

HF DIGITAL MADE EASY

Fun, Easy and power efficient

- ▶ **Digital Modes on HF (or VHF/UHF)**
 - ▶ **Uses the power of your computer to encode and decode**
 - ▶ **One interface works on almost all modes**
 - ▶ **Low Power required**
 - ▶ **Moderate computer either desktop or laptop**
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- A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, located in the lower right quadrant of the slide.

- ▶ **Many modes to choose from – Find your favorite**
 - ▶ **Most software is FREE FREE FREE**
 - ▶ **Easy to build interface from Radio to Computer**
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- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the green background.

OK, What do I need?

- ▶ HF Radio, Frequency stable VFO (most solid state radios)
 - ▶ Power supply with stable clean DC
 - ▶ Antenna, dipole, rain gutters, vertical, flag pole
 - ▶ Interface, build, buy, or built-in
 - ▶ Program
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- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

HF Radio

- ▶ Does not have to be fancy or expensive.
 - ▶ Example – Yaesu FT-840, Icom IC-718, IC-706, Kenwood TS-130
 - ▶ If it is stable on CW, then it is stable enough.
 - ▶ 50 watts is more than you will need.
 - ▶ Contacts on 5 – 10 watts are not uncommon
 - ▶ ALC meter is your best friend
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- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

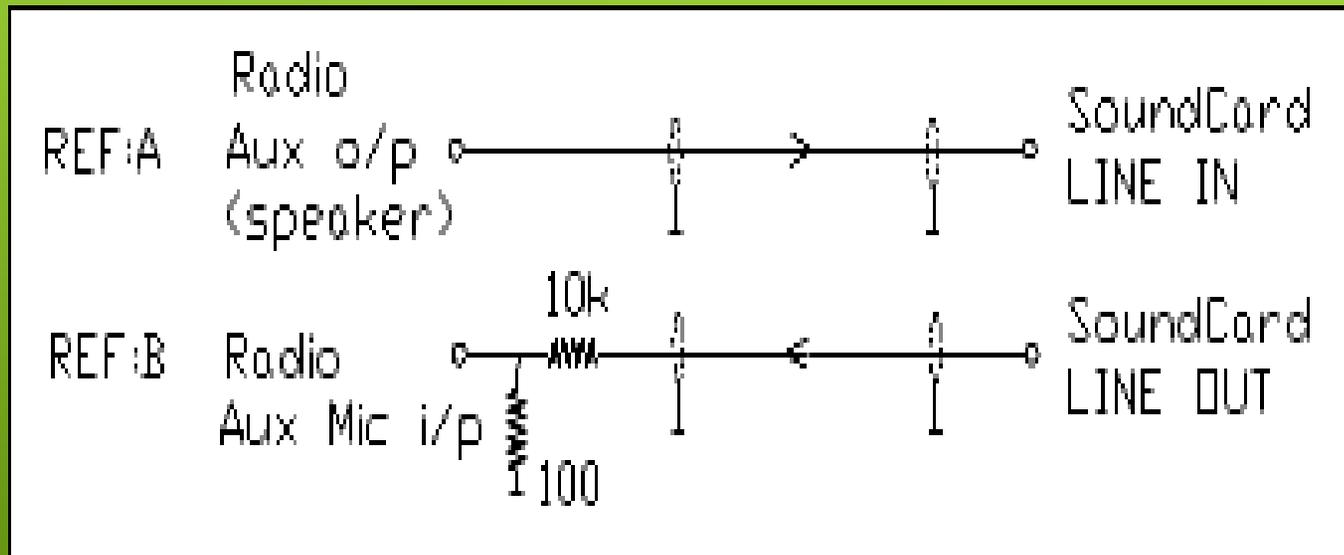
Computer to Radio Interface

- ▶ What does it do?
- ▶ Pass audio from the radio to the computer and from the computer to the radio
- ▶ Key the radio
- ▶ PC Control of the radio, not required but can make remote operation

easier!

