

Amateur Television Journal

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BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com

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



Hi-Des -- Do We Have a Problem ? Fortunately NO !

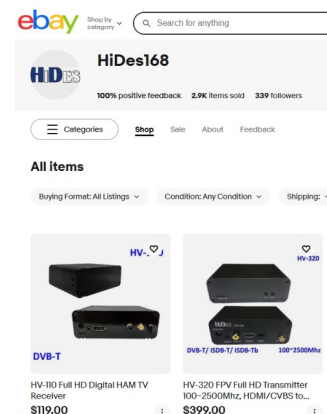
We just received (7/21) this email from John: *"Hi Jim --- In case you haven't noticed, HiDes has just completely changed its website and product line. It looks like they have now abandoned all their previous product lines and*

are focusing on \$\$ stuff for UAV's. I hope that isn't really the case. It looks like Darko Banko's comments at Dayton about HiDes refocusing away from Ham Radio is coming true." 73 de John Kozak : K0ZAK



Following up on John's email, we found that yes, Hi-Des has dramatically changed their web site and are advertising some new products focused on the military drone market where drones have taken over the bulk of the fighting in the Ukraine & Russia and now Iran and middle east. Check them out at: www.hides.com.tw The link to their really old web site has disappeared. Checking their E-Bay site -- it is still active and unchanged still listing the key products we have been purchasing from them, namely their HV-110 receiver and HV-320 modulator. <https://www.ebay.com/str/HiDes168>

We then sent an email inquiry to Hi-Des to clarify the situation, in particular regarding their continued support of the amateur radio / TV market.



We very promptly received this response from Hi-Des:

"Hi Jim --- My old friend — rest assured, we will absolutely continue our ham radio support. The ham radio community has helped HiDes enormously over the years: excellent advice that improved our products, a wealth of field test experience, and generous help in promoting HiDes products.

Our new website is still under construction, but it will include a dedicated ham radio page with links to our original ham products. I really appreciate your advice, and I hope to keep our close relationship with the ham community as strong as ever."

Best regards, Jeff, HiDes

6 MHz vs. 2 MHz & Hi-Des:

I then shared with John, K0ZAK, the good news from Hi-Des. Here are his follow on comments. The issue of narrower band-width suppliers for DVB-T is very relevant to Hi-Des continuing support for ATV.

"Hi Jim --- Very good news! I know you guys in Boulder are using 6 MHz bandwidth, which gives you some Chinese options for modulators, but for us 2 MHz guys there is no other game in town than Hi-Des. At least in a fully built unit.

While I have a Adalm Pluto, a Pluto+, and a HackRF One that will all transmit DVB-T at 2MHz and below, they all require a decent computer full time to control. Most hams I have talked to about them don't want to get so heavily into the computer end of the system.

I do have one China modulator that would be capable of 2 MHz bandwidth transmission if I could modify the firmware. The modulator chip is an ITE chip capable of 1-8 MHz bandwidth, but the current firmware limits it to the commercial 6-8 MHz settings. Unfortunately I am not fluent in firmware decompiling and modification.

If I recall correctly, you introduced me to a couple of hams in California that were working on modifying the firmware of a Thor modulator for 2 MHz bandwidth. When I talked to them they said they were close to success. Do you recall this effort?

Anyway, thanks for the update and keep me posted on any further updates." John Kozak : K0ZAK

(Editor's comments) I too am in agreement with John. Most of us ATV hams don't want to become computer geeks to be able to do ATV. We far prefer the KISS solution of being Appliance Operators. The ability to simply be able to buy an off the shelf, plug-n-play box is very appealing. It is a big make or break issue for most hams thinking about getting into ATV - or not. -- Jim, KH6HTV

New Application Note

DVB-T Transmitter & Receivers (70cm - 3cm)

This new note AN-78 documents all of the DVB-T rigs I have built and operated for the 70, 33, 23, 13, 9, 5 & 3cm bands. - KH6HTV available from:

<https://kh6htv.com/application-notes/>



70 cm



5 cm



3 cm

BCARES & Colorado ARES PR:

Allen Bishop, K0ARK, BCARES E.C. and Jim Andrews, KH6HTV, were the featured speakers on the July session of Colorado ARES E.C. training. It was a Zoom meeting hosted by the state of Colorado E.C. Perry Lundquist, W6AUN. The topic was ATV in ARES. The meeting was held on Saturday, July 18th. There were 37 participants in the Zoom meeting.

