Boulder Amateur Television Club
TV Repeater's REPEATER

May, 2021, 2ed edition
issue #77

BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com

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Microwave DXing Can Be Dangerous !

And I am not talking about RF exposure. I am instead referring to irate land owners, especially in rural areas.

We recently were alerted to the problem by a microwave ham on the east coast. He stumbled onto an angry posting online on the Reddit web site about one of our Colorado microwave enthusiasts. He solicited our assistance in warning him of the potentially lethal danger posed by this very irate land owner. The land owner posted on the internet this photo of the ham with his big microwave dish. This land owner has had legal issues with the government and he thought that the microwave truck was the FBI spying on him.

The political environment in the USA has become very negative and confrontational recently. This was evidenced dramatically on January 6th with the violent insurrection and storming of our national capital in Washington, D.C. Add onto that the gun control issue and the alarming increase in mass shootings, of which we here in Boulder recently experienced at our own King Soopers grocery store with ten victims. Especially in the rural areas of our county, the residents seem to be more and more paranoid about the government trying to control their lives and guns.

Captain Bill, K0RZ, of the Boulder County Sheriff's Dept. (now retired), has been a long time microwave DXer, moon-bouncer & ATV ham. Bill's advice to the rest of us is to be aware of the changing times and attitudes. He would hate to see us stop doing our microwave experiments. But be extra cautious and vigilant about our surroundings.

Best not to go out alone, but have a buddy along to keep eyes on the surroundings. This has always been BCARES policy when sending ATV teams out in the field. Send two persons, never be alone. Bill also now recommends we pick our sites extra carefully. He suggests only going to public locations, such as parks, etc. and avoid rural private lands. Even though we have never been trespassing on private land, but parking on the side of public highways, the rural land owners still sometimes get upset. Several of us have in fact, at times in the past, been confronted by a nearby land owner who was antagonistic about our presence.

Jim, KH6HTV, Boulder, CO

Tnx to NEVARC NEWS, N-E Victoria Amateur Radio Club newsletter, May, 2021

USE VLC to Watch BATC Streaming

Since the demise of Flash at the end of last year, a standard web browser uses the HTML 5 stream and has about 15 seconds delay on the streamed signal. Using the free program, VLC enables you to watch a flash stream with only about ~ 5 seconds delay.

Simply follow these instructions:

Download VLC – that's if you don't already have this on your PC!

Go to "Media" > "open network stream":

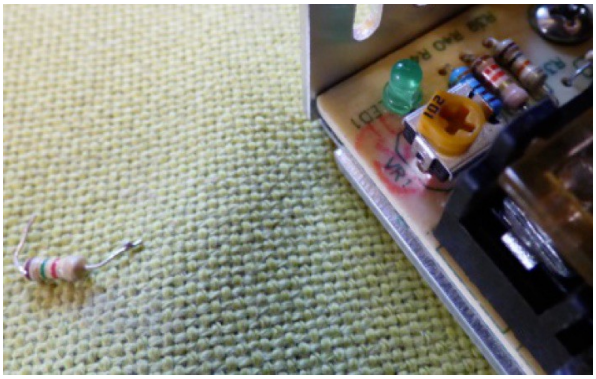
Enter the following in to the network URL box:

rtmp://rtmp.batc.org.uk/live/vk3rtv1 - where VK3RTV1 is the name of the stream you want to watch. --- Press play.

To create a desktop shortcut in Windows
First create a shortcut to VLC on your desktop, then right click on the shortcut and add the path to your favorite channel at the end of the line in the "Target" window.
"C:\Program Files\VideoLAN\VLC64\vlc.exe" rtmp://rtmp.batc.org.uk/live/vk3rtv1
By adding -f it will open in full screen
"C:\Program Files\VideoLAN\VLC64\vlc.exe" -f rtmp://rtmp.batc.org.uk/live/vk3rtv1

Thanks again to NEVARC News, May, 2021 issue

24 Volt Switcher goes to 32VDC to run the Harris Amps



The switcher mentioned previously will go to 32VDC with one resistor change. There are 3 resistors just inboard from the adjusting pot. The middle one is 1500 Ohms. Swap it for a 1200 Ohm and the switcher easily goes to 32 Volts with a bit to spare. It will still do 24 V if you wish, it's just a bit further down the adjustment. (CCW). I managed to open it up without damaging the yellow warranty sticker.

