JT65-HF

Derived from Nobel Prize Recipient Joe Taylor Weak Signal Software (WSJT)

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A Little Background

- **Joe Taylor worked on Pulsars, Moonbounce and Meteor Scatter as prof and ham. Software developed to detect very weak signals under such conditions as EME with WSJT software.**
- **Joe Large W6CQZ refined and made more suitable for 160-2M with JT65-HF. Details are given at:**
- http://www.arrl.org/files/file/Get%20on%20the%20Air%20with%20HF%20Digital/jt65-hf-setup.pdf

What JT65 IS and IS Not

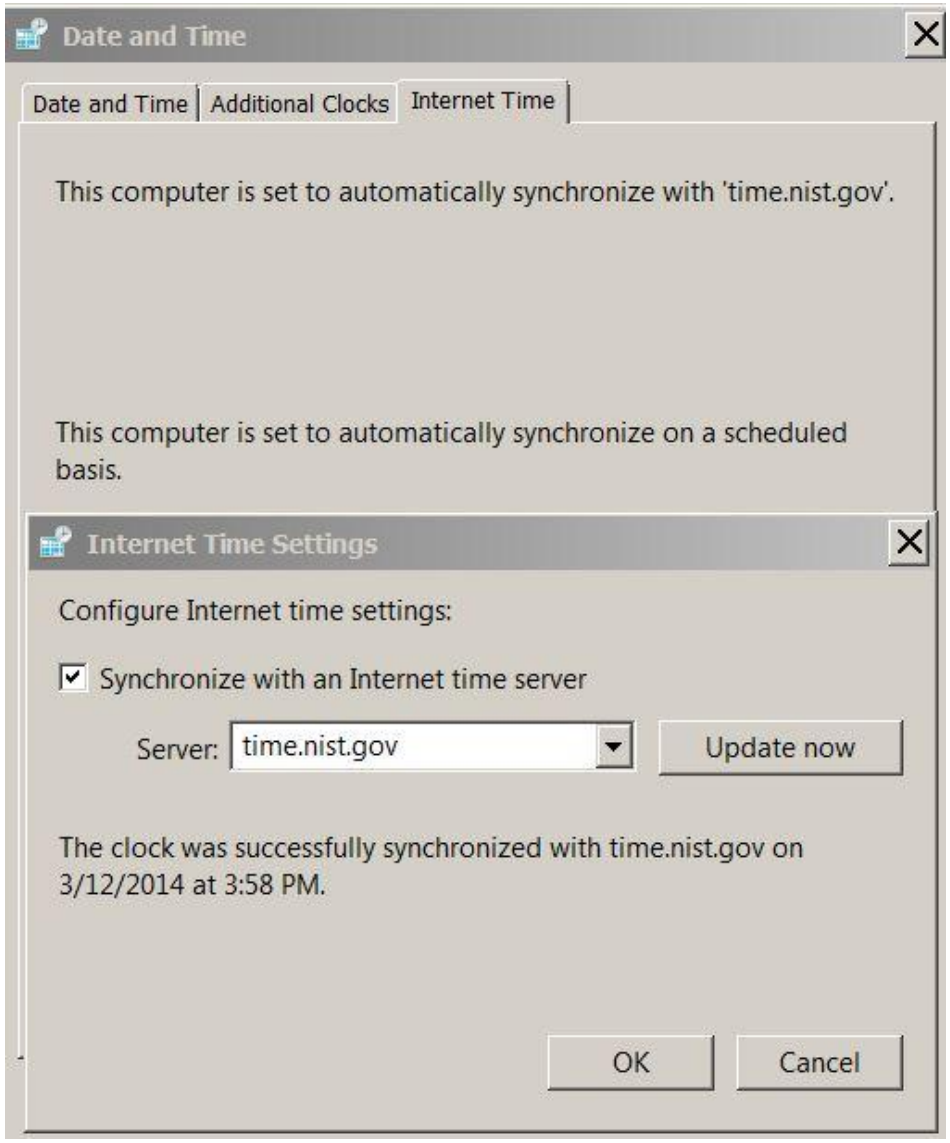
- Can make DX contacts easily with low power and poor antenna, DXCC & WAS recognized
- Standard format
- Signal Report comes back electronically—not arbitrarily
- Like PSK31, reverse beacon shows where you are being heard
- Very simple operation
- Activity level makes it easier to compete

- Not a conversation mode
- QSO's take 4-7 minutes
- 13 character maximum on any one transmission
- This is a mode where you look up QTH and Name if you want to know it
- Activity level is typically less than 500 all bands at any instant
- Not a contest mode

Computer's Time Is Critical

For JT65-HF software to work your computer's time must be synchronized to National Time Standard within +/- 1 second.

In Windows Vista, 7 & 8 this is done by clicking time in lower Right Corner and choosing Internet Time. You can get by with +/- 2 seconds but many contacts are lost because of timing error. My Lenovo Windows 7 requires adjusting about every 10-12 hours. Use Thinkman.com. For XP go to www.meinberg.de/english/sw/ntp.htm or www.thinkman.com/dimension4



JT65 QSO

- **Strict protocol. Transmit at the beginning of a minute. Receive at the beginning of the next minute.**
- **Each transmission lasts 47.7 seconds. There is a 1270.5 sync tone plus 64 other tones; hence the weird sound of a JT65 QSO.**
- **You have approximately 10 seconds to respond or you have lost the next minute.**
- **A full protocol QSO takes 6 minutes—abbreviated takes 4 minutes.**

QSO Protocol

- **CQ W4ZSC EL98 (1406)***
- **W4ZSC VK3BOB QF22 (1407)**
- **VK3BOB W4ZSC -14 (1408)**
- **W4ZSC VK3BOB R-7 (1409)**
- **VK3BOB W4ZSC RRR (1410)**
- **W4ZSC VK3BOB 73 (1411)**
- **VK3BOB W4ZSC 73 (1412)**
- ***=UTC**
- **Can Abbreviate as you will see later**

Maidenhead Grid (EL98)

- **The base for the first pair of letters—called a *field*—was chosen to be 18, thus dividing the globe into 18 zones of longitude of 20° each, and 18 zones of latitude 10° each. These zones are encoded with the letters "A" through "R".**
- **Longitude is 180° at Greenwich so “I” is 160 to 180 or 0 to -20 or 0-20 W; hence “E” is 80-100 W.**
- **Latitude is “A” at South Pole 0 to 10; Equator N is “J” (90-100 or 0-10 N) and “L” is 20-30 N**
- **Lakeland is EL98 (81° 58” W, 28° 00”N**

Maidenhead Grid cont. (EL98)

- **The first pair of numbers, called a *square* and placed after the first pair of letters, uses a base number of 10, and is encoded using the digits "0" to "9". This is where the alternative name "grid squares" comes from. Each of these squares represents 1° of latitude by 2° of longitude.**
- **W4ZSC 81°58”W, 28°00”N; hence 1 equates to 9 and 8 equates to 8 and we complete EL98**
- **N4ESS is 82.2°W and 28.25°N; hence, EL88**
- **http://www.levinecentral.com/ham/grid_square.php**
- **http://www.qrz.com/gridfinder**

JT65-HF Operating Frequencies KHz

1838	3576
7076	10139
14076	18102
21076	24920(24917)
28076	50276

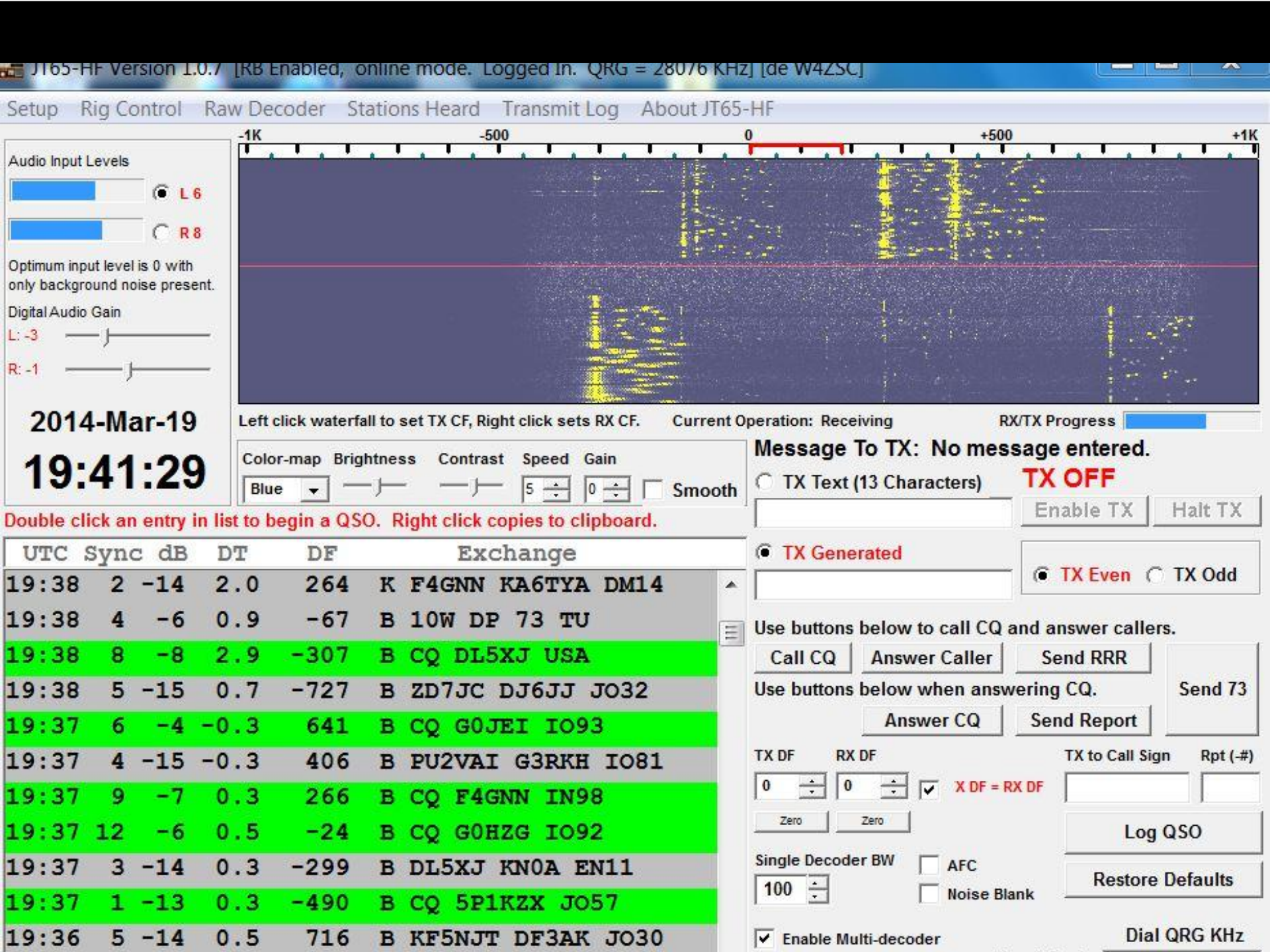
Important Transmitting note: You are transmitting continuous for 47.7 Seconds. A 100 W rated XMTR should only be run at a max of 50 W or less, really 30 W or less. Many use QRP.

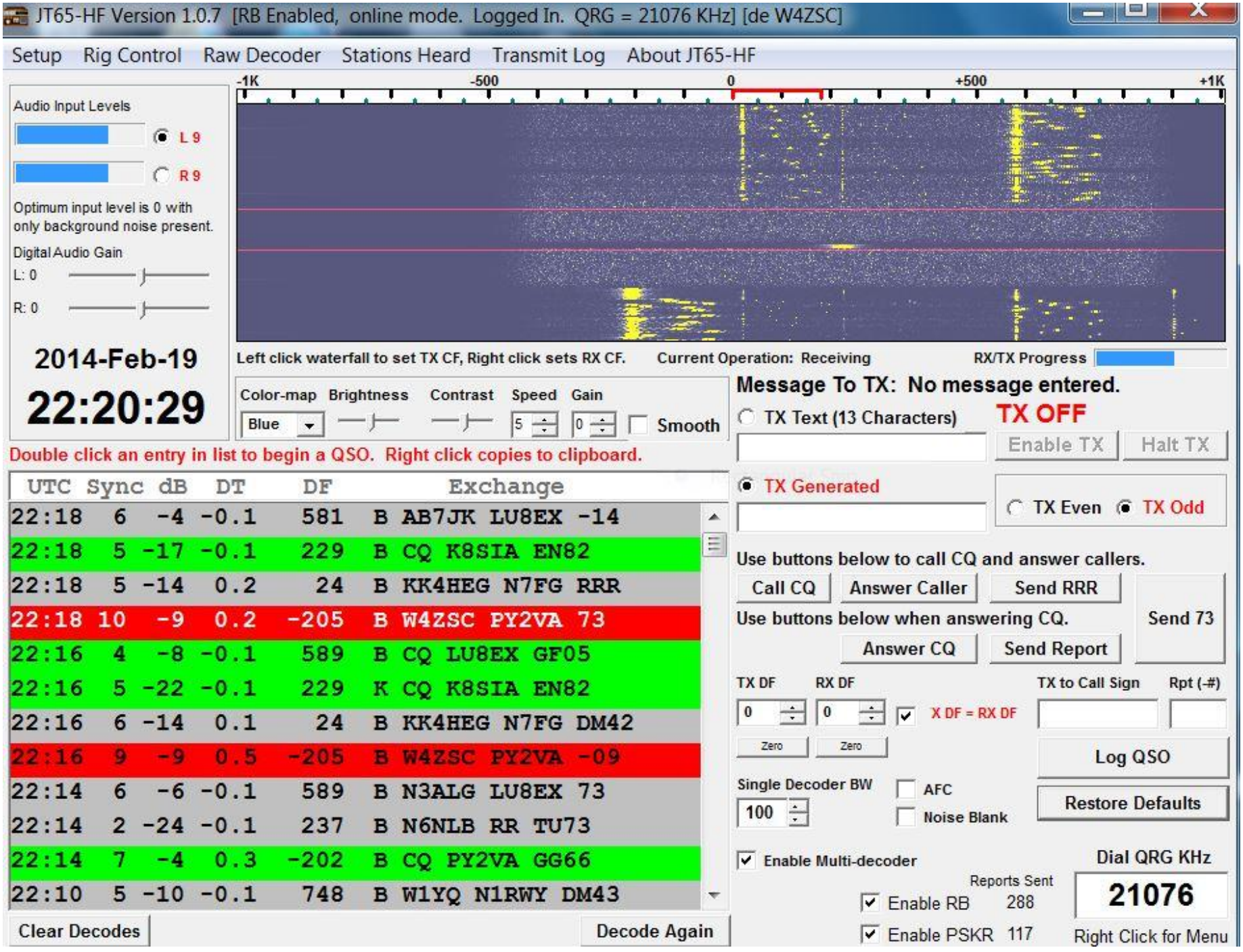
Critical URL's for JT65-HF

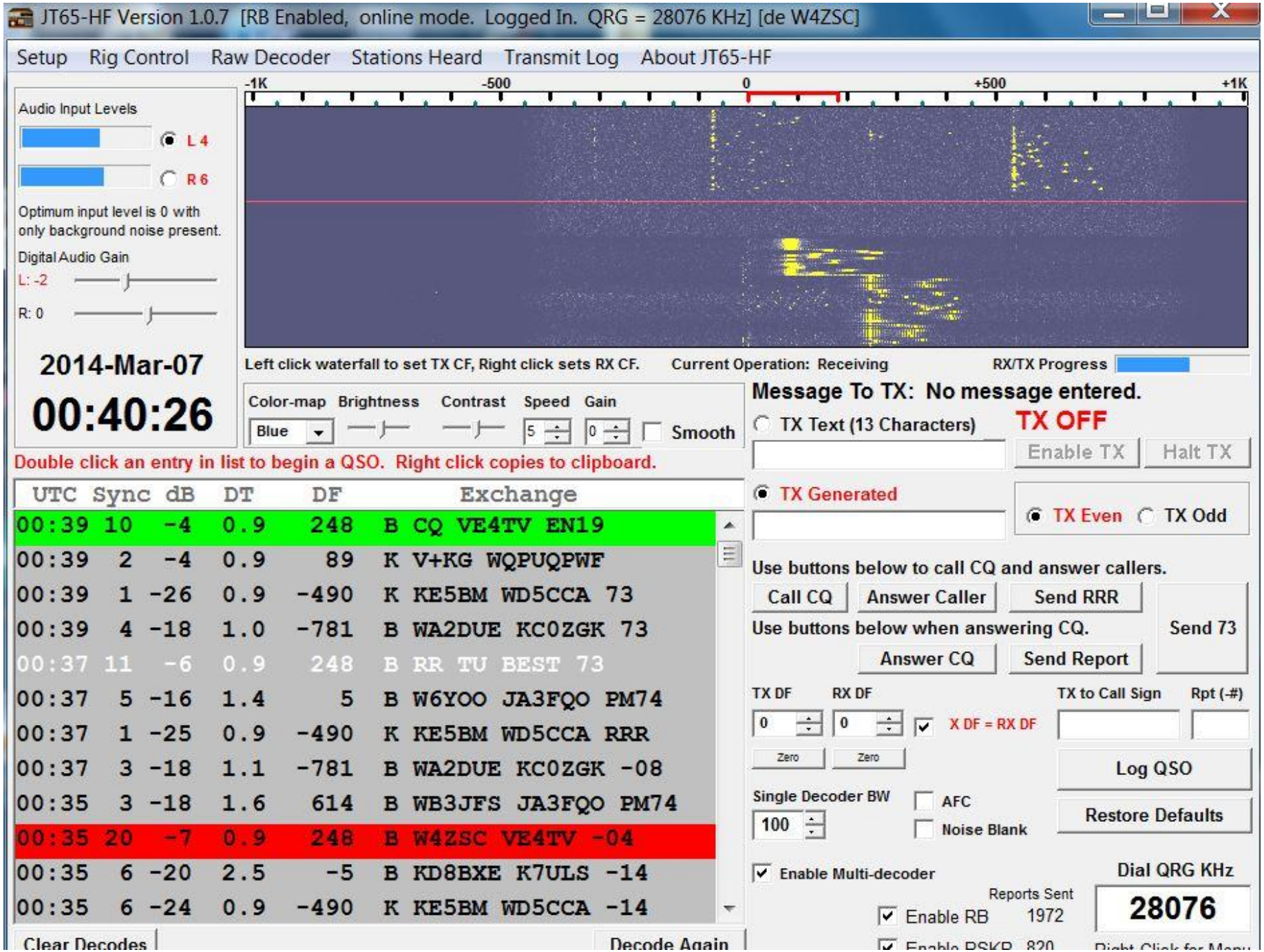
- www.arrl.org/hf-digital
- http://sourceforge.net/projects/JT65-HF/files/
- http://physics.princeton.edu/pulsar/K1JT/Download.htm
- www.thinkman.com/dimension4 Time
- www.meinbergglobal.com/english/sw/ntp.htm Time
- http://jt65.w6cqz.org/receptions.html Rev. Beacon
- http://jt65.w6cqz.org/freceptions.html Your activity
- http://PSKReporter.info/pskmap.html?preset&callsign=ZZZZZ&what=all&mode=JT65&timerange=86400 Rev. Becn
- http://www.reversebeacon.net/index.php Rev Becn Agg
- Yahoo and Google digital groups with JT65 as keyword

JT65-HF Setup

- **Setup is critical. The site referenced earlier is a detailed step-by-step to follow:**
- **http://www.arrl.org/files/file/Get%20on%20the%20Air%20with%20HF%20Digital/jt65-hf-setup.pdf**
- **Be sure to use None for the PTT port if you are using SignaLink and select the *USB Codec* on Sound Input and Output Devices.**
- **SignaLink TX about ½ way and RX about 20-25%. DLY 0. Keep ALC low. Too much gain will give a lot of splatter and shows a lot of yellow background. Adjust sound settings in software, also.**
- **Check RB and PSKR Boxes. Enable Multicode if CPU will handle it.**


JT65-HF Version 1.0.7 [RB Enabled, online mode. Logged In. QRG = 28076 KHz] [de W4ZSC]
Setup Rig Control Raw Decoder Stations Heard Transmit Log About JT65-HF
Audio Input Levels
L 6
R 8
Optimum input level is 0 with only background noise present.
Digital Audio Gain
L: -3
R: -1
2014-Mar-19
19:41:29
-1K -500 0 +500 +1K
Left click waterfall to set TX CF, Right click sets RX CF.
Current Operation: Receiving
RX/TX Progress
Color-map Brightness Contrast Speed Gain
Blue
Smooth
Message To TX: No message entered.
TX Text (13 Characters)
TX OFF
Enable TX
Halt TX
TX Generated
TX Even
TX Odd
Use buttons below to call CQ and answer callers.
Call CQ
Answer Caller
Send RRR
Use buttons below when answering CQ.
Answer CQ
Send Report
Send 73
TX DF
RX DF
X DF = RX DF
Zero
Zero
TX to Call Sign
Rpt (-#)
Log QSO
Restore Defaults
Single Decoder BW
100
AFC
Noise Blank
Enable Multi-decoder
Dial QRG KHz
Double click an entry in list to begin a QSO. Right click copies to clipboard.
UTC Sync dB DT DF Exchange
19:38 2 -14 2.0 264 K F4GNN KA6TYA DM14
19:38 4 -6 0.9 -67 B 10W DP 73 TU
19:38 8 -8 2.9 -307 B CQ DL5XJ USA
19:38 5 -15 0.7 -727 B ZD7JC DJ6JJ JO32
19:37 6 -4 -0.3 641 B CQ G0JEI IO93
19:37 4 -15 -0.3 406 B PU2VAI G3RKH IO81
19:37 9 -7 0.3 266 B CQ F4GNN IN98
19:37 12 -6 0.5 -24 B CQ G0HZG IO92
19:37 3 -14 0.3 -299 B DL5XJ KN0A EN11
19:37 1 -13 0.3 -490 B CQ 5P1KZX JO57
19:36 5 -14 0.5 716 B KF5NJT DF3AK JO30


JT65-HF Version 1.0.7 [RB Enabled, online mode. Logged In. QRG = 21076 KHz] [de W4ZSC]
Setup Rig Control Raw Decoder Stations Heard Transmit Log About JT65-HF
Audio Input Levels
L 9
R 9
Optimum input level is 0 with only background noise present.
Digital Audio Gain
L: 0
R: 0
2014-Feb-19
22:20:29
-1K -500 0 +500 +1K
Left click waterfall to set TX CF, Right click sets RX CF.
Current Operation: Receiving
RX/TX Progress
Color-map Brightness Contrast Speed Gain
Blue
Smooth
Message To TX: No message entered.
TX Text (13 Characters)
TX OFF
Enable TX
Halt TX
TX Generated
TX Even
TX Odd
Use buttons below to call CQ and answer callers.
Call CQ
Answer Caller
Send RRR
Use buttons below when answering CQ.
Answer CQ
Send Report
Send 73
TX DF
RX DF
X DF = RX DF
Zero
Zero
TX to Call Sign
Rpt (-#)
Log QSO
Single Decoder BW
100
AFC
Noise Blank
Restore Defaults
Enable Multi-decoder
Dial QRG KHz
21076
Reports Sent
Enable RB 288
Enable PSKR 117
Right Click for Menu
Double click an entry in list to begin a QSO. Right click copies to clipboard.
UTC Sync dB DT DF Exchange
22:18 6 -4 -0.1 581 B AB7JK LU8EX -14
22:18 5 -17 -0.1 229 B CQ K8SIA EN82
22:18 5 -14 0.2 24 B KK4HEG N7FG RRR
22:18 10 -9 0.2 -205 B W4ZSC PY2VA 73
22:16 4 -8 -0.1 589 B CQ LU8EX GF05
22:16 5 -22 -0.1 229 K CQ K8SIA EN82
22:16 6 -14 0.1 24 B KK4HEG N7FG DM42
22:16 9 -9 0.5 -205 B W4ZSC PY2VA -09
22:14 6 -6 -0.1 589 B N3ALG LU8EX 73
22:14 2 -24 -0.1 237 B N6NLB RR TU73
22:14 7 -4 0.3 -202 B CQ PY2VA GG66
22:10 5 -10 -0.1 748 B W1YQ N1RWY DM43
Clear Decodes
Decode Again


JT65-HF Version 1.0.7 [RB Enabled, online mode. Logged In. QRG = 28076 KHz] [de W4ZSC]
Setup Rig Control Raw Decoder Stations Heard Transmit Log About JT65-HF
Audio Input Levels
L 4
R 6
Optimum input level is 0 with only background noise present.
Digital Audio Gain
L: -2
R: 0
2014-Mar-07
00:40:26
-1K -500 0 +500 +1K
Left click waterfall to set TX CF, Right click sets RX CF.
Current Operation: Receiving
RX/TX Progress
Color-map Brightness Contrast Speed Gain
Blue
Smooth
Double click an entry in list to begin a QSO. Right click copies to clipboard.
UTC Sync dB DT DF Exchange
00:39 10 -4 0.9 248 B CQ VE4TV EN19
00:39 2 -4 0.9 89 K V+KG WQPUQPWF
00:39 1 -26 0.9 -490 K KE5BM WD5CCA 73
00:39 4 -18 1.0 -781 B WA2DUE KC0ZGK 73
00:37 11 -6 0.9 248 B RR TU BEST 73
00:37 5 -16 1.4 5 B W6YOO JA3FQO PM74
00:37 1 -25 0.9 -490 K KE5BM WD5CCA RRR
00:37 3 -18 1.1 -781 B WA2DUE KC0ZGK -08
00:35 3 -18 1.6 614 B WB3JFS JA3FQO PM74
00:35 20 -7 0.9 248 B W4ZSC VE4TV -04
00:35 6 -20 2.5 -5 B KD8BXE K7ULS -14
00:35 6 -24 0.9 -490 K KE5BM WD5CCA -14
Clear Decodes
Decode Again
Message To TX: No message entered.
TX Text (13 Characters)
TX OFF
Enable TX
Halt TX
TX Generated
TX Even
TX Odd
Use buttons below to call CQ and answer callers.
Call CQ
Answer Caller
Send RRR
Use buttons below when answering CQ.
Answer CQ
Send Report
Send 73
TX DF
RX DF
X DF = RX DF
Zero
Zero
TX to Call Sign
Rpt (-#)
Log QSO
Restore Defaults
Single Decoder BW
100
AFC
Noise Blank
Enable Multi-decoder
Reports Sent
Enable RB
1972
Dial QRG KHz
28076
Right Click for Menu

Some Important Notes

- **After you send 73 line, it will keep repeating unless you Click *Restore Defaults*! Also *Restore Defaults* will let you receive on every minute rather than just Even or Odd**
- **Pay close attention to *DF*. Some stations will end QSO with non-standard text that does not include Call Sign. You must check *DF* to see if that is part of your current QSO.**
- **Look at your first group of receptions to ensure most stations are showing a *DT* < +/-1. If not adjust your computer time.**

Some Important Notes (cont.)

- **To send extra text, better to use call then less text, e.g., *KI4ZMV R TU73*. Note you are still limited to 13 Bytes.**
- **Get yourself a Grid map of US and World www.dxmaps.com**
- **Fifty countries and forty states relatively easy, but Dxpeditions are almost out of question. ND, ID, & NH are among states that I have not heard. WY, SD, VT, RI, NV, AR & NM rare. Probably because of technology South Africa is only African country I have heard. Have not heard China, S. Korea, Indonesia or Bolivia.**
- **Have worked Asiatic Russia, Japan, Cyprus, Australia, Turkey, and most of former Eastern Block, AK & HI**

Abbreviated Protocol

- **CQ W4ZSC EL98**
- **W4ZSC RN9AZ MO05**
- **RN9AZ W4ZSC -14**
- **W4ZSC RN9AZ R-11**
- **RN9AZ RRR 73**
- **W4ZSC RN9AZ 73 (optional)**
- **DO NOT FORGET TO RESTORE DEFAULTS HERE**

Making a Contact Without CQ

- **Stations A and B in QSO with A being the initiator that landed on the *DF* and in use, calling the CQ. Double click on the QSO so your red frequency marker's left side lines up on the QSO *DT*. This is just a precaution in case other station is not using multi-decoder, but not necessary. Type Station A's call in box *TX to Call Sign*. Click *Answer CQ*. Be sure to set ODD or EVEN to whichever one Station B is using. *Enable TX* transmit in the 10 seconds after B sends his 73.**

Logging Your QSO

- **The built in logging program *Log QSO* works well, but it is not foolproof.**
- **Needs you to enter frequency in QRG box of software—right click to get preset frequencies**
- **Sometimes it will not get Grid so Manual Entry Required. And, power must be entered each time program is re-booted.**
- **When you are transmitting, the computer load is such that the Log screen may not show. Best to click when you are receiving**
- **Generates ADIF file which can be easily exported**

Summary JT65-HF

- **Easy transition from PSK31. Long Range. Low Power. Simple Antenna. Limited Contact Competition.**
- **Long QSO Time for Limited Info Exchange (some say quicker to watch paint dry!). Limited Contact Availability (Africa, certain states, no Dxpeditions). Equipment will only go so far in domination.**
- **Best to have SignaLink and CPU >= 1.5GHz**