My Very First RF Burn!

I am not the smartest of the people in the world. -- No, far from it. I am now 59 years old, but my 'radio' experiences started at my tender age of 9.My Dad was a forestry technician in the northern part of Quebec. He had a beautiful office, and a lovely company house. Sometimes in the evening, maybe once or twice a month, he would take me with him as he headed back to work, get on what looked like a 160M dipole, and talk on AM to the fellows up in the lumber camps. He would fire up the company radio, a Hallicrafters I believe, and chat away about how a new piece of equipment was operating. I gather his role was to evaluate the new and upcoming forestry equipment to see if the company should invest in it or not.So, at a tender age, young, (and handsome), Dan was introduced to HF. A year later, I went swimming. The swimming hole was located a good 3 miles from home, so it was a bit of a hike. Normally I would follow the road around a large field to the tiny beach. You would never dare cut across the field because it was home to a large bull.I had a great time swimming, and finally had to face the march home for supper. That shortcut across the field looked very tempting. It would save me 10 minutes or more. The bull was nowhere to be seen. In the middle of the field was the local AM broadcast station vertical tower. -- All nicely painted red and white. It was gorgeous! I ducked under the fence, and headed for the tower. It was exactly where the shortest distance in my shortcut would take me.As I approached this work of art, this marvel of engineering, this magical radio thing, this gleaming structure standing so tall, I noticed something. A ground strap! The strap was a piece of heavy tin about 3" wide. I didn't figure out what it was hooked to on the tower side, but it had been carefully

bent in fine style out and over the concrete base that supported this heavenly beauty. It was meticulously contoured to follow the base down towards mother earth, where it disappeared in the grass. Nice, I thought, very nice. With a young, clean, outreached finger I chose to carefully 'touch' this wonderful workmanship, to give it my blessing, to commend the individual who had taken so much care in its installation. The 'touch of Dan' turned into a jolt of the most excruciating pain I had ever felt. The current rippled up through my (ever so masculine) 10-year-old arm, through my upper body (Charles Atlas, of course), into my hungry stomach, down my both legs, out my tennis shoe shoelaces, and into the immediate area I was standing in. 'HOLY COW' I kept repeating as I did the proverbial dance of stricken heroes. 'GEEZ' was all I could formulate as my heart rate dropped from 300 BPM. 'WHEW' as I quickly scanned to see if there were any witnesses, and in particular of the Bull type.So I made it home, I didn't speak of the event. I kept it to myself and finally decided to share it with you fine folks.It was only 30 years later that I stepped into a canoe with an HF rig, a battery, a vertical, and a trailing bare metal ground. But that is another burn, sorry story.

VE9DAN

JT65-HF -- an 'Odd' but Fun Digital Mode

In case you've never seen it before, let's explore a seemingly-little-known digital mode called **JT65-HF**. In some ways, it is very similar to other digital modes such as PSK31, but it some ways, it is very much different.

First, the similarities. The equipment required is the same as other digital modes, that is, the rig, the antenna, the computer with software, and a sound card interface. None of that will be new to you if you've ever done digital before.

It is also a low-power mode, even more so than PSK31. On the upper HF bands, you'll often run 5W-10W or so. On the lower bands, 5W-10W will often do the trick, but for DX you might well crank it up to 30W-40W if really needed. Some JT65-HF users are committed to 5W max, period. It is important not to crank up the power too much because it will make it hard or impossible for others to hear weaker signals, just like on PSK31. In most cases, 10W will be sufficient. This is an extremely efficient weak-signal mode.

Just like PSK31, you'll also want to watch the ALC meter on the rig to keep from overdriving the signal. This isn't quite as critical on JT65-HF as it is on PSK31, but it is still important. There should be zero ALC for these modes – if you see some, turn down the sound card volume/output until ALC readings disappear.

OK, fine, that's the stuff you already knew. So what's so different about JT65-HF?

First, your favorite software doesn't do this mode. It's not in FLDIGI or HRD/DM780 or MixW or anything else like that. You need special software. (Have no fear, it's free!) There are technically two choices, though in reality there's only one good choice for the

new user. You could use WSJT v9, which is *THE* choice for VHF/UHF high-speed meteor scatter (HSMS), as one of its modes is JT65A (JT65-HF), but this is not the wise choice for HF because it doesn't help with QSO procedures on HF. What you really want to get (trust me on this) is JT65-HF. The current version is 1.0.7, and can be found at the link listed at the end. Installation is pretty easy, and requires only limited configuration.

Second, and the thing that is most unique about JT65-HF, are the QSO procedures. It is not a transmit-at-will or send-whatever-you-want mode. It is highly structured (similar to FSK441 or ISCAT on VHF) and because the maximum number of characters you can send in freeform is 13 (that's right, thirteen). And here you thought a 140-character tweet on Twitter was short!

The sequence of a contact depends on the computer clock being very accurate. We're not talking within 30 seconds here. 2 seconds off is barely acceptable. 1 second off is usually OK. In reality, you'll want it to be less than 0.5 seconds off. What that means for you is that the built-in Windows clock sync probably won't be sufficient. You need to get good clock sync software. The most popular one is D4 (Dimension 4); Meinberg is the other major choice (links below). If you're running Win7 or Vista, look at Meinberg first, but D4 will work if you run it as Admin and in XP compatibility mode. Either of them will keep your clock accurate to within a few hundredths of a second.

So now that your clock is good, you're ready to decode some signals. Start the software and tune your rig to 20m (USB dial freq 14076) or 40m (USB dial freq 7076), or pick one of the other bands, but make sure to pick a standard JT65-HF freq (1838, 3576, ~10138, 18102, 21076, 24920, 28076 kHz) and make sure it is USB. If you're receiving a signal, it should look something like this waterfall:
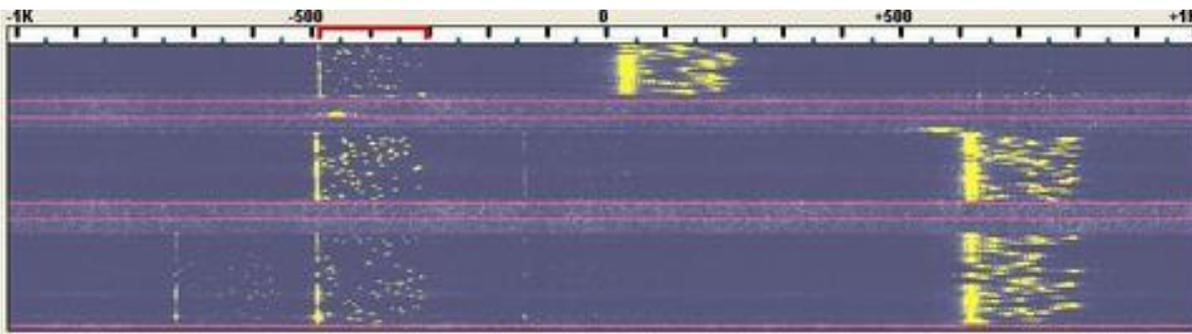
This is very similar to waterfalls for other digital modes. Across the top is the offset in Hertz – note the 2kHz width. From top to bottom is time, most recent on top. The thin red lines delineate minutes. Where you see two thin red lines close to each other means I was transmitting most of that minute. In the current minute (at the top) there is a modestly-weak signal at nearly -500Hz, and a strong one at about +40Hz. If you go back several minutes, you might see the very weak signal at -150Hz and another at about -730Hz. Those very weak signals could very well have been decoded. The "sync" tones at the left of the 175Hz signal are transmitted more than the others, so they tend to show up the best.

JT65-HF is done 60 seconds at a time. For 48 seconds, a station will transmit, and then there are 12 seconds of silence. Then in the next minute, the other station transmits for 48 seconds, followed by (you guessed it) 12 seconds of silence. During those 12 seconds, the computer is very busy decoding everything it can in the 2kHz segment and displaying the results in the decode window. Near the end of the 12 seconds, the receiving station decides if he wants to answer a CQ, or proceed to the next step of an in-progress QSO.

OK, time for the description of how a QSO works. I'm going to call CQ, and W1AW will decide to answer me.

I click on the Call CQ button and Enable TX. At the 00 second mark (of either the even or odd minute, depending on which I chose), I will send **CQ N0RQ EM13** . (This is what is generated by the program, and as you'll see, both grids and a signal report are exchanged.) My xmit will last for 48 seconds, and in the following minute, I'll wait to see if I get a response.

W1AW sees my signal, decodes it, and decides to answer, so he'll double-click the decoded line which will make the software start sending at the 00 second mark of the next minute. He will send **N0RQ W1AW FN31** . When I see that and decode it, I'll proceed to the next step (either by double-clicking on that decoded line, or by clicking on the Answer Caller button), which will make me send **W1AW N0RQ -06** . "06" is the signal strength in dB, automatically filled in by the program, and will range from -01 (extremely strong) to -25 or so (extremely weak). After that, W1AW will send **N0RQ W1AW R-13** , meaning "roger, your signal is" -13 or whatever. My response to that is **W1AW N0RQ RRR** , and then he'll send **N0RQ W1AW 73** (or some freeform "73"-type text), and the final step is for me to send **W1AW N0RQ 73** (or perhaps something like **TU HQ! 73** or **5W DIPOLE 73**).

To see it a bit more clearly, it would look like this:

CQ N0RQ EM13 (I CQ)

**   N0RQ W1AW FN31 (he answers with his grid)**

W1AW N0RQ -06 (I send signal report)

**   N0RQ W1AW R-13 (he sends Roger and my signal report)**

W1AW N0RQ RRR (I acknowledge receipt of his report)

**   N0RQ W1AW 73 (he sends a standard or freeform 73)**

10W DIPOLE 73 (I send a freeform or standard 73 – contact is over)

Key note: only proceed to the next step if you heard that the other station proceeded to his next step – otherwise, repeat the step you're on until you hear him proceed. The buttons in the JT65-HF software show the natural progress of a contact – the first row of buttons if you're doing the CQ, and the second row of buttons if you're answering a CQ.

That's it in a nutshell. When you actually see the JT65-HF screen and watch a couple of QSOs, it will make a lot more sense. As you can see, a single contact takes 7 minutes or more.

JT65-HF is so labeled because it sends 65 tones spread out over 175Hz. The "JT" part comes from the original creator of this type of mode, Joe Taylor, K1JT, the 1993 winner of the Nobel Prize in physics, and the author of the excellent HSMS and EME software known as WSJT.

JT65-HF is written by W6CQZ, and is an extremely efficient weak-signal mode – it is possible to decode signals you simply cannot hear in audio and can even barely see on the waterfall display. You'll probably love it or hate it – if you're a ragchewer, you might hate it – but many of us have found it to be addictively fun! Even with my modest remote station in the central US and low power, I've worked guys all over Europe and in other countries as well.

For logging, the mode in your log should say JT65 (though technically, the mode is JT65A). A good majority of JT65-HF users are LOTW participants, making QSLing easy. The software has a built-in logging function, which creates a standard .adif file, which can easily be imported into your favorite logging software.

Before concluding, it is certainly worth mentioning a very useful add-on product called JT-Alert by VK3AMA. It is distinct from JT65-HF, but works closely with it. It looks at the decodes made by JT65-HF and then displays info and makes sounds when it detects things like CQ, or your callsign being sent by someone (such as an answer to your CQ), or a wanted state. It can also detect that you've worked someone before on the band you're on and optionally ignore

any alert that may have been generated. It is a helpful tool that is worth installing.

Here are those links I promised:

http://sourceforge.net/projects/jt65-hf/files/ download the latest software and .pdf setup/operations doc

http://www.hamclubs.info/JT-Utilities/ JT-Alert add-on software with visual and audio alerts

http://hamspots.net/wsjt/ "cluster"-type spots for JT65-HF and other digital modes

http://groups.google.com/group/jt65-hf JT65-HF group discussions (on Google groups)

http://www.thinkman.com/dimension4/index.htm D4 time sync

http://www.meinberg.de/english/sw/ntp.htm Meinberg time sync

Although I've gone into a modest level of detail with this article, there are setup options and some operating procedures that were not covered. I highly suggest reading the excellent setup manual/documentation. The JT65-HF group discussions are also very useful, with a great set of friendly and helpful folks participating.

Go forth and have fun on JT65-HF!

73, Dave NØRQ

China Successfully Launches Nine Amateur Radio Satellites:

 After a few postponements, nine Chinese satellites carrying Amateur Radio payloads were launched on September 19 at 2300 UTC, separating from the Long March (Chang Zheng 6) launch vehicle about 15 minutes later. Four of the microsatellites and two of the CubeSats included in the launch have been designated as XW-2A through XW-2F. The other

three satellites -- a CubeSat, a nanosatellite, and a picosatellite -- carry the designations CAS-3G, CAS-3H and CAS-3I (NUDT-Phone-Sat), respectively. All of the new satellites have 2 meter downlinks and 70 centimeter uplinks. Satellite enthusiasts have been enjoying the sudden surfeit of spacecraft to work. "So many signals, so little time," observed Tennessee resident Alan Biddle, WA4SCA, on the AMSAT-BB. China Amateur Satellite Group CAMSAT CEO Alan Kung, BA1DU, told ARRL that the anticipated life of the satellite cluster is 3 years. "Very good copy on CW beacons on [XW-2] A, B, C, D, E, F. Strong!" Clayton Coleman, W5PFG, reported from Texas. The nine satellites are in fairly close proximity in orbits about 310 miles up, and the AMSAT Online Satellite Pass page lists all under "XW-2." Shortly after the launch, W5PFG and fellow Texan Glenn Miller, AA5PK, worked each other via CAS-3F. He reported the CW beacons were strong on all of the CAMSAT satellites. Special event stations commemorating the US visit of Pope Francis announced plans to be active on some XW-2 passes.

The CW beacons carry individual call signs for the satellites as well as telemetry in the form of three-character text groups and the word "CAMSAT." Text copied from XW-2A through XW2-F indicated call signs BJ1SB through BJ1SG, respectively.

The satellites have been heard around the world. "Good signals from CAS-3F at 0700 UTC," reported David Bowman, G0MRF, who was at the Rugby World Cup special event station GB0RWC. He reported contacts with SP5ULN and F1AFZ.

"The polarity shifts were challenging to keep up with, but other than that, signals were strong," reported Mark Hammond, N8MH, in North Carolina, after using the XW-2E transponder on a September 20 pass. "Congratulations to CAMSAT and everyone involved in these projects."

The 200 mW FM transponder on LilacSat-2 (CAS-3H; call sign BJ1SI) was activated on the evening of September 22, and users took advantage. The transponder test was expected to last less than 24 hours. Dave Swanson, KG5CCI, in Arkansas said in an AMSAT-BB post that he checked out LilacSat-2 "on a

whim" about 10 minutes after the transponder was turned on, and found the downlink "very strong." An updated frequency table and more information are on the LilacSat website. The IARU was only able to coordinate operating frequencies for XW-2D and XW-2E, and the other seven satellites in the recent launch apparently will not be eligible for traditional OSCAR numbers. Information on the just-launched CAMSAT satellites is available on the ARRL website. XW2 predictions are available on the AMSAT website. In addition to the Chinese satellites, the Braziliansatellite, launched on September 17 from the ISS, has been heard.

Upcoming DXPEDITIONS:

- Tanzania Sep 13- Oct18
- Belize Sep 13- Oct15

For Sale:

NOTHING FOR SALE THIS MONTH!

That's this edition of The Amateur's News!

73, DE N8CAM