Then again on Thursday, July 23ed, Allen and Jim repeated their presentation, but this time as a live, in-person talk and ATV demo for the Douglas and Elbert County ARES group. The meeting was held in the Douglas County Sheriff's sub-station in Highlands Ranch



Allen, K0ARK

Feed-Back Western Vision Network:

In our recent previous issue #214, we talked about "Early ATV in Denver". Well at the Douglas County ARES meeting, I was pleased to meet Ron Hranac, N0IVN. Ron was one of the founders and the key guru for the Denver Western Vision Network and their ATV repeater. I found out a lot more of their history from Ron. Their group's main mission was working with the Weather Bureau as weather spotters using the TV cameras and repeater. They were not Storm Chasers, but would setup at locations around the Denver metro area and sent their video images of storms, etc. to the weather



Ron, N0IVN

bureau then located at the old Stapleton airport. Ron said things went well until the new Denver International Airport opened up in 1995, replacing Stapleton. DIA was much further out on the prairie north east of Denver. Ron said their repeater's TV signal from Lookout mountain couldn't reach all the way out to DIA. Thus they were no longer able to provide video to the weather bureau. As a result most WVN members soon lost interest in ATV. Ron said they then removed the repeater from

Lookout and gave it away to a ham group in Colorado Springs who had plans to put it on Pike's Peak. He doesn't recall they ever accomplished it.

Looking at Ron's www.qrz.com page, he has had an interesting background in professional TV. There he wrote: "I've worked in the cable television industry since 1972. A past member of the Society of Cable Telecommunications Engineers' national board of directors, I've served as President and Chairman of the Board of that organization. I've written and published hundreds of articles and papers, including amateur radio articles in "73 Amateur Radio," "Spec-Com Journal," "CQ VHF," and contributed to both editions of the "ARRL RFI Book."

Optimizing T-Notch Filter for Maximum Rejection while Minimum Insertion Loss

Chris Grund, K0CJG

During a recent 10GHz DVB-T rig-test outing I was able to view my signal strength and SNR as received by the local area repeater at NCAR (reported in an earlier newsletter). Despite the fact that my signal was very strong into the repeater, the DVB-T SNR was anomalously (only 13dB compared to the expected 23dB). Clearly my rig needed some work.

The design of my 10GHz transceiver uses an Anaren 96340 SSB modulator to up-mix the DVB-T signal at 405 MHz with a 10785 MHz LO from a Magnum Microwave "brick" oscillator to generate the 10380 MHz transmitter signal that is then input to a Harris 076-10192 LNA/AGC used as the final power amplifier before the antenna (in principle delivering ~10 dBm DVB-T signal output power as indicated by an HP 432A power meter).

To diagnose the transmitted DVB-T SNR problem, a Rigol DSA-815 spectrum analyzer (max frequency 1.5GHz) was used to view the 10380 signal down-converted to 630MHz by an Edision satellite LNB. As can be seen in the SA scan in Fig. 1, the down-converted 10380 signal output from the PA contains both the desired 6 MHz wide DVB-T signal (630 MHz) and a large leakage component 405 MHz above at the 10785 MHz LO frequency (1.035 GHz in the scan). Also evident in the scan are additional low level spurs at 405 MHz and 225 Mhz that do not appear on the output of the SSB modulator, so I assume they are generated in the PA.