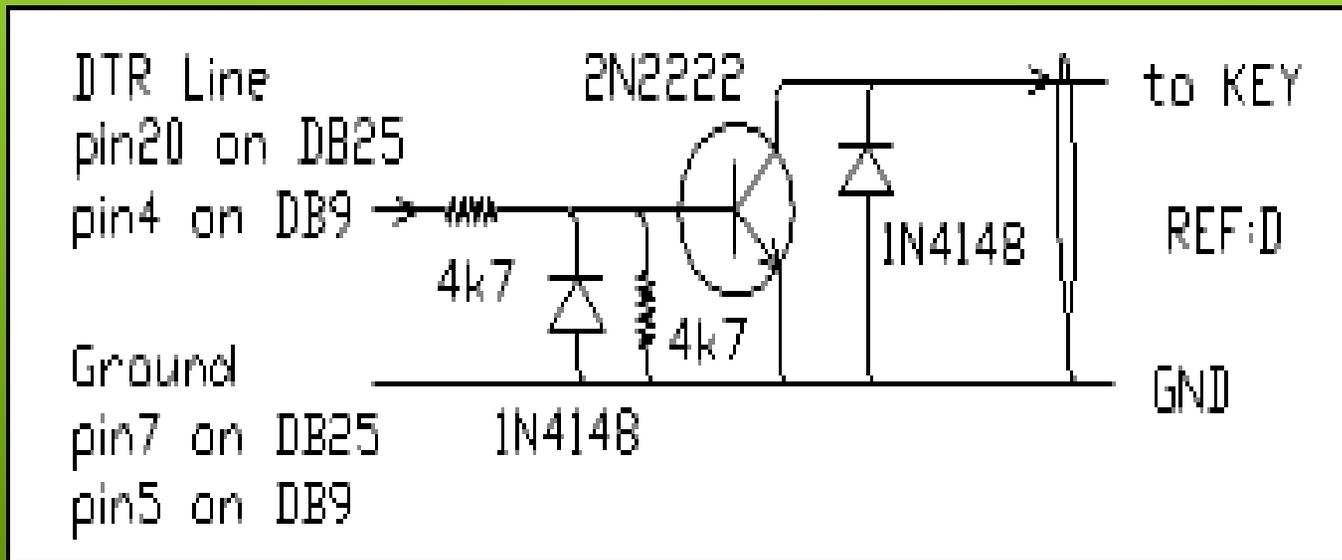
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Computer to Radio Interface (cont.)



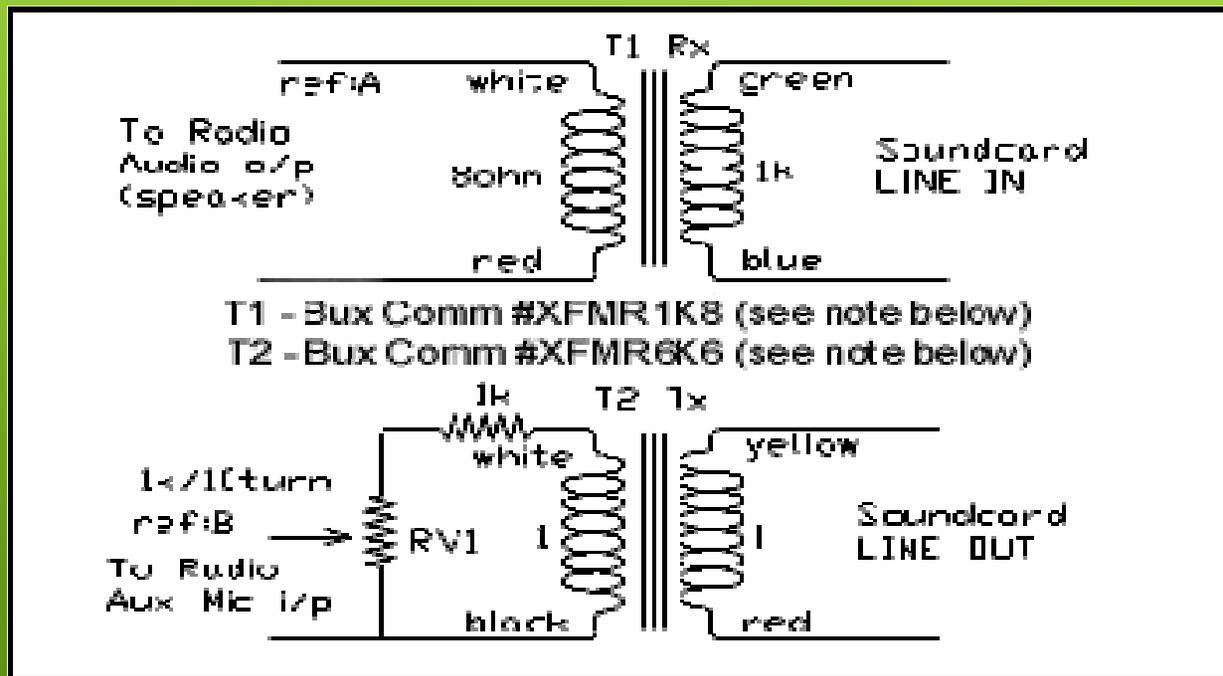
Simple Audio Interface

Computer to Radio Interface (cont.)



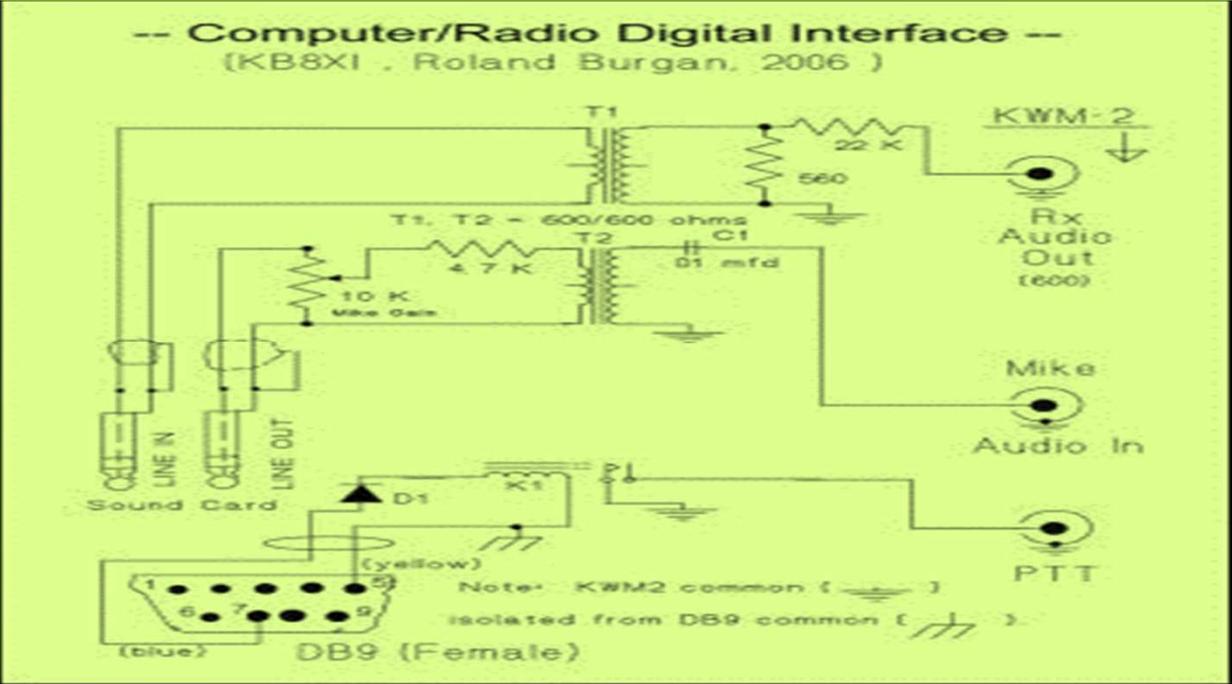
Transistor Keying Interface

Computer to Radio Interface (cont.)



Isolated Audio Interface

Computer to Radio Interface (cont.)



Complete Simple Interface

Computer to Radio Interface (cont.)

Available Interfaces to buy (just a few)

- **BUXCOM Rascal**
- **Donner Digital**
- **Tigertronics – Signalink**
- **West Mountain Radio Rigblaster**
- **DigiMaster (Europe)**
- **MFJ-1275 , MFJ-1279**
- **RigExpert**

HF Radio Antenna

- If you can have 1 antenna, use 20m (14.070 Mhz)
 - Attic, home gutters, simple dipole, end fed wire, Slinky, vertical, beam,
 - ***THEY ALL WORK!***
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- A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, set against the green background.

Digital Programs

- **DIGIPAN** - simple to use, one of the originals (FREE)
- **MixW** – Feature packed but older and not free (\$50)
- **HRD DM780** – Version 5.24 is free, all later versions are \$100 but you get HRD!
- **FLDIGI** – My personal favorite! Lots of features (FREE)
- **MultiPSK** – OK, a little different but many modes (FREE)
- **WSJT-X** – JT-65 & JT-9 only (FREE)
- **JT-65 HF** – JT-65 Another Favorite (FREE)
- Many others, but all use the same interface.

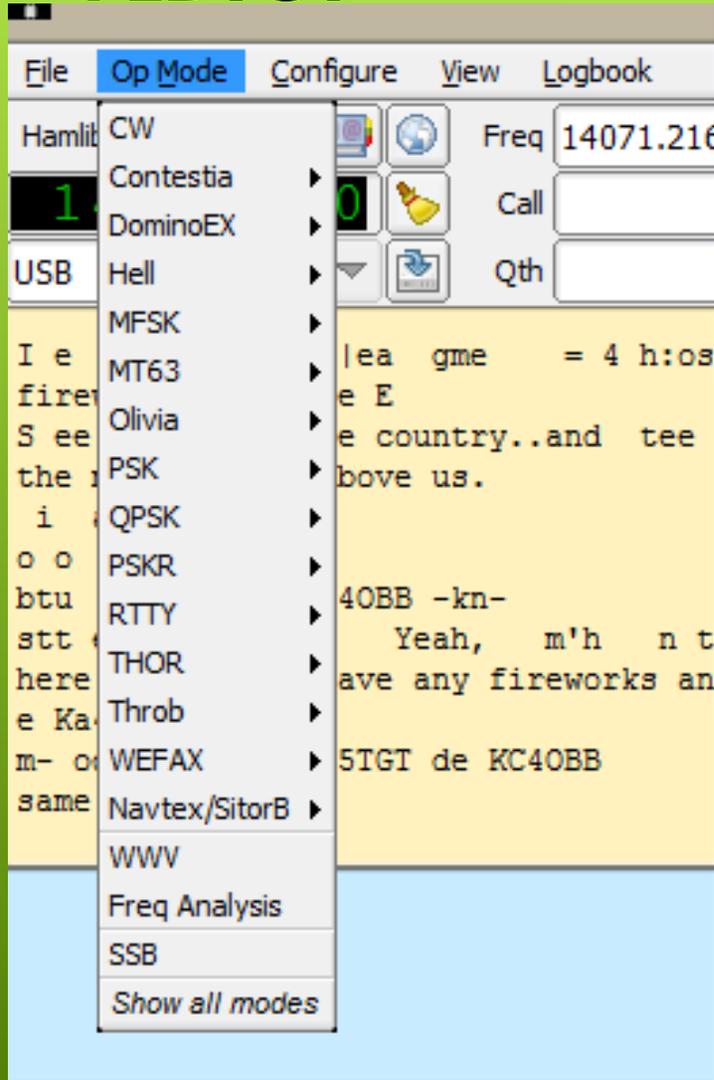
Digital Programs - FLDIGI

The screenshot shows the fldigi - K9FE software interface. At the top, there is a menu bar with 'File', 'Op Mode', 'Configure', 'View', 'Logbook', and 'Help'. Below the menu bar, there are several control fields: 'Hamlib IC-756PROIII', 'Freq 14071.216', 'On', 'Off 2100', 'In 599', 'Out 599', 'Call', 'Op', 'Az', 'USB', 'Qth', 'St', 'Pr', and 'Loc'. A digital display shows '14070.000'. The main text area contains a digital message:

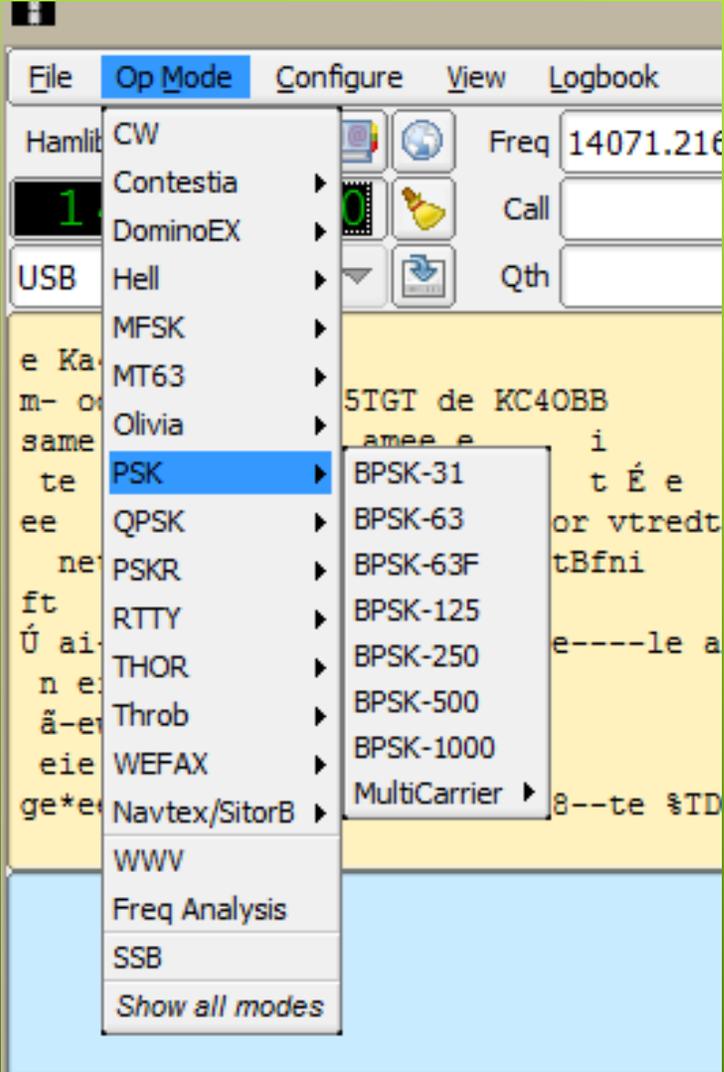
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ã<DC4> eueie e<ACK><ETB>0 @  
ee @net ns 6oE =e neo s  
iS I i <DC3> eso{eu0 rg -t ilent ep eeaCt t žnee  
ngate I + o a e  
S et Lte d/ <ETX>*>r O e aei Pe a,aaeatem fob rl ruoene ht  
e htebrf aterarer ew<ACK>Well it's been great to qso with you on this holiday weekend and i hope you are have a great one... BTU  
KC40BB DE KC5TGI K  
% s oon o`3ol t KC5TGI deieKk o NetoAS  
I e ec<US>k S|ea gme = 4 h:osodgi c m ei S+oJG @p cooler today..yesterday hi 95
```

Below the text area is a large blue rectangular area. At the bottom, there is a control panel with various buttons: 'C Ans', 'C rpt', 'C Rep', 'ClubInfo', 'CQ CW', 'Log QSO', 'CW-CQ', 'Job', 'CQ +', 'CQ-ID', 'Weather', 'Signal', 'CQ', 'ANS', 'QSO', 'INFO', 'BTU', 'BRAG', 'Bye Bye', 'CLEAR', 'QRZ?', 'RX', 'DIT DIT', 'TX'. Below the buttons is a frequency scale from 500 to 3500 kHz. A waterfall display shows a blue background with yellow and red vertical lines indicating signal activity. At the very bottom, there are more controls: 'WF', '-20', '81', 'x1', 'NORM', '1216', 'QSY', 'Store', 'Lk', 'Rv', 'T/R', 'BPSK31', 's/n 18 dB', 'imd -23 dB', '-3.0', 'AFC', 'SQL'.

Digital Programs - FLDIGI



Digital Programs - FLDIGI



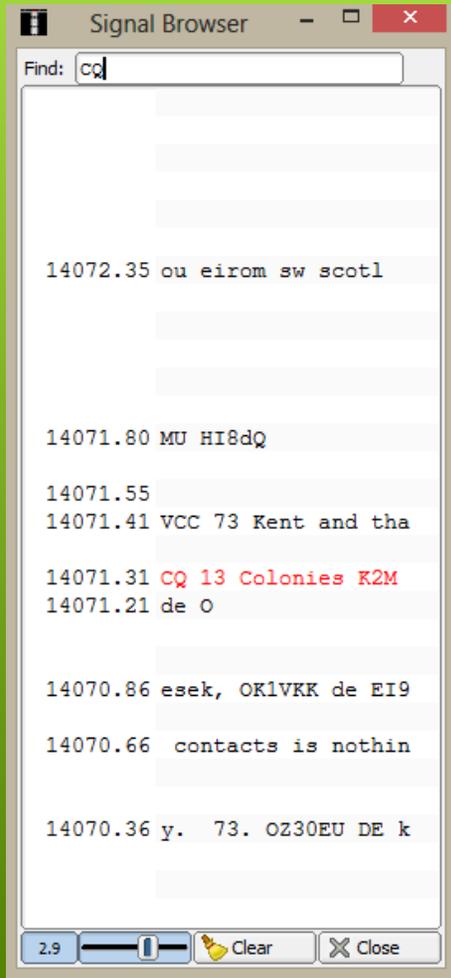
Digital Programs - FLDIGI

The screenshot shows the 'Fldigi configuration' window with the following settings:

- Operator | UI | Waterfall | Modems | Rig | Audio | ID | Misc | Web | Autostart
- Hardware PTT | RigCAT | Hamlib | XML-RPC
- PTT tone on right audio channel
- h/w ptt device-pin
 - Use separate serial port PTT
 - Device: COM1
 - Use RTS
 - RTS = +V
 - Use DTR
 - DTR = +V
- Initialize
- PTT delays valid for all CAT/PTT types
 - Start of transmit PTT delay: 0
 - PTT end of transmit delay: 0
- Restore defaults | Save | Close

Digital Programs - FLDIGI

Select VIEW, Signal Browser



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```
ã<DC4> eueie e<ACK><ETB>0 @  
ee @net ns 6oE =e neo s  
iS I i <DC3> eso{eu0 rg -t ilent ep eeaCt t žnee  
ngate I + o a e  
S et Lte d/ <ETX>×r O e aei Pe a,aaeatem fob rl ruoene ht  
e htebrf aterarer ew<ACK>Well it's been great to qso with you on this holiday weekend and i hope you are have a great one... BTU  
KC40BB DE KC5TGI K  
% s oon o`3ol t KC5TGI deieKk o NetoAS  
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Digital Programs – Time Dependent Modes

- Some noise resistant modes require an accurate clock on your computer (weak signal modes)
- Simple FREE program to do this – DIMENSION 4 (Thinking Man Software www.thinkman.com)
- Runs in background and uses SNTP to get the time from servers across the world.
- Can be set to any interval to obtain time, (if your computer is poor at keeping time you can use a shorter interval)

Digital Programs – WSJT-X (JT-65 & JT-9)

WSJT-X v1.3, r3673 by K1JT

File Setup View Mode Decode Save Help

Band Activity

UTC	dB	DT	Freq	Message
2126	-20	-0.1	431	# LA9RTA OH3BY -05
2126	-23	0.2	1661	# G0IXE EA3DE JN12
2126	-4	-0.1	2152	# K4YZZ N6VQO R-19
2127	-16	0.5	430	# OH3BY N27X CN85
2127	-12	0.3	1029	# CQ N4EMP EM63 !United States

Rx Frequency

UTC	dB	DT	Freq	Message

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

20 m **14.076 000**

+2 kHz

50
40
30
20
10
59 dB

DX Call DX Grid

W5COV EM26

Az: 263 1821 km

Lookup Add

2014 Jul 04
21:28:38

Receiving JT65 Last Tx: TUNE

Tx even

Tx JT65 #

Tx 1450 Hz

Rx 1450 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

Digital Programs – WSJT-X (JT-65 & JT-9)

The screenshot displays the WSJT-X software interface. At the top, the 'Wide Graph' window shows a frequency spectrum from 200 to 3000 Hz. A red box highlights a signal at approximately 1600 Hz. Below the graph are various control parameters: Bins/Pixel 4, Start 200 Hz, Zero 0, Palette, Flatten (checked), JT65 2400 JT9, N Avg 6, Gain 1, Digipan, and Cumulative.

The main interface, titled 'WSJT-X v1.3, r3673 by K1JT', features a 'Band Activity' table and an 'Rx Frequency' table. The 'Band Activity' table contains the following data:

UTC	dB	DT	Freq	Message
2126	-20	-0.1	431	# LA9RTA OH3BY -05
2126	-23	0.2	1661	# GOIXE EA3DE JN12
2126	-4	-0.1	2152	# K4YZZ N6VQO R-19
2127	-16	0.5	430	# OH3BY N27X CN85
2127	-12	0.3	1029	# CQ N4EMP EM63 !United States

The main interface also includes a 'Log QSO' button, a frequency display showing '14.076 000', and various control buttons like 'Monitor', 'Erase', 'Decode', 'Enable Tx', 'Halt Tx', and 'Tune'. A 'Tx even' checkbox is checked, and the 'Tx JT65 #' field is empty. The 'Rx' frequency is set to 1450 Hz. The 'Calling CQ' and 'Answering CQ' fields are set to 'CQ' and 'Grid' respectively. The 'dB' field is set to 'R+dB' and the 'RRR' field is set to '73'. The 'Gen msg' radio button is selected. The 'Report' field is set to '-15'. The status bar at the bottom shows 'Receiving', 'JT65', and 'Last Tx: TUNE'.

▶ ***On to the demonstration!***

