

BOULDER TV Repeater's REPEATER

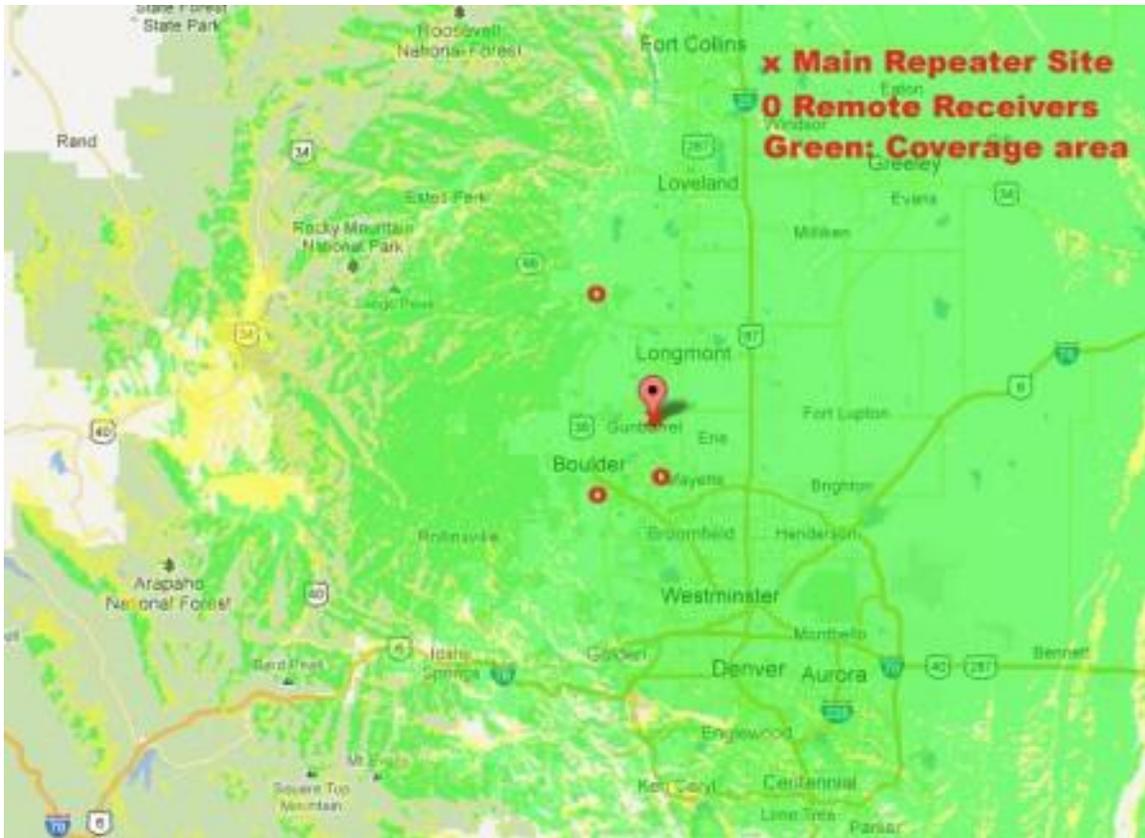
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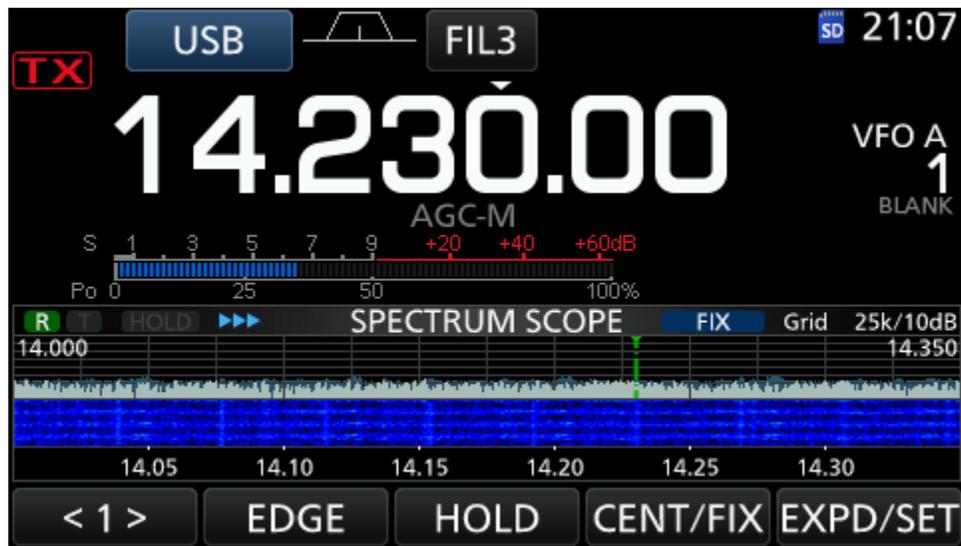
Jim Andrews, KH6HTV, editor - kh6htv@arrl.net