I thought perhaps the LO leakage was causing some compression or other distortion of the DVB-T signal leading to the SNR degradation, and transmission of the LO spur is also undesirable. Suppression of the spurs requires a bandpass, low pass or notch filter, but the proximity of the two signals is such ($\Delta f / f \sim 4\%$) that sophisticated multistage bandpass or low pass filter would be required to be effective, and the insertion loss (IL) of such filters can also be several dB or more. Given the low power of my system, every dBm counts.

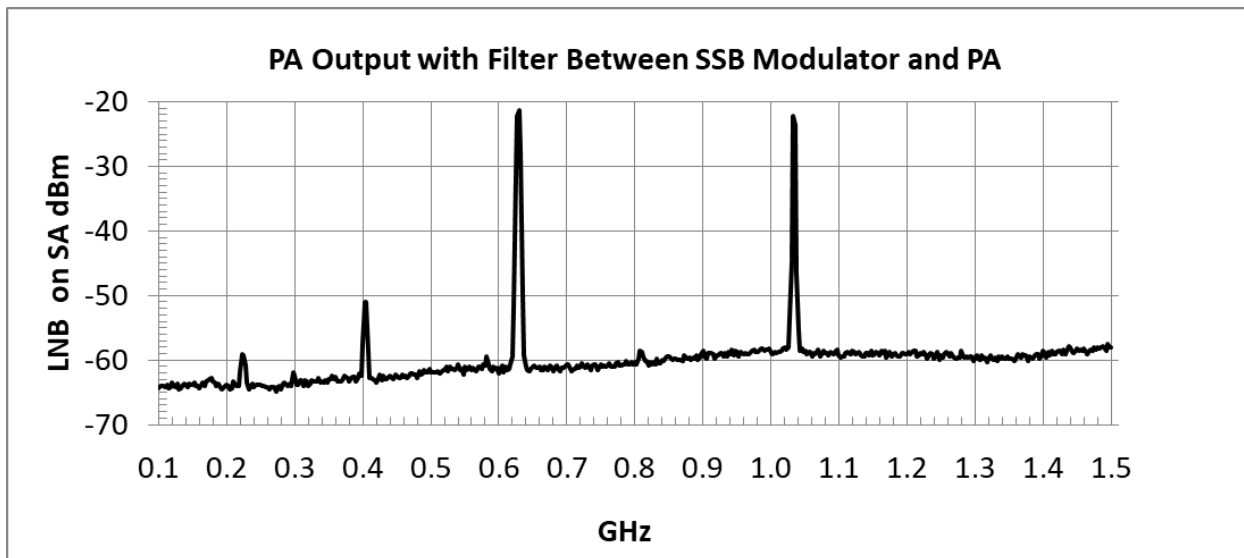


Figure 1 Spectral scan of the power amplifier output before adding the filter.

In contrast, T-notch filters are very simple to construct and tune for signal rejection at a specific frequency, requiring only a coax stub of some even multiple of $\frac{1}{2}$ (shorted end), or odd multiple of $\frac{1}{4}$ (open end) of the notch wavelength to return a 180 degree out of phase reflection to the T-junction, effectively cancelling the troublesome signal. These filters have a periodic response function, with the 1st order stub length given by L_o for open end and L_s for shorted end:

$$L_o = c * VF / 4f \quad L_s = c * VF / 2f$$

where c is the speed of light, VF the velocity factor in the coax, and f is the notch frequency.

At X-band frequencies and coax velocity factor of ~ 0.7 , this makes the 1st order stub < 1 cm long. The problem with this approach is that no account is taken of the reflection interference at the desired pass frequency, resulting in some cancellation of that signal and contributing to IL. However, by making the stub long enough so that the desired and rejected frequencies are naturally 180 degrees out of phase with each other when they reach the end of the stub, then trimming the end for best notch, both the desired frequency IL and the spur frequency can be simultaneously minimized.

