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Florida Baptist Disaster Relief
“Communications Group”

RE: Individual Activity Report, my involvement Dec 2,3,4th 2020, Lake Yale Campus

Dear Sirs:

This report is filed in the sincere effort to avoid some of the problems we’ve faced because of lack of prior documentation in the construction of radio assets and systems, and also to address some interpersonal friction that I perceived during my stay at Lake Yale on the above dates. I’m not the best at dealing with interpersonal friction-- I’m much better at technical things and documentation – but I was once told it is one of the most common causes of missionaries QUITTING and that is regrettable in a Christian ministry where RECONCILIATION of people to God and each other is a prime goal. I’ve learned it is much better to only discuss my perceptions (“I felt this way.....”) rather than to make pejorative statements (“You made me.....”) in marital and other type interpersonal friction issues, which are part of life and for which our Savior and the Apostle Paul gave us lots of instructions how to deal with.

Although Dave Puscher has made a remarkable effort to create a location for saving videos and potentially training documents, I’m not as “up” on how to do things there and so far we haven’t (yet) seen a good repository for technical documentation that needs to be kept safe. (And I detest Microsoft TEAMS.) The Facebook page is here:

<https://www.facebook.com/groups/FLBaptistDRCommunicationsTeam/about>

but I don’t know how to invite everyone. And I don’t see a way to store documents there.... So I’ll create a place to store some of the documentation here:

<https://qsl.net/nf4rc/FBDR/FBDRTechnical.html>

and the materials stored there could be easily moved to a web page owned by our group (e.g. *qsl.net/n4fbc* for example if we get permission from Luther to apply for that site) – but we need a place so documentation doesn’t get lost. It could also be on paper, but as we saw, paper in the PCC Trailer got damaged by water, so even that isn’t perfect.

My Understanding of my mission during Dec 2-4 effort.

Appendix One shows a few copies of emails and a spreadsheet discussed in the lead-up to the deployment to Lake Yale for a work group. **From this information it was my understanding that I would be working on:**

- Technical documentation of the existing frequencies, legalities, and emissions characteristics of existing radio assets (NONE of which we had ANY significant documentation for, not even model numbers.)
- Possibly participate in man-lift training (though I have a fear of heights, and as it turned out, I had rented and operated a nearly identical man-lift for an entire weekend trimming my palm trees and putting up antennas, so I was pretty familiar with it)
- Assist with creation of a permanent end fed half wave antenna at the site.
- Work toward the ability to purchase additional business band radios
- Work toward a legal and licensed repeater system

LICENSING SITUATION PRIOR TO DEC 2:

Because the group empowered me in open discussions and votes to move forward with FCC licensing efforts, and subsequent lengthy documentation to Marvin Corbin and Delton Beal resulted in my being authorized to contact the Convention's radio broker, I had accomplished that. I had then donated the funds to accomplish the licensing, after negotiating with **businessradiolicensing.com** to get our license accomplished. I was then waiting on FBDR officials to SIGN the authorizations we received in email from **businessradiolicensing.com**

With those data as background, here is a summarized list of my individual activities at Lake Yale:

DAILY ACTIVITY LIST

TUE 12/1/20

Loaded my trailer with every piece of radio equipment that I thought might be necessary for anything related to radio at Lake Yale, including:

My entire portable ham radio station, antenna analyzer, slingshot equipment and my personal antenna and baluns

Spectrum analyzer, Ethernet cable, RG174 cable, tapped dummy load, adapters, cables,

Part 90 transceivers: wound, charger, cables, Baofeng UV82, charger,; spare raspberry pi, controller board, oscilloscope, two high quality UHF transceivers, fuse holders, soldering gear, heatsinks, blower,

Spare duplexer, attenuators cables, double shielded coax, crimp connectors, small tools

Plywood, screws, aluminum sheeting, tin snips, sabre saw/blades, drills, drill bits

Balun materials, FT240-43 toroids, PTFE wire, etc.

Loading the trailer took over 6 hours.

WED 12/2/20

Arrived approx 10-11 AM, set up trailer.

Removed Motorola repeater from the rack (with difficulty) and transported to my trailer. Set up with tapped dummy load (approx 36 dB pad) and external 12 dB pad to Siglent spectrum analyzer. Center frequency = 464.975 MHz, span 50kHz, RBW 300Hz, VBW 1kHz (FCC testing setup), obtained reasonable looking signal.

Worked to find a way to couple 2500 Hz FCC test signal into repeater transmitter: disassembled microphone after audio coupling efforts seemed inadequate. Wiring of Motorola 10-pin modular plug looked at from top, is as follows:

1
2
3
4 GREEN
5 RED
6 BLACK
7 BLUE
8
9
10

Considerable experimentation with the mic and examination of its circuitry suggested the following wire assignments

GREEN = PTT (ground to go into transmit—but I avoided doing this and just pushed the micro switch because I observed it only went down to 0.6VDC)

RED = mic audio, pretty high level (100-200mV RMS) 4.3 Volt DC bias

BLACK = grounding

BLUE = suspect DC power for the mic, approx 4.2 VDC

Able to get 2500 Hz signal injected, not certain it is sufficiently supra-normal (16dB past limiting required) but at least LOUD and limiting – signal is clearly within the FCC 12.5kHz spec for narrowband. (emission spectrum has been previously provided to the group in a report sent out 12/3/2020 “Legal Radio Opportunities” and now provided here:

<https://qsl.net/nf4rc/FBDR/LegalRadioOpportunities12032020.pdf>

1430: Power measurement @ 60 watts on my SX-400 VHF watt-meter. This seems HIGH and not sure my measurement is accurate. We can't legally use more than 35 watts on the itinerant frequency and we asked for 35 watts ERP also – so this has to be confirmed and/or reduced. My measurement is NOT a high quality accurate measurement....

MOVING TO KENWOOD REPEATER

Measured output of Kenwood repeater appears to be 20-30 watts on one meter but only 15 on another – device is not supposed to put out more than 20 watts so suspect it is at best 20 watts. Frequency is slightly off of spec. Tried acoustic coupling...not very successful.

Mic is dynamic, 600 ohms and only approximately 5 mV RMS – no DC that I could see. Trouble getting adequate signal into this low impedance....tried as low as 100ohm resistor in dropping network of my homebrew sound card system.... About here I slipped and damaged my homebrew sound card system to the point that its sound dongle was no longer functional. Thankfully I had a backup system and was able to continue, but will have to resolver in a compete new sound card dongle thanks to that error.

1530: Got a reasonable emission signature from the Kenwood repeater. (This has been documented in the report cited above and is available at:

<https://qsl.net/nf4rc/FBDR/LegalRadioOpportunities12032020.pdf>

1600: Began to understand how to look up and read the test documentation of these two repeaters. (I had worked some on this before for candidate radio systems but didn't have the MODEL NUMBERS of our existing equipment)

Kenwood Repeater: TR-820-1 FCC ID is ALH9TKTKR-820-1. The site to look up FCC testing results is here:

<https://www.fcc.gov/oet/ea/fccid>

This is an important site with which to be familiar. The first three letters (“ALH” above) are the Grantee Code, and the remainder are the Product Code. Using this site and the above FCC ID I was able to find that the Kenwood repeater FCC ID lists 16K0F3E (16.0 kHz, voice frequency modulation) and does NOT have the FCC “summary” that I could find at that time. This 16 KHz emission means it is NO LONGER LEGAL for Part 90 usage in the United States.

MOTOROLA: FCC ID is AAM25RKC9AA1AN

(Repeater is Motorola CDR700; radios are CDM750). (Programmed by CPS software RVN4191 ?)

I was able to look this up now and found it contained TWO different filter possibilities:

25 kHz channels: 16K0F3E

12.5 kHz channels 11K0F3E – meaning it is legal when programmed for narrowband, to be used currently on narrowband business band frequencies.

After I learned how to look these things up and read the testing report, I realized this was a lot easier than going through all the work that I had done to measure it myself....

Working on the TS-2000

I don't have this on my written notes, but either on Wednesday or Thursday (not sure which) I was asked to work on an additional project (not on the original list) to try and make the TS-2000 successful on WINLINK for possible usage by Art Giles.

Relatively quickly I was able to assigned the CODEC (audio playback and record) and get the unit working successfully to make what should work (see later note on failures above a few watts of RF output likely due to RFI)

However, I was very very confused trying to get the CAT (computer controlled) frequency control to work. I think I spent well over an hour, possibly two hours, trying every possible combination of two cables, and available ports and choices in WINLINK to get computer control of the frequency working. Using Simple Terminal (a terminal emulator program) I was finally able to confirm that I had a working UART in one of the two available cables between the older Windows 7 computer I was asked to work on, and the TS-2000. In the process I had to download some drivers for one or the other of these cables. Since the Windows 7 computer had only a hardwired ethernet connection, I succeeded at this by

- Establishing a Hot Spot with my phone outside the door of the trailer (I had not yet done the WE BOOST experiment)
- Connecting my backup Lenovo to the iPhone Hotspot to get Internet
- Asking my Lenovo to bridge to its ethernet
- Connecting ethernet from Lenovo to the Windows 7 computer

There might have been an easier way to do this using the PCC routers, with a long ethernet cable but for some reason I didn't seem to understand that as a viable solution.

After HOURS of working to get the frequency control to work, I finally gave up.

Sometime on Wednesday I checked with Marvin and discovered the signature pages for the approval to go ahead with the FCC modification submission had not been forwarded to the Convention (I had already paid on one of the form sheets and sent that back in) and Marvin moved to get that done expeditiously – it was accomplished within hours, so businessradiolicensing.com has everything they need to proceed with our licensing modification request.

THURSDAY 12/4/2020

0730 The day before, I had been asked to make measurements to characterize a large roll of “mystery coax” It finally dawned on me that I could look up how to do this with the antenna analyzer, so this morning I found the instructions on line, terminated the coax with the 50 ohm dummy load, found the max and min resistive frequencies at zero reactance points and concluded the impedance was about 55 ohms by my measurements so very likely it was 50 ohm cable. Estimating the length on the roll to be 500 feet, and using the antenna analyzer to measure the open-circuited loss I measured a loss of approximately 1 dB/foot at 10 MHz. Looking through coax specifications, this pretty closely matches RG-8X, and the sizes of the two cables are similar also. So I reported these measurements to M. Crisler.

Approximately 0800:

I then put up my own personal EFHW antenna from the palm tree mount that I had constructed about a year earlier, to my mast on my trailer. I had originally intended to operate HF from my own trailer, but I was SO BUSY that I never even got my personal ham rig out of my truck to finish putting my own IC-7300 together. I had been asked the day before to help with a Kenwood TS-2000 and I needed this antenna to try that station out; and the antenna would also allow comparisons of noise when the station was running from the diesel generator that M. Crisler had by this time repaired. About this time N. Murabito came around and asked if there was anything he could do,, so I handed him my personal 100 foot roll of coax and asked him to run my personal antenna feed over to the PCC trailer, about 100 feet away.

0930: Working on the TS-2000 that I'd been asked to additionally help with, I was now able to make – after several tries – a successful connection to KX4Z RMS 100 miles north on 40 meters. However, the rig completely shuts down/blanks out if the output power is > 4 Watts. I concluded there was a Radio Frequency Interference problem of some sort, likely needing some serious ferrite and banal addition, and resolved to later test it with a DUMMY LOAD (to rule out any other cause) – but in the end I was so busy I never got back to this.

1000 Attention now turned to the Kenwood ERT hand-held radios. Marvin had helped me get two of them.

Model: KT-3400-K

FCC ID: ALH 435002

IC 282D-435002

IC Model KT-3400-K Serial No's B7410897 and B5600358

Looking up the FCC ID's I was pleasantly surprised to find they were licensed for both

11K0F3E and

16K0F3E emissions

A 34-page FCC Part 90 test report was reviewed, Rev. 1.0 Aug 31 2012. In that report they used 500 mV pp 2.5kHz audio input for the test and the test unit clearly passed their narrowband 12.5 kHz test.

Since I still wasn't sure exactly how our systems were programmed, it dawned on me I could test the handhelds and find out if THEY were programmed for narrow- versus broad band performance.

I then worked to characterize both units and their "channels" After some testing I was able to show:

Channel	Unit # B5600358	Unit # B7410897
1 (channel appears to be set for a	TX 469.975-.976 (wobbles) RX: appears to be 464.975	TX 469.975-.976 (wobbles) RX: 464.975

repeater with +5 offset)		
2 (channel appears to be set for simplex operation)	TX 464.975-.976 (wobbles) RX: receives 464.975	TX: 464.975-.976 (wobbles) RX receives 464.975

I created a paper-cut-out “mask” of the allowable limits for narrowband 12.5 kHz channel operation because it was so time consuming to make a measurement, download it to USB from the spectrum analyzer, move it to a computer, edit it in PAINT application to add the limits. With the to-scale paper cutout I could just tape it to the spectrum analyzer front display at the right height for the signal being measured and easily determine if it were narrow-band legal.

Doing this for the Kenwood handitalkie, it was very obvious that they had been programmed for NARROW BAND operation – again confirming that our repeater was working in narrowband operation. A photo of this result has previously been provided in the published report visible at:

<https://qsl.net/nf4rc/FBDR/LegalRadioOpportunities12032020.pdf>

My notes stopped at this point so I’ll have to reconstruct from memory and computer records and emails.

MOTOROLA DUPLEXER

I needed to make a final decision on whether to stick with the frequencies that I’d originally forwarded to businessradiolicensing.com or whether to ask a change to the 464.5/464.55 469.5/469.55 pair 15 MHz higher – so I decided I needed to characterize the Motorola repeater’s duplexer and find out if it would be obviously easier to go with the 464 frequencies --- so I disassembled the repeater further and made connections directly to the duplexer, using 6 dB pads on both tracking generator and spectrum analyzer input, normalizing the trace for those losses with a direct connection, and then connecting to the duplexer, using a valid 50 ohm load on the unused port. I was able to show that performance of the Motorola duplexer was VERY GOOD – and that it has a very wide passband and a VERY sharp cutoff. The duplexer was tuned to have its best isolation (approximately -70 to -75 dB) right at the appropriate offset frequency, but even on the 464 frequencies, it would already be basically usable (approximately -65 dB or better). This seemed to confirm in my mind that we should request the higher “pairs” –

I then found the rest of the group and brought them to the trailer to see this measurement and to ask their input to confirm the idea that we should change our requested repeater pairs to the 464/469 pairs instead of the previously requested 451/456 pairs – M. Crisler and N. Murabito agreed with me on that.

This allowed me to finish that part of the decision making. It was getting later in the day and I didn’t want to foul up that letter to jerry@businessradiolicensing.com so I resolved to get that done Friday morning early, the last day of my stay at Lake Yale on that trip.

GA ARES CONFERENCE

In the evening after dinner, at 8 PM, GA ARES held a training session with the Emergency Manager of Hall County giving a one-hour talk on his duties and experiences to familiarize hams with working closely with the authorities. I listened to his entire talk via the web, and at the same time I worked to disassemble the Kenwood repeater so I could investigate whether we could salvage any part of it, and/or how its duplexer was tuned.

I found the Kenwood repeater had an integrated receiver/transmitter/controller, actually sharing some oscillator circuits and it would be very difficult to separate them cleanly. The controller is programmed by removing an EEPROM from the unit and reprogramming according to the directions I found online....this would be very difficult for us. The power supply is a 10A 13.8VDC power supply and it might have some usage, but in general the unit would be difficult for us to take any more advantage from, than just using the DUPLEXER and the POWER SUPPLY.

FRIDAY 12/5/2020

I got up very early (about 5 AM) and worked on wording a letter to Jerry to ask for a change in the frequency requests, hoping to get that to him before he actually began the FCC Form 601 modification request, so he wouldn't have to re-work, and potentially be irritated or charge us more.

The resulting letter can be viewed here:
<https://qsl.net/nf4rc/FBDR/BusinessRadioLicensing12042020.pdf>
 and gives the corrected UHF repeater pair frequencies.

In reading that letter, the following acronyms will be needed:

MOI – mobile, itinerant unit. The FCC doesn't have an abbreviation for "hand-held" so you use MO for anything that doesn't have a specific address, including handhelds and units mounted in vehicles; the I signifies that you want licensing not even tied to a distance from a specific address.

FB2I – this is FCC speak for an itinerant, for temporarily stationed repeater.

The UHF Frequency pairs can be understood with this table.

	USER HANDHELD OR MOBILE Freq #1	REPEATER Freq #1	USER HANDHELD OR MOBILE Freq #2	REPEATER Freq #2
Receives	464.5000	469.5000	464.5500	469.5500
Transmits in	469.5000	464.5000	469.5500	464.5500

duplex mode		Repeater Output		Repeater Output
Transmits in simplex “talkaround” mode	464.5000 (transmits on repeater output frequency)	N/A	464.5500 (transmits on repeater output frequency)	N/A

These always confuse me, and I had to review my letter and catch an error and rewrite part of it before sending to Jerry. I spent about 2 hours merely writing that letter.

So the channels that we would have our BAOFENG UV-82C would be channels 1-7 below, and the older Kenwood (UHF only) would be programmed for the channel 1-4 which work seamlessly with the BAOFENGs. So the two physical transceivers have channels 1,2,3,4 in common (to reduce confusion) and the Baofengs have an additional 3 VHF simplex channels.

Channel No. (These can be moved around)	Receives On	Transmits On	Usage
1	464.5000	469.5000	UHF Repeater #1
2	464.5000	464.5000	Simplex on UHF Repeater #1 output frequency (TalkAround)
3	464.5500	469.5500	UHF Repeater #2
4	464.5500	464.5500	Simplex on UHF Repeater #1 output frequency (TalkAround)
5	151.7000	151.7000	VHF simplex #1
6	151.7600	151.7600	VHF simplex #2
7	154.5275	154.5275	VHF simplex #3

The email to Jerry went out at 0624 AM on Friday 6/24, and **was a huge relief to me to get this straightened out. I had now completed most of the tasks assigned to me specifically in the deployment planning.**

At 12:26 PM (our time) Jerry responded that he got the request and apparently had no issue with it (this would be maybe 8:30 his time). I keep looking for completed draft Form 601 from him, but haven't yet seen it (as of 0900 12/8/2020)

I was requested to fix the punch-down for a female ethernet RJ-45 socket at the PCC trailer power connection pole. I had hoped to help Nick learn how to do this, but that just didn't seem to become convenient so I went ahead and did the punch down connection, and then mounted the weatherproof box that Mike had purchased, just below the power connection. It looks like I should have put it a few inches lower --- sometime either me or someone else can move it about 4 inches lower and the power cord from the trailer won't be bent at such a strange angle.

I also put RJ-45 (8-pin) modular connections on both ends of a 50 foot ethernet cable to go from that jack to the jack that M. Crisler and N. Murabito placed on the front left corner of the PCC. And hooray, it all worked!!

I put together the duplexer measurement system (as documented above) to measure the Kenwood duplexer (since it was one of the only remaining useful parts of that repeater) with 6dB pads at both ports, and found that it has about 10 dB less ultimate attenuation than the Motorola unit, and the tuning is such that it could be used "as is"

A photo of the duplexer mounting and connections of the Kenwood repeater and the spectrum curves from both ports of that repeater are attached in Appendix Two.

Assisting Greg Lueck with his Go-Box

I don't have this on my written list either so not sure if this happened on Thursday or Friday, but I worked at the request of Greg Lueck to get his Icom 7300 working on WINLINK in various modes, including a sound card mode as well as PACTOR, and I got all this working. I further assisted him in diagnosing his problems with his solar power supply – measurement of the output voltage of the solar panels suggested that the panels were not producing any output voltage.

Friday evening when I was getting ready to pack it in, Greg ran into a problem getting VARA to work. Having already fixed his station once, it seemed appropriate to give him some time to try and figure this out for himself; I was in phone call with Nancy about her dad who had been hospitalized with a possible stroke. I'm not going to always "be there" and I know that all members of the team understand their need to develop their own skills at diagnosing and fixing communications difficulties (if we are to have any value at all.....) Greg understands this as well, based on later communications. After having given him some time to solve it, he was still stuck and it looked like he was past the point of useful learning, so I took a look and it seemed like he had succeeded at getting PTT to work, but he had NO MODULATION – usually a clue that the Icom 7300 is not accepting input from the source you're providing it on (in this case the USB rather than the mike) --- so I suggested he go to SSB-DATA (because this might accept the USB input) and bingo! This solved this problem. On the 7300 it seems important to figure out how to configure the inputs accepted (MIC, USB, Both, whatever) for EACH MODE that you try.....this can be very confusing and is one of the "gotchas" of that particular radio.

Perception on my part: By that time Friday evening I was beginning to feel fairly “pressured” by others to “solve their immediate problem” at their instant request. Unfortunately, I have limits also, and I get tired also and I simply cannot “always be there”so in my opinion it is important that I let others develop their own diagnostic skills and become proficient at solving communications problems – and when I’ve already worked for hours on a given person’s setup and gotten it working, I think it is a good idea that I step back and let them begin to study what worked and learn how to generalize it to other issues with the same setup. I’m not someone’s “genie.” I’m just another volunteer, and I put in three incredibly hard days of work to volunteer for this group. The friction that I experience was very surprising.

I worked with the other volunteers to help put together an end-fed half wave antenna for a more permanent installation, donating my personal antenna to the purpose (it is cheap, easy to replace #14 stranded house wire, and already had all the required connections and insulators). This went up fairly well and I screwed in a dog leash ground and put in a temporary 49:1 Balun – one of the best three I’ve constructed. I wasn’t intending to leave that one at Lake Yale but later M. Crisler hoped it could stay so I agreed. I had intended to possibly build additional baluns but I just ran out of time and didn’t get to that. I’ve learned how to extend the frequency response so I’ll definitely be building more. The one I left needs to have dielectric grease etc added to better secure it for the elements and the ground connection post wouldn’t screw down properly so that definitely needs improvement.....

In the afternoon, Greg Lueck wanted help putting together one of his self-purchased Ubiquity systems. This turned out to be EXTREMELY FRUSTRATING for both of us. The ubiquity documentation has changed, their software has changed, and they do a poor job of separating out

SSID passphrase

from the administrator password

in their explanations.....and the default software installed IMPOSSIBLY complicated passwords – 4 of them between two units. Greg and I must have worked for at least two hours on this and I know that both of us were about to pull our hair out. I finally changed ALL the passwords to “password” to reduce the chances we would misunderstand what they wanted. We were trying to use the cell-phone based setup software and it was DIFFERENT from what was in the youtubes and this was horribly horribly more difficult than I had experienced with the AREDN ham radio software..... I encouraged Greg that he would probably succeed now with the simpler passwords.

I was feeling much more pushed for time at this point because I knew I had to leave by about 6 AM the next morning in the dark, and I needed to pack my trailer back up, get all outside items stowed safely before DARK came on....so I attempted to politely excuse myself from working on the Nanobeams.

After I was able to get my trailer much better squared away, I noticed in packing things up that I had never tried the cell-phone amplifier system that I had brought as a potential solution to the incorrigible cell data modem problems I had struggled with at Pensacola.....so I decided that I should at least make a simple try at that experiment.

BACKGROUND:

At Pensacola, I spent HOURS trying to make the cell phone data modem work better. We studied the instructions, I look at all kinds of options of how to improve this system, which is somewhat unique and also somewhat outdated. Technology has somewhat moved on, and there aren't many options other than replacing the entire system.

I spend a LONG TIME trying EVERY POSSIBLE COMBINATION of antennas / no antennas, repositioning the Verizon cell-data modem at Pensacola – very very painstaking experiments to measure signal levels giving time for the cell phone signal reports to stabilize. I was very surprised and very discouraged at Pensacola to find NO DIFFERENCE when trying either deployed WIFI Antenna – both up many feet above the trailer. They were no better than using the cell data modem by itself in the trailer. It appeared to somehow be getting signals from the vent opening in the roof....this was very surprising to me and made no sense, but it is hard to argue to repeatable experiments.

I didn't know if the antenna input to the device was broken, or disabled, or burned out – or whether the coaxes were damaged --- but it was very very clear that nothing was working. And from studying the available options for replacement....there were not very good options.

THEREFORE, it had dawned on me that the simplest solution was to simply use a current commercially available cell phone booster system that are widely available just for people in RV, boat and similar situations – and the relative Faraday cage of the PCC trailer was perfect for this goal. I had purchased and successfully utilized a WE BOOST amplifier system for our home in North Carolina so I was very familiar with this successful system.

EXPERIMENT: I was able to deploy the WE BOOST system with an outside antenna. My previous experiments with this system indicate the outside antenna is only slightly directional, even tho it is supposed to have 10 dB gain. I ran my only RG6 (100 feet?) from the antenna on a ladder outside, inside to the amplifier and inside antenna was VERY pleasantly surprised to go from ZERO signal to 2+ bars of signal on ATT iPhone. Huge success! This was a possible solution to one of the last items that was on the list promulgated by M Crisler with my name on it. We were out of time trying to get to supper, so I just rotated the antenna blindly 180 degrees outside on its perch only 5 feet above ground and rechecked the signal inside and it was identical. Directionality appeared to have zero effect, at least in our environment with such huge reflecting metal trailers everywhere.

What surprised me was that Greg's VERIZON cell phone ALSO had good signal! I had no idea that Verizon might use the same frequencies --- but if so, this was likely a huge step forward as it might provide a great and simple off-the-shelf solution to the problems we were having with the cell data modem on the Cradlepoint and be a huge improvement for difficult situations for the PCC and FBDR.

I was stunned at how easily and simply this problem had found a solution.

Unfortunately, it appeared that some others didn't quite appreciate the advance. I was completely confused later that evening by the criticism of "leaving systems broken" or some similar verbiage. But I had to get moving because I had to leave early the next morning.

SATURDAY 12/6020

I was able to successfully depart by about 0530 and arrived back in Gainesville in time to carry out the duties my wife, son and ham group had expected of me on Saturday on multiple other missions that took the entire day. At this point my father in law was doing very poorly in the hospital.

APPENDIX ONE: DOCUMENTATION LEADING UP TO LAKE YALE DEPLOYMENT

NOV 16 email from M. Crisler:

Many of these items depend on what Marvin can support. So far I don't have commitments.

In no order here are the things I hope we can accomplish. I wanted to have said list available for our evening call in case there are questions, deletions and additions.

Clean up diesel fuel system and become checked out on the ONAN

Get trained and certified on the man-lift and install EFHW in a semi-permanent configuration, add coax to PCC (to enable our future Wednesday check out sessions to be more efficient)

Practice WL on said antenna

Update the DC system, test and document

Update the grounding system and document

Go through the trouble shooting and check out procedure for the fail-over network.
Take the DEG test

Possible testing of MOORS radio system (if Luther wants to bring it over)

Fine tune Wednesdays and pre-deployment check out sheets

Leave PCC ready to deploy with a documented list.

Hope to see you all on the call this evening!

To which I had responded:

All of those sound like worthy efforts for our Lake Yale work time.

For TONIGHT, I hope that we have discussion and RECOMMENDATION (conclusion) on the proposal to apply for Form 601, using whatever procedure (ourselves, Marvin, or forward info to the commercial firm the Convention appears to be using) is suitable, to move forward on business band licenses. Or you folks may see problems or better

ways -- but I hope there is DISCUSSION and CONCLUSION one way or the other. I found a note from almost a year ago where I had started addressing this....

I am working on a document of possible Business Band radios (both handheld and mobile vehicular) to complement the information that I dug up on the MURS we have already concluded and recommended as a group. I have a legal \$54 business band handheld but finding cheap mobile rigs (35 watt class) is a little more pricey so still working on that. Hope to have it out by tonight but it is ADVISORY only, at this point. Just trying not to lose all the research I've been doing.

Nov 16 spreadsheet from Mike Crisler, identifying proposed tasks, and those for discussion that evening:

PCC Action Items

Number	Action	Assigned to:	Description/plan	Last Update	Current Status
1	2 carbon monoxide detectors	Crisler/ Gordon	Purchase at HD and install, place on pre trip check list	9/30/2020	Planned for 12/2-6
2	2 nd coax into workstations for additional/personal radios (2 coax cables)	Crisler	Purchase coax crimper set and crimp/crimp PL 259 connectors for 8x and 8. We have lost of coax that we can repurpose, saving the longest runs. Is team happy with NON-SOLDERED coaxes? They are quick and secure and don't require much skill...	9/30/2020	Planned for 12/2-6
3	Add coax hangers	Crisler	In ONAN fueling compartment add hangers for rolls of coax... cover bottom of compartment mostly with AL mesh - to prevent massive loss	9/30/2020	Planned for 12/2-6
4	Install Polyphasers for ALL used connections	Crisler	Ask MC for budget (had been discussed before and approved...) 2-HF, 2- VHF/UHF, 1-Repeater, Cell?	9/30/2020	Planned for 12/2-6
5	External wifi antenna	David	Determine what is best and procure quote	9/30/2020	Planned for 12/2-6
6	Work with FBC HQ to enhance and augment Cell Service	Crisler	Will request permission form MC to contact Jax directly to negotiate new contract and present to team	9/30/2020	Waiting on reply from MC
7	External cellphone antenna ATT and Verizon networks	Crisler	Depends on what service we get and if they provide. I do have some superflex hardline we can use to minimize loss...	9/30/2020	Waiting on reply from MC
8	ATT cellular data modem	Crisler/ Gordon	Plan to request a quote for new modem CradlePoint Router combo so we will only have ONE device, not two	9/30/2020	Waiting on reply from MC
9	Repair leak in roof	Crisler	I have leak repair stuff in my RV that I can use to do this	9/30/2020	12/3/2020
10	Mini fridge	Crisler	Will request permission form MC for space allocation in PCC. Then take up a collection	9/30/2020	
11	Extension cable for hardwire phone 25'	Crisler	Special cable, Art has speced out, will order from AMAZON for arrival on next trip or when needed	9/30/2020	Planned for 12/2-6
12	Hose Hangers for cables at LY	Crisler	To hand coax from new EFHW and Network on post near parking place. Will coordinate with MC	9/30/2020	Planned for 12/2-6
13	Battery issues and !@ VDC system	Crisler	Re-design for team review 12 VDC redundant system uith solar charger connected	9/30/2020	Planned for 12/2-6
14	Fuel issues	Crisler	Bleed filter/seperator, verify operation via max load. Install Current-voltage and CPS metering in Rack	9/30/2020	Planned for 12/2-6
15	ONAN Current monitor	Crisler	Part of ONAN update	9/30/2020	

16	Grounding system	Crisler	Attach braided cable to frame, verify hardware to drill, drive and secure to ground rod, more cable for other grounds	9/30/2020	Planned for 12/2-6
17	General Grounding	Crisler	Will verify plan or lack there of with MC, and prepare training session on floating neutral concerns	9/30/2020	
18	Ladder hooks in aft cabins	Crisler	Verify with MC and install HD hooks to trailer sturcture under cabinets and above wheel well in aft cabin	9/30/2020	Planned for 12/2-6
19	Spare ground rods and connectors cut to length	Crisler	Part of grounding project, to include masonry drill and patch,	9/30/2020	Planned for 12/2-6
20	Procure and mount permanent EFHW antenna and coax	Gordon/ Crisler	From peak of barn to pole behind trash dump. All become qualified on new man lift (for use with Ubquity later?)	9/30/2020	Planned for 12/2-6
21	Mount EFHW feed point on AI sheet to QD from ground rod	Crisler	This is for the deployable antenna in the large wood box, to facilitate mounting it to the partially driven ground rod	9/30/2020	
22	Sort network cables into cable management	?		9/30/2020	Planned for 12/2-6
23	1/2" &??wrench(s) for various bolts in nearby storage compartments	Crisler	be sure wrenches are color coded and stored near needed fasteners and on pre-trip inventory	9/30/2020	Planned for 12/2-6
24	Paint for EFHW Gobx	Crisler	White and yellow paint for box to assist in outdoor storage, and DR Decals with N4FBC logo	9/30/2020	Planned for 12/2-6
25	Trim and paint edge of conf table in PCC - need chamfer bit	Crisler	Need color selection from MC	9/30/2020	Planned for 12/2-6
26	Battery Maintainer	Crisler	Part of DC project -Amazon when I am there to match other one	9/30/2020	Planned for 12/2-6
27	Mount phones and ext ringer-Amazon	Crisler	Where MC says...	9/30/2020	
28	Pull 50 Amp Wire for feed to PCC when at LY	Team	Verify with MC and install HD hooks to trailer sturcture	9/30/2020	
29	Pinger to verify antenna coax and network	Crisler	Will bring up next time and do labels	9/30/2020	Planned for 12/2-6
30	Add Network drops in aft compartment to minimize wireless useage	Crisler	This will be a decision for MC, if the ADMIN folks DON'T plan to use it, not issue, but if they do I think David is correct it should be hardwired to limit overhead.	9/30/2020	Planned for 12/2-6

31	Sat bill review permission	Crisler	Same as cell phone, I'll ask Marvin for permission to open negotiations and include the team on said negotiations	9/30/2020	Waiting on reply from MC
32	RG 8X cable and connectors?	Crisler	I have a Crimp Crimp set from Quicksilver Radio that I would like the team to review	9/30/2020	Planned for 12/2-6
33	Dymo label maker PC Driven	Marvin	MC indicated he had such a thing, set up, add driver and place on Pre-Trip List (ie may be in MC's office..)	9/30/2020	Planned for 12/2-6
34	Additional business band radios and chargers	Gordon	Crisler to query for quantity, budget and Logistics use	9/30/2020	Initial testing in progress.
35	Fix ceiling light behind IT rack	Crisler	What is issue?	9/30/2020	
36	Spec out Ubiquity Links	Gordon	Prepare mission statement, ops brief and item list and submit for budget review	9/30/2020	
37	Spect out wired link	Art	Art has proposed a solution for team to discuss . If approved prepare mission statement, ops brief and item list and submit for budget review	9/30/2020	
38	Google docs	Mike	find out thru put for use...	9/30/2020	
39	Poor On Site Comms	Nick	Work with ERT to determine comm needs on site once PCC has gone	9/30/2020	
40	Review repeater concepts	Gordon	review proposal gordon has made	11/10/2020	Zoom Call on 11/16

APPENDIX TWO: KENWOOD REPEATER DOCUMENTATION