REPEATER STATUS: The Boulder ATV repeater is presently working fine. Details about the repeater are available on our web site: www.kh6htv.com AN-43 gives all the technical details. If you have any questions about the current operations or status of the repeater, contact the asst. trustee, Don, N0YE.

NEW 2 Meter ATV NET FREQUENCY: As mentioned in last month's newsletter, we were considering moving our ATV net, 2 m intercom frequency from the 146.70 to the 146.76 repeater. This was to eliminate the 70 repeater RFI into the 70cm analog TV input of our ATV repeater. Debbie, WB2DVT, has obtained permission for us to now use the 76 repeater from the owner and trustee, Mike, N0BP. The 76 repeater is located on Gunbarrel Hill in eastern Boulder County. See the coverage map. It also has several remote receiver sites at various Sheriff's dept. radio sites around the county. The repeater transmits a 100 Hz PL tone. A 100 Hz PL tone on your transmitter is required to access the repeater. The 76 repeater's call sign is W0IA. The 76 repeater used to be the 2m repeater for the Rocky Mountain VHF Society. The RMVHFS used to be a very active club in Boulder with an emphasis on VHF, UHF, and microwave amateur radio. It discontinued holding monthly meetings many, many years ago. The "club" still exists on paper with a 2m repeater which has been maintained over the years by Mike, N0BP. It serves as the primary 2m voice repeater for BCARES. For this reason, the Sheriff's dept. continues to support the 76 repeater and allows it to use it's various radio sites and microwave network, including the primary site on Gunbarrel Hill. A google search for RMVHFS gives a very old (2008) web site on qsl.net (www.qsl.net/wb3cbu/rmvhfs/) For full technical details about the 76 repeater go to: <https://www.qsl.net/wb2cbu/rmvhfs/tech.htm>



146.76, 2m Repeater Coverage Map -- same location as Sheriff's GREEN repeater



IC-7300, 20 meter band scan showing the nature of my extreme RFI

MAUI HF WOES: Janet & I were back in Colorado for Christmas with our kids and granddaughters. While there I fired up the HF rig, only to find that the finals in the Yaesu FTdx-3000 had gone sour. I could only squeeze perhaps a watt out it. So what to do? Spend several 100\$ on repair at Yaesu - or - upgrade to the new SDR radio, the

Icom IC-7300. The price on the IC-7300 has recently dropped to about 1K\$. I opted to go with the IC-7300. Great rig ! Very impressed with it.

So after test driving the IC-7300 in Boulder, I brought it with me to Maui hoping it would work better than my old Yaesu FT-857. Wrong - I still have to contend with impossible levels of external RFI, especially on 20 meters, the work horse band. What the new IC-7300 did however allow me to do was get a better feel for the nature of the RFI. The new IC-7300 has an excellent spectrum analyzer which runs in real time, at the same time as the regular receiver. I set it up to do full band scans. The above screen capture of the IC-7300 shows the RFI I am experiencing. The scan is from 14.0 to 14.35MHz. The current spectrum is shown in white with 10dB divisions and 80dB full scale. The "white" noise across the entire 20m band jumps up and down about 20dB at about a 2 Hz rate. It is then shown on the waterfall (at bottom) in blue as horizontal descending lines. This holds the S meter up to readings from S 6.5 to S 9 (no preamp) $S9 = 50\mu$ (-73dBm). (note: I calibrated the S meter and found that Icom's S meter drops 1 S unit for each -3B change in rf power. This is contrary to the IARU definition of 6dB / S unit.). The other RFI source noted is something causing harmonics everywhere spaced 38kHz apart and seen as vertical blue lines on the waterfall. Unfortunately, one of these harmonic lines lands right on the SSTV frequency of 14.230MHz. Only extremely early in the morning, is 20 meters clear of this RFI for me. At "wake-up" time, somebody in the neighborhood is turning on something. The jumping white noise and the 38kHz harmonics are from separate sources as they both don't appear simultaneously in the morning. I have tried turning off all the AC power in my house to see if I am the culprit, but I am not the cause. As a result, HF is almost useless here for me. Bummer ! Guess I will ship the IC-7300 back to Boulder and just use the FT-857 and live with the (@@%#*) RFI.

