
WHITE



NOISE

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HOW NOT TO SEAL A CONNECTOR

By Doug Welcker (WB4KGY)

That may sound like an unusual title but the importance of proper connector weather proofing can't be understated if you want to keep the antenna system operating like it is still new. What most recently brought this the attention of the Palm Beach Technical Committee is a persistent lack of signal from the Boca Raton Switch on the backup 223 MHz link. Some weeks ago John (WB4MOZ), Andy (KF4ATC), and myself meet Joe (WB4TEM) at the Boca Raton Hospital Switch site. (The worst part about this place is the parking) After carting our stuff up to the sixth floor to the equipment room we set out to find the problem. Installing an SWR meter inline we found the reflected power was nearly the same as the forward power – definitely a big problem. Andy and I climbed to the roof pulling up a box of tools using Andy's long extension cord. After locating the 223 MHz beam our best guess was the jumper between the ½" HELIAX and the antenna.



This is where the problem really begins. The connection was poorly rapped with electrical tape. After removing the tape and separating the connectors we opened the brass HELIAX connector only to find that corrosion from years of moisture and dissimilar metals had completely separated the center pin from center conductor. While attempting to install a new connector we found the closed foam filled HELIAX was contaminated with water. Cutting off four inches didn't make any difference so we cut off two feet before reinstalling the connector. Terminating the transmission line with a fifty-ohm load the SWR was checked again and none was observed.

To prevent the return of water into the cable junction never uses just electrical tape. The idea is to create an air tight seal and to do that the connection must first be wrapped with a moldable rubber tape in such a manner as to leave no voids or sharp edges. Start in the center and end in the center overlapping each wrap 50% and filling voids with extra rubber tape. This should leave a smooth tapered junction ready for wrapping with a good quality electrical tape. Wrap the joint with the electrical tape just as you had wrapped the sealing tape by starting in the center and extending past the sealing tape before wrapping back to the center. Keep good tension on the tape to avoid air pockets but be sure to wrap without tension for the last two turns. This helps keep the tape from unraveling and canceling all your hard work. To make this a really long lasting job paint the tape with "Scotch Kote", a liquid plastic (this has lots of handy home uses as well). I will also recommend using Scotch, 33 or 88 which is a thicker tape that will stand more abuse. All these products are available at Home Depot including the rubber sealing tape in the electrical supply section.

It was also interesting that a new vinyl roof had been installed and the roofing people hung the extra coax lying on the roof on the various antennas from other installations. We secured the excess coax from the Switch installations to prevent wind damage. In the end it turns out the 223 MHz radio has only 3.6 watts out due to a weak power amplifier but the signal is now full scale back in West

Palm Beach. We have restored the link to a usable condition and hopefully to a long life and got off the roof and out of the building in-time to beat the lunch rush at a local home style restaurant.

CLEWISTON ARPS RELOCATION

By Doug Welcker (WB4KGY)

This is a review of just what it takes to keep a site on the air and hopefully improve its performance for years to come. First lets set some background. A couple of years ago in September the Palm Beach Packet Group was invited to share the antenna at a commercial AM radio station in Clewiston. The word share is the operative word here. The antenna is located at the top of 320-foot shunt-fed AM broadcast tower and intended for reception of remote programming. As remote pickups happen only a few times a month for only a few hours at a time this antenna was certainly underutilized. I think all of us can appreciate how exciting it would be to have our VHF antenna at that height.

The site owner, Jim Johnson (W4JBZ) invited us to install in one of his equipment cabinets the necessary equipment to go on the air with APRS. The only stipulation was it had to be designed so he could switch the antenna to his equipment when he did a remote broadcast. This turned out to be easily accomplished by using a good quality T/R relay to switch the antenna transmission line between the two pieces of equipment. The T/R relay has auxiliary contacts that are used to remove power from the TNC which disables the APRS radio from transmitting into an unterminated transmission line. The relay is controlled through the site controller which is controlled over the phone line with the DTMF keyboard of the phone.

As with everything in life and ham radio everything is subject to change and in this case for the better. Jim needed to up grade the transmitter site as more equipment was being and he wanted to improve the lightning protection and add emergency power. As was originally configured the transmitter building was about 360 feet from the base of the tower which is a pretty long run when you include another 320 feet to get up the tower. Since the site is built in a swamp fill was brought in to extend the road closer to the tower and a concrete pad was poured for the new portable building and the generator. Turns out the building is big "Ted's Sheds" type that Jim's son Brian built into a first class equipment shelter. It takes lots of conduit, insulation, paneling, central air, and a good ground system before you can even think about installing equipment.

Finally on Friday February 16th the move is scheduled and our hardest working technician Andy (KF4ATC) is dispatched to the site arriving about 10:45 A.M. It was one of those days where everyone shows up at once since there is a lot to do in a short time. Remember that this move needs to be done without taking the AM Transmitter off the air. Fortunately there are two transmitters in the building and the second one is a backup unit. The easiest part was actual moving the APRS equipment from the rack in the old building into the new rack. Jim had arranged the rack such that there was one space left which the APRS equipment fit perfectly. At the same time as this was going on the tower climber was installing a commercial FM band antenna and 1 5/8" air line, increasing the number of shunts feed wires around the tower to lower the Q and repairing the VHF antenna on top of the tower. Turns out several years ago this site was shared with another tower which due to poor maintenance blew over in a wind storm subsequently landed on the AM station tower and pulled the transmission line out of the antenna. Previous repairs had deteriorated and water had leaked into the antenna harness creating a mismatch and deteriorating the coverage. With the repairs normal range has been restored but only time will tell if the antenna will need replacement.

On the ground, work continued with the removal of the standby 1KW transmitter out of the old building. These puppies are full size, about 6' high 4' wide and 3' deep. As it was a tight fit and heavy and it took four people to muscle it out of the building. In the process of removing it from the building they accidentally tripped off the online AM transmitter twice creating a minor crisis. Since this was a golden opportunity for cleaning Andy and Brian vacuumed and polished the transmitter inside and out before moving it eighty feet and into the new building. During a break in the action Andy noticed the air-conditioning in the new building wasn't working. The problem was traced to the electrical contactor for the compressor that had become home to a nest of ants. With a little cleaning the air was restored to normal operation.

Previously installed at the new building were two 10 foot ROHN 25 tower sections. On this tower Andy helped Brian install an UHF yagi aimed to the studio in town and a two-foot dish aimed where the new Lake Port tower will be installed. After the antennas were installed transmission lines were run down the tower and into the building. This pretty much rapped up the first day but as the

transmission line for the APRS had not been relocated our equipment was off the air. After a hard days work Andy headed home about 4:30 P.M.

The next workday, Friday February 23rd, turned out to be comedy of errors. Andy arrived early at 8:45 A.M. to help the electricians with getting the transmission lines buried. The problems started with the Ditch Witch. It just wouldn't start. When you have three hundred feet of trench to dig through shell rock you want a power trencher. After working on the engine for three hours the wiring harness was replaced and the digger finally started. The ditch was dug from the tower to within 20 feet of the building when it was time to knock off for lunch. After lunch guess what - It wouldn't start again. Now it is time for manual labor for the last 20 feet.

Installing the lines in the ditch was more involved than one would think. The 1 5/8" line needed to be in a 3" plastic electrical conduit but with a line this big you don't pull the line through the conduit, you put the conduit over the line. With the line laid out alongside the ditch the conduit has to be slipped over the length of line one piece at a time then glued. This was aggravated by the fact the plastic conduit sections were only eight feet in length! Next the 7/8" transmission line for the APRS equipment was removed from the old building and relocated into the ditch. Other lines previously run in two inch PVC include the 1/2" transmission line for the AM Transmitter and AC power for the tower lights.

With all the lines in the ditch Andy was finally able to turn his attentions to connecting the transmission line to our equipment. To get our line out of the ditch he used a ten-foot length of 1 1/2" PVC bent into a "S" shape to bring the line up out of the ditch and underneath the building. With this done a new "N" male connector was installed on the 7/8" line and connected to a 1/2" SuperFlex jumper which was brought through the floor. Andy terminated this line on the PolyPhaser lightning protector that he had previously installed and connected to the building ground system.

Now it was time some testing. I was home listening to the 147.135 repeater when Andy called me from his mobile. He was quite weak to unreadable. After a few minutes he called me again with a full quieting signal. He had run a forty-foot piece of coax from his van to the PolyPhaser antenna connection. On low power he was still full quieting so next he took his hand held into the building and connected it to the antenna. At 1 1/2 watts it was still perfect copy and nearly full quieting simplex. These simple tests confirmed that the system was performing as expected. To complete the job another SuperFlex jumper was run from the PolyPhaser to the change over relay, the power supply mounted on our equipment shelf and plugged into the station UPS and turned on. Within a very few minutes the site beacon was received and stations from the West Coast of Florida began appearing on the monitor. Another job well done Andy.

ARRL Seeks to Expand Amateur Access to 216-220 MHz

ARRL Bulletin 008

The ARRL has suggested that the FCC expand the secondary amateur allocation at 219-220 MHz to provide access to the entire 216-220 MHz band. The League commented this month in response to a Notice of Proposed Rule Making, ET Docket 00-221, that proposes to reallocate 27 MHz of spectrum in various bands, including 216-220 MHz, from government to non-government use.

In general, the FCC seeks to allocate the entire 216-220 MHz band to the Fixed and Mobile services on a primary basis. At 219-220 MHz, Amateur Radio now is secondary to the Automated Maritime Telecommunications System (AMTS). Within the 1-MHz of spectrum, Amateurs may install and operate point-to-point digital message forwarding systems, including intercity packet backbones, but only under strict limitations.

While the FCC has promised to protect AMTS and other operations from new interference, it extended no such assurances to amateur operations at 219-220 MHz. In its comments, the ARRL expressed fears that additional co-primary users "will essentially foreclose what limited opportunities there are now for amateurs to make use of the 219-220 MHz segment."

The League suggested that permitting amateur access to the entire 216-220 MHz band on a non-interference basis would be one means to accommodate Amateur Radio operations in that portion of the spectrum. Such a move would, the ARRL said, "provide at least some opportunity for amateurs to engineer fixed links into the band, which would not be possible in the 219-220 MHz segment alone."

"The Amateur Service is well-known for being able to make use of bands used by other services, which increases the efficiency of spectrum use," the League said. The allocation could be made "without any adverse impact on AMTS operations, television broadcast reception, or other, new co-primary operations in the 216-220 MHz band, Fixed or Mobile," the ARRL concluded.

PALM BEACH PACKET GROUP
MEETING MINUTES
March 8, 2001

Board Members Present:

President - Doug Welcker (WB4KGY)
Secretary – Dick Schofield (AF4OR)
Treasurer – Marvin Kaskawits (KD2CK)
Registered Agent – John Green (WB4MOZ)

The meeting was called to order at 7:30PM by President Doug Welcker.
As all nine members present knew one-another no introductions were necessary.
There was no Treasures report given, as the credit union statement had not arrived.

Doug gave the **Technical Committee Report** and again all is well with the West Palm Beach SWITCH. John, Andy and Doug met Joe (WB4TEM) at the BOCA SWITCH to investigate problems with the 220 backup link. A bad connector was located on the roof end of the ½” HELIAX to the 220 MHz beam and replaced. Radio power is down to 3.6 watts but the link has full-scale signal at the West Palm Beach end. John (WB4MOZ) has been in discussion with John (KN4HX) to help with the conversion from ROSE to a FPAC SWITCH in Hollywood. Andy (KF4ATC) has completed the relocation of the APRS Digi to the new building in Clewiston. Jim Johnson (W4JBZ) is most appreciative to Andy for his two days of hard work not only working on the Digi but with getting Jim’s equipment installed in the new building.

Under **Old Business** it was announced that the Wellington Radio Club has decided to publish it’s own newsletter and not merge with the White Noise. They will also be developing a Web Site. A call for articles or subject for articles was made. If you have suggestions for same please contact a board member and make you’re thoughts known. The March issue of “White Noise” was mailed on Friday March 2nd. PBPG has six books on packet and digital radio. Dick (AF4OR) is the librarian for these books.

In our **New and Info** section we have been invited by Jim Johnson (W4JBZ) to install APRS Digi sites at locations on Marathon Key and Sebring. In the same vain, John, Andy and Doug will investigate relocating the Lake Placid Switch to a new and much higher location. (More next month). If you have run out of thing to buy Motorola has introduced a new “Software Defined Radio” which covers 30 MHz to 2.5 GHz. By just loading software into this radio it will work on all know modes and modes not yet defined when software programs are written. All were reminded of the Hamfest in Stuart on March17th.

In the category of **New Business**, BOCA ARC in interested in publishing with the Palm Beach Packet Group “White Noise”. Further information will be presented on this possibility next month. Several interface boards have been spoken for but boards are still available. These boards allow you to connect your computer sound card to your hf/vhf radio enabling you to operate many of the new digital modes.

Dick (AF4OR) gave the Workshop on the news CORES registration. All amateurs must register in order to deal with the FCC. This ended the meeting that was adjourned at 8:30 P.M.

Respectfully submitted by Secretary

Dick Schofield AF4OR

PALM BEACH PACKET GROUP

MEETING MINUTES

April 8, 2001

Board Members Present:

President - Doug Welcker (WB4KGY)
Secretary – Dick Schofield (AF4OR)
Treasurer – Marvin Kaskawits (KD2CK)
Registered Agent – John Green (WB4MOZ)

The meeting was called to order at 7:30PM by President Doug Welcker.
As all eleven members present knew one-another no introductions were necessary.

The **Treasures Report** given and accepted. (see last page)

Doug gave the **Technical Committee Report** and again all is well with the West Palm Beach and Stuart SWITCH and no maintenance was necessary. The APRS Digi equipment for Marathon Key is under assembly and expected to be completed by May.

Under **Old Business** there has been no communications between the Palm Beach Packet Group and the Boca ARC concerning include their membership in our mailing list and include their club articles in the White Noise. Several interface boards have been spoken for but parts kits have not been completed. These boards allow you to connect your computer sound card to your hf/vhf radio enabling you to operate many of the new digital modes. Another call for articles or subjects for articles was made. If you have suggestions please contact a board member and make you're thoughts known. PBPG has six books on packet and digital radio for lending. Dick (AF4OR) is the librarian for these books.

In our **New and Info** section a UPS was purchased at the Stuart Hamfest for the Back Bone network and will be installed by PBPG technician Bill Sinbine (N4XEO) at the Okeechobee Switch. It was also mentioned that there would be a Hamfest in Gainesville at the fairgrounds on Saturday April 28th.

Under the category of **New Business**; while at the Stuart Hamfest Marvin (KD2CK) engaged Adam (N2PNO) in conversation and found he just happens to work at the Bell Glade Hospital and is an avid packter. He has offered the PBPG space for equipment and antennas after the hospital completes a State inspection on the 1st of May. The PBPG has been looking for some years for a suitable location in Belle Glade and has equipment ready to install.

Bill (KB4XE) has suggested we take pictures of each site and post them on the web site along with and explanation. In this vein we are in need of a web page designer and looking for someone to help. Please contact a club officer.

The **WorkShop** was presented by Doug who presented information on how to work packet using the International Space Station (ISS). His handout included information on the proper settings for your TNC, frequency and antenna setups and satellite tracking software.

The next meeting will be May 10, 2001
This ended the meeting that was adjourned at 8:30 P.M.

Respectfully submitted by Secretary

Dick Schofield AF4OR

Broward Amateur Radio Digital Society

May 12, 2001

John, KN4HX, created a EX-NEC presentation based on modeling the Skeleton-Sleeve-Fed Monopole. The SSFM construction program given by Paul, KF4FSM, at the Broward Amateur Radio Club last March, inspired the modeling challenge. Paul built his SSFM from the October 2000 CQ magazine article. The SWR plots from the magazine article did not match those obtained using the given construction dimensions. The SSFM is a derivation of the J-Pole and is in many ways similar. John did an excellent job of showing the options and capabilities of the graphical capabilities of EX-NEC. He also was using his new Compaq laptop, which was very fast, doing calculations and displays in what seemed like real time. The model's SWR plots were compared with SWR plots the SSFM made Bob, N4CU, on the AEA HF Analyst. We learned a lot about antennas, patterns, SWR, and modeling from John's program. If a conclusion can be drawn it is that modeling is fun and comparing your model with test results may result in a surprise. An accurate model will match results exactly but getting the model right can be tough.

The June 16th presentation will be by Tom, K4GFG, on Amateur Reception of Radar Echoes from Venus. This promises to be an excellent program. Think about how difficult it is to send a signal from earth, spinning and rotating about the sun, and hitting another planet which is following a different path about the sun. Then receive that signal bouncing off the other planet. The White Noise web site is www.qsl.net/pbpg. The BARDS web site is <http://www.geocities.com/ResearchTriangle/Lab/7781/>

73, Bob, N4CU