

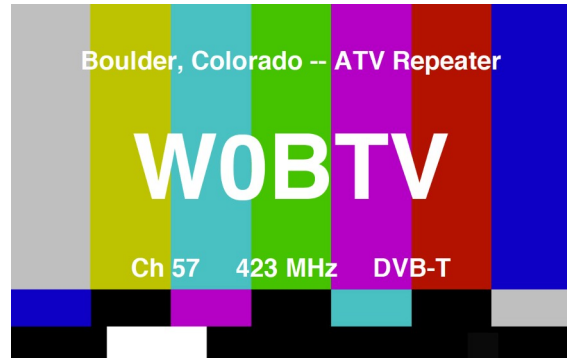
Boulder Amateur Television Club TV Repeater's REPEATER

May, 2022
issue #100

BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com

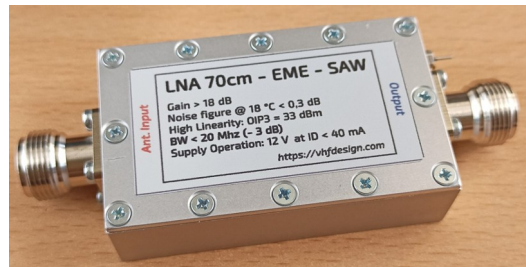
Jim Andrews, KH6HTV, editor - kh6htv@arrl.net www.kh6htv.com



Our 100th Issue !

DARA compares Pre-Amps

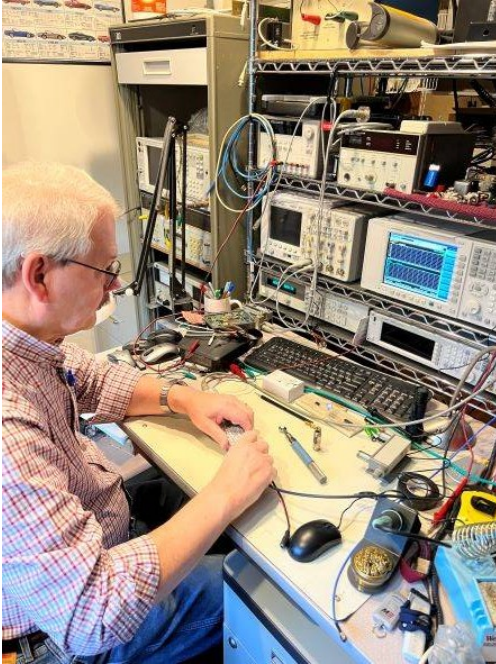
The Dayton Amateur Radio Assoc. (DARA) ATV group has been having interesting technical discussions on their weekly ATV net.



More recently they have been discussing the pros & cons of several 70cm pre-amps. One pre-amp of particular interest to them was from the Ukraine. The company is called **VHFDesign**. www.vhfdesign.com The pre-amp is labeled as their LNA 70cm-EME-SAW and was designed by US4ICI. It uses the Mini-Circuits SAV-541+ E-PHEMT transistor. It's key specs. are: Noise Figure < 0.3dB, Gain > 18dB, BW > 20MHz, OIP3 = 33dBm, 12Vdc @ 40mA. Dave, AH2AR, says they sold in the \$170 price range. He also says that dozens of EME folks here in the USA are using them.

Dave reports that the Ukraine pre-amp has just been tested by Tom N8ZM. Dave writes -- I brought over one of the five pre-amps discussed on last week's ATV Net to Tom's lab and Tom's testing produced some interesting results. The noise figure at 429 MHz

ended up at 0.69 dB at 429 MHz. (*spec. was < 0.3dB*) The noise figure that the manufacturer called out happens to be the noise figure for the Mini-Circuits device used in the preamp, and obviously is not the resultant noise figure of the circuit elements as a whole. Granted, the noise figure was a little better further up the band. Oddly enough, the claimed 18 dB gain ended up measuring at around 26 dB gain at 429 MHz.



Tom at the helm conducting the Noise Figure and Gain Measurements on the VHF Designs preamp for 70cm

This is the Agilent EXA Signal Analyzer that Tom used for this test measurement.



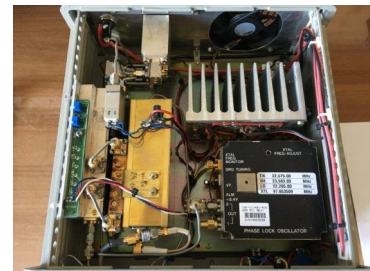
The **VHFDesign** group is a new one (*at least for your editor*). They do have an interesting product line. It is worth checking out their web site www.vhfdesign.com Included in their product line is this 300 Watt, 23cm RF Power Amplifier. Unfortunately, the Ukraine is presently at war having been recently invaded by Russia.



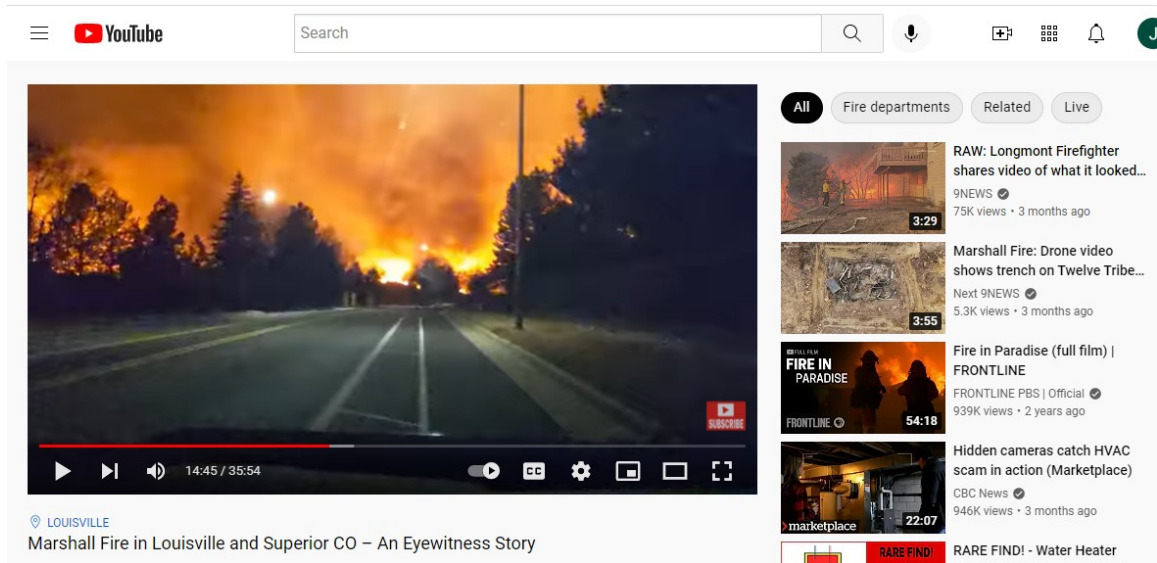
24 GHz DVB-T

Hello Lads --- Rudi Pavlic, S58RU, (Koper, Slovenia) has prepared two supports with two parabolic antennas to be able to perform the first connection tests on 24GHz DVB-T. Putting the two transceivers into operation that I made. We found ourselves in the courtyard at Rudi's house, and at a distance of about 15-20 meters from each other we placed the two 24GHz stations. The real and only problem was the sun, hence the difficulty to display the receiver menu on the monitor ... and then ... large signals with an excellent MER value. The frequency of the two transceivers is 24.1Ghz. The analog output power is around 100mW and in DVB-T 15mW. We are very satisfied and the next test we will try to do it from a greater distance, which should be around 4 Km.

73 ... see you soon Mauro ... IV3WSJ, Trieste, Italy



YouTube Videos of 30 December Fire in Boulder, Colorado



This fire was called the **Marshall Fire** because it started in the tiny town site of Marshall, which is just south of Boulder. We have previously shared with you one video shot by a neighbor of KH6HTV. There now are a lot more available on YouTube. Some of these YouTube videos, being non-commercial, un-copyrighted, they could be suitable material to be shown on your local ATV repeater. Most videos posted on YouTube were by commercial broadcast TV stations and newspapers and are not legit to use for ATV. Here are the links to several, private citizen's videos we have found.

<https://www.youtube.com/watch?v=8Hkzr9SX4lk> (36 minutes) "Marshall Fire in Louisville and Superior CO -- An Eyewitness Story" - note: This particular one is quite disturbing because the fella who shot it was a "fire addict" who actually deliberately drove into the burning areas against the flow of terrified residents who were trying to desperately evacuate. It included his driving right past the qth of KH6HTV. The comments posted for his YouTube video give him hell for doing it.

<https://www.youtube.com/watch?v=-dT9D5zrBbs> (4 minutes) "Boulder County Marshall Fire – A View from Sagamore"

<https://www.youtube.com/watch?v=GQ2PyBf4jWw> (½ minute) "Sheriff Deputy driving through the Marshall Fire at night"

<https://www.youtube.com/watch?v=zzFjluH6zr8> (½ minute) "Dogs rescued from Marshall Fire"

<https://www.youtube.com/watch?v=v021bTL0d7E> (1 ½ minutes) “Marshall Fire Evacuation”

<https://www.youtube.com/watch?v=V-3vhw3XsQA> (4 minutes) “Drone video showing the devastation of the Marshall Fire”

<https://www.youtube.com/watch?v=BjF4HNcKyaw> (1 minute) “Google Earth animation showing growth of Marshall Fire”

<https://www.youtube.com/watch?v=ex1vgIFtIjQ> (18 minutes) “The Marshall Fire: The Embers”

<https://www.youtube.com/watch?v=03Fi0uLn6oM> (2 ¼ minutes) “Marshall Fire as seen from Gunbarrel”

<https://www.youtube.com/watch?v=1pIudp48Esg> (4 ¼ minutes) “Marshall Fire as seen from north-west Louisville”

<https://www.youtube.com/watch?v=Na1nJ25e7fA> (2 ½ minutes) “Marshall Fire as seen from 6 miles away”

<https://www.youtube.com/watch?v=IB9hvfDNSck> (6 minutes) “Marshall Fire Aftermath”

<https://www.youtube.com/watch?v=0N9F46oS2Pc> (15 minutes) “My Evacuation from the Marshall Fire”

<https://www.youtube.com/watch?v=jzG7c2Ye5Q0> (35 minutes) “Dogs Rescued During the Marshall Fire that destroyed more than 1000 homes in Colorado”

<https://www.youtube.com/watch?v=6-TMc9N8Yqo> (4 ½ minutes) “Marshall Fire – A RAW look inside”

https://www.youtube.com/watch?v=_tKz2bKEltY (6 minutes) “Start & Spread of Marshall Fire”

<https://www.youtube.com/watch?v=pRBZu9WvoYg> (3 minutes) “Time Lapse Trail Camera showing barn catching fire”

<https://www.youtube.com/watch?v=flWwWn6Lb84> (1 ½ minutes) “Marshall Fire footage from beginning”

https://www.youtube.com/watch?v=oj_pWPHCPjs (8 minutes) “Marshall Fire Police Evacuation in Superior”

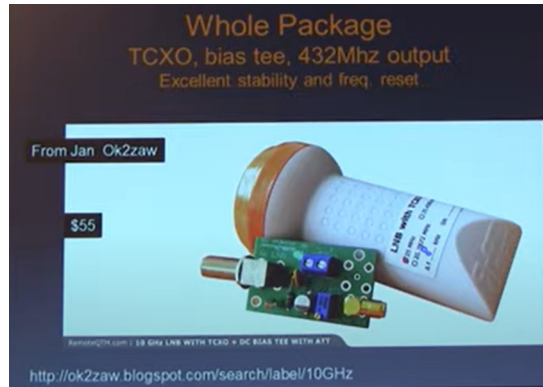
<https://www.youtube.com/watch?v=epK2a61vtuw> (1 ¼ minutes) “NWS Reflectivity & Velocity of the Marshall Fire”

<https://www.youtube.com/watch?v=24-hkzfnR1A> (70 minutes) – Ham Nation: small portion devoted to Marshall Fire”

LNBs for 10GHz ATV

Dave, AH2AR, has alerted us to an interesting You Tube video. It is from the 2019 Microwave Update Conference. Doug Miller, K6JEY, shows us how to use Ku band LNBs on the 10 GHz band for ham radio. The video runs for 30 minutes. The URL link is:

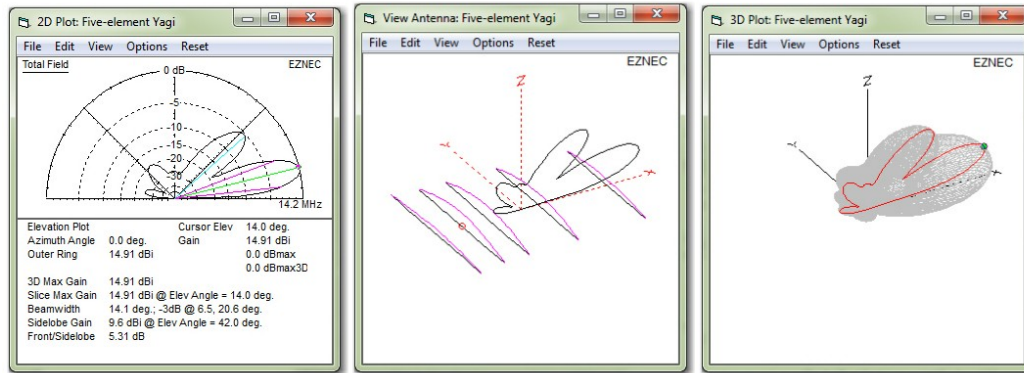
<https://www.youtube.com/watch?v=V3FXRT8qD8I>



Some of our ATV readers may not have been aware of the great electronic ATV magazine, **CQ-DATV**. It was a free, on-line magazine published by Ian, G0FCT, Trevor, G8CJS, and Terry, VK5TM. They started it in 2013 and their last issue was in October, 2021. All of their 100 issues are still available for free downloading on: <https://cq-datv.mobi/ebooks.php>

EZNEC Antenna Software by W7EL

FREE - EZNEC Pro+ v. 7.0 is now available! - FREE



Recently the ARRL announced that Roy Lewallen, W7EL, was discontinuing support of the great antenna modeling program, EZNEC. This has caused a lot of concern in the amateur radio community as EZNEC has become the “defacto” program of choice for us to model our antennas. However, all is not lost, at least not yet. Roy is now making available on his web site (www.ez nec.com) the program FREE. The only caveat is his statement --- “Support is no longer available for any type or version of EZNEC program.”

The ARRL and Roy gave away free a demo version of EZNEC which would only accomadate very simple wire model antennas. Roy sold the standard version for about \$100. He also offered a professional version for about \$500.

Roy developed EZNEC and copyrighted it way back in 1990. So we owe him a geat deal of thanks for his contribution to the art and knowledge of amateur radio. 32+ years of service developing and constantly upgrading, plus hand holding many of us is phenomenal. Thank You Roy !

EZNEC uses Numerical Electromagnetics Code (NEC) originally developed by the USA govt., Lawrence Livermore National Lab (LLNL) in the 1970s. LLNL made the code publicly available for general use as NEC-2. They still sell later versions for a nominal fee with signing a license agreement. NEC is based upon the Method of Moments solution of the electric field integral equation. For a more complete description see Wikipedia (https://en.wikipedia.org/wiki/Numerical_Electromagnetics_Code)

Interesting possible microwave tool

Skip, K1NKR, has passed along to us this interesting post he found on the 10GHz & Up .io group. It was posted by Sean, KB8JNE

I thought this was interesting enough to pass along to some of you because it involves 10GHz and ATV. I decided that with all this talk about dishes and LNBS recently that I might as well try Free To Air satellite TV. Yesterday I ordered a cheap dual LNB, some push on F adapters and cable then ordered from eBay a GT Media V8 Satellite Finder. It has a receiver, signal strength meter, spectrum Analyzer and calculator for pointing and other features but is primarily a battery portable sat finder. While poking about online for tips on how to get it all set up I found this little YouTube video. Some



of you may already know about all this but I never even thought about it. I did consider one of the cheap finders as a signal hunter but I have an IF rig so that wasn't necessary to explore.

Who knew. Not being into Amateur TV, but having a world renowned ATV group here in Columbus, Ohio that does DTV, this could be fun. I need to check in and find out if their system matches up with what this can receive now. The finder/receiver was about \$45 - from China. I thought using a finder/receiver like this as an ATV digital 10GHz receiver was a brilliant idea. Not sure how good the spectrum Analyzer is in this thing but if it's decent, it is even cheaper than a TinySA device. Sorry if this is old news to some of you guys but I had not seen this before nor any mentions of it as a possible tool for microwave stuff.

“How to Configure the GT Media V8 Sat Finder”, Justin, G8Y TZ, (<https://www.youtube.com/watch?v=7LGAL7bbDUA>)



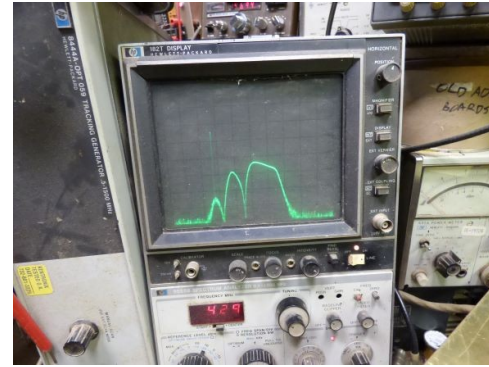
LOW COST COLOR BAR GENERATOR

Have you been looking for something to serve as a fixed image for testing analog video? Here is a suggestion. I have always wanted a simple ATV transmitter package to take with me when I travel to our ATCO repeater for testing. I have been using a PC Electronics “Kreepee Peepe” 1 watt transmitter board packaged in a small box with a standard security camera connected to it. The transmitter is OK but the camera is bulky and doesn’t have a fixed image.

I found an HDMI to CVBS converter available on Amazon for \$9.95 to be just the ticket to supply a complete self contained compact video “test signal”. I removed the standard case the converter was packaged in and mounted the internal PCB in my transmitter test assembly. I added a simple 12v to 5v voltage converter to power the PCB from the internal 12v supply already in the box. Externally, I added some small attenuators so the output was in the order of 100 microvolts to test the RF input sensitivity of the repeater receiver. The complete package is now the test standard as a known ATV RF signal.

The Mini HDMI2AV converter is an HDMI to CVBS converter that outputs an analog vertical color bar pattern whenever there is no HDMI signal feeding it. Essentially the color bars replace the usual blue screen “no signal” pattern from other units. In this case, the converter is used to furnish a color bar pattern for a “poor man” fixed pattern signal generator. There is a “NO SIGNAL” message overlaid on the color bars in the upper left side of the pattern but we’ll just have to ignore it. The unit is normally powered from the USB port of the computer it is connected to which supplies +5V power. If you use it as a the test generator described above, you’ll need to find a 5V power source. The supply current is less than 100 mA.

HAPPY TESTING!!!! de Art, WA8RMC, Westerville, Ohio
(reprinted with permission from ATCO Newsletter, April, 2022)



DUPLEXER for Omaha -- John, WB0CMC, writes us ---

“Initial testing for an in band ATV duplexer. Photo on left is ANT to RX, 434 passband Photo on right is pass through RX-TX. Next stage is put a TX into a dummy and check RX RFI/desense. Looks promising, so far. Marker on 003 is 421.25.

Black filter is a commercial channel filter I took from CH 47 down to 421, Has about 0.5 dB loss in the pass band. The brass one is a copy I made out of an old 6M cavity I built decades ago and silver plated it. It only has about 0.8 dB loss in the pass band and the notches aren't as nice as in the commercial one. Back to more testing. Be nice to have only one antenna. The testing isn't all done yet. I still have to hook up my 200 watt TX and look at what is really on the 434 port. 421.25 is -70 dBc there now but the rest of the band width is still in question. Worth a try. Be nice to have only one antenna.”

(editor's note: We wish John success in his new duplexer experiments)

70 cm ATV Antennas

Dave, AH2AR, reports that another topic of conversation on a recent DARA ATV net was the subject of favorite 70cm antennas for ATV service. The following were some of the antennas mentioned.

M-Squared model 440-11,	11 element Yagi, 13.5 dBi gain
M-Squared model 440-18X,	18 element Yagi, 16.5 dBi gain
Directive Systems model DSEF-0432-15RS,	15 element Yagi, 15.6 dBi gain
Directive Systems model DSE-0432-25ATV-H,	25 element Yagi, 18.6 dBi gain

PC Board Feed-Back

I have bought some boards from OSH Park (<https://oshpark.com>). They are known for their purple boards, but you can also get black. They have 1183 boards they have made for customers that have been put in public domain. A lot of references to Github and Tindie that are open source websites. They will accept files from just about all board drafting software. I see a lot of Kicad drawn boards, a free program. They have some from the Eagle software before Autodesk bought them out. Their prices are reasonable. Only

thing I noticed is they do not solder coat the exposed pads, probably one reason they are inexpensive, no lead.

Fred, K4RBT, Salem, Virginia



WOBTV S Meter Calibration --- Our Boulder, Colorado ATV repeater has an accurate S meter to tell us the strength of our input DVB-T signals. Our repeater has the On Screen Display (OSD) feature in it's Hi-Des HV-120 receivers permanently activated. See the above photo. In the lower left is the call sign of the incoming signal. In the upper left corner is the frequency and bandwidth. In the lower right corner is the signal to noise ratio in dB. In the upper right corner is the S meter reading in dBm. This S meter is quite accurate, in that 1 dB change in the input signal level causes a 1 dB change in the S meter reading. However do not believe the absolute number shown. It is way too optimistic. There is a significant offset in the value displayed. The HV-120 has a significant offset in it's S meter reading. In addition we have preamps and band-pass filters ahead of both receivers with gain and loss which affect the readings. The S meter for our repeater has been calibrated in terms of the actual input signal at the antenna input. The correction factors to be applied are 24 dB for the 70cm receiver and 42 dB for the 23cm receiver. Thus for the example shown in the above photo, Clyde's 23cm signal on 1243 MHz shows -34dBm & 23dB s/n. His signal strength was really

$$P_{in} = -34 \text{ dBm} - 42 \text{ dB} = -66 \text{ dBm}$$

W0BTV Details: **Inputs:** 439.25 MHz, analog NTSC, VUSB-TV; 441MHz/6MHz BW, DVB-T & 1243 MHz/6MHz BW, DVB-T
Outputs: Channel 57 --- 423 MHz/6MHz BW, DVB-T, or optional 421.25 MHz, analog VUSB-TV. Also, secondary transmitter, 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 (22:00 UTC). 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 (-600 kHz, 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 about 500. 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.](#)

DB Products
model DB-411
70cm Base Station
Antenna

I am offering to give away **FREE** this antenna to any Boulder, Colorado ATVer. This is an extremely rugged antenna. It originally was part of our Boulder ATV repeater when it was located in Chautauqua Park. More recently it was on my 50 ft. tower. In my new QTH, antennas are not allowed. (except my invisible ones !) Thus, I need to find a new home for this great antenna.

Our Boulder ATV repeater, W0BTV, is currently sharing this same model antenna with BARC's 70cm FM voice repeater.

This particular antenna was custom built for the 70cm ham band (420 – 450 MHz). It has 11dBi gain and is broadband covering the whole 70cm band. But it is BIG ! It is 9 ½ ft. tall and weighs 25 lbs. New these sell for over \$500. Plus shipping is expensive as they are so big they have to be shipped by truck freight. Your price is \$ 0, but you need to pick it up at my QTH. Interested ? --- call 303-594-2547, or e-mail: kh6htv@arrl.net



Jim, KH6HTV