

Amateur Television Journal

September, 2026

2ed edition, issue # 218

BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com

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

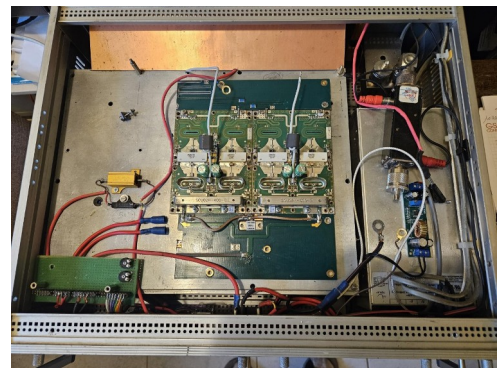


ATV NEWS from across the BIG POND

French, ON4VVV, shares with us his Dutch ATV newsletter, "ATV NIEUWS". His most recent issue had some interesting stories to share with our ATV Journal readers.

70 cm:

Since my last newsletter, I have been working on building a completely new PA for 70cm and hope to have it ready for the September contest within 14 days. I have removed the original and defective pallet so that I do not have to build a completely new 19-inch cabinet. The meters and part of the circuitry can be reused.



3 cm: During the July contest, I had the opportunity to successfully test my 3cm upconverter and PA with Corn  ON7MOR, and a week later—which had not been successful during an attempt in the contest—I could also be received by Jack PA0BOJ at a distance of 112 km, and that even with an SR of 2000 ks/s.

This experiment is very encouraging, and I have therefore started attempting to receive various 3cm beacons as practice, which I am successfully doing for ON0HVL at a distance of 73km, for example. Not only do I always spot that beacon, regardless of the conditions, but I can also receive a number of reflections from completely different directions, with a few even being stronger than the original, direct signal. One of these reflections occurs on the Ghent Book Tower.

Such a discovery usually gives me new ideas: a reflection of the 3cm signal off a tall building is likely perfectly usable to enable an ATV or D-ATV connection with OMs that do not necessarily have a sufficiently high location. The condition for this, however, is that the incident and outgoing angles of the reflection off the building must be approximately the same. I therefore also note that the reflecting building absolutely does not need to be midway between the two stations, but rather in line of sight with both stations.

In addition to reflection off buildings, rain scatter also acts as a propagation method on 3cm. Rain is regularly available in both Belgium and the Netherlands, and the gust would need to occur approximately halfway between the two stations; however, whether a D-ATV signal remains decodable is another matter that still needs to be tested. For analog ATV, however, this should be less of a problem, which prompted me to purchase a HACK-RF in order to generate an analog ATV signal at the control frequency desired for my application.

During a contest, an analog ATV signal is much easier and faster to decode than a D-ATV signal, especially during QSB. Incidentally, it was Jack PA0BOJ, who has quite a bit of experience on 3cm, who gave me the idea. Given my limited knowledge of everything that needs to be done on a PC, I will have to rely on the advanced experience of Kenneth ON5KR to get that HACK-RF running on my laptop.

COMPARATIVE TESTS BETWEEN DVB-S – DVB-S2 :

Very intensive and repeated tests have shown that 1dB to 1.5dB less signal is required for DVB-S2 signals than for DVB-S reception. That is of course very little, but still not unimportant to know, because as radio amateurs we like to get the most out of it.

COMPARATIVE TESTS BETWEEN DVB-S2 AND DVB-T :

ON0TVO's, 1000kHz, DVB-T RX input at 436MHz has been in service for some time now, and a repeated series of tests shows that I personally need 3dB less signal to get through smoothly, whereas for Wim ON8DSW it makes a difference of 6dB compared to DVB-S2. These observations are not insignificant when you consider that, on the one hand, less power can be produced with DVB-T, but on the other hand, this is compensated for by better sensitivity of the RX combined with a more robust signal for DVB-T that is less easily disturbed by multipath phenomena (the dreaded candy cane).

In the meantime, I am in possession of a recent V4 version of an RTL-SDR stick, and last Friday we had the opportunity to test it extensively thanks to the setup and efforts with “gnu-radio” by Jan, ON6LM. The results showed that we could receive images very smoothly with a bandwidth of only 125kHz and an FEC of $\frac{1}{4}$. The only setting we couldn't immediately find was to adjust the “guard interval,” which was set to $\frac{1}{32}$, to $\frac{1}{4}$, but according to theory, reception with this latter setting should become even easier. (At the last minute, I received a message from Jan that he had found the specific combination of settings.) Caution: with DVB-T, and especially with narrow bandwidths, the frequency must match perfectly, otherwise the RX will not work.

NEW ENGLISH ATV REPEATER GB300

This ATV repeater has been in service in Folkestone, Kent, U.K. for a good month now, at a distance of (only) 192 km from me, and in the meantime, under favorable conditions, it has already had to handle an invasion of Belgian, Dutch, French, and even German stations. I was the first



station located outside the UK to receive the image from GB300 and also be received there on 70 cm, after which the aforementioned invasion from outside the UK began.

The GB300 output is at 1304 MHz with an SR of 2000 ks/s and the input at 437 MHz with an SR of 333 ks/s. (<https://www.qrz.com/db/GB300>) You can view the output of GB300 via the BATC "streamer" The repeater maintains a fully automatic logbook of all received stations as well as a copy of the received images. More info?? See <https://gb300.co.uk>

ATV CONTESTS: During the previous contest on August 14 and 15, I was only present for the last 20 minutes. To my delight, I was able to confirm that there were still 7 ON participants, despite the fact that this was a Reduced Bandwidth contest in which traditionally few Belgian stations participate. As you can see on the following BATC "DX spot" map, truly spectacular results were achieved. With distances of up to **361km on 70cm** by Reinhard DL4FBN, while Guido ON1AFB also scored brilliant distances of up to **358km on 2m and 70cm**. The calendar for the rest of the year looks as follows: September 12 and 13, everything from 70 cm and above in all ATV modes from Saturday at 2 PM to Sunday at 8 PM local time. December 12 and 13 everything from 70 cm and above in all ATV modes

AUSSIE ATV NEWSLETTER

NEVARC NEWS

VK3ANE

Incorporated in Victoria, 2014, Registration Number: A0061589C

The bi-monthly magazine of the

North East Victoria Amateur Radio Club

<http://nevarc.org.au/>



An Affiliated club of Wireless Institute of Australia

An Affiliated club of Radio Amateur Society of Australia Inc.



Volume No: 14

Issue 05

September - October

2026

Still another newsletter with lots of ATV stuff in it. The North East Victoria Amateur Radio Club's newsletter is edited and published by Mick Ampt, VK3CH, an avid ATVer. While it includes club news, Mick also includes a whole lot of stuff about ATV in it. Want to be included in Mick's distribution mail list? -- send him an email to: magazine@nevarc.org.au

2026 DATV QSO PARTY

For a very complete write-up and record of Peter's (VK3BFG) recent DATV QSO party, see Mick's latest issue (Vol 14, issue 05 2006, 31 Aug) of the NEVARC NEWS, pages 8-16.

14th Annual DATV QSO Party 2026

14th Annual DATV QSO Party for 2026 was held on Saturday 29th August, last weekend in August each year. Peter VK3BFG says there are 26 stations in Melbourne that are capable of transmitting television signals. Local morning and local evening sessions were live streamed and recorded to YouTube by Richard VK3BFG. Richard was also a co-ordinating party station, assisting Peter VK3BFG, with both very busy coding video.

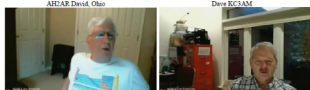
Morning YouTube link: <https://www.youtube.com/watch?v=SPFEE5N3J4c>
Evening YouTube link: <https://www.youtube.com/watch?v=6m5H3A31c>

SATURDAY MORNING SESSION



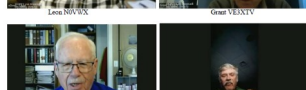
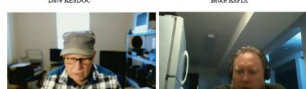
14th Annual - 2026 DATV QSO Party - Opening address

A pre-recorded presentation from the ATCO DARA - 26 August Net reports news from the U.S.A. was sent.



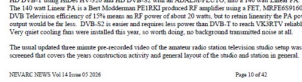
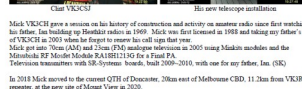
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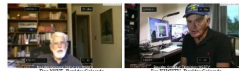
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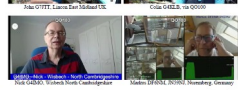
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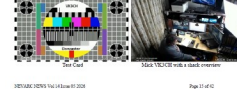
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ATSC 3.0 --- Ron Econoos, W6RZ, of Mountain View, California, also reports doing experimentation on ATSC 3.0. (w6rz@comcast.net).

NBTV CORRECTION: Hi All --- I see in the ATV Journal this is an error with the NBTV article, the RF bandwidth 96 kHz, not 400 kHz as that is raw data bandwidth which is compressed down. The current version is 96 kHz and the one I am working on at the moment will have sync encoded which works out to 100 kHz with extra RF carriers added (from 192 to 200). Grant, VE3XTV

Summary of 10 meter, NBTV Meeting

Dave, AH2AR

The recent YOU-TUBE presentation by Grant (ZL1WTT) explored his development of a Narrow-Band TV (NBTV) digital mode for HF amateur radio communications. The video outlined the software setup, configuration, and the challenges associated with running high-bandwidth video over limited amateur radio spectrum. In the video, Grant explained that while he has managed to achieve results with bandwidths as low as 200 kHz to 300 kHz, he considers 100 kHz to be the absolute practical limit for his digital NBTV system to maintain the desired resolution and frame rate.



Grant, ZL1WTT

Grant noted that reducing bandwidth for moving images requires significant trade-offs compared to traditional Fast-Scan Television (FSTV), which typically occupies much wider channels. His approach to achieving this involves a hybrid system that uses:

- * OFDM (Orthogonal Frequency-Division Multiplexing): Utilizing 192 carriers to mitigate the effects of phase noise common on HF bands.
- * Digital Multiplexing: Encoding audio and video together into the data stream.
- * Analog-style Visual Compression: Heavily compressing the chrominance signal and motion frames to fit within the constrained bandwidth.

Key Highlights of his Presentation:

- * Software & Setup: Grant demonstrated how to run his custom Gambas and Python-based encoder/decoder system alongside GNU Radio. He emphasizes the importance of setting correct directory permissions and ensuring proper UDP port alignment for system communication.
- * System Requirements: The system is resource-intensive, requiring a modern, high-performance computer. Grant explained that he is currently using an aging i7 system that struggles to maintain the target 12.5 frames per second, often hitting 100% CPU usage. A gaming computer would work much better with this software.
- * Operational Details: The mode uses an OFDM (Orthogonal Frequency-Division Multiplexing) scheme with 192 carriers to minimize phase noise and handle the constraints of HF propagation. The system is a hybrid, combining digital processing with analog-style visual compression to achieve a resolution of approximately 120x96 6 pixels.

-- Grant demonstrated how to run his custom Gambas (Visual Basic for Linux) and Python-based

Encoder/Decoder system alongside GNU Radio Modulator/Demodulator.

-- He emphasizes the importance of setting correct directory permissions and ensuring you are able to run the software, Communications are via UDP ports for system interfacing.

-- visual compression to achieve a resolution of approximately 120x96 with four different transmission TV modes.

Grant explained that the absence of error correction in his NBTv system is a deliberate design choice intended to maximize bandwidth efficiency.

Key reasons for this decision include:

* **Bandwidth Constraints:** To maintain the target 12.5 frames per second with a resolution of 120x96 pixels within a very narrow channel, there is no available room for the extra data overhead that error correction requires.

* **Efficiency Trade-off:** Implementing error correction would consume a significant portion of the available bandwidth—potentially 40% to 50%—which would likely cause the system to fail given the limited spectrum available on HF.

* **Visual Characteristics:** By omitting error correction, the system is designed so that any data corruption manifests as noise in the picture, similar to traditional analog television systems, rather than causing the digital stream to completely collapse or break down.

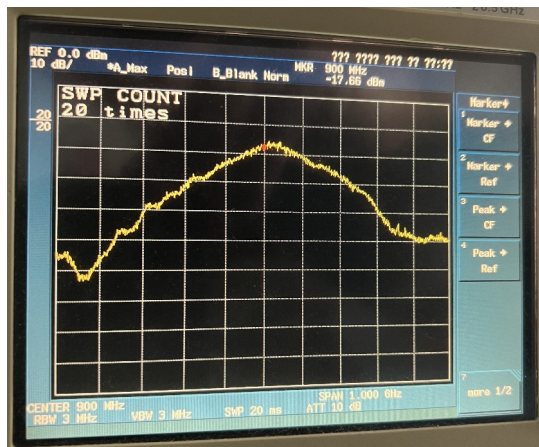
Future Goals: Grant discussed the need for GPU-accelerated processing to optimize performance and plans to integrate an automatic synchronization (sync) trigger to improve the reliability of the image transmission, which currently requires manual delay adjustment.

Grant concluded by noting that while the current setup is limited by his hardware and lack of access to an HF antenna, the project serves as a proof of concept for high-frame-rate television over narrowband channels. A tip of the hat to Grant's implementation of HF Fast Scan. Maybe petitions to the FCC will free up some unused band segment space on 10 meters so U.S. hams can transmit using this Fast Scan ATV NBTv mode!

- RF Controller: An [ITG] flex-RF controller is included to manage the RF output from the exciter to the Power Amplifier (PA) as part of the Linux computer's functions.

- Linear Power Amplifier: Features a linear power amplifier with options for 1.5W, 3W, or 5W.

ATV Journal - Reprinted: The most recent (Sept/Oct) issue of the Surrey, B.C. Amateur Radio Club's SARC "Communicator" newsletter includes an article reprinted from our newsletter. It was "Cheap ATV ? - an Editorial".



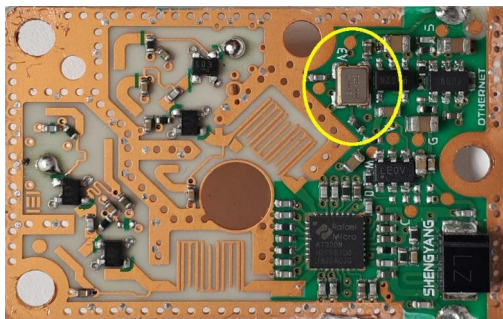
900 MHz center freq. 1 GHz span
10 dB/div & 100 MHz/div



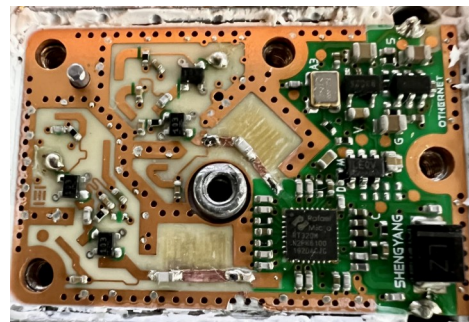
X band wave guide transition to
Bulls Eye LNB for testing

BULLS-EYE LNB contd.

Mike Henkoski, KM7MH, writes --- "A search revealed no published band-pass characteristics for the Bullseye LNB. The image is the IF output centered at roughly 900 MHz for a sweep 10 to 11 GHz at -70 dBm. LNB input was through a coax transition. I'm sure there are others that have wondered what the band-pass looks like. Very poor sensitivity on my in-band 10.2 GHz input is what caused me to investigate.



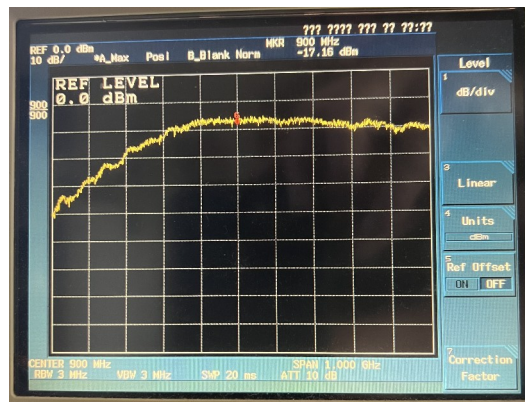
original PCB



PCB with filters removed

Since I'm employing an iris filter on the front end I decided to remove the onboard inter-digital filters to see if the lower frequency response of the pass-band could be improved. There was an overall flattening, but not what I hoped for at the lower end, possibly due to the physical feed geometry.

Final word. Direct PCB signal connection to the LNA exhibits the same low frequency roll off as connection via waveguide indicating that the LNA frequency response is the limiting factor.



Modified frequency response after
removing filters

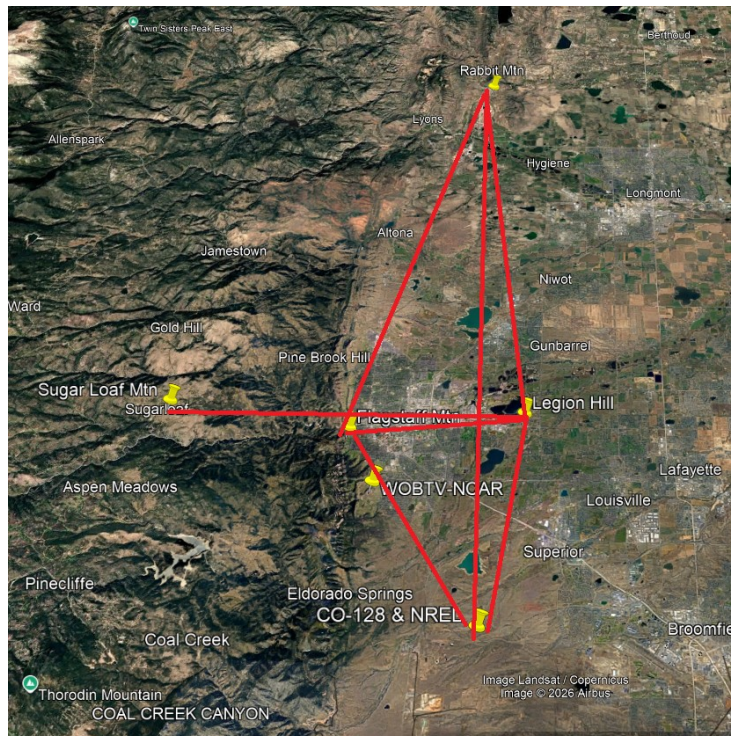
New KH6HTV App. Note: While this new app. note is not directly related to our ATV hobby, I still wanted to alert our readers to it. After 35+ years, I decided to reveal the details of an invention of mine. The app. note is AN-79 entitled *"The ANDREWS Non-Reflective, Low-Pass, Risetime Filter"*. It is available as a .pdf download from my web site: <https://kh6htv.com/application-notes/>

Boulder ATVers Again on the 3 cm Band !

On Sept 16th, members of the Boulder Amateur TV Club (BATVC) once again headed out into the field to exercise their 3cm, 10 GHz, DVB-T rigs. They went to five separate locations through out Boulder County, Colorado. The farthest distance between sites was 37 km. The best site with a view of all the other sites was Legion Hill just east of the city of Boulder.

Chris, K0CJG, and Pete, WB2DVS, set up their rigs on Legion Hill. Don, N0YE, went south to the site we call "Windmills" or CO-128 & NREL. Bill, AB0MY, went north

to Boulder County open space called Rabbit mtn. Jim, KH6HTV, setup on Flagstaff mtn. Steve, WA0TQG, operated from his home qth on Sugar Loaf mtn. in the western mountainous part of Boulder



County. Steve's microwave, narrow field of view is restricted to strictly due east down Boulder Canyon. So from his qth, he is only able to work Legionnaire's Hill.

The distances between the various sites were: Legion Hill to Sugar Loaf = 18 km, to Rabbit mtn = 26 km, to NREL = 11 km and Flagstaff = 9 km. From Rabbit mtn to Flagstaff = 27 km, to NREL = 37 km (the max.) From NREL to Flagstaff = 13 km

Here are the reports and some of the photos from the various stations:

Steve, WA0TQG, reports: On our field tests today, below are the stations I communicated with (both on Legion Hill): K0CJG, Chris; P5 both ways; RX signal level at my QTH -77dBm. WB2DVS, Pete: P5 both ways; RX signal level at my QTH -85dBm. I am using a "combo" receiver, not a Hi-Des. Thus I am unable to report directly receiver S meter in dBm, nor S/N in dB. Note: My RX signal level is based on the spectrum analyzer reading that was calibrated at my 825 MHz IF and with the rest of the measured system gains then factored in for the 3 cm system to the antenna port. I am getting a -112 dBm noise floor and can still receive a video signal down to about -109 dBm. This doesn't quite pass the sanity check so my gain and/or calibration factor calculations must be a few dB off. I am guessing that about 7 to 8dB should be added to these RX signal strength numbers based on the expected RX performance. My 3 cm video TX power is +28.2 dBm (0.66 W) and my antenna gain is measured as +31.3 dBi and I have about 1 dB of coax feed line loss. This gives and ERP of +58.5dBm (708W).

Pete, WB2DVS, reports: I was on Legion Hill. I worked AB0MY on Rabbit mtn both directions P5. Also WA0TQG on Sugar Loaf both ways P5. I only received KH6HTV on Flagstaff at P5. My 3 cm transverter puts out +24 dBm with an antenna gain of 27 dBi. It was a good morning.

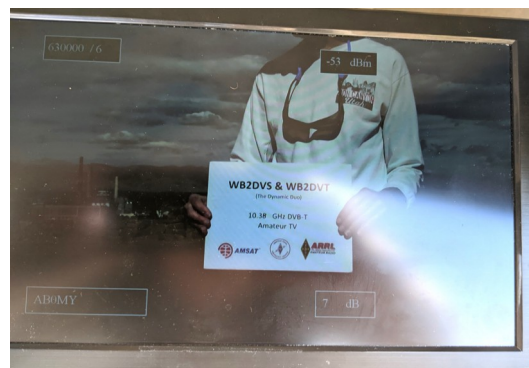
Chris, K0CJG, reports: I too was on Legion Hill. I only worked 2 way to Steve. The only other signal I received was from Jim. Steve, Don, Bill and NCAR all receive my signals P5. I believe there is a problem in my receive path because I was not able to copy Bill but Pete did so easily. Also, later Steve and I tried to establish thresholds for copying each other. I could add 26 dB to attenuate my signal to him until I hit his threshold, but only 13 dB to my receive path until I hit threshold for his signal on my end. I'm guessing my receiver is down ~20 dB from where it should be. No idea why at the moment. My transmitter power was +20 dBm and my antenna gain was about 30 dBi.

Don, N0YE, reports: I was at the "Windmills" site (CO-128 & NREL). My best DX was 37 km north to Bill, AB0MY, at Rabbit mtn. He received me at P5, but I was unable to see his signals. Sun glare on my "hero" photos make it difficult to see that they really were solid P5 digital videos. My rf power was +20 dBm to a 12" dish antenna. I also validated that I could get a good signal into our W0BTV-ATV repeater at NCAR.

Bill, AB0MY, reports: I was up north at Rabbit mtn. I received a signal from Don, 37 km away. I had a two way, P5, DATV contact with Pete only. What was unusual was also receiving a reflected P5 signal from Pete while he had his beam pointed 180 degrees away from me towards Don. We eventually determined that I was seeing a reflection off of one of the nearby cars in the Legion Hill parking lot. Like Jim's antenna situation, I too am not using a dish reflector. For receive, I am

simply using a Bulls-Eye LNB direct. For transmit I am using a separate circular feed horn salvaged from an LNB. See my photo.

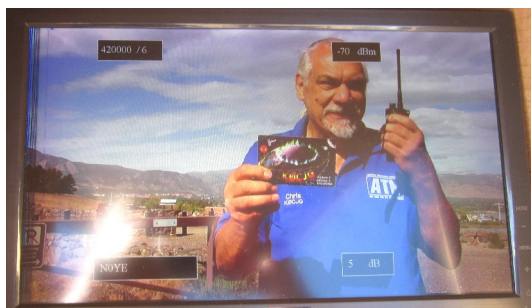
Jim, KH6HTV, reports: I was on Flagstaff mtn. at Panorama Point, 1/2 way up the mountain side. I had receiving problems and was unable to even see my own signal, but I was able to transmit and my signal was received P5 at Legion Hill and Windmills. Later, once back home, I realized that it had not been a visit once again from the infamous Dr. Murphy. This time the problem was old Dr. "Dumb" Jim. I had programmed the wrong IF frequency into my DVB-T receiver. UGH ! My transmit power was +17 dBm. My transmit antenna was a 17 dBi X-band waveguide horn. My receive antenna is a Bulls-Eye LNB. No dish reflectors used.



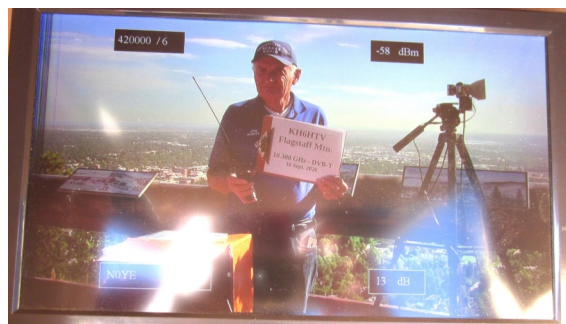
DATV signals received by Bill, AB0MY, at Rabbit Mtn. (left) 37 km longest DX of the day. Don, N0YE, at "Windmills" 8 dB S/N. (right) "REFLECTED" !!! signal from Pete, WB2DVS, on Legion Hill, 9km, 7 dB S/N



(left) AB0MY, Bill's equipment setup at Rabbit mtn. (right) NOYE, Don's signal from NREL Windmills site, relayed back to him on 70 cm from W0BTV-ATV repeater at NCAR. Camera is looking towards the Boulder Flat-Iron mountains and also NCAR.



(left) K0CJG's signal received by N0YE



(right) KH6HTV's signal received by N0YE



(left) K0CJG's signal received by WA0TQG



(right) WB2DVS's signal received by WA0TQG



(left) WA0TQG's signal received by K0CJG



(right) KH6HTV's signal received by K0CJG

Well, as usual, on this 10 GHz outing, we won a few and lost a few. Steve, Bill and Pete seemed to come away as the winners with no operating issues. Their rigs seemed to perform fine for them. The rest of us have some bench work ahead of us to work out the "bugs". Also listening to our 2 meter FM voice chatter on 146.76 vividly demonstrated the antenna alignment frustrations with using really big dish antennas with gains in the 27 to +30 dBi range. The pointing of the smaller, simpler, waveguide horns was much simpler. But the trade-off was at least -10dB or worse in antenna gain.

Newsletter Details: This newsletter was started in 2018 and originally published under the title "*Boulder Amateur Television Club - TV Repeater's REPEATER*" Starting with issue #166, July, 2024, we have changed the title to "*Amateur Television Journal*." This reflects the fact that it has grown from being simply a local club's newsletter to become the "de-facto" ATV newsletter for the USA and overseas hams. This is a free ATV newsletter distributed electronically via e-mail to ATV hams. The distribution list has now grown to over 900+, both in the USA and overseas. 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.

Newsletter Archive: All past issues of the newsletter are archived on the web site: <https://kh6htv.com/newsletter/> A free DVD with all past issues is available upon sending an e-mail request to the editor.

Boulder CO - W0BTV Details: **Inputs:** 23 cm Primary (CCARC co-ordinated) + 70 cm & 3 cm secondary all digital using European Broadcast TV standard, DVB-T with standard 6 MHz wide TV channels. Frequencies listed are the center frequency of the TV channel.

23 cm = 1243 MHz (primary), 70 cm = 441 MHz & 3 cm = 10.380 GHz

Outputs: 70 cm Primary (CCARC co-ordinated), Channel 57 -- 423 MHz with 6 MHz BW, DVB-T

Also, secondary analog, NTSC, FM-TV output on 5.905 GHz (24/7 microwave beacon).

Operational details in AN-51d Technical details in AN-53d. Available at: <https://kh6htv.com/application-notes/> 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. ATV nets are streamed live using the British Amateur TV Club's server, via: <https://batc.org.uk/live/> Select *ab0my* 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).

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

Boulder Amateur Radio Club (BARC)

BARCfest Hamfest

Ham Radio and Electronics

Sunday, October 4, 2026, 9 am to 1 pm

Boulder County Fairgrounds -- Exhibit Building

(Just north of the Hover Rd. & Nelson Rd. intersection in Longmont, Colorado)

Admission \$5 – Under 18 Free with Paid Adult
(Correct Change Appreciated to Avoid Delays at Door)

Lots of Great Treasures

Home of Gift Bag Door Prizes

(Must be Present to Win)

Main Hamfest Doors Open at 9:00 am

Vendor Doors Open for Set-Up at 7:30 am

V.E. License Testing, 10 am

Pre-registration strongly recommended -- walk-ins are possible. Go to BARCfest session at [hamstudy.org](https://ham.study/sessions/6a4a85804ec39875f805fc69/1)

Direct registration link: <https://ham.study/sessions/6a4a85804ec39875f805fc69/1>

For questions write to: barc70@arrl.net

**For more information email to DebbieBARC@gmail.com
or call Debbie (WB2DVT) 303-447-3183**



70-9B front view



70-9B rear view

70cm, 10 Watt (DATV), RF Linear Power Amplifiers -- for Sale

These amplifiers have been used successfully for over 15 years now by digital ATV hams. It is the heart of the Boulder, Colorado, W0BTV-digital ATV repeater. 65 units have been sold and are in DATV service now. The basic amplifier is capable of up to 70 Watts in FM/CW service. It is de-rated to 10 Watts (avg) for digital TV service due to the head-room required for digital signals. With about 55 dB gain, it can be driven directly by a low-level Hi-Des modulator. For more info check out the KH6HTV Video web site: www.kh6htv.com