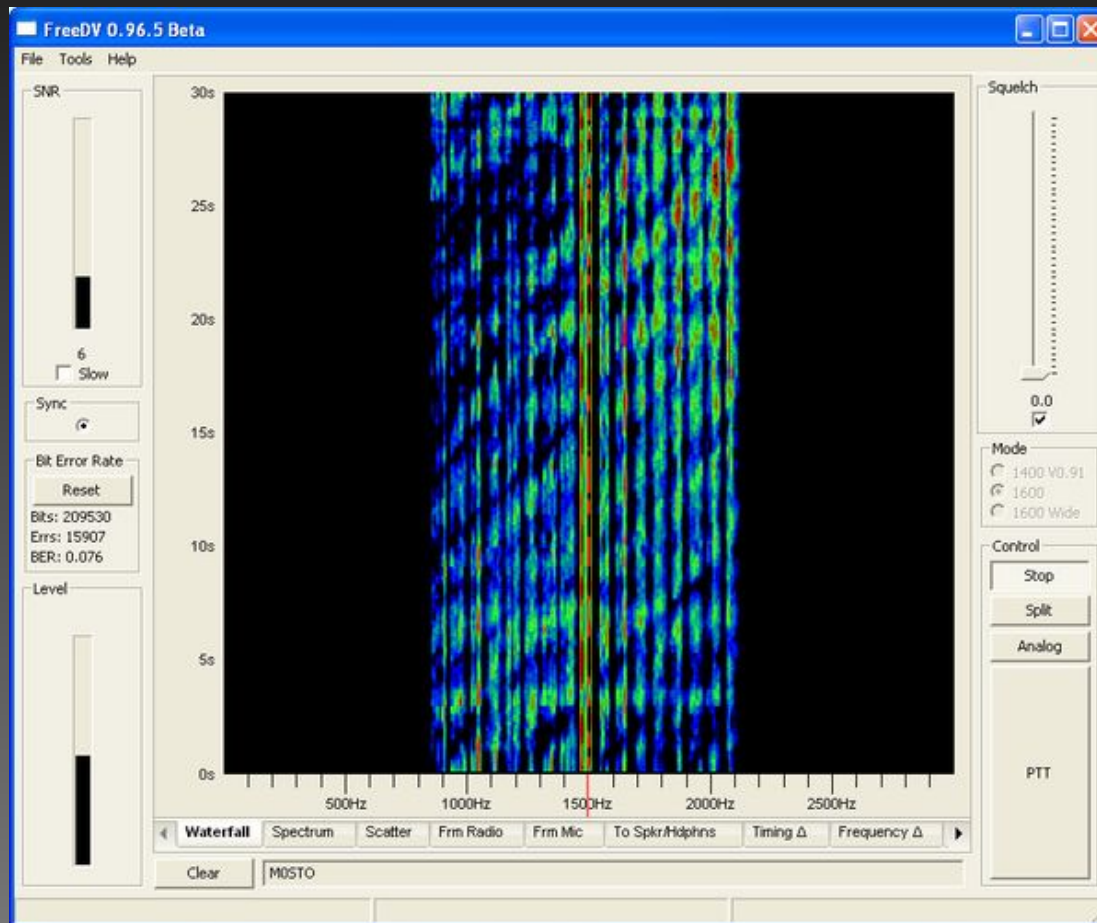
de\_VE1HBV-4-mars2003\_rover.jpg

Gamma < >

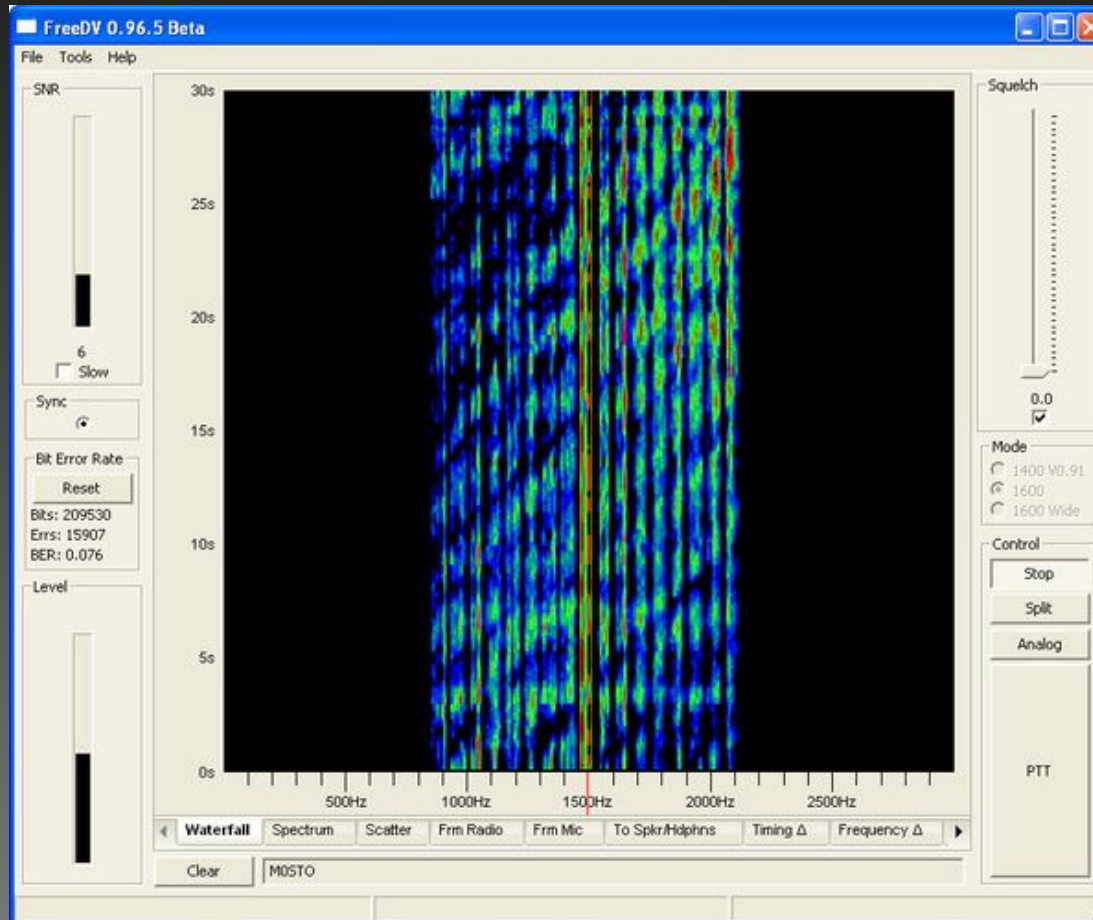
# Free DV

*Digital voice on HF*

*Free DV, free and popular, needs two sound cards, 20 Meters 14.236*



# Free DV



# Hellschreiber

*Fax mode from back in the 20s*

*Feld Hell Club, monthly sprint contests*

*FLDigi , 20 Meters 14.063*

The screenshot shows the FLDigi software interface for F/N4SPP. The main window displays a QSO log with columns for QSO Freq, On, Off, Call, Name, In, Out, and Notes. The current frequency is 3578.000. The interface is filled with Hellschreiber text, which is a form of digital communication. The text includes phrases like "BRENGEN. PA0AOB DE PA0KDF KKK", "7373 CHEERID ENBYE++DOK VOOR FRANK EN DEO VOLENTE TO TKOMENDE ZONDAG", and "DOK VOOR DEHELL SWL STNS//IF ANY// EN NATUURLIJK 88+++88+++ VOOR ST". The bottom of the interface features a waterfall display showing frequency bands from 3578.5 to 3580.5. The display shows a signal at 3579.0. The interface also includes various control buttons and a status bar at the bottom.



# Hellschreiber



The screenshot shows the fldigi software interface with the following details:

- Window Title:** fldigi - F/N4SPP
- Menu Bar:** File, Op Mode, Configure, View, Help
- Frequency:** 3578.000 (displayed in a digital display)
- QSO Freq:** 3578.852
- Call:** 1701
- Mode:** USB
- QTH:** QTH
- Table:** A table with columns: Rig Not Specified, QSO Freq, On, Off, Call, Name, In, Out, Notes. It contains several rows of Hellschreiber text, including "7373 CHEERID ENBYE++DOK VOOR FRANK EN DEO VOLENTE TO TKOMENDE ZONDAG" and "DOK VOOR DEHELL SWL STNS//IF ANY// EN NATUURLIJK 88+++88+++ VOOR ST".
- Control Panel:** A row of buttons for CQ, ANS, QSO, KN, SK, Me, QTH, Brag, Tx, Rx, and a volume control slider.
- Waterfall Plot:** A frequency waterfall plot showing a signal centered around 3579.0 kHz. The x-axis is labeled with frequencies: 3578.5, 3579.0, 3579.5, 3580.0, 3580.5.
- Bottom Panel:** A row of buttons for WF, -20, 70, x1, NORM, 852, QSY, Store, Lk, Rv, T/R, and a status bar with "FELDHELL" and "APC SQL".

# Digital Sample Files

## Digital Modes - Sight & Sound

[BPSK/QPSK](#)

[BPSK - Overdriven](#)

[Contestia](#)

[CW](#)

[DominoEX](#)

[Feld Hell](#)

[MFSK](#)

[MT-63](#)

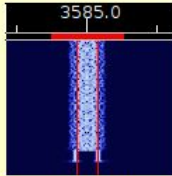
[Olivia](#)

[RTTY](#)

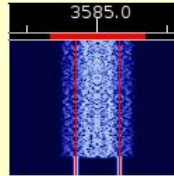
[Thor](#)

[Throb](#)

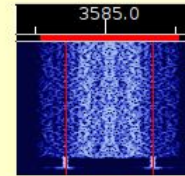
[Mode Comparison](#)



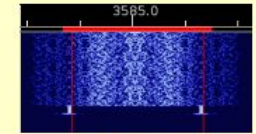
BPSK-31  
[Spectrum](#)  
[Sound](#)



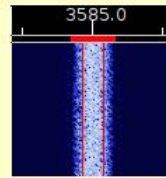
BPSK-63  
[Spectrum](#)  
[Sound](#)



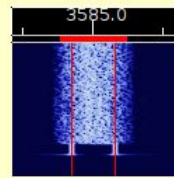
BPSK-125  
[Spectrum](#)  
[Sound](#)



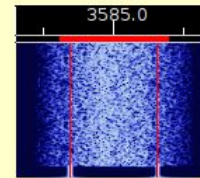
BPSK-250  
[Spectrum](#)  
[Sound](#)



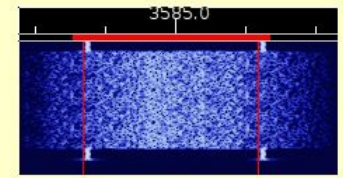
QPSK-31  
[Spectrum](#)  
[Sound](#)



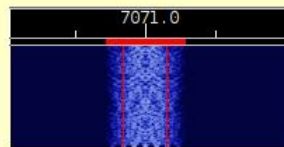
QPSK-63  
[Spectrum](#)  
[Sound](#)



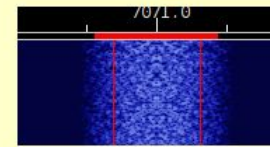
QPSK-125  
[Spectrum](#)  
[Sound](#)



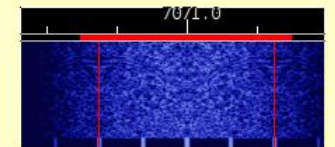
QPSK-250  
[Spectrum](#)  
[Sound](#)



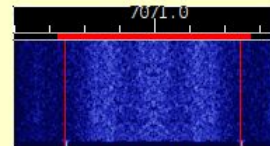
PSK-63F  
[Spectrum](#)  
[Sound](#)



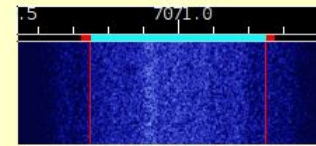
PSK-125R  
[Spectrum](#)  
[Sound](#)



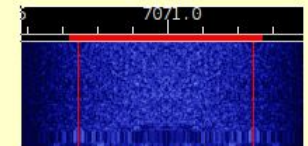
PSK-250R  
[Spectrum](#)  
[Sound](#)



BPSK-500  
[Spectrum](#)  
[Sound](#)



QPSK-500  
[Spectrum](#)  
[Sound](#)



PSK-500R  
[Spectrum](#)  
[Sound](#)

# Digital Sample Files

Digital Modes

## G4UCJ's Radio Website

LAST UPDATED: **1st January 2018**

**SOME DIGITAL MODES USED IN HAM RADIO**

Digital modes are becoming more and more popular on the amateur bands. This is mainly due to the following reason: Affordable home PC's with built in soundcards. This has brought forth a multitude of decoding software, some free, others not. There are new modes being invented all the time and keeping track of these is turning into a full time job! One of the main problems encountered by the newcomer to digital modes (or digimodes as they are known) is how to identify what they are seeing/hearing. Most of the decoding software uses a visual 'waterfall' display to facilitate easy tuning.

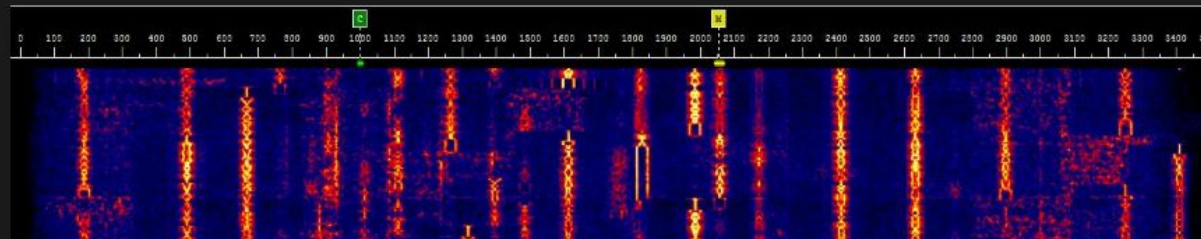
With that in mind I went on the bands and captured images of the most common digital modes in use at the moment. Below you will see images of each mode together with some brief notes on the mode. The images show the most common variant(s) of the mode, although some have many different 'flavours'! I will add to this list as and when I hear/identify a new mode that is being used on a regular basis (last popular 'new' one is Olivia which wasn't around when I did this page on my original site)

Click on the name of the mode (where the name is underlined) to hear an mp3 of how the mode sounds on air (these are to give you an idea of how that mode sounds, not for analysis purposes) I have included some sound files of mode variants - more to come as I find them).

### PSK31

PSK, or Phase Shift Keying has become the most popular of the newer digital modes. There is a wealth of information on the web regarding BPSK (Binary PSK) and QPSK (Quadrature PSK)

Because PSK31 has a bandwidth of only 31Hz, many signals can fit into the same bandwidth that would be occupied by an SSB signal (2.4kHz approx.). It is quite common to see 15 or more signals on a 2.5kHz waterfall display.



A 'clean' BPSK31 signal. This is how your signal should look!

[www.hfradio.org.uk/html/digital\\_modes.html](http://www.hfradio.org.uk/html/digital_modes.html)

And now the 800 pound digital gorilla



FT8  
Ham Radio  
Without The Jibber-Jabber

# FT8 WSJT-X

*Faster, 15 second version JT65, Steven Franke, K9AN, and Joe Taylor, K1JT*

*The numeral designates the mode's 8-frequency shift keying format. Tones are spaced at 6.25 Hz, and an FT8 signal occupies just 50 Hz. Unlike JT65 or JT9, transmit and receive cycles in FT8 each last about 15 seconds. Like JT65, FT8 requires accurate time synchronization. An auto-sequencing feature offers the option to respond automatically to the first decoded reply to your CQ.*

*"FT8 is an excellent mode for HF DXing and for situations like multi-hop Es on 6 meters, where deep QSB may make fast and reliable completion of QSOs desirable," Taylor's release notes assert.*

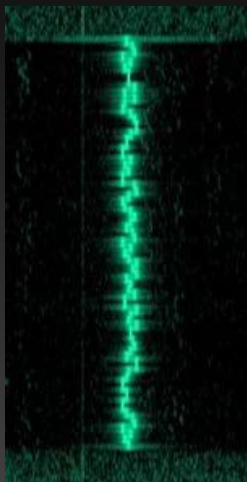
## 14.074 & 7.074 MHz

The screenshot shows the WSJT-X v1.8.0-rc2 interface. On the left is a waterfall plot with a frequency axis from 500 to 2500 kHz and a time axis from 20:47:45 to 20:48:00. The plot shows several vertical signal traces. On the right is the control panel. The 'Band Activity' table lists received signals, and the 'Rx Frequency' table lists decoded messages. The frequency display shows 14.074000 MHz. The status bar at the bottom indicates 'Receiving FT8' and 'Last Tx: J. ITZQ K7AGE 73'.

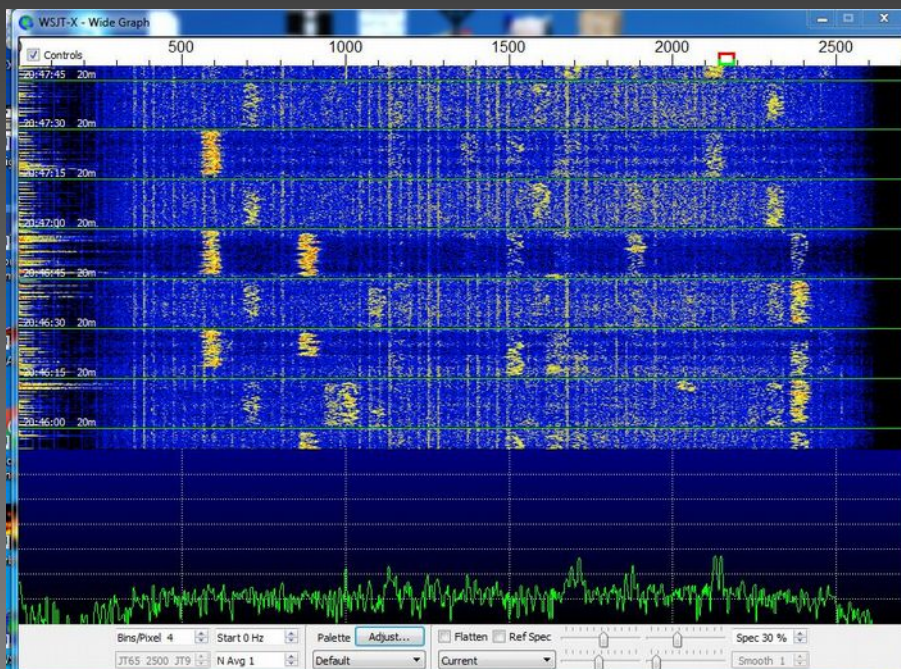
UTC	dB	DT	Freq	Message
204645	-12	0.3	1497	KS90 K4CAE -09
204645	-7	0.2	2366	JLITZQ W3IH 73
204700	-10	0.2	692	CT1APP KB5GLV EM12
204700	-11	0.1	1577	G4UGB KOXB -03
204700	-18	0.1	1866	CQ WY1G FN32
204700	-9	0.1	2291	PE1MPI K2DSW RRR
204715	5	0.9	569	MW1CFN KG7OG DM34
204715	-15	0.2	1134	MW1CFN VE6SH 73
204715	-14	-0.5	1497	KS90 K4CAE -09
204715	-12	0.2	2106	CQ W3IH DM63
204730	-13	0.1	692	CT1APP KB5GLV EM12
204730	-16	0.1	1137	MW1CFN KD2ISV FN02
204730	-15	0.1	1577	G4UGB KOXB -03
204730	-10	0.1	2291	PE1MPI K2DSW 73

UTC	dB	DT	Freq	Message
204330	3	0.8	2140	CQ JLITZQ FM95
204347	Tx		2140	JLITZQ K7AGE CN72
204400	3	0.8	2141	K7AGE JLITZQ -03
204415	Tx		2141	JLITZQ K7AGE R+03
204430	5	0.9	2142	K7AGE JLITZQ RRR
204445	Tx		2142	JLITZQ K7AGE 73
204500	1	0.8	2143	K7AGE JLITZQ 73
204515	Tx		2142	JLITZQ K7AGE 73

# FT8 WSJT-X



14.074 & 7.074 MHz



WSJT-X v1.8.0-rc2 by K1JT

File Configurations View Mode Decode Save Tools Help

Band Activity				Rx Frequency					
UTC	dB	DT	Freq	Message	UTC	dB	DT	Freq	Message
204645	-12	0.3	1497	~ K590 K4CAE -09	204330	3	0.8	2140	~ CQ JL1TZQ FM95
204645	-7	0.2	2366	~ JL1TZQ W3IH 73	204347	Tx		2140	~ JL1TZQ K7AGE CN72
----- 20m									
204700	-10	0.2	692	~ CT1APP KB5GLV EM12	204400	3	0.8	2141	~ K7AGE JL1TZQ -03
204700	-11	0.1	1577	~ G4UGB KOXB -03	204415	Tx		2141	~ JL1TZQ K7AGE R+03
204700	-18	0.1	1866	~ CQ WY1G FN32	204430	5	0.9	2142	~ K7AGE JL1TZQ RRR
204700	-9	0.1	2291	~ PE1MPI K2DSW RRR	204445	Tx		2142	~ JL1TZQ K7AGE 73
----- 20m									
204715	5	0.9	569	~ MW1CFN KG7OG DM34	204500	1	0.8	2143	~ K7AGE JL1TZQ 73
204715	-15	0.2	1134	~ MW1CFN VE6SH 73	204515	Tx		2142	~ JL1TZQ K7AGE 73
204715	-14	-0.5	1497	~ K590 K4CAE -09					
204715	-12	0.2	2106	~ CQ W3IH DM63					
----- 20m									
204730	-13	0.1	692	~ CT1APP KB5GLV EM12					
204730	-16	0.1	1137	~ MW1CFN KD2ISV FN02					
204730	-15	0.1	1577	~ G4UGB KOXB -03					
204730	-10	0.1	2291	~ PE1MPI K2DSW 73					

Log QSO Stop Monitor Erase Decode Enable Tx Halt Tx Tune Menus

20m 14.074 000

DX Call DX Grid Tx even/lst Tx 2142 Hz Tx - Rx  
JL1TZQ FM95 Rx 2142 Hz Rx - Tx  
Az: 301 4899 mi Lookup Add Report S Lock Tx=Rx

2017 Oct 08 20:47:49

Generate Std Msgs Next Now Pwr  
JL1TZQ K7AGE CN72 Tx.1  
JL1TZQ K7AGE +05 Tx.2  
JL1TZQ K7AGE R+05 Tx.3  
JL1TZQ K7AGE RRR Tx.4  
JL1TZQ K7AGE 73 Tx.5  
CQ K7AGE CN72 Tx.6

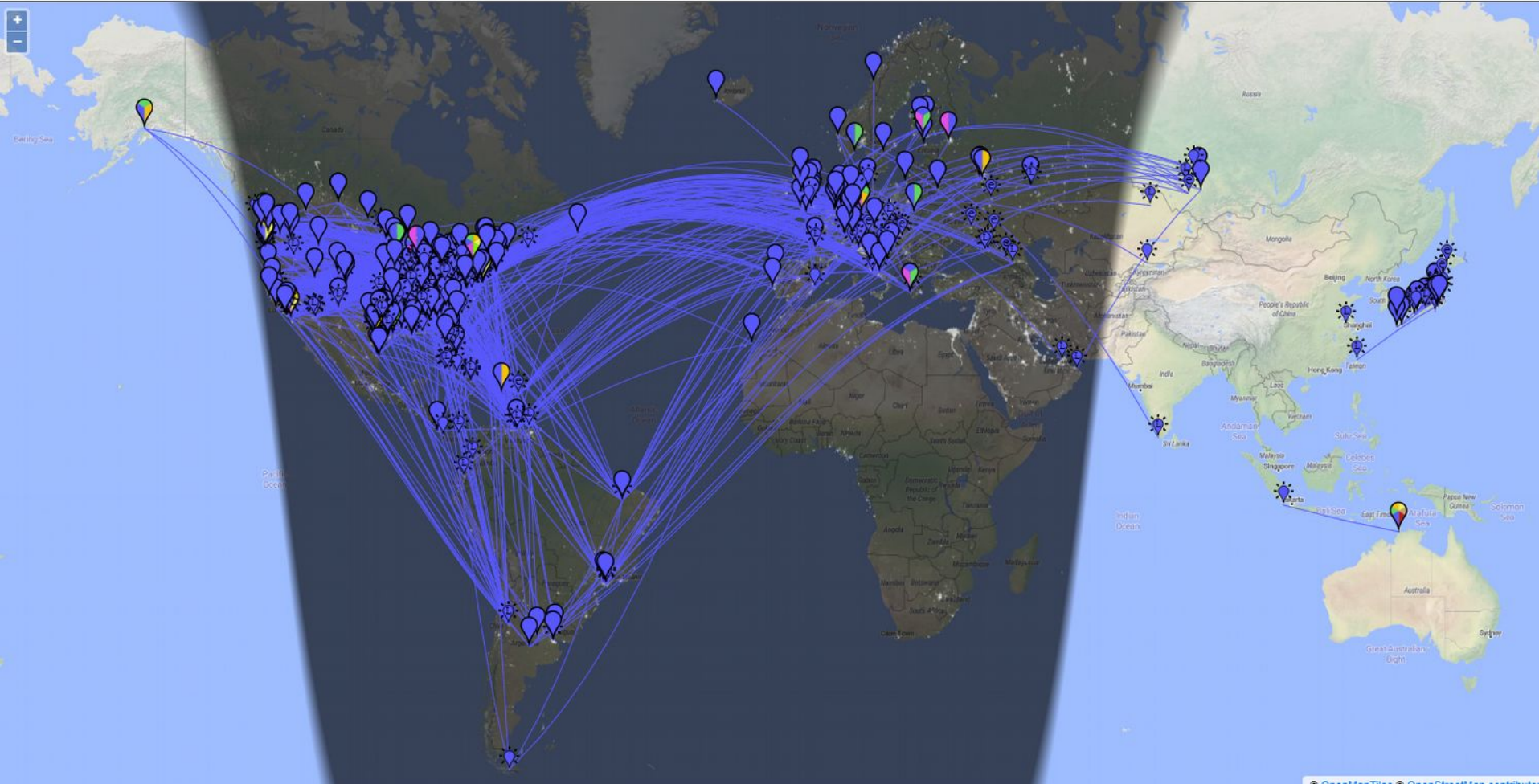
Receiving FT8 Last Tx: JL1TZQ K7AGE 73 4/15 WD:6m

# FT-8 Activity 40 M, 6 hours

On 40m ▾, show signals ▾, sent/rcvd by ▾ anyone ▾, using FT8 ▾ over the last 6 hours ▾ Go! [Display options](#) [Permalink](#)

Automatic refresh in 5 minutes. Large markers are monitors. [Display all reports](#).

There are 675 active FT8 monitors on 40m. [Show all FT8 on all bands](#). [Show all on all bands](#). [Legend](#)





# FT8 – Tipping Point for Ham Radio?

*Gerald, K5SDR CEO, FlexRadio*

*FT8 counters the current dearth of sunspots*

*FT8 opens “dead bands”*

*FT8 is addictive – see em, click em, work em... Boom!*

*FT8 lets little pistols work DXCC like a big gun*

*FT8 lets you work the world from small or deed restricted lots*

*FT8 is a weak signal – not a low power mode (power works the really weak ones)*

*FT8 lets you work DX on 6m when there would be none*

*FT8 is suddenly dominating VHF/UHF contesting*

*FT8 lets you work weak signal DX without proficient CW skills*

*FT8 decoding to -20 dB SNR is like turning 100W into 10kW*

*FT8 is like having constant DX beacons on every band*

*FT8 puts the DX, WAS, WAZ, etc. on the air when they might not be*

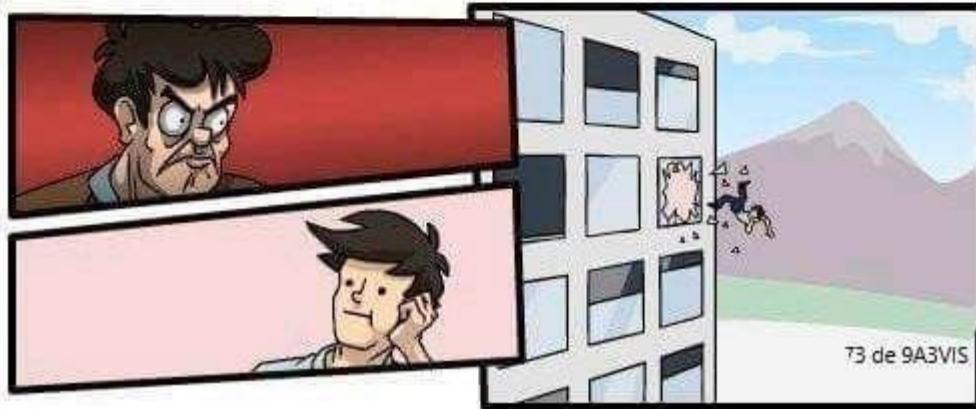
*FT8 let's you work DXCC on 160m without a big station*

*FT8 let's you call CQ and become the DX*

*FT8 is amazing literally space age technology*

*FT8 is probably other things I haven't realized yet but some of you have*





# JS8Call

JS8Call by KN4CRD 

[Home](#) [Download](#) [Contact](#) [FAQ](#) [Guides](#) [News](#) 



The screenshot displays the JS8Call software interface. At the top, the frequency is set to 7.078 MHz with a 1550 Hz offset. The call sign M0IAX - IO90IV43 is shown, along with the time 11:36:59 and date 2019 Feb 22. The interface includes buttons for RX, TX, TUNE, SPOT, AUTO, and LOG. A message log shows several messages, including "M0IAX ACK -20" and "DH7AHO IZ5CND ACK +00". A call list on the right shows stations like @ALLCALL, DH7AHO, and HB9AVK. A central text box contains the following quote:

**JS8Call**

"The idea with JS8Call is to take the robustness of FT8 mode and layer on a messaging and network protocol for weak signal *communication* on HF with a keyboard-to-keyboard interface. JS8Call is heavily inspired by [WSJT-X](#), [Fldigi](#), and [FSQCall](#) and would not exist without the hard work and dedication of the many developers in the amateur radio community."

At the bottom, there is a frequency display with a CAT indicator and a spectrum plot showing a signal at 1500 Hz.

# JS8Call



## JS8Call Frequencies

From version .0.5.x the default calling frequencies set up in JS8Call are listed below, but please note these are not set in stone and can easily be changed in your settings, or you can simply manually retune your radio to another frequency.

1.842Mhz	3.578Mhz	7.078Mhz
10.130Mhz	14.078Mhz	18.104Mhz
21.078Mhz	24.922Mhz	28.078Mhz
	50.318Mhz	

# JS8Call

# JS8Call

FT8Call de KN4CRD (v0.4.2-devel) a derivative of WSJT-X by K1JT

File Configurations Save Window Help

20m  
14.080 000  
495 Hz

M0IAX  
2018 Aug 15  
09:44:41  
Next Beacon: 739 s

RX TUNE SPOT  
AUTO BCN LOG

496	(6m)	-03	...T	UP TODAY? Z	YICM -	HI JULIAN	-
246	(now)	+07	OH6J	OH8STNP	OH6J TESTING	...	-
741	(now)	-13	...8STNP:	ALLCALL	SHORT STATION BRE		
947	(14m)	-12	SQ8W:	CQCQCQ KN09	-		
1045	(14m)	-06	... BEACON KP10	OH1EEZ:	BEACON KP10	-	
1376	(1m)	+07	...K:	BEACON JN47	HB9AVK:	BEACON JN47	-
1601	(now)	-01	...CQCQCQ KN09	-	SQ8W:	CQCQCQ KN09	-
1853	(11m)	-07	...N3URE SNR -06	-	SQ8W:	ON3URE QSL	-

09:31:59 - (495) - OH8STNP: M0IAX# HELLO MARK. SITREP WX +13C. SOME CLOUDS. BATTERY LEVEL OK. HC7 RD3DKV -  
09:32:14 - (490) - OH8STNP: M0IAX# HELLO MARK. SITREP WX +13C. SOME CLOUDS. BATTERY LEVEL OK. HC7 -  
09:34:02 - (495) - M0IAX: OH8STNP HI JULIAN GOOD TO HEAR FROM YOU  
09:35:51 - (496) - M0IAX: OH8STNP SMR -16  
09:36:44 - (495) - AND YOU MARK. WHAT IS YOUR SETUP TODAY? ZYICM -  
09:38:15 - (490) - HI JULIAN!  
09:38:40 - (496) - M0IAX: OH8STNP RASP PI KOM 7300 AH4 TUNER RANDOM WIRE FLOATING IN 2M SEA WATER  
09:41:02 - (496) - M0IAX: OH8STNP WX IS CLOUD +20C

ALLCALL  
HB9AVK (1m) +07 JN47 803 km  
LB9YH (12m) -18 J048 1099 km  
OH1EEZ (14m) -06 KP10 1863 km  
OH6J (45s) +00 KP12 1971 km  
OH8STNP (12m) -16 KP25 2304 km  
SM5SYD (10m) -12 J089 1517 km  
SQ8W (now) -01 KN09 1575 km

Type your outgoing messages / commands here.

CQ QTC QTH Macros Directed Conts Halt

500 1000 1500 2000 2500

80  
60  
40  
20  
0  
-20  
-40  
-60  
-80  
53 dB

09:44:30 20m  
09:44:15 20m

Bins/Power 3 Start 0 Hz Palette Adjust... Flatten Ref Spec Spec 0 %  
Offset 495 Hz N Avg 1 Default Cumulative Smooth 1

Receiving FT8CALL Last Tx +20C 11/15

# Hans Summer G0UPL QRP-LABs kits

## QRP Labs

QRP Labs Shop

[Click here for Shop!](#)

### News

- [July 2018 newsletter](#)
- [Dayton FDIIM/hamvention 2018](#)
- [May 2018 newsletter](#)
- [March 2018 newsletter](#)
- [February 2018 newsletter](#)
- [2017 archive](#)
- [2016 archive](#)

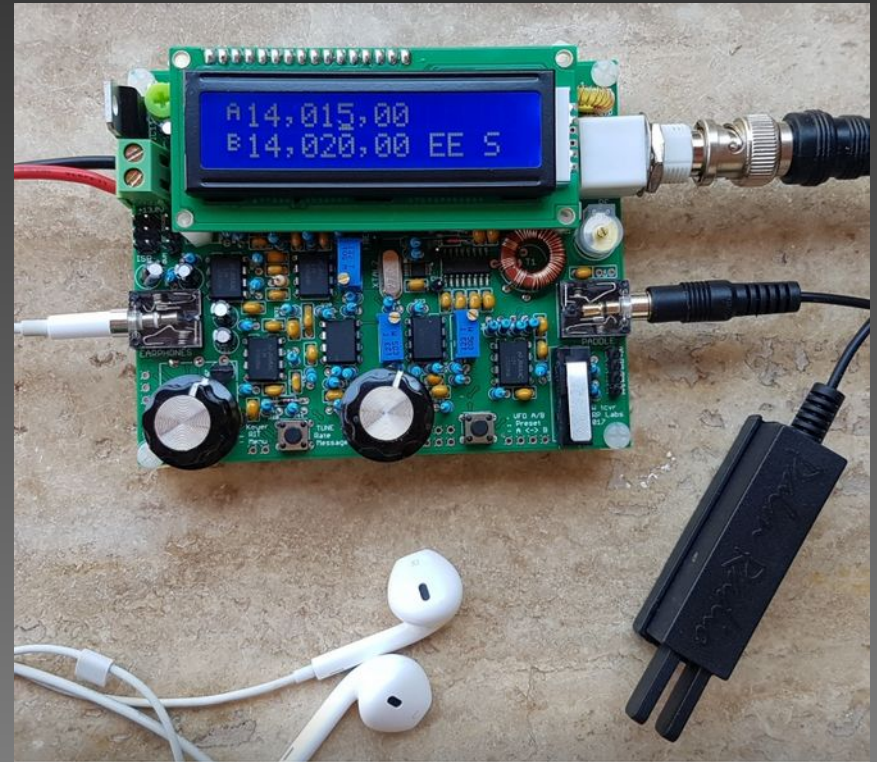
5W CW transceiver kit



QCX: a feature-packed, high performance, single-band 5W CW transceiver kit, with WSPR beacon and built-in alignment/test equipment. Available for 80, 60, 40, 30, 20 or 17m bands. It has rotary encoder synthesised tuning, VFO A/B/Split, Iambic keyer, CW decoder, and more...

**Click!**  
**Shop order**  
**\$49**

# > 7,300 Shipped



# Hans Summer G0UPL QSX Kit

## QSX all-band all-mode transceiver

QSX (QRP Labs SSB Xcvr) is a 40m SSB transceiver. It will have an optional 10-band (160m-10m) filter module, and an optional extruded aluminium enclosure. This will make an all-band HF all-mode 10W High performance transceiver.

The kit inherits all the functionality of the famous [QCX single-band CW transceiver kit](#) but adds SSB, AM, FM, PSK31 and RTTY. This will be the lowest cost all-HF radio available but also high performance and packed with features. These are the planned features of QSX:

- Software Defined Radio (SDR) technology with standalone Digital Signal Processing (DSP), no PC required
- Very high performance 24-bit Analog to Digital Converter (ADC) and 24-bit Digital to Analog Converter (DAC)
- 40m (single band); or with optional extra board, 160-10m (10-band, including 60m)
- Modes: SSB, CW, AM, FM, PSK31, RTTY, WSPR beacon
- Power output: 10W from 13.8V supply (power output is adjustable by the firmware)
- Single power supply needed, 12V to 14V
- USB host interface and connector, for USB keyboard to allow PC-less operation on PSK31 and RTTY
- USB device interface and connector, for PC CAT Control
- QSX can appear to a PC as a high performance 24-bit USB sound card and radio - for digital modes from a PC e.g. FT8, either demodulated or as I-Q for PC SDR programs
- Built-in CW IAMBIC keyer (or straight keying also possible) with raised-cosine key-envelope shaping
- DSP features (selectable sharp filters, AGC, Speech Compression, Noise Reduction etc.)
- Dual microphone inputs (mobile phone headset with VOX, or RJ45 connector for Kenwood/Yaesu mics)
- Dual VFO (A/B/Split), frequency and message memories
- Through-hole assembly only
- Built-in test equipment features for alignment, debugging and general purpose use
- Detailed assembly manual
- Macro facility for user defined sequences of operations, or redefinition of controls
- Front panel: 16 x 2 LCD (yellow/green backlight), 2 rotary encoders, 4 buttons, mic/earphones socket
- Soft-power on/off switch, the radio saves its state automatically on switch off, so that it starts up in the same state next time
- Free firmware updates for life, very simple firmware update procedure via a USB memory stick

QSX is still in development! The above list is subject to change. The following is a FAQ with information about QSX.

QTX

Single Band ~ \$75

10 Band with enclosure ~\$150



Thanks for listening  
Randy, K7AGE

Twitter @k7age

k7age@k7age.com

Get on the air

Be Radio Active

The screenshot shows a YouTube search results page for the query "k7age psk". The page features a search bar at the top with the YouTube logo and the search term. Below the search bar, there are several video results, each with a thumbnail, title, channel name, and view count. The first result is a playlist titled "How to get started with PSK-31 Ham Radio" by K7AGE, containing 7 videos. The second result is "How to receive PSK-31, Introduction" by K7AGE, with 211,087 views. The third result is "How to operate PSK-31 Ham Radio" by K7AGE, with 106,571 views. The fourth result is "Ham Radio PSK-31 Presentation at SEA-PAC" by K7AGE, with 7,786 views. The fifth result is "Pacificon 2012: K7AGE PSK-31 Forum" by K7AGE, with 3,736 views. The thumbnails for the first three results show a blue background with the text "PSK-31" and "K7AGE" and a spectrogram. The fourth result shows a yellow banner with "K7AGE PSK-31 Presentation" and the "SEA-PAC" logo. The fifth result shows a building and a circular logo for "Pacificon 2012".

YouTube k7age psk

Filters About 516 results

**How to get started with PSK-31 Ham Radio**  
K7AGE  
How to receive PSK-31, Introduction 16:26  
How to interface a sound card for Ham Radio 10:26  
View full playlist (7 videos)

**How to receive PSK-31, Introduction**  
K7AGE  
9 years ago • 211,087 views  
I will show you how to get Digipan up and running in a few minutes receiving PSK31 without needing any interface boxes or ...  
CC

**How to operate PSK-31 Ham Radio**  
K7AGE  
9 years ago • 106,571 views  
Video shows operating aspects of PSK-31 using Digipan. I show how to use the Macros and Logging within the program.

**Ham Radio PSK-31 Presentation at SEA-PAC**  
K7AGE  
2 years ago • 7,786 views  
My Ham Radio PSK-31 Presentation at the SEA-PAC Hamfest in Seaside Or, June 7, 2014. I cover the basics of PSK-31. Thanks ...

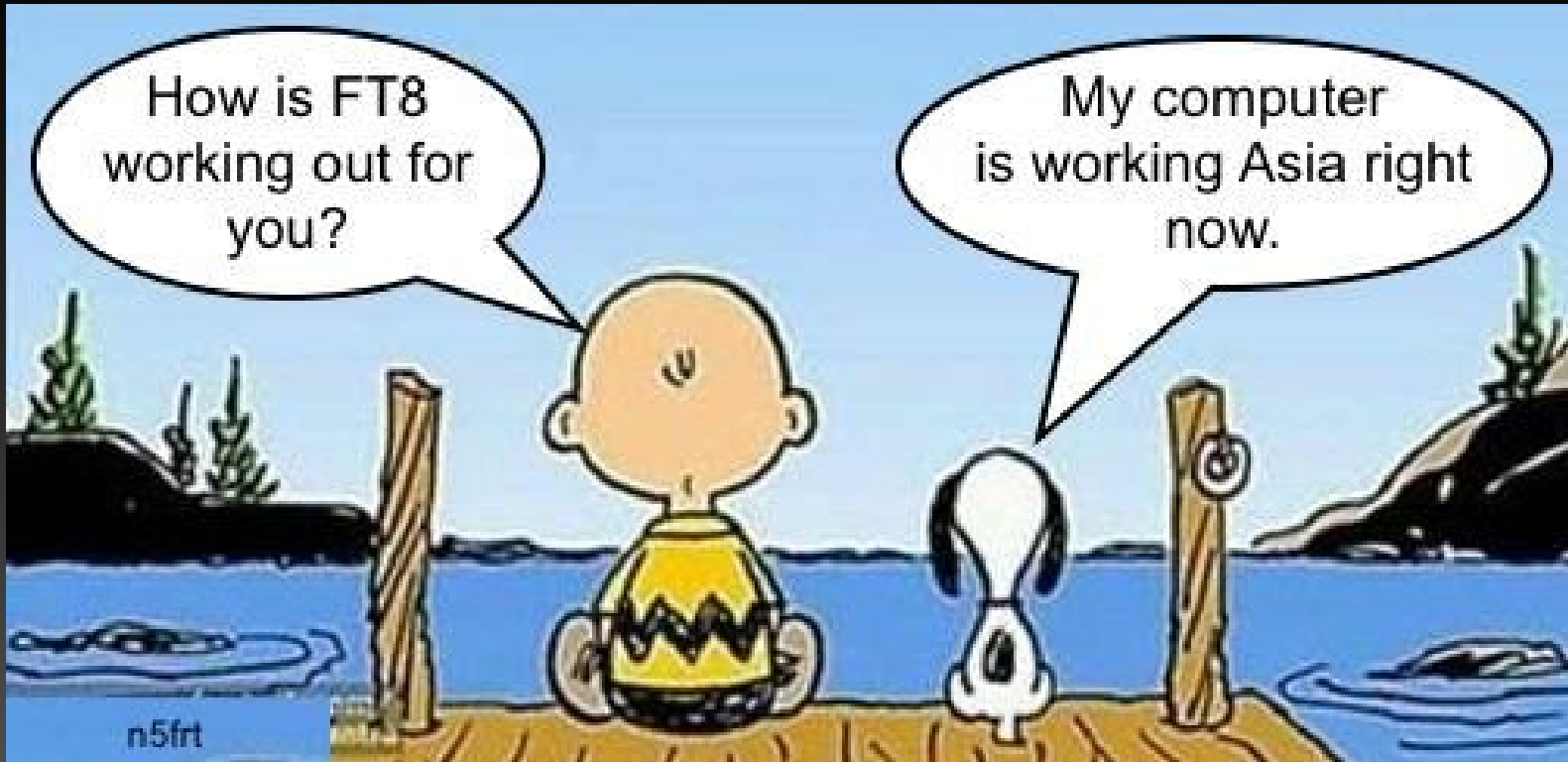
**Pacificon 2012: K7AGE PSK-31 Forum**  
K7AGE  
4 years ago • 3,736 views  
This is a video is of my Pacificon 2012 Ham Radio PSK-31 presentation. If you would like a pdf copy of the presentation and the ...



How is FT8 working out for you?

My computer is working Asia right now.

n5ft



JUST WHEN I GOT UP TO SPEED ON  
JT65 AND THEN ON JT9, THEY CAME  
OUT WITH FT8!



NOW EVERYBODY'S TALKING ABOUT FT4.