With this mod it should run any of the 300 Watt, Harris amplifier boards with any modulation other than CW/FM. @300 W CW, typical current demand, depending on static bias, is 16.5-17Amps. With NTSC black burst it is typically 12-13 A and with color bars around 10 A. I'm guessing with one of the digi modes a bit less. My cost from Amazon: $33 including shipping. Replacement resistor: about 1 cent. (I buy them in quantity). Easy mod. It just takes a little time to do. You can use a razor blade to carefully lift the yellow sticker to open the case. 6 screws for the top and unplug the fan, 5 more for the board and 4 more plus 2 long screws for the heat sinks inside. The board tilts out and soldering in a new resistor is then easy. Don't forget to plug the fan back in, something I might neglect to do. The fan may not run until the temp goes up in the switcher. I think it's on a thermostat.

John, WB0CMC, Omaha, Nebraska

Editor's Note: The switcher John describes is available from Amazon Prime for $30+. It is advertised as the Mean Well model LRS-350-24. To read more about the FREE, 300 Watt Harris amplifiers which John has, see these previous issues of our ATV newsletter: Feb. 2021, #70 (pp. 5-8) and April 2021, #75 (pp. 7-8). If you are interested in obtaining one of these free amps from John, contact him at: wb0cmc@cox.net

What Broadcast TV Channels Can I Watch ?

Simple, just go to: www.rabbitears.info
Click on Signal Search Map, enter your address, position the pointer on the map to where your TV antenna is located on your property, and click on "GO" You can also select your antenna height and max. distance for the search, our use their defaults of 30ft & 60 miles. RabbitEars will then give you a nice print-out with station call signs, RF channel, virtual channel, compass bearing to transmitter & distance, and predicted Field Strength (dBµV/m)

ATV in Europe: OE7DBH reports -- "I hope amateur radio interest in DVB-T in the USA continues to grow and they get even more ATV colleagues. Here in Europe, terrestrial DVB-T has fallen sharply since the start of QO100. HiDes equipment -----> my TX recommendation is on: HV320 and not on HV310."

ATV in Florida: We have an ATV repeater here in Panama City, Florida. Input is 434 MHz and output is 919.25 MHz. One of our main focuses is to provide live ATV information to EOCs in disasters as "boots on the ground" so they can decide what help is needed to send into the affected area. We link pictures and video from our drone to them. I'm also an Air Force MARS station and am working on introducing SSTV and ATV into the MARS system if and when needed.

Wolfgang, KV4ATV, Panama City - ATN Florida State President

ATN - Atlanta, GA: Thanks for the newsletters. I relay them to our members.

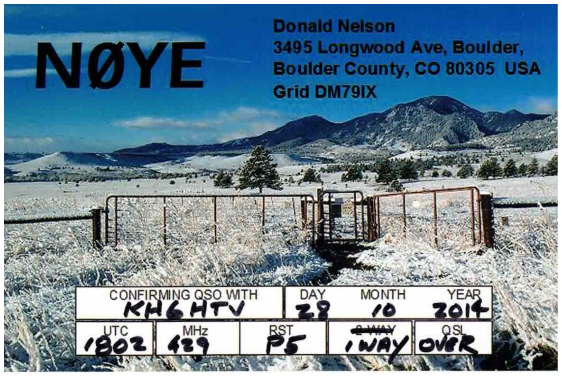
Ralph, N4NEQ, ATN Atlanta

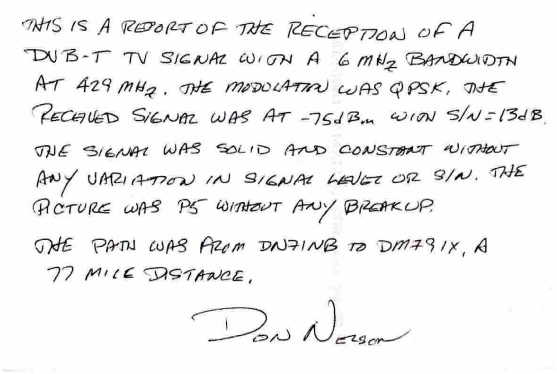
ASSUME NOTHING ! When working with microwave pieces, do NOT assume anything. Every part has to be validated and some times multiple times. From time to time, I have found SMA cables that have gone bad when they worked in a circuit before.

Pictured here is a beautiful commercial band pass filter I use in my 5678 MHz DVB-T transverters. There was one each in two transverters. One of these filters became frustratingly intermittent and then failed completely. The SMA center pin on one end became disconnected from the metal strip on the ceramic board. In the picture the SMA center pin of note is adjacent to the black magic marker dot. I tried soldering the pin to the board and the metal strip was no longer on the board and "disappeared". The metal strip next to the lost strip came loose on one end from the ceramic board. Clearly the failure was the bonding of the metal strips to the ceramic.

I have soldered a piece of hookup wire to the SMA connector as a attempt to repair the filter. The IL is down quite a bit and so the filter has been set aside to be attended to later. I hope to possibly recover some of its band pass capabilities.

Don, N0YE, Boulder, CO




THIS IS A REPORT OF THE RECEPTION OF A DVB-T TV SIGNAL WITH A 6 MHz BANDWIDTH AT 429 MHz. THE MODULATION WAS QPSK. THE RECEIVED SIGNAL WAS AT -75dBm WITH S/N=13dB. THE SIGNAL WAS SOLID AND CONSTANT WITHOUT ANY VARIATION IN SIGNAL LEVEL OR S/N. THE PICTURE WAS P5 WITHOUT ANY BREAKUP.

THE PATH WAS FROM DN71NB TO DM79IX, A 77 MILE DISTANCE.

Don Nelson

1st Colorado, 70cm, DVB-T, DX contact -- Cheyenne, Wyoming to Boulder, Colorado
Distance was 77 miles

BATVC - ATV Loaner Equipment

The Boulder ATV group has an assortment of ATV equipment to loan out to prospective hams who express an interest in getting into ATV. The first step for an interested ham is to borrow one of our digital ATV receivers. The purpose is to prove to themselves and us that they can actually receive the DVB-T signals from our Boulder ATV repeater at their QTH. If they are successful in receiving signals, then we are willing to loan them a TV camera and TV transmitter. The loans are not permanent., but for a short term. If the prospective ATV ham then decides to really jump into ATV, we expect him/her to then purchase their own ATV gear. The following is a list of the equipment available for loan:

