

HOT WASH FEEDBACK
Alachua County ARES Exercise “WILDFIRE”
Saturday, June 9th 2018

Item (good or bad)	Possible Improvement Plan
<p>COMM UNIT 2 One volunteer's laptop arrived without FLDIGI installed and the group wasn't equipped to install it.</p>	<p>Pre-designated Unit Leaders might want to come prepared with all installation software on a usb flash drive. This should include: FLDIGI WINLINK Express Soundmodem Easyterm Itshfbc (propagation program required by Winlink Express)</p>
<p>Unexpected problems with Radio Frequency Interference, so bad that a station locked up in “Transmit” and they didn't know how to quickly stop it from transmitting --- laptop software froze</p> <p>Discussion ensued explaining that when electrical circuits exist they have to have TWO wires. This group was using end-fed antennas, without any access to an excellent “ground” return path.</p> <p>Thus the transmitter's RF energy on the opposite terminal to that going to the Antenna was “in search of ground” --- and the transmitter happily happens to be connected to a sound card interface, which happily happens to be connected to a computer --- all of which offers a nice “counterpoise” or opposite wire to the Long wire.</p> <p>So the full circuit looks like:</p> <p>left terminal: long wire end fed right terminal: wire to soundcard ---> wire to Computer----> fingers of person touching computer</p> <p>All this RF energy coursing through soundcard and usb cabling (inductors!) causes significant voltage differences every few inches of wiring and is unpredictable per frequency as inductances and</p>	<ol style="list-style-type: none"> 1. Try to use the “most balanced” antenna systems possible. Center fed dipoles are easiest, and offcenter fed are as far away from “balanced” that some people will tolerate. 2. Keep radiating antennas away from computers as much as possible. 3. Use current-baluns between antenna and radio equipment to try and avoid “ground” currents following as common mode currents on coax or balanced line. 4. Use ferrite beads (effectively, a current-balun) on the audio cables from the radio to the soundcard interface. 5. Use ferrite beads (effectively a current-balun) on the USB cable from the soundcard interface and the computer. 6. External mouse may function when capacitive touch pad isn't working due to RF fields. Consider a ferrite bead on the USB cable from the external mouse. 7. Some times it is so bad that you have to use not one but TWO current baluns in the transmission line to the transmitter. 8. Reduce power if the above doesn't work.

capacitances change --- so different parts of the computer mother board (part of the “ground” path) now are are instantaneous <i>different</i> RF potentials --- locking up usb driver chips and other system.	
Unable to reach distant Winlink gateways	Get higher antennas
Unfamiliarity with FLDIGI – led to people typing and typing and leaving “dead air” on the frequency so the counterparty thought the link was lost.	Unless battery power is an issue, keep a signal up as fast as possible --- hit the TX or T/R button immediately when it is your turn to transmit and then just start typing on PSK31 --- doesn't matter if you get ahead or behind, or even use backspace --- it works perfectly.
Unfamiliarity with radio equipment	Read manuals
Power cables with wrong size eyelet holes for deep cycle batteries	Plan power systems in advance or bring tools (drill, crimp terminals, crimper) to deal with unexpected mismatches. SUGGESTION: put polarity protection permanently on wires to expensive transceivers (series fuse and shunt diode on the RADIO side of the fuse, back connected, so it will conduct heavily if wrong polarity, protect radio and blow fuse) --- we've already lost a \$400 transceiver due to a mixup and people in unfamiliar circumstances can easily get DC polarities backwards since humans don't inherently “sense” + and -
Able to do the PSK quite well (Particularly when the RX gain was turned down so the waterfall was completely whited out)	
Hilarious Oddity: ham radio operators using a 2 meter link to confirm reception of message on a WORKING 10 METER LINK	No need to use 2 meters to confirm reception when you already have a working connection on an HF band --- simply reply “QSL” or “received perfect copy” or similar by voice, cw, psk or other mode --- millions of QSOs happen every year on 80/40/30/20/15/10 meters....and the hams manage to do it all over thousands of miles without a 2 meter connection to inform the other side that they have sent something!
Participants watched an in-progress PSK QSO between two very very distant stations thousands and thousands of miles away, demonstrating the incredible distance possibilities on an 'open' HF amateur radio band.	
EOC Known problems with horribly inefficient antenna	Waiting for antenna replacement urged now for 2 years and potentially about to happen.

<p>Able to hear PSK signals from groups 5 miles away (hooray, we are on par with CB communications!)</p>	
<p>Able to carry on direct FM 2 meter simplex communications after switching to put highest 2 meter antenna on the simplex link and using the lower 2 meter antenna only for repeater-based communications.</p>	
<p>Recognized that all the ICS forms are available in the file cabinet so switched to those to avoid need to utilize Forms booklet, saving it for later use.</p>	
<p>Problem with confirming reception.</p>	<p>Remember to SEND the QSL, not just speak it aloud in the shack! More practice doing regular ham radio contacts in a multitude of modes (SSB, FM, CW, Digital) will help.</p>
<p>Initial difficulty in conducting peer-to-peer winlink communications followed by success.</p>	<p>Requirements to get a peer-to-peer connection going:</p> <ul style="list-style-type: none"> a) utilize a peer-to-peer type winlink session rather than a 'winlink' type session b) be on the same frequency as your counterparty (if you have computer controlled frequency, this is actually more troublesome, because you have to put in the correct center frequency in the dialog box for initiating the connection) Also remember UPPER side band c) Initiating station must have entered the callsign of the counterparty they wish to call in the dialog box. c) Click Start to begin the connection sequence <p>Remember that while systems like EasyTerm, FLDIGI, Ham Radio Deluxe etc. make keyboard-to-keyboard easy...WINLINK does email-passing ONLY and itsn't made for the purpose of doing keyboard-to-keyboard connections!</p>
<p>Difficulty getting the HF transceiver into Upper side band</p>	<p>Read manual and practice with the ACTUAL EQUIPMENT you'll be using in an emergency.</p> <p>Suggestion for a party time where $\frac{3}{4}$ of the group goes to the EOC, uses their gear, and a few remain at home to make connections; swap persons the next time it is practiced so everyone gets to know the EOC equipment.</p>
<p>Various labels were improved and corrected in the ham shack.</p>	

<p>COMM UNIT 1</p> <p>Very close proximity of the Incident Commander HF station meant that coordination of frequency bands in use by powerful transmitters had to be continuously arranged over handitalkie to avoid damage to receivers (antennas were set at right angles) (We had the happy problem of LOTS of HF transmitters.)</p>	<p>Next time position HF transmitters farther apart.</p> <p>If possible, be certain that back-to-back protection diodes are installed within the receiver input circuitry of equipment that will be used in emergencies or field days --- this is very commonplace in many QRP designs and can be added to transceivers for only about \$1. Two 1N4148's can be used.</p>
<p>Forrestry tower (50 feet) worked GREAT for the VHF communications as well as supporting the HF homebrew buckmaster antenna.</p> <p>a) Van remembered to bring the N connector adapters that Gordon forgot</p> <p>b) Van's home-built buc*master cloneworked VERY well and was positioned 40 feet up or so --- both Van and Gordon used it to make WINLINK connections to WW4MSK near Atlanta on 40 meters.</p>	
<p>Difficulty in reaching very many HF WINLINK Gateways</p>	<p>Don't have transmitters so close so that operators can move more freely across different bands --- Gordon and Van did a superb job coordinating but this added an additional level of complexity.</p> <p>Winlnk connections tend to be the HARDEST right in the middle of the day --- the number of stations in "green" propagation prediction dwindles badly --- and tends to be EASY in the morning, evening, and dark hours but on lower bands (80/40/30) while during the day 40/30/20/18 may have to be used.</p>
<p>INCIDENT COMMANDER</p> <p>[Icom 725 computer controlled by Win8.1 computer, Pactor modem as well as soundcard; push-up mast 25 feet up, 2 meter slim jim and homebrew non-resonant antenna balanced line fed]</p> <p>Difficulties as noted above reaching winlink stations and coordinating with nearby transmitter.</p>	<p>Significantly, we were unable to raise KX4Z gateway on 80 meters just 15 miles away....no way to accomplish 'point to point' and not enough ground wave or else KX4Z gateway was otherwise occupied.</p>
<p>The 25 foot high inverted vee just didn't have the communications ability that the 40 foot high buc*master had!</p>	<p>To be a really effective long distance antenna, one or more ends of the antenna are going to have to be lifted significantly higher with slingshot- or</p>

	otherwise deployed lines – the little push up mast isn't enough for good daytime communications, although it worked to KQ4ET (virginia) the evening before.
New trailer worked well – AC worked, 12V power distribution worked, antennas worked for point to point 10 meter and 2 meter communications.	
Handling the balanced line from the rear was more problematic	Consider converting to coax at the REAR coax passthrough and then running coax inside the trailer to the radio positions. Problem: higher coax losses.
2kw Sinewave inverter ran the refrigerator fine.	
3.4 kw Champion inverter generator ran from 9AM until about 12:30 PM on its internal gas tank and then stopped --- seems to be an overheating problem rather than actual running out of gas as it was refilled and wouldn't run more than few minutes, ran fine cooled off hours later	The inverter generator probably measures temperatures in its inverter. a) SHADE the generator from the sun to reduce its temperature. b) Reduce load by setting AC a little less cold c) Provide more circulation around generator, possibly a FAN for it.
When unable to reach distant HF gateways, employed the local VHF packet system to send/receive winlink via KX4Z-11. (145.030 to Beatty Towers W4DFU-8...digipeating directly to KX4Z-11 on 145.030). Some difficulty initially with KX4Z-10	a) detailed geographic knowledge of 2 meter packet systems is a requirement to best use them b) possibly still some internet connectivity issues at the KX4Z station (AT&T DSL) – switching to KX4Z-11 (which caches to RMS-RELAY on a windows machine instead of direct to the internet) got around this issue and email flowed fine c) better knowledge of packet systems allows knowledge of when digipeater operations will work and when a CONNECT script will be needed to switch ports to change frequencies.
RADIO-ONLY Tests Dave Welker W2SRP graciously sent us radio-only winlink emails. Unfortunately, Gordon forgot to check NF4AC radio only....and couldn't reach any of the designated MPS anyway...and the antennas at the EOC are thoroughly inadequate for this task most of the time. The transit of Dave Welker's email was interesting: he had trouble even getting it off to a radio only gateway due to his own antenna/propagation issues, but finally got it to a CANADIAN gateway, VE1YZ, which immediately attempted a direct connection to one	1. REMEMBER to check for radio only email in a vast disaster..... 2. keep track of your posted MPS stations 3. Better antennas because you MUST reach your MPSs,...not just any old gateway, it HAS to be one of your MPS's.

of common MPS stations, KX4Z gateway --- this made an initial connection, then the propagation failed so the canadian gateway computed a relay route and started the message on it's way ---it reached gainesville in 1 hour 9 minutes by the following route:

Dave's radio mail sent to VE1YZ @ 12:12:42 GMT

Went to WB2LMV @ 12:25:54 (13 minutes later)

Went to KC8YJJ @ 12:29:02 (4 minutes after WB2LMV)

Went to KC0TPS @ 13:01:28 (32 minutes later)

Went to KX4Z (the gateway station, not my client station) at 13:21:59 (20 minutes after Kc0TPS).

Total elapsed time from Dave leaving it in Canada to it making it back to Gainesville: 1 hour, 9 minutes.

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