The length L of a piece of coax required so that two frequencies are 180 degrees out of phase when the reflection from an open or closed end reaches the signal injection point is :

$$L_{180} = c * VF / 4 [f_2 - f_1]$$

where f_1 and f_2 are the desired and rejected signal frequencies, respectively. Of course, for this application, the stub could be half of L_{180} because the signal travels both ways in the stub. In my implementation, I did not opt to take advantage of this shortening in case I needed the extra length for more tuning attempts.

Fig 2. Shows my filter implementation, employing an SMA Tee, an SMA bulkhead connector, and an RG-402 semi-rigid open-ended coax stub, installed between the RF output of the SSB modulator and the input to the PA.

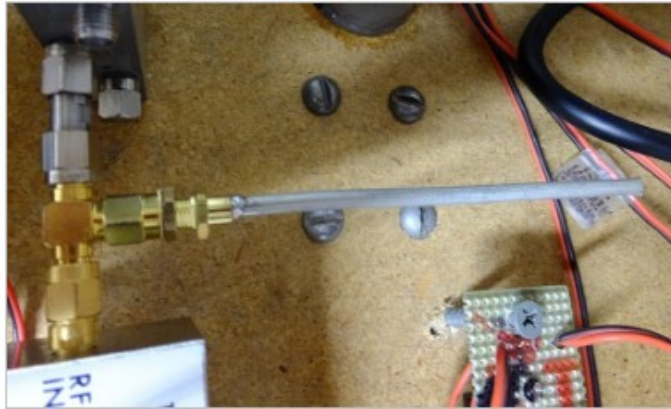


Figure 2 Optimized length T-Notch filter as implemented.

After installation, the SA was used to tune the filter for deepest notch at the LO frequency by trimming the open end stub length with a Dremal rotary tool using a small drum sander attachment. This step is very touchy. I made my stub a few $\frac{1}{2}$ wavelengths longer than optimal including the segment in the SMA tee (143 mm for this case). As the notch is approached, I found grinding ~ 10 microns at a time (estimated not measured) is necessary to capture the deepest response. I missed the notch on the first two tuning attempts, but noted the best dB difference between the desired to nulled signal. Third time was the charm, since I knew where to stop for best response. The final response is shown in Fig. 3. The measured IL is 0 dB (yes!) and the LO spur is -18.1 dB, compared to the before scan in Fig.1.

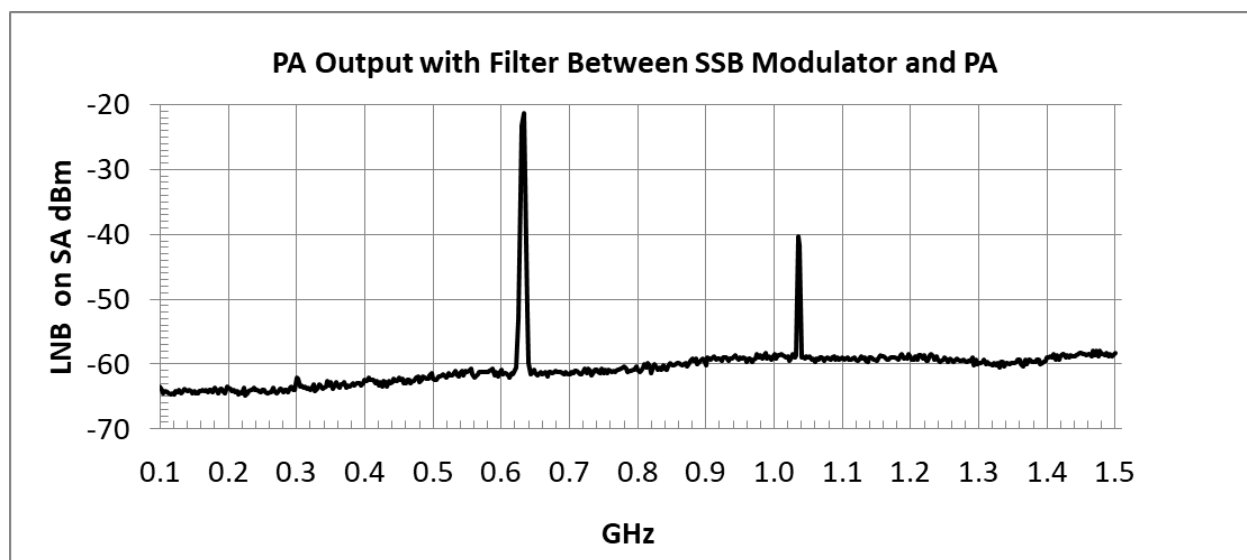


Figure 3 Final result scan, output from the PA after precision tuning the filter.

I found that tightening or loosening the SMA connection to the stub could easily ruin the notch depth (and was impossibly difficult to use as a tuner). If I make such a filter again, I think a direct solder connection would be more stable, with SMA connections on the thru coax. The choice of attaching the stub with an SMA bulkhead was fortuitous in that the nut supplied with the connector could be used to tightly jam the connection before tuning the stub so it cannot be easily disturbed. I suppose, a future project could be adding a second stage to further improve rejection, given that choosing the length by this method introduces minimal IL and when one section is tuned on frequency, there should, in principle, be no interaction between it and the second section.

So, did suppressing the LO spur reduce compression of the DVB-T signal? NO! Apparently, the PA has poor tolerance for wideband signals. To achieve the desired 30dB flat-top to pedestal knee DVB-T signal profile (needed for good received SNR) out of this PA required input attenuation resulting in a DVB-T output power of only 0 dBm.

A different PA, currently on order, will hopefully develop more useful output power before signal compression occurs. However, this filter exercise was fun and very instructive!

73 de Chris, K0CJG, Boulder, Colorado

Observations on DVB-S vs. DVB-T

There is an on-line forum DATV group called: <https://groups.io/g/digitalatv/> As part of a recent discussion about narrow-band DATV on 10 meters, Michael, HB9AFO, and Andrej, S57RW, have posted replies. As part of their comments, they have also included some of their personal observations about the differences they have noted between DVB-T and DVB-S. I am reprinting them here.

HB9AFO: *"Since years, I have done a lot of tests and QSO with DVB-T, and you are right, this mode is very efficient in UHF, in mountain regions like Switzerland, especially in mobile. It takes mountains and buildings as reflectors to improve the signal. So OFDM is better in this case, that's clear."*

DVB-S, S as Satellite, is good to do QSO with small signals, in quiet environments. it's more sensitive than DVB-T but also more delicate. When a QRM or QSB occurs, it de-synchronize and after take a moment to recover. Not good in HF environment."

S57RW, on 10 meter NBDTV: *"2 weeks ago made a field test by transmitting from home and receiving at 2 different locations abt. 4km distance both DVB-S2 and DVB-T 250 kHz BW for comparison. For DVB-T reception I have the BATC Knutcker receiver + upconverter which can receive down to 150 kHz BW. For TX I'm using the portsdown where I can select 125 or 250 kHz BW so the 250 is the lowest I can go. For DVB-S2 RX I'm using SDR-Television."*

Results as expected on 2nd receiving location where I didn't have line of sight and some QRM DVB-S2 decoding was problematic. With DVB-T on the other hand had uninterrupted decode. On DVB-T 250 kHz BW I can encode a standard definition 25 fps video using H265 and 16QAM."

Now all above maybe bit off-topic but I have a concern if in my country is even legal transmitting 250 kHz BW on 29 MHz. Our legislation says only about frequencies assigned to ham radio and max allowed power. There is a note about BW for bands we got in recent years like 630m, 60m and 8m but nothing for 10m. In a band plan publication from our national Ham association it says for BW to reffer to the IARU-R1 band plan if not specified otherwise. IARU says max 20 kHz on 29 MHz if I'm not mistaken. Maybe topic of dispute but can happen 250 kHz BW is too much..."

Another FREE ! ATV Newsