

Rambler

Newsletter of the
Ottawa Valley Mobile
Radio Club
Incorporated



Apr 2013

Edition 57

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IRLP – A GREAT COMMUNICATION TECHNIQUE

By: Brian Williams, VE3KNE

A couple of year ago, some areas in Australia were besieged by rainfall that defied belief. Normally that would not have caused me concern, however my brother lived in the area in which there was extensive flooding according to the news reports. I could not get in contact with him by phone, and I was concerned that his home was in trouble.

He lives outside of a small town named Gympie in Queensland. A google search found that the town had an active amateur club that supported a 2 meter repeater with IRLP. I located the IRLP address for Gympie and then learned about accessing IRLP along with the etiquette.

Later that day, I managed to get on the Gympie repeater, and gave a general call with the reasons why I was attempting to make a contact – no reply. I then remembered about the time differential and realized that the local time time was 3 am in Queensland – a 12 hour time difference. Really dumb move Brian.

At a more reasonable hour, I tried again and this time received a reply. I was able to find out that part of

Gympie was flooded but the area in which my brother lived was on pretty high ground and was safe from flooding. This greatly relieved my anxiety. In this instance the communication using IRLP signifies what amateur radio is about – getting through when other communication techniques fail.

On another occasion I tried a general call using IRLP to the same repeater and consequently had a great QSO with an amateur who lived on the Gold Coast. During the conversation he mentioned that during certain times of the year he had to be careful in walking across his property as brown snakes (highly poisonous) were fairly commonly found. Canada may have the cold and Grizzly bears, but we happily lack the poisonous spiders, snakes and other insects that call Australia home. I learned a lot about this amateurs geographic area, and hopefully he learned a little about Canada.

Both IRLP contacts were crystal clear and it was like talking with someone across town on the phone – you just have to leave that 2-3 second delay after you end your conversation and the other amateur replies. IRLP offers the opportunity to contact other amateurs world-wide with only minimal equipment, in my case an FT-817 at 1 watt into a simple vertical (Buddipole) antenna while sitting on the deck.

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Meeting Date

Club Meeting:

April 25th

Speaker: Marcus Leech, VE3MDL
Subject: Software Defined Radio

How Luke Learned to Love the Source

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For information about the duties and responsibilities about all Executive and Chair positions, please visit the OVMRC forums, Member section or contact any member of the Executive.

Sponsors

The OVMRC acknowledges the following organizations for their support of our activities:

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• **BYTOWN MARINE,**
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• **KENWOOD ELECTRONICS
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The club's web site is hosted by:

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www.ovmrc.on.ca

OVMRC Life Members

Maurice-André Vigneault, VE3VIG
Ralph Cameron, VE3BBM
Doug Carswell, VE3ATY
Doreen Morgan, VE3CGO
Ed Morgan, VE3GX
Bill Wilson, VE3NR (SK)

OVMRC Repeaters

147.300 MHz(+)

444.200 MHz(+)

Amateur Radio Exhibit

VE3JW

Web site:

ovmrc.on.ca/ve3jw.htm

Canada Science & Technology
Museum

The Rambler is the official newsletter of the Ottawa Valley Mobile Radio Club Incorporated and is published 11 times a year (monthly, except for July). Opinions expressed in the Rambler are those of the authors and not necessarily those of the OVMRC, its officers or its members. Permission is granted to republish the contents in whole or in part, providing the source is acknowledged. Commercial use of the contents is expressly prohibited.

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Meeting Minutes March 21, 2013

Home-Brew Night

1. Call to Order

The meeting was called to order by the President, Michel (VE3EMB) at 7:45 pm. There were no visitors present that evening.

2. Home Brew Night

This was home-brew night and Michel announced that 4 individuals had brought in their projects. The four entries were:

- George Ankerman (VA3LZY)
- Brian Williams (VE3KNE)
- Ernie Jury (VE3EJJ)
- Paul Labbe (VE3NJS)

2.1 George gave a very professional overview of his project, which was a simple logger that he developed that did not require a computer to input data, and would reduce paper waste and provide faster post-processing of data. A demonstration of the system was carried out in which audience members were invited to log data through their smart phones, and the resulting information was displayed.

2.2 Brian showed his modified 2 meter beam antenna (4 element - by Arrow), which had been cut to enable it to be stored in a small space, but quickly put into operation. The antenna characteristics had been tested after the surgery and not been adversely affected.

2.3 Ernie always seems to have unique projects to share, and this evening he showed a modified timer that was used to cut off power

when charging NiCad batteries to ensure that they were not overcharged. He moved the power connection for the timer motor to a location after the switch, which would cut power to the motor and thus the charge cycle would cease. A simple and very useful idea.

2.4 Paul brought in a vintage 3 band linear amplifier that he and his father had constructed. The amp could deliver in excess of 500 watts for a power input of 100 watts. This design was similar to ones found in the ARRL Handbook. The matching power supply (extremely heavy) could deliver 2500 volts to the amp which used 6155 tubes.

The audience decided that the overall winner in the projects presented was George, with his professional presentation of his logger. Thanks to all who participated, and for all others, how about bringing in your own projects next year and telling your fellow amateurs about what you are building in your basement or shack.

3. Reports of Club Executive

3.1 Membership – Sandy (VE3HAZ) - no report

3.2 Treasurer – Joe (VE3EUS) - little activity. Have received word from CRA that all is in order.

3.3 Secretary – Brian (VE3KNE) - no report

3.4 Technical – Paul (VE3NJS) – the issue of the club repeater was reviewed with some ideas on the sequence that the various pieces of equipment would be removed, replaced or added. Paul also indicated that he was considering adding solar panels to the club

trailer to keep the battery fully charged over the winter.

3.5 Training – Ernie (VE3EJJ) – the club course is almost finished and all 10 persons taking the course have passed, most with honours.

3.6 Amateur Radio Exhibit – Darin (Beth) – expressed concern that the station needs more operators. If you have the time and like to deal with the public, visit the station to get a feel for how it operates and how people touring the museum interact with the display. It's an opportunity to use gear that you may not have in your own station.

4. General Announcements

Joe (VE3EUS) announced that the Rideau Lakes Cycling Tour would be taking place in June, and that amateur volunteers were needed to provide communications along the route. Those with two meter gear are invited to help out.

The Larry Wilcox Memorial 2M Simplex Contest will take place on the first Saturday in May.

Flea Market Photos

Feb 21st



Photos courtesy of: Joe Lemieux, VE3EUS

NOTICE OF CLUB ELECTIONS

CALL FOR VOLUNTEERS TO FILL EXECUTIVE POSITIONS

FISCAL YEAR 2013-2014

Members in good standing are invited to consider running as Directors or Chairs of Standing Committees for the fiscal year that will begin on September 1, 2013.

Elections will take place at the Annual General Meeting that will be held in June 2013. All positions are open. Those interested in serving their fellow Club members should contact any of the current members of the Club Executive to indicate their willingness to serve and which of the many positions available they might be prepared to fill.

Signed "Joe VE3EUS," Treasurer

The Wise Owl Net is Alive

Well, that's almost true – the UNOFFICIAL Wise Owl net has been running thanks to James VE3MYZ. Since October 12th of 2012, he has been acting as net control for the unofficial Wise Owl net, held Fridays at 8:00 pm.

Attendance for the net has been good, with as many as 10

participants. The topics of discussion are wide ranging and James has the gift of making each session interesting and informative. Normally the net ends at 9:00 pm, but has carried on well past that hour on occasion.

It's the end of the week and time to relax, so why not join the net and enjoy an hour of conversation with your amateur companions.

We should thank James for maintaining this net and keeping the repeater active. There seems to be less activity on VE3TWO lately and James is helping to maintain the 'profile' of both the club and repeater.

Submitted by Brian Williams
(VE3KNE) Club Secretary

INTER-CLUB COOPERATION SAVES THE DAY

In late March, I received an email from Brent Petersen, VE9EX, a professor at the University of New-Brunswick who wanted to introduce Amateur Radio to 50 students of the Oromocto campus who were participating in their annual Activity Day.

Brent suggested that he would use his 2m radio to link into the IRLP network and put his students in contact with the Canada Museum of Science and Technology Amateur Radio Exhibit station VE3JW. The students wanted to have this contact in the French language.

I immediately jumped at the opportunity to demonstrate Amateur Radio in this fashion. I proposed that we would use the IRLP link provided by the "Club Radioamateur Outaouais" (CRAO) Node 2330 on their Gatineau repeater (VE2RAO). I would look for French speaking operators at the VE3JW station to answer the students' questions and we would link into the Fredericton IRLP Node 2780.

A week prior to the contact which was scheduled to take place on Monday, April 8, from noon to 2pm, Brent and I tested the IRLP link. The connection was made easily and we both copied each other very well.

I contacted the CRAO President, Jonathan, VE2LOJ, and asked permission to use their repeater for this special event. Jonathan agreed and he said that the repeater would be kept free for the duration of the event.

Aghast! Murphy threw a monkey wrench into the gear box. During the weekend prior to the contact, repeater VE2RAO began acting up and we could no longer have access to the IRLP function.

On Sunday, one day before the contact, dedicated members of the CRAO took it upon themselves to correct the problem by reaching to the top of the hospital where the repeater was located, and by making some changes to the antennas, they were able to restore the IRLP service. They were supported by other members of their club as they all wanted to conduct this event on their repeater rather than sending us on a back up repeater on the Ottawa side. A matter of cooperation, and pride, I understood.

On the morning of April 8, we could hear several CRAO members testing out the repeater which was back to normal. At 9:10am however, the repeater started acting up again. CRAO members rushed to the repeater and node locations. The problem was located on the UHF link on which the node was set up.

At half and hour before the sked event, one of the mobile stations, Michel, VA3XDJ, used his VHF/UHF mobile radio in a crossband mode to provide the link back to the IRLP. We were able then to reach node 2780 in Fredericton.

But our troubles were not over yet. At the VE3JW station, the Kenwood D700A that we were using failed to transmit in offset mode. I had to quickly activate the Kenwood TS-2000 and set it up for proper offset and tone for the VE2RAO repeater.

2013 Meeting Dates

Club Meeting Date:

April 25th

May 16th

June 20th

Rambler deadline

Meeting date minus 13 days

May.....3rd

June.....7th

Jul/Aug.....9th

Please submit articles for the Rambler to the editor:

[Robert Cherry](#)

No later than the deadline for the desired edition.

**May Rambler
submission deadline is:**

Friday, 3rd May

As the sweat was drying out, we made contact with Fredericton and had a great time talking with the students as all went well during the event. At VE3JW, we had Michel, VE3EMB and Joe, VE3EUS who fielded the questions, as Brent in NewBrunswick prompted the students to use the universal phonetics to spell out their names.

Brent had his part of difficulties in setting up his station at the school when high winds tipped over his antenna.

(Continued on [page 6](#))

(Continued from [page 5](#))

In the photo, you can notice a bucket of sand at the foot of the tripod, a needed addition to hold the antenna in place.



Many students showed interest in Amateur Radio, and who knows, may be at some time they will join the ranks of our community.

Many thanks go out to the members of the CRAO who went all out to salvage this event to the credit of their club. OVMRC fully appreciates your cooperation.

We are looking to spread the word to other schools by having similar contacts. Bring your Amateur Radio contact project to a school near you and contact us to set up an event.

Maurice-André Vigneault, VE3VIG
Volunteer at CSTM/VE3JW

Rideau Lakes Cycle Tour

Support of the Rideau Lakes Cycle Tour (RLCT) will again require many talented, volunteer radio operators to help out on the weekend of June 8 and 9, 2013. If you can volunteer for one or both days, or lend equipment to another licensed amateur, please contact us. If you know another ham who would be interested in volunteering for this event, please consider relaying this message to them.

The cycle tour is organized by the Ottawa Bicycle Club (OBC) and runs from Ottawa to Kingston on the Saturday, returning to Ottawa on the Sunday. The RLCT originally began in 1972 and, today, typically involves over 2000 cyclists. Fixed and mobile amateur radio communications assist the event to efficiently coordinate repair and relief vehicles across the entire 177 km course to help keep the cyclists safe and happy (and to remind the public about how magical radio can be when used correctly).

Communication support for this event is provided collaboratively via three neighbouring Amateur Radio Emergency Service (ARES) groups,

namely: Frontenac County ARES, Lanark-North Leeds ARES and Ottawa ARES/Emergency Measures Radio Group (EMRG). Essential repeater and equipment support is also graciously provided by several other local amateur radio clubs and radio volunteers come from all over to help out.

The time commitment for radio operators working on the Ottawa leg of the course is expected to be

about 5 to 7 hours on Saturday and again on Sunday (if you can only volunteer for one of those days, we would still appreciate your help). The Ottawa section of the course is to be comprised of 10 checkpoints, provided there are enough radio volunteers.

There is also a need to place a radio operator in each of the 4 mobile rental vehicles and provide them free overnight accommodation in Kingston.

Basic recommended equipment for this event is: a 50 Watt 2-metre transceiver with CTCSS and instruction manual and a 5/8-lambda magnetic-mount omni-directional mobile antenna (or equivalent). For some checkpoints, a small 15-foot mast is desirable to reach some Ottawa-based VHF repeaters. Newcomers to the event are also most welcome and mentoring will be available. Don't own your own radio yet?

If you are a licensed amateur, keen to help, we will strive to make sure that you won't miss out on the fun due to a lack of radio equipment.

Please contact Gord Mein VE3FRB <ve3frb@rac.ca> or Tyler Tidman VA3DGN <va3dgn@rac.ca> for details, or to lend your support to the team and help make this event a success.

LARRY WILCOX MEMORIAL 2M FM SIMPLEX CONTEST

General Rules

THE ONLY ALLOWED MODE IS 2M FM SIMPLEX VOICE. NO DIGITAL, NO DUPLEX, NO REPEATERS, NO DIGITAL VOICE. 2M FM SIMPLEX VOICE ONLY.

The contest starts on Saturday May 4th 2013 (Saturday) at 1000 hrs Eastern Time and runs for a duration of 4 hours finishing at 1400 hrs Eastern Time.

By participating in this event you agree with the following:

- You are participating at your own risk and expense.
- You will not operate from a vehicle in motion (mobile).
- You will set up in a safe location before operating.
- You will abide by the laws as they pertain to private property and act accordingly.
- You will watch out for overhead wires and other obstructions before setting up any antenna to be used for this event.

Categories

Fixed Station: Your home station.

Portable Station: A station in a fixed location that is not at your home.

Rover Station: A portable station that changes location during the contest. A rover station may not operate while mobile.

Mobile Station: Mobile operators are not permitted to participate.

Contacts with mobile stations will not be counted in this contest.

Frequencies

Although you are allowed by the IC regulations to operate anywhere in the 2M band (144.000 – 147.999), it is suggested that you operate on one of the following frequencies that are in line with the RAC band-plan and that avoid local repeater inputs:

146.415, 146.445, 146.475,
146.490, 146.505

146.535, 146.550, 146.565,
146.580, 146.595

Operating in the Contest

Using the 2M simplex frequencies and avoiding the 2M calling frequency of 146.520, you make contacts with as many stations as you can. Call CQ OVMRC CONTEST or CQ CONTEST or reply to stations making such calls.

Arranging contacts by use of repeaters, telephone, email, social networks or similar means is not allowed, nor is it in the spirit of the contest.

Once you have logged a particular station, you cannot log it again, unless it is a rover station that has moved to a different city ward and that it does not appear twice in succession in your log.

Rover stations calling CQ may want to indicate their current ward location.

Note, there is a condition on a repeat logging. A repeat logging cannot be made if it results in a station being the same consecutively in the log. For example, if contact 6 is with VE3RAM you cannot log that station again as contact 7, even if

the station is a rover and has moved to another ward. Work another station first and, then, you may make a repeat contact but only if the rover station is in a different ward from the previous logging(s).

If you decide to call CQ, listen first to see if the frequency is in use. Remember, just because you cannot hear anything does not mean that a QSO is not going on. You may not be in range of one of the stations but you could be within the range of the other. Follow good operating practice; listen, ask if the frequency is in use and listen again. Then repeat the process until you are satisfied that the frequency is not in use.

Exchange

When a contact is made, you need to exchange the following information: call sign, contact number, location (use the city electoral ward or district for this). If you are operating VE3RAM or VE3JW, then you would also let the person you contact know that you are one of the Club stations.

Rover stations must give their current ward location. The location is important for the location multiplier and for the longest distance QSO award.

Maps of the wards or districts of Ottawa and Gatineau can be found, at the following web locations;

Ottawa: ottawa.ca/en/city-hall/official-and-master-plans/ward-boundary-review/new-ward-structure-and-ward-maps

Gatineau: www.gatineau.ca/page.asp?p=histoire_cartes_statistiques/cartes

Stations outside Ottawa and Gatineau should use the name of

the local town, e.g., Carleton Place or Rockland.

Do not feel that this is all you should exchange. You are encouraged to talk to the other station if you want. For example, find out how long they have been an amateur radio operator..

Points and Multipliers

Power

You must claim the power multiplier for the highest power level that you used during the contest. If you made 25 contacts and one was at 50 watts but the other 24 were at 1 watt, then you must claim the 50 watts multi (2) for all 25 contacts.

Power	Multiplier
51 watts to 100 watts	1
26 watts to 50 watts.....	2

11 watts to 25 watts.....	3
6 watts to 10 watts	4
1 watt to 5 watts.....	5
Below 1 watt.....	6

CONTACTS

Every OVMRC member that you contact counts as 5 points. Every club station (VE3RAM or VE3JW) that you contact counts as 25 points. Each non-member of OVMRC member that you contact counts as one point. If you are an OVMRC member, you get a bonus multiplier worth one point. If you are a RAC member, you get a bonus multiplier worth one point. Each city ward contacted counts as one multiplier.

LONGEST DISTANCE CONTACT

In the event that two or more stations claim the same distance for

the longest contact, the winning station will be the station claiming the highest power multi (i.e., lowest power level used). If the event is still tied, then the glory will be shared and a tie declared.

Logs are to be submitted by the end of the May OVMRC general meeting so the judges can check scores. Winners will be announced and prizes awarded at the June OVMRC general meeting.

RAC MEMBERSHIP

If you are a RAC member, you can claim the RAC multiplier (1 point)

WARDS

Claim one point for each of the wards with which you made a contact. You can claim a given ward only once.

ENTRY FORM

Larry Wilcox Memorial 2M FM Contest

Category (Fixed, Portable or Rover): _____

Logs for Station: _____ Operator: _____

Contacts with OVMRC Members: _____ X 5 Points = _____

Contacts with Non OVMRC Members: _____ X 1 Points = _____

Contacts with Club Stations : _____ X 25 Points = _____

Total Points: _____

MULTIPLIERS

OVMRC Member Multi: _____ RAC Multi: _____

Power Multi:- _____ City Wards Multi: _____

TOTALS

Total Multis Claimed: _____

Total Points (From above): _____

My Claimed Total Score (Points X Multis) is _____ Points

My furthest contact was contact # _____ between _____ and myself for an approximate distance of _____ kms.

I understand the Judges decision is final

My logs follow:



Larry Wilcox Memorial 2M FM Contest Log Sheet

#	Contact Station Contacted	City Ward	OVMRC Member	CLUB STATION
0	SAMPLE	99	NO	NO
00	SAMPLE 1	98	YES	NO
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

USE EXTRA SHEETS IF NEEDED. LOGS CAN BE SUBMITTED VIA EMAIL USING THE SAME FORMAT

PAGE ___ OF ___ SUBMITTED BY: _____ (CALLSIGN)



JT65 – Watts it all about?

An introduction to JT65: A weak-signal high frequency digital mode.

By: VE3BUX

WSJT Modes

Mode	Typical Bands	Intended Propagation Mode	Minimum Transmission Duration (sec)	Notes
FSK411	2m & 70cm	Meteor Scatter	~1	Optimized for decoding "pings" of information less than 150ms in duration.
JT6M	4m & 6m	Meteor Scatter	~1	Also optimized for decoding transmission "pings" of very short duration.
JT65	HF	Earth-Moon-Earth, Weak Signal	47	Computers must be synchronized. Transmissions occur on the minute.

WSJT modes of digital communication were originally developed by Dr. Joe Taylor (K1JT) in 2001 as a method of communicating via radio in conditions where other modes would not be intelligible.

These so called WSPR (weak signal propagation) modes use sophisticated DSP (digital signal processing) methods to decode signals which are not audible as they exist below the noise floor.

JT65: Overview

- Protocol developed in 2003 for EME and Tropospheric propagation modes but was later adapted for HF long-haul low signal-to-noise communications
- Intended to be a **QRP** style mode in HF
 - QRO operation wreaks havoc around the world!
 - Please! No more than ~20W

3

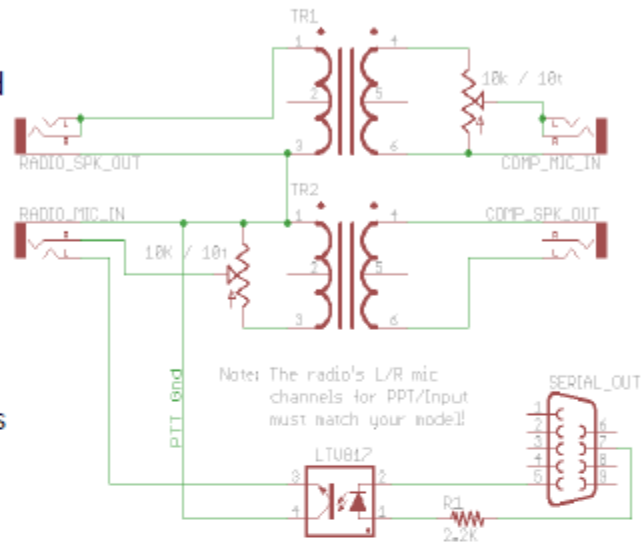
JT65: Overview

- Able to decode signals with a SNR of -23 to -25dB
 - an additional -4dB if using deep-search Koetter-Vardy decoding
- Intelligence sent using MFSK with 65 tones
- Bandwidth is ~200Hz, pass-band is ~355Hz
- Each transaction takes 1 minute
 - Transmit duration is ~48 seconds
- Forward error correction done via RS (Reed-Solomon)

JT65 Requirements: Interface

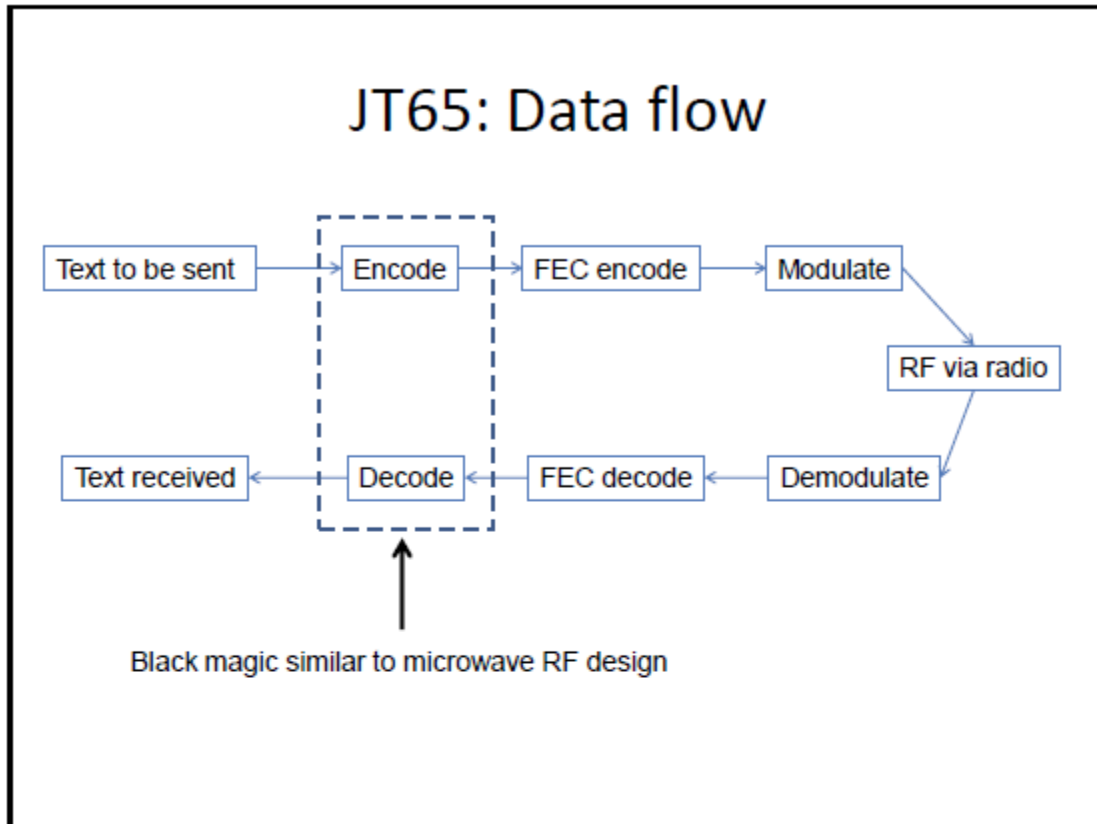
- Sound card interface (same as PSK31)

- Need to couple radio audio to a computer and vice-versa
- Can be as simple as a 3.5mm stereo plug from the computer to the radio
- Recommend using a transformer decoupled interface, though capacitor coupling works too ...



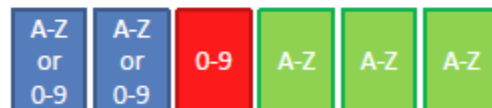
JT65 Requirements: Operating

- Computer clocks must be synchronized
 - The use of an NTP (network) time server such as time.nrc.ca is highly recommended
 - Any operating system can be set to synchronize with a central time server
 - When using JT65, ensure your time is correct as a difference of 10s may prevent proper operation
- Transmit on either even or odd minutes
 - Traditionally, Region 2 transmits on even minutes
 - In HF bands, the convention is generally followed but if conditions require, it is common to switch to “odd frames” (minutes)



Encoding: Clever tricks

- Amateur callsigns take the general form of:



#possible comb.	37	36	10	27	27	27
-----------------	----	----	----	----	----	----

$37 \times 36 \times 10 \times 27 \times 27 \times 27 \approx 262$ million possibilities

$2^{28} > 262$ million therefore, using 28 bits,
all valid amateur callsigns can be encoded!

Encoding: More clever tricks

- There are a total of 32400 “4-digit” maidenhead locators possible on the earth
– 180x180
- $2^{15} > 32400$ (by 368) so we can use only 15 bits to encode maidenhead location!

Data: Bit count

- To send a transaction, two callsigns are sent along with (at worst) a maidenhead locator:
- <my call> <your call> <your grid>
- 28 bits + 28 bits + 15 bits = 71 bits total

Data: Sending using Morse

- Example message: "VE3BUX VE3RAM FN25"
- Each "dit" is the equivalent to 1-bit

A = 4	B = 6	E = 1	F = 6	M = 6	N = 4	R = 5
U = 5	V = 6	X = 8	Space = 5	2 = 11	3 = 9	5 = 5

- The above message would require a total of:

35 bits for VE3BUX
 31 bits for VE3RAM
 26 bits for FN25
 + 10 bits for spaces

102 bits

Data Comparison

- So to send the message:
 <my call> <your call> <your grid>
- Uses:
 - 71 bits using JT65 or ..
 - 102 bits using Morse Code
- However, JT65 sends characters at an equivalent rate of 0.3char / s

Error Correction

- The JT65 protocol uses Reed-Solomon forward error correction (63,12)
- Converts 71+1bit message to “channel” symbols where each sequence differs by at least 52 of the 63 symbols used
 - This ensures very high likelihood of correct decode
 - The key trick behind the SNR performance of JT65

Synchronizing: Time & Frequency

- JT65 uses “synchronizing vectors” which are inserted into the intelligence
 - Time synchronization of $\sim 0.03s$
 - Frequency synchronization of 1.5Hz
- Approximately half of the transmission time is devoted to synchronizing the transmitter and receiver
 - Having such tightly coupled timing and frequency allows for some very powerful signal processing

Transmission Timeline

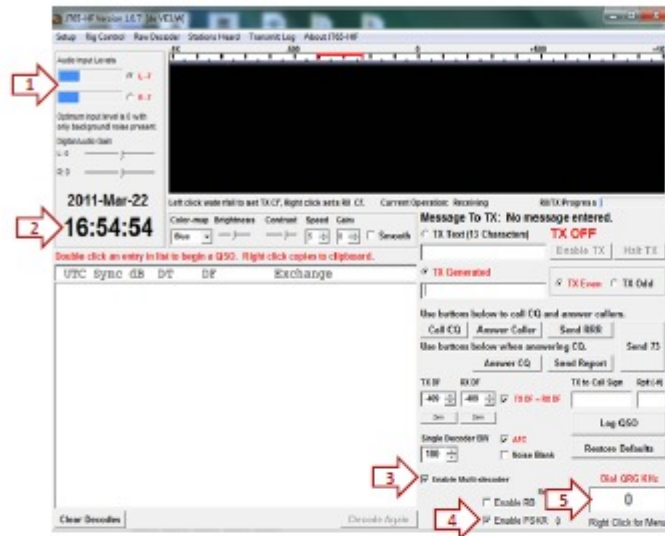
- $t = \text{UTC} + 1\text{s}$: transmission begins
 - 1270.5Hz synchronizing tone begins
 - sent at each interval which has a value of "1" in a pseudo-random sequence
 - JT65 transmission broken down into 126 time intervals of 0.372s
 - 4096 digitized samples at 11025 samples / sec
 - at each time interval, 65 tones (constant amplitude) are frequency shifted
- $t = \text{UTC} + 47.8\text{s}$: transmission ends

Transmission Timeline

- A full QSO takes 6 minutes !!
 - 143.4s (~2.4 minutes) of transmitting
 - ~150s (2.5 minutes) of receiving
- Great mode for relaxed operation
- Probably not a good choice for most contests where contacts / hour matter

JT65: Initial Setup

When the JT65 software first loads up, you will see the standard display. You are almost ready to operate! As with all modes, the best way to learn is to listen first.

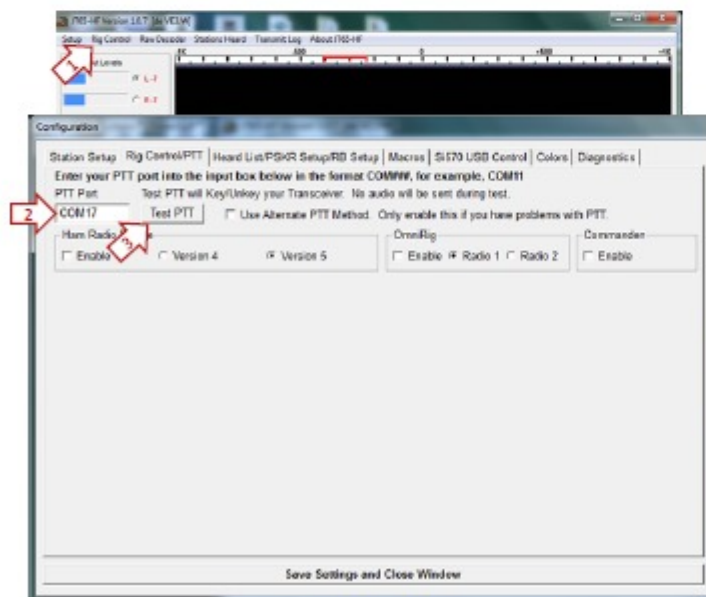


To set up the software properly:

1. Verify the audio input levels
2. Check that the time displayed is properly synchronized
3. Confirm that "Multi Decoder" is enabled
4. Ensure that the PSKR reporter is enabled.
5. Right-click in the "QRG" box and select the frequency your radio is tuned to

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JT65: PTT Function



To transmit, JT65-HF must be able to engage the PTT (push to talk) serial port for your radio

To check that the PTT function will work:

1. Click on "Rig Control"
2. Ensure the PTT Port displays the correct Com port for your config.
3. Confirm PTT functionality by clicking on "Test PTT"

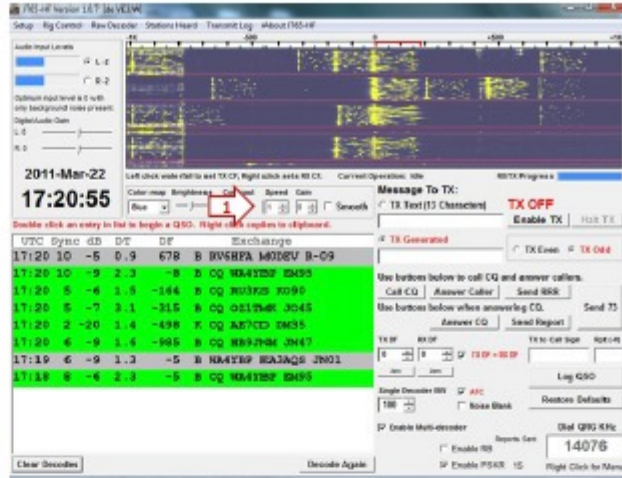
18

JT65: Receiving

The image displayed shows all signals decoded from the last few minutes.

The display speed (1) was set to "1" in an effort to better show the multiple exchanges in the spectrum display (top right).

The red horizontal bars in the spectrum view indicate the beginning of the next frame (minute). Notice the regions which seem squashed? Those show when a transmission was being made.



The data in the bottom left shows seven people calling CQ (green) and two QSOs in progress (gray). This region provides much information and warrants further discussion.

JT65: The QSO Window

UTC	Sync	dB	DT	DF	Exchange
17:22	6	-5	1.3	-161	B VE3JW RU3KS -12
17:20	10	-5	0.9	678	B RV6HFA M0DEV R-09
17:20	10	-9	2.3	-8	B CQ WA4YBP EM95
17:20	5	-6	1.5	-164	B CQ RU3KS KO90
17:20	5	-7	3.1	-315	B CQ OZ1TMR JO45
17:20	2	-20	1.4	-498	K CQ AE7CD DM35
17:20	6	-9	1.6	-985	B CQ HB9JNM JN47
17:19	6	-9	1.3	-5	B WA4YBP EA3AQS JN01
17:18	8	-6	2.3	-5	B CQ WA4YBP EM95

Colour Codes:

- Gray = QSO in progress
- Green = Someone Calling CQ
- Red = Someone replying to YOU

Header	What It Means
UTC	The time of the exchange (most recent at the top)
Sync	The number of synchronizing tones received as part of the transport layer protocol design. The more sync tones, the better. This is usually related to the received strength.
dB	Received strength (after decoding). The closer to 0, the stronger. Theoretically, the software is able to decode down to -26dB. Those are the fun signals!
DT	Time differential. Ideally, this value would be 0.3 to 0.1 – the fact everyone was showing +1 sec (average) suggests we are ahead by 1 second. Better re-sync that computer clock!
DF	Decoding frequency. This corresponds to where in the pass-band the signal was heard.
Exchange	The actual data payload – i.e.. The pre-defined “conversation”.

JT65: A Standardized QSO

The nature of the optimized JT65 decoding algorithms requires each exchange to be very short in length. You are limited to a message of no more than 13 characters. The software uses some special tricks to squeeze more out of the protocol by using prosigns.

A standard QSO only consists of the following exchange:

CQ <my call> <my grid>	- ME	(on even minutes)
<my call> <your call> <your grid>	- YOU	(on odd minutes)
<your call> <my call> <your RSQ in dB>	- ME	...etc
<my call> <your call> R <my RSQ in dB>	- YOU	...etc
<your call> <my call> RRR	- ME	
<my call> <your call> 73	- YOU	

People will sometimes exchange one last bit of information and the last transmission often looks like:

3EL 5W TU73 Which tells us they used a 3 element beam at 5W

Notice that the entire (proper) QSO takes at least 6 minutes from start to finish!

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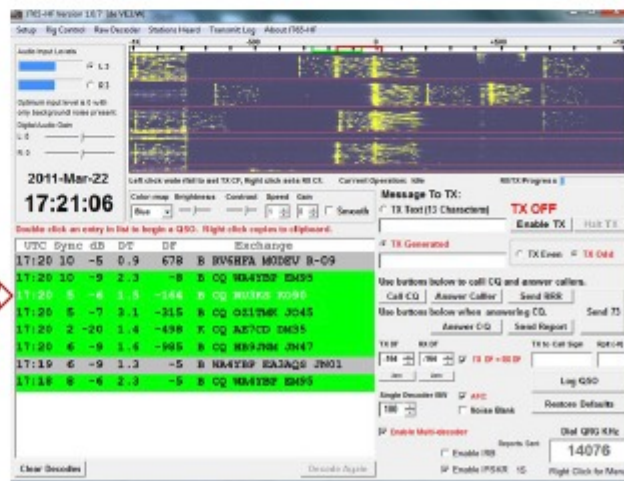
JT65: Answering CQ

To answer someone's CQ call, the preferred method is to simply double click on the contact of interest in the QSO window.

Here I have only clicked once on the contact of interest to illustrate that the software highlights it by changing the text to white.

When you double click a CQ, the software will automatically generate the appropriate response text.

When answering a CQ, the convention is: <their callsign> <your callsign> <your grid>



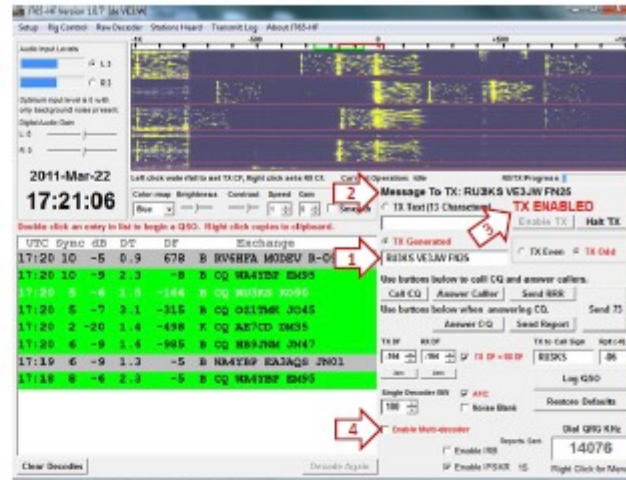
22

JT65: Answering CQ continued

When you double click on a CQ call, the software does four things automatically:

1. Generates the appropriate response to the CQ
2. Displays the out-bound message to be transmitted
3. Enables the transmit mode
4. Disables multi-decoder

The software knows we are responding to a CQ call made during an "even frame" so it sets itself to transmit on an "odd frame" as appropriate.



The software disables multi-decoder to avoid spending too much time decoding signals not relating to your QSO. You should re-enable this when you are ready to listen again. After 2 frames of no decodes, the software re-enables multi-decoder by default.

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JT65: Answering CQ continued

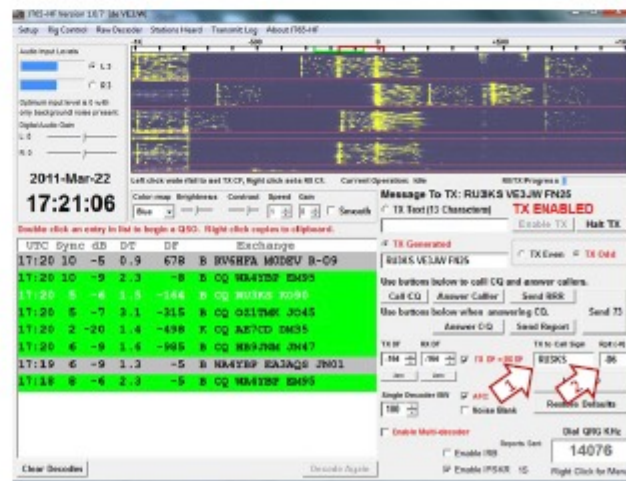
The other method of replying is to manually enter the information as follows:

1. call sign in the: "TX to Call Sign" box
2. the report in the "Rpt (-#)" box

When ready, simply click on the "Answer CQ" button.

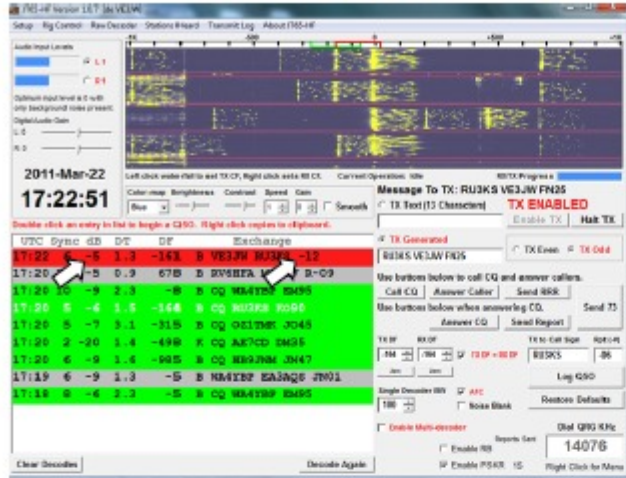
It is advised that you stick to the double-click method as it is faster, and less prone to input error.

You have a very narrow window (less than 10 seconds) between the decoding phase and the start of the next transmission "frame". Thus, to answer a CQ you need to be quick and decisive.



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JT65: QSO Established



The station who we replied to has now sent our signal report (-12dB) and so we reply with their signal report (-5dB in this case) but we add R as a prefix.

RU3KS VE3JW R-05

This indicates to the recipient that we have received their signal report.

To have the software generate this automatically, simply double click on the QSO line. As usual, this should be done as quickly as possible to avoid missing the reply frame.

JT65: Sending a signal report



By double-clicking on the QSO line, the software will automatically generate the reply:

RU3KS VE3JW R-05

This message will of course be transmitted on the next odd-minute cycle (as is shown).

JT65: Missed frame



You may notice that the same exchange was transmitted by the distant station a second time.

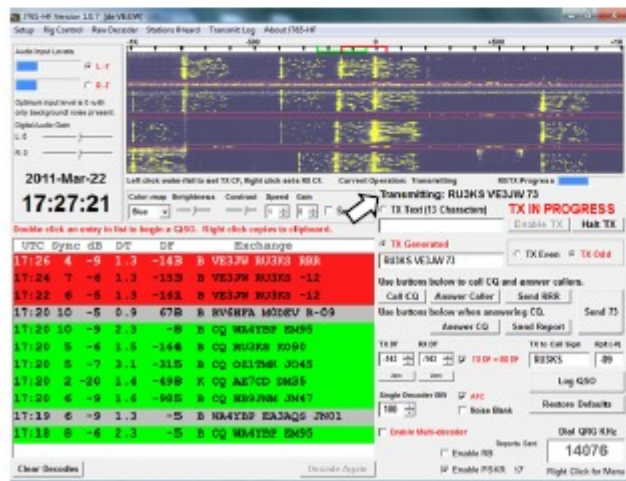
There are many reasons for a repetitive exchange, one of which may be that they did not receive our reply.

On occasion, it is a result of the operator failing to generate the appropriate response in time and so the previous message was retransmitted.

By default, the JT65-HF software will only transmit a message 15 times before automatically disabling the TX function. This is to prevent run-away transmissions.

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JT65: End of QSO



The second last step of a JT65 QSO is the exchange of RRR and 73 prosigns.

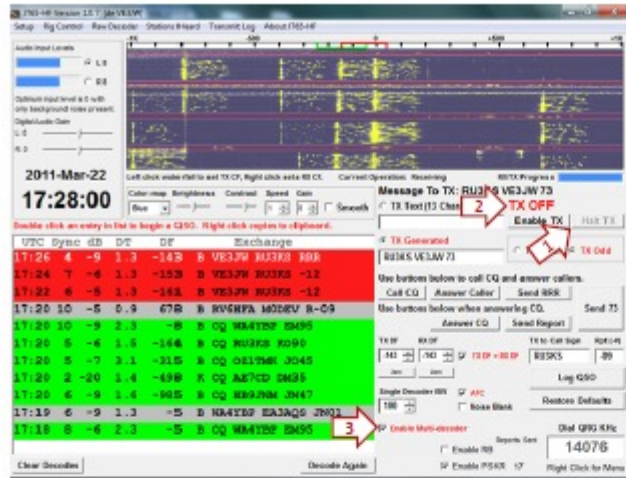
Whoever calls CQ is the one who is supposed to send RRR as their final exchange.

It is common courtesy to respond to the RRR with a 73.

As usual, double clicking on a QSO line with RRR will generate the 73 response automatically.

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JT65: QRT - End of transmission



Once you are done transmitting your regards, be sure to halt any further transmissions.

1. Simply click on "Halt TX"
2. Ensure TX OFF is seen
3. Re-enable multi-decodes

If you forget to halt your transmission, the software will continue transmitting your last message 15 times before being halted automatically.

To log your QSO, a suggested convention is as follows: (note the time)

Date	Time (UTC)	Freq. (MHz)	Mode	RXQ	TXQ	Details	Operator
22 Mar	1727	14.076	JT65	-6	-12	Andrey from Russia – sent using 20W	VE3BUX

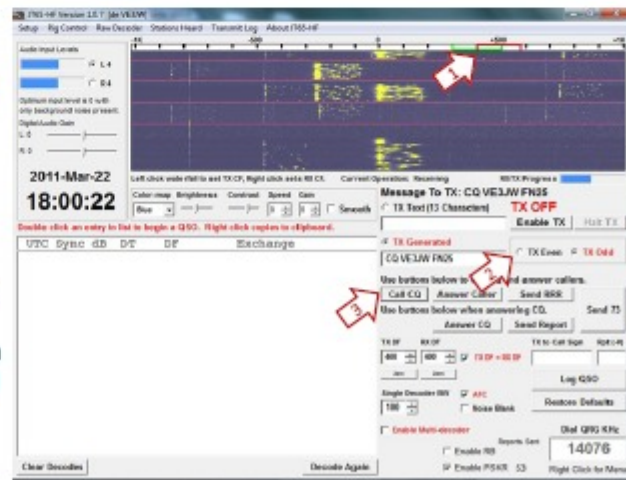
JT65: Calling CQ

Calling CQ is simple.

Unlike in answering a CQ, you must click on a button to initiate the call.

The procedure is as follows:

1. Tune to a vacant region of the spectrum by left-clicking in the black space.
2. Decide whether to call CQ on an even or an odd frame and select the appropriate choice.
3. Click on Call CQ

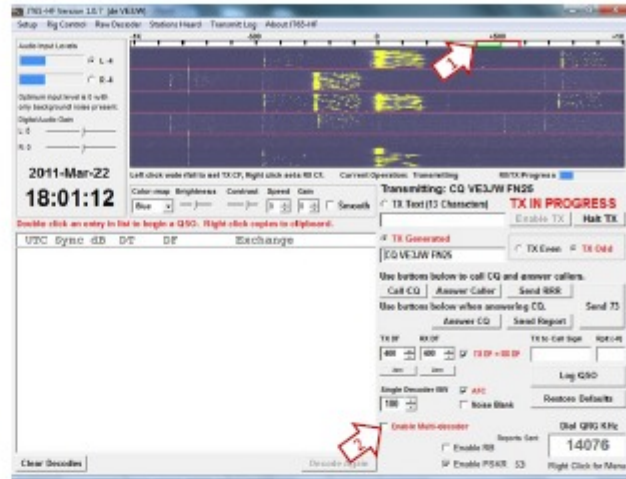


JT65: Calling CQ

When you “tune” in before transmitting, you will notice a red bar appear (1).

The left edge of this region (250Hz wide) will be placed where you click.

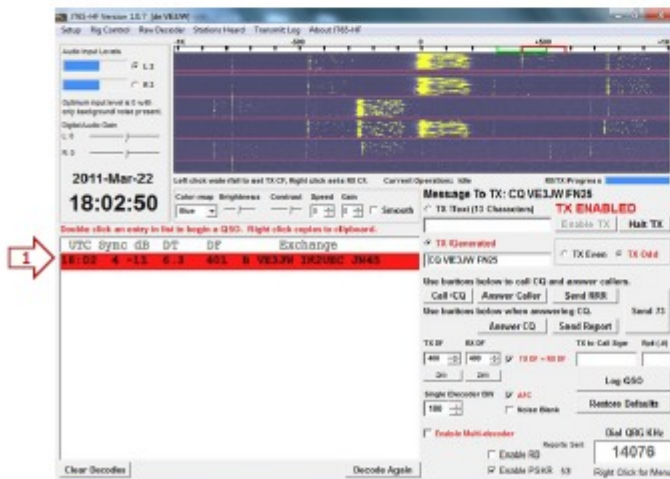
The hard-copy of this guide may not show the bar very well, so be sure to try it for yourself and observe the results of clicking on various locations in the spectrum.



When you call CQ, the “enable multi-decoder” function should automatically be disabled (2). If you see otherwise, be sure to disable the multi-decoder.

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JT65: Answering a station



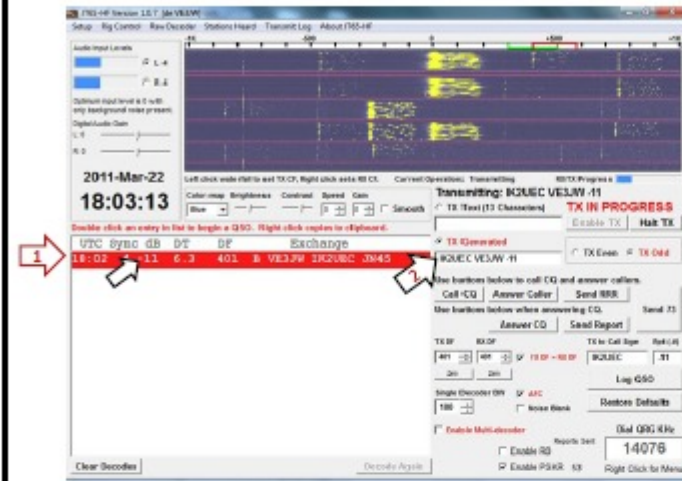
When you receive an answer to your CQ, the resulting QSO will be colour coded as red.

Be sure to decide whether to answer or not quickly!

This was a quick decode, giving a full 10 seconds before it was my turn to either continue calling CQ or to answer the caller.

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JT65: Answering a station



1. By simply double clicking on the QSO, the software will respond by giving a signal report.
2. In this case, the response is:

VE3JW IK2UEC -11

Keep in mind that if the station you are attempting to communicate with is coming in weak, it may take 2 or more cycles to receive a response.

JT65: Answering a station



Success!

The operator at the far-end acknowledges their signal report by responding with ours preceded by an R as follows:

VE3JW IK2UEC R-16

This means we are coming in fairly weak (recall -26dB is the lower limit) and so we may have to transmit the same message more than once to complete the QSO.

JT65: Finishing QSO with RRR



As always, double clicking the most recent QSO line will auto-generate the response dictated by the protocol which is:

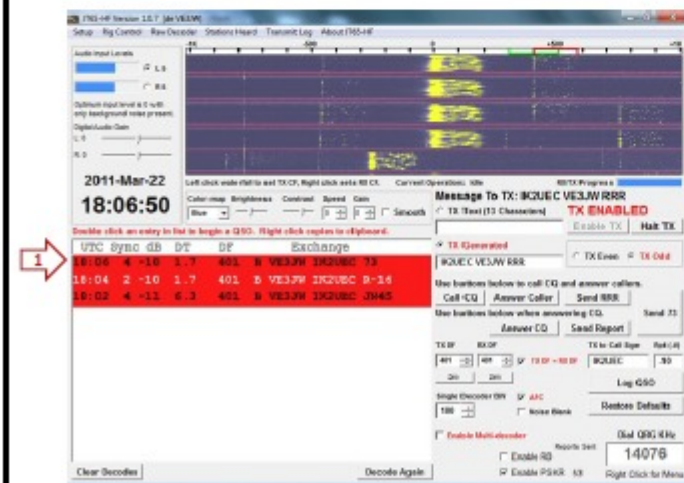
IK2UEC VE3JW RRR

Because we initially called the CQ, we are the one who terminates the QSO by sending the prosign RRR.

To log your QSO, a suggested convention is as follows: (again, note the time)

Date	Time (UTC)	Freq. (MHz)	Mode	RXQ	TXQ	Details	Operator
22 Mar	1806	14.076	JT65	-10	-16	Bruno from Italy – sent using 10W	VE3BUX

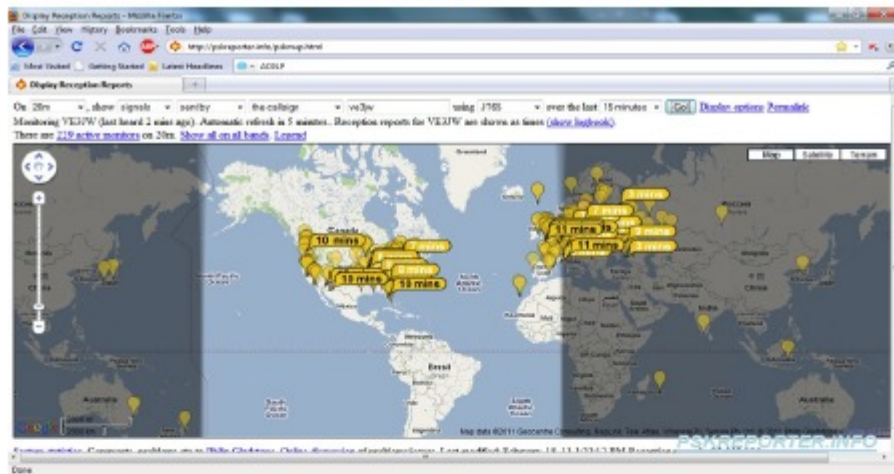
JT65: Final transaction



The final transaction is the courtesy 73 from the other operator.

I usually log this as the QSO time since it was the last transaction between the two of us.

JT65: Final Words



Part of using the JT65 software should include automatic submission of PSKR reports which serve to provide a centralized real-time propagation map. You can view the results at:




<http://pskreporter.info/pskmap.html>

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Questions?



MEMBERSHIP FORM

-  *The membership year starts in September and runs to the end of August of the following year.*
-  *Regular membership is open to licensed amateurs.*
-  *Associate membership is open to all unlicensed radio enthusiasts.*

Date: **PLEASE PRINT**

RENEWAL NEW CHANGE OVMRC NAME TAG (COST \$10.00) NO YES

Call Sign	Surname	Preferred First Name
Street		Apartment Number
City	Province	Postal Code
Home Phone	Work Phone	E-mail Address
Are you a member of Radio Amateurs of Canada (RAC) Yes <input type="checkbox"/> No <input type="checkbox"/> RAC ID: _____ Expiry Date: / /		

Full Membership (Not a Member of RAC) \$35.00/year

Full Membership (Member of RAC) \$25.00/year

Amount Enclosed
\$ _____
Cheque Cash

My Interests are: **VHF/UHF Phone** **VHF/UHF Digital** **VHF/UHF CW**
 Satellite **HF Phone** **HF Digital** **HF CW**

Current Occupation:

If Retired, Former Occupation:

Skills: *(Please list them all)*

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