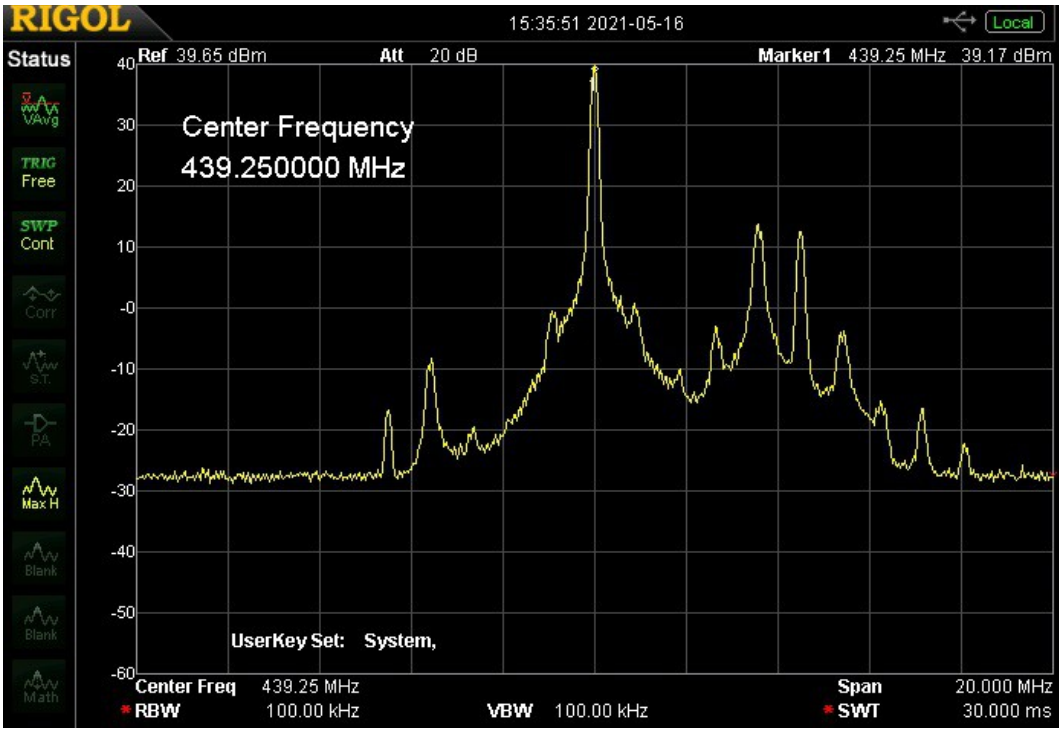
1. DVB-T, digital TV set-top box receivers. Requires a 70cm antenna and a video monitor. The monitor can either be high-definition with an HDMI input, or older analog TV with RCA composite video plus audio inputs.
   (note: items 2 - 6 comprise a complete 70cm digital ATV transmitter)
2. DVB-T modulator -- Hi-Des model HV-320E. includes AC/DC wall wart power supply.
3. 70cm, 6 Watt (rms), RF Linear Power Amplifier, KH6HTV prototype.
4. 13.8Vdc Power Supply -- Samlex model DC1212, to power the amplifier.
5. Hi-Def (1080P) Camcorder --- Canon model VIXIA HF-R80, has HDMI A/V output
6. Camera Tripod
   (note: items 7-8 comprise a complete 70cm analog ATV transmitter)
7. 70cm, 10 Watt (pep), NTSC, VUSB-TV, analog ATV transmitter -- built by K0RZ
8. TV camera, older JVC model GX-N7 --- includes set of assorted C mount lenses & extension cable. It gets it's DC power from the K0RZ transmitter.
9. 70cm Base Station Antenna -- Diamond X-50 (2m/70cm)
10. Antenna Tripod Mount
11. Coax Cable -- 35 ft. of RG-8

Pass the word around. We are always looking for new ATVers to join in the fun. If you have ham radio friends who might be interested in trying out ATV and are interested in borrowing any of the above items, have them contact Jim, KH6HTV. kh6htv@arrl.net

K0RZ, 70cm, Vestigial Upper Side-Band, TV Transmitter

One of the pieces of TV equipment in our club's inventory for temporary loan to prospective ATVers is a fine, 70cm analog TV transmitter. This transmitter was built by Bill, K0RZ, in the early 90s. Bill donated it to our group to be used as a "loaner". Joe, AD0I, has been using it successfully to put a really fine, P5, NTSC analog signal into our W0BTV repeater. Joe recently returned it to our equipment pool to be loaned out to someone else.

This photo shows the high quality construction technique Bill used in building this transmitter. Bill used a PC Electronics model TXA5-70A exciter board along with a model FMA5-F, 4.5 MHz sound sub-carrier board.. The low level RF output from the exciter board was then amplified by a Toshiba SAU-4, RF brick amplifier module. The output from the SAU-4 was a 15 Watt (PEP), full, double side-band, AM-TV signal with a bandwidth well in excess of 12 MHz. To eliminate the lower sideband and convert the signal to a commercial standard, 6 MHz, TV channel bandwidth, VUSB-TV signal, Bill included in his transmitter a pair of inter-digital, band-pass, channel filters. These filters were made by Spectrum International. SI was the dominant supplier of such filters in the 1990s. Bill's original transmitter operated on channels 57 & 58 (421.25 & 427.25 MHz). The RF output from the transmitter after the channel filters is 10 Watts (PEP).



Spectrum of K0RZ, 10 Watt, ATV Transmitter. Top reference line is +40dBm (10 Watts). 10dB/div & 2MHz/div. Test signal was NTSC color bars

Bill also included a quality RF coaxial relay to switch the antenna between transmit and receive. There is an F connector on the rear panel to attach the transmitter to a separate analog TV receiver. Bill also included coax relays to switch in the appropriate Ch 57 or 58 (now 60), SI band-pass filter.

The transmitter was designed for multiple A/V inputs. Standard composite video & line level audio with RCA connectors are found on the front and rear panels. It was also wired with a special A/V connector to use with an old JVC color TV camera which Bill also donated to our group. Adjustable audio and video level controls are provided on the front panel. The transmitter also included a Video IDer from Elktronixs. The IDer has a custom burned EPROM with a selection of four different test patterns with the call sign K0RZ. The IDer would ID the transmitter automatically every 10 minutes. The transmitter is totally self contained as it also includes a built-in, hefty, 12 Volt linear power supply for operation from 120Vac mains. The nice 17" x 4.5" x 19" cabinet weighs in at a hefty 36 pounds.

Our Boulder ATV repeater accepts 70cm, analog, NTSC, VUSB-TV signals as one of it's three possible inputs. It is on Channel 60 (439.25). The other inputs are digital, 6 MHz, DVB-T on 441 & 1243 MHz. To work on our repeater, Bill's transmitter needed to be modified. Jim, KH6HTV, found a surplus crystal for 439.25 MHz. It was installed in the transmitter and the transmitter was retuned to optimize performance on Ch 60. Don, N0YE, modified the Ch 58, SI, BPF to work on Channel 60. This involved shortening the resonator rods to 6.45" length and retuning the filter.

W0BTV Details:

Inputs: 439.25MHz, analog NTSC, VUSB-TV; 441MHz/6MHz BW, DVB-T & 1243MHz/6MHz BW, DVB-T
Outputs: 423MHz/6MHz BW, DVB-T, or optional 421.25MHz, analog VUSB-TV. FM-TV output on 5.905 GHz (24/7).
Operational details in AN-51a Technical details in AN-53a. Available at: *https://kh6htv.com/application-notes/*

W0BTV ATV Net: We hold a social ATV net on Thursday afternoon at 3 pm local Mountain time. The net typically runs for 1 to 1 1/2 hours. A DVD ham travelogue is usually played for about one hour before and 1/2 hour after the formal net. ATV nets are streamed live using the British Amateur TV Club's server, via: *https://batc.org.uk/live/kh6htvtvr* or *n0ye*. We use the Boulder ARES (BCARES) 2 meter FM voice repeater for intercom. 146.760 MHz (-600kHz, 100 Hz PL tone required to access).

Newsletter Details:

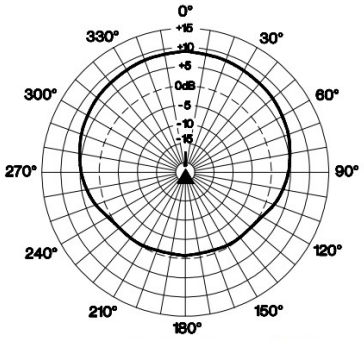
This is a free newsletter distributed electronically via e-mail to ATV hams. The distribution list has now grown to over 400. News and articles from other ATV groups are welcomed. Permission is granted to re-distribute it and also to re-print articles, as long as you acknowledge the source. All past issues are archived at: *https://kh6htv.com/newsletter/*

ATV HAM ADS

Free advertising space is offered here to ATV hams, ham clubs or ARES groups. List here amateur radio & TV gear **For Sale - or - Want to Buy.**

For Sale --
70cm Base Station Antenna
DB Products DB-411. $250

This is a 70cm antenna with broad band capability covering from 420-440MHz. It is a vertically polarized, co-linear array of four folded dipoles. The overall length of the mast is 9.42 ft. The gain is 11.1dBi. It is very rugged, commercial grade antenna. It was previously used as the 70cm antenna for the Boulder ATV repeater. New these antennas sell for $500-600. Local sale only. I will not ship. You must pick up in Boulder, CO. interested ? ---- contact Jim, KH6HTV, kh6htv@arrl.net



Top-mounted Radiation Pattern