

Summary of MidAtlantic ATV Meeting March 9, 2019

Mid-Atlantic ATV is a coalition of ATV repeater owners, hams interested in constructing ATV repeaters and hams generally interested in this aspect of amateur radio. As the name implies, members are from the various states that make up the Mid-Atlantic region of the US. A strategic planning meeting of sorts took place this afternoon at Hoss' Restaurant in York, Pennsylvania. The meeting was held with an eye toward the future of this branch of our hobby, including the possibility of linking ATV repeaters in the region together. A great deal was accomplished!

- **White Rock Remote Receiver**

Results from the remote receiver our group has at the White Rock, PA tower site (with video viewable via the web) were discussed. There has been an issue where, under certain signal conditions, the receiver will hang up and become stupid. When this happens, someone needs to physically go to the receiver to reset / power cycle it as there is currently no way to reboot it via the web. This is a relatively remote site. It might be many days before someone is able to go to the site, and so Jeff Elliot (W3JVU) is going to supply an Internet controllable power switch that will permit us to do a hard reboot via the web when necessary.

The receiver is currently connected to a directional antenna as that particular antenna was already in place on the tower. It was felt that more testing should be done with an omni-directional antenna. That change out can be made with an antenna yet to be determined as weather conditions improve.

- **Rib-Cage Antenna**

Dave Stepenowski (KC3AM) and Vince Vitullo (N3BFZ) brought along a new, omni-directional, horizontally polarized, rib cage antenna they had constructed. Dave has been using a similar model at his Ebright, Delaware ATV repeater for some time. Vince did the physical blacksmithing on this one and did a great job! What remains is to tweak the antenna's matching transformer. To that end, yours truly brought the antenna to the home QTH in order to sweep it out with a return loss bridge to see where things stand and possibly make adjustments. We'll see how that goes.

- **Results of Our First DTV Beacon Transmitter Test**

Tests of the beacon transmitter which had been located at the WA3ATV QTH near Summerdale, PA are complete. Rich Reese (KR3EE) performed field reception tests at multiple locations. In a previous life, Rich performed field testing for a cellular company and so had his test procedures down pat. Rich did a super job! Many thanks for all the time

and effort he put in on behalf of our group! The bottom line of the tests is that Rich found that the actual field test results tallied very closely with coverage predicted by the Radio Mobile software modeling our group has been using. This will hopefully reduce the number of field locations that need to be tested for future beacon tests at other locations.

A discussion of the next location for beacon transmitter tests ensued. Based on the Radio Mobile propagation modeling, it is hoped that we can obtain permission to place the beacon at the Cornwall, PA repeater / CPIN microwave relay site. This site is a stone's throw from the former location of the Cornwall analog ATV repeater which has since gone dark. If Dave's rib cage antenna can be tuned up in time, the hope would be to use it as an omni-directional antenna for the next beacon test.

- **Repeater Antenna Polarization**

The question of standardizing the polarity of DTV signals came up. The pros and cons of each mode for our application were discussed at length. Ultimately, the group unanimously decided to use horizontal polarization for repeater outputs. Advantages include the inherent isolation from interference to / from vertically polarized voice repeaters and compatibility with U.S. over-the-air broadcast television. The biggest obstacle is the need for omni-directional, horizontally polarized antennas at the repeater sites. The off-the-shelf pickings are rather slim and leave something to be desired in terms of performance. It is hoped that Dave's rib-cage antenna will provide a solution, hence the desire to use it in the next beacon test.

It's important to note that only the repeater sites themselves require the horizontally polarized, omni-directional antennas. Thus, only a few such antennas will be needed. Individual hams accessing a repeater will all be using directional antennas and therefore have multiple, readily available antennas to choose from.

- **Frequency coordination**

The group reached the conclusion that it would make sense to coordinate a common output frequency for all repeaters in the region, with input frequencies coordinated by the individual repeater operators as they see fit based on local operating practices and conditions.

Given the antenna systems and power levels we will be using, the terrain and predicted coverage plots from various active and potential repeater sites, it is unlikely that one repeater will interfere with another.

In addition, with COFDM modulation in use for both DVB-T and ATSC 3.0 it will eventually be possible to operate linked repeaters as a Single

Frequency Network (SFN) that would allow the signals from multiple repeaters to augment rather than interfere with one another.

Finally, the use of a common output frequency will allow much more efficient use of valuable ham radio spectrum and (hopefully) make frequency coordination an easier task.

- **Power Amps**

Rich Reese has also done a fair amount of research into the availability of power amplifiers that might be suitable for DTV use. The issue of course is the need for an absolutely linear amplifier since any sort of phase distortion will corrupt a DTV signal. This eliminates the use of Class B or Class C amplifiers.

Rich has found a number of amps on the web that are allegedly suitable for digital voice use. Whether they would be linear enough for application in the DTV world is another matter. However, Rich did purchase surplus power amp modules from a decommissioned DTV broadcast transmitter that might serve as a PA. He also purchased a lower power linear amplifier that could be used as an IPA to drive the PA. He will keep us informed on how his experimentation progresses.

- **Status of ATSC 3.0 Deployment**

The status of deployment of the new ATSC 3.0 standard for over-the-air broadcast television here in the U.S.A. was discussed. This is similar to DVB-T in that both use COFDM modulation. However, ATSC 3.0 uses an IP based data protocol that more easily supports simultaneously connecting consumer devices to the web for interactive television programming. ATSC 3.0 is also more spectrally efficient, so much so that it can transmit full motion 4K images over the air in a standard 6 MHz U.S. television channel.

It was learned that Sinclair Broadcast Group will be partnering with Nexstar Broadcast Group to facilitate the rollout of ATSC 3.0. These are the two largest TV station group owners in the U.S. and own several stations here in the Mid-Atlantic region. Such partnerships are necessary for the transition from ATSC 1.0 to ATSC 3.0. During the transition, it will be necessary for two stations to broadcast their programming on one ATSC 1.0 transmitter while the second transmitter is being converted to ATSC 3.0. Surprisingly, Sinclair expects to have more than thirty (30) ATSC 3.0 stations on the air by the end of this year! This is a much faster rollout than most people would have predicted. This means we will likely be seeing ATSC 3.0 television receivers on store shelves and in Internet stores much sooner than expected. Sinclair is pushing hard for the new format as they view the interactive aspects of the system as a whole new revenue stream.

What does this mean of those of us interested in amateur DTV? If a repeater transmits using the ATSC 3.0 format, hams will be able to use consumer TV sets to receive the signals, similar to the situation we had in the analog NTSC days. To facilitate the rollout, Sinclair is also involving itself in the hardware end. They will be partnering with manufacturers to build and distribute low cost converter boxes for existing TV sets as well as dongles that will permit reception on smart phones, notebook computers and desktop PCs. It is unknown at this point whether these devices will be capable of receiving ATSC 3.0 / COFDM modulation on cable channels or not, but if this proves to be the case, it will be possible to tune these consumer devices directly to the 70 cm ham band.

An immediate question is, what does this mean for hams in the U.S. that already have an investment in DVB-T, DVB-S or analog equipment? The answer is, not much. ATSC 3.0 does not make other formats that hams are currently using obsolete. If anything, ATSC 3.0 simply adds to your tool belt. A repeater may transmit using ATSC 3.0, but that repeater can still receive whatever format is in use in the area in its input(s.) Just as it is possible to receive analog video at a repeater and re-transmit it as a DVB signal, it will be possible to receive DVB-T, DVB-S, ATSC 1.0, VSB, FM-TV or any other format and re-transmit it as ATSC 3.0. Repeater owners would be free to accept whatever signal formats on their inputs they choose based on their particular local practices and preferences.

- **501(c)3**

There was brief discussion about the merits of making MidAtlantic ATV a 501(c)3 tax exempt organization which would allow companies and individuals to donate equipment and/or funds with tax benefits for the donor. It was decided that we are not yet at that point. In the meantime, should any opportunity to accept such a donation present itself, the donation could be made by way of one of the 501(c)3 clubs affiliated with our coalition.

Join the MidAtlantic ATV group's page at <https://groups.io/g/MidAtlanticATV> to keep abreast of future developments.

73,
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