ATSC 3.0 -- The future of Broadcast TV in the USA

On Jan 9, 2019, I received the following e-mail from Dan, W3ATV, which I thought was relevant to be shared with the group.

Hello Jim,

I'm a retired television broadcast engineer and a ham operator in Pennsylvania. We've formed a group here called "Mid-Atlantic ATV" to try to generate some DATV activity in this area. Like you, our experimentation so far has been with Hi-Des DVB-T equipment. One of our guys passed along a link to your "Introduction to Amateur Digital Television" article. This is a really excellent article and I'm sure it will be very useful for hams considering becoming involved with DATV. Thanks so much for taking the time and effort to put that article together! I've taken the liberty of putting a link you your article on our "groups.io" web site.

I wanted to call your attention to an aspect of DTV here in the US. that most people are not aware of. A little over a year ago the FCC authorized a new standard for over-the-air digital broadcast television here in the US. It's referred to as ATSC 3.0 and has many

advantages over our current ATSC transmission standard. the details are a bit much to go into in an email, but I'll touch on some of the highlights.

- Like DVB-T, it uses COFDM modulation to impress the digital information on the RF channel. As you know, this is far more robust in terms of dealing with multipath and other interference than the 8-VSB modulation system we currently have here. It is NOT backward compatible with our current system. However, manufacturers are expected to include reception for both modes in consumer sets.

- It is scalable similar to DVB-T. You can set parameters for a robust signal vs. a high quality signal. However, in ATSC 3.0 you can have both at once. That is, you can have a robust stream for mobile operation AND a high quality stream within the same RF channel at the same time.

- ATSC 3.0 is capable of transmitting 4K video in a 6 MHz channel.

- Apart from the RF transmission method, the data protocol is I.P. based. That is, it is intended from the get-go to connect to and work with the Internet. the purpose is to allow broadcasters to engage in interactive television programming. The benefits for hams are only limited by the imagination.

- Also of interest to hams, the RF system is designed to function as a Single Frequency Network. That is, you can operate multiple transmitters carrying the same information in the same area and the transmitters will augment, rather than interfere with one another. For broadcasters, this means they can operate translators on-channel and can also now have low power null-fill transmitters to fill in gaps in their coverage. For ham operators, it means that linked DATV repeaters carrying the same video could all operate on the same output channel and improve one another's' coverage while at the same time conserving spectrum.

- The ATSC 3.0 protocol has built-in provisions for a greatly improved Emergency Alert System to allow broadcasters to disseminate information to the public during emergency situations. Hams will no doubt find many ways to use this provision in our EMCOMM work.

ATSC 3.0 has already been deployed in Korea and so manufacturers are now making consumer sets. They should begin showing up in stores in the US shortly, making it possible to use an off-the-shelf TV set to receive DATV signals much as we did in the analog ATV days. I'll attach a pdf of an article that appeared in "The Signal" which is the newsletter of the Society of Broadcast Engineers. It touches on the basics that were presented at last year's National Association of Broadcasters convention. I hope you'll find it interesting. Feel free to share this info with any of your fellow DATV enthusiasts!

Good luck with your continued foray into the DATV field!

73, Dan Rapak - WA3ATV

DanRapak@verizon.net

Mid-Atlantic ATV Group

ATV REPEATER DIRECTORY

Recently Don, AA6TV, was cleaning out his ham shack and gave away some old ARRL Repeater directories. He gave me the 2009 edition. The old directories included a separate listing of ATV repeaters. Don tells me that the new directory no longer has a separate listing for ATV repeaters, but mixes them in with all of the other voice repeaters. With over 31,000 repeaters for just the USA & Canada, it now seems an impossible task to find the ATV repeaters buried in the mix. The ARRL directory is also available on-line as a subscription service from www.RFinder.net. Also the free, on-line, Repeater Book (www.repeaterbook.com) does not even list ATV repeaters, only voice (analog & digital). I thus decided to work up a new ATV repeater directory for the USA. At the same time, Art, WA8RMC, in Columbus, Ohio got the same idea. We have been working together on creating a new directory. I have published the new directory on my web site (www.kh6htv.com) as my AN-47. I am sending it to you separately from this newsletter.

In 2009, there were a total of 91 separate ATV repeaters listed for the USA. So far, with our research we have come up with a current total of only 36 ATV repeaters in the USA. We have thus lost almost 2/3rds of our ATV repeaters in the last decade. Is this because most of them were analog and today's modern TVs are all digital ?? At least the Boulder ATV group has moved into the digital era.

So, analyzing the remaining 35 ATV repeaters, I have come up with these statistics.. 14 repeaters have 70cm outputs, while 17 have 23cm outputs, and 3 have 33cm outputs. There are two with 5.8G outputs and only one with a 10G output. 18 repeaters are strictly analog, while the others support some digital TV, either as inputs or output. 7 repeaters have digital outputs, while 14 have digital inputs. DVB-T is the dominant digital TV mode. There are only 3 repeaters using DVB-S. Almost all of the repeaters (30) have inputs on 70cm, either analog and/or digital. Many repeaters also support multiple inputs on various bands/modes. The most complex repeater is the ATCO repeater in Columbus, Ohio, WR8ATV. (www.ATCO.tv) It has 5 different inputs and 6 outputs covering from 70cm to 3cm with modes of VUSB, FM, DVB-T & DVB-S. It is also transmitting from a very tall building in downtown Columbus, at 630 ft. above street level ! The most complex ATV network is the ATN (www.atn-tv.org) which links six repeaters in southern California, four repeaters in Arizona, and one in southern Nevada.

In doing the research for the ATV repeater directory, I corresponded via e-mail with a large number of fellow ATV hams. I got some interesting letters from some of them that I would like to share with the readers of this newsletter.

KC8LMI - ATV Rptr -- Jackson, Michigan

Bryan Dygert, KC8LMI, KC8LMI@hotmail.com

6 JAN 2019

Hi Jim,

I am Bryan kc8lmi. I have built and do the upkeep for a Jackson, MI cross band repeater. It uses 439.25 lvsb input and 923.25 output am analog. The receive antenna in a home made rib cage slot and atvr-4 receiver. The tx is a txa5-33 driving a Glenayre class A amp to appx. 240 watts. The output is vertical omni to a commercial 8 dbd stick. There is a 7 pole pauldon vsb filter in the rx line along with 2 cavities to notch 442.500. An adjacent moto trbo repeater on site. The system is located in down town Jackson about 220 ft above street level. The system covers the area quite well, and mobile up to 10-15 miles with a good antenna setup and 75 watts mobile. I may experiment with dvb-t here in the very near future and see how well it works from this site. There are not many users, mainly my dad Bruce ka8zxx and myself. I have tried to force people into atv by handing them equipment but they just don't get on. I do work Ron k8dmr on band openings but he is 80 miles from me and about 90 from the repeater. He also has an inband uhf repeater and a couple remote sites setup for batc but I cannot work him unless band is open.

I also helped build the Bowling Green, OH atv/r which is at Craig n8djb's house at 150 feet on an old cell tower on his property. The receiver, tx, controller, and vsb filter are my dad's equipment. It is also a cross band repeater, with 439.25 lvsb horizontal in and 923.250 vertical out running 400 watts. He is in the process of moving to KY and there is not a lot of activity on that machine either. The machine will be under my call here soon (under kd8kcf right now) but we may just pull the plug as there is no real local activity to it. Bryan kd8kcf is about 16 miles in Toledo and can get in fine but due to high interference has trouble seeing it. He used to be real active on atv but have not heard him on in over 2 years. My number is (517)914-8282.

I did buy a HV-110 and HV-320(the one with pa for 400MHz) and testing them on the bench right now. Dad has the HV-120 and HV-320 also. We have a few Comark amplifiers that we started to mod and need to finish yet. One of them is done and testing shows good but more to tweak. Figured I would pass along the info.

73, Bryan

WA0NUB-ATV Rptr -- Wabasha, Minn

Jonathan Peterson, WA0UNB, jonmcpete@yahoo.com

5 Jan 2019

Caught me right in the middle of something. Yes on the air. Can give you all details. In process of incorporating as if I fell off the tower and died the worse part of it would be that we might lose the frequency pair (the xyl does not appreciate my "humor."). If I do not get back to you by tomorrow night with details PLEASE harass me.

Call of the ATV repeater will change to kd0hwx (actually that is already in the FCC data base I believe).

Incorporating as (named after the ridge we live on along the Mississippi River stretching from Wabasha to Lake City, MN - Pepin Hill) "Pepin Hill Amateur Radio and Television Society." The acronym is **PHARTS**. The FCC doesn't care but the ARRL will not let us become an official club unless we change the name. Sheesh! This breeds creativity! if they are going to be that fussy, we may just create a sub-group (as we do a huge amount of NWS duties for SKYWARN) called the Weather/Emergency/Television team of PHARTS. THAT acronym would look good on the side of our emergency vehicle. [you can spell it out yourself] The County Sheriff says "Fine with us."

Jon

WB0CMC-ATV Rptr --- Omaha, Neb

John Gebuhr, WB0CMC, wb0cmc@cox.net

4 Jan 2019

It is on the air here in Omaha. It's on the highest spot in the city limits and about 350 feet above that on a radio tower. Still analog, NTSC, and TPO of 200 watts. It is capable of almost 300 but clips sync too much at that. 434 in and 421.25 out. We do get some interference from some part 15 devices on 433.95. Other than that it has run flawlessly since we put it in back in march. Of note, the side band filter on the TX is a commercial 10KW model tuned down from broadcast Ch. 48. 0.5dB loss and aural LSB reject of -75dBc. < 0.2dB ripple in the pass band.

I'm only on my first cup of coffee so if you want more info just ask.

John

W7AMQ-ATV Rptr --- Portland, OR

Dennis BELLES. WA7DRO,

belles73@comcast.net

4 jan 2019

Jim:

Yes the repeater is still on the air with a very small group. We are actually meeting on the BATC under W7AMQ on Monday nights 7-8PM Pacific Time, using the BATC as a pseudo repeater and IRLP for talk back. The repeater is in the center of Portland but since we dropped the repeater 375' lower because of tower rent, to 1250' roof level, it only serves SE Portland. We were at the 375' level 1600' above average terrain for 25 years on the second orange platform.



I made an attempt to go digital with a 19", 1 RU, DVB-S exciter from China only to find it needs an International/European DVB style encoder not a North American DVB mpeg 2 encoder. Nice 17 Watt haystack though, with no regrowth but also no modulation. That's where the project got hung up. If you know where I can get a used European DVB Mpeg-2 encoder I would be interested.

I have thought about getting a Hides exciter with it's internal Mpeg 4 encoder to rebroadcast BATC or the repeater output from a different location. Another thought, since OFDM is very multipath friendly and 23CMs likes to bounce perhaps the 1000' very massive three legged tower 1000' away might work as a passive repeater.

What ATV needs is a dedicated IRLP style internet linking channel so that small repeater groups have someone to talk to, in my opinion. This would facilitate multiple repeaters around town linked together at free but still usable locations. The new BATC can also be a great source of video content due to it's excellent full screen digital video and completely quiet audio when not in use. I have thought about building a simple audio VOX circuit to activate a transmitter. Someone a little smarter than I could pick up the video bit stream to key the transmitter.

I do miss the ATVQ. After 30 years I still love ATV.

Dennis WA7DRO, 503.789.2755cell

Future Newsletters: If you have contributions for future newsletters, please send them to me. Jim Andrews, KH6HTV, email = kh6htv@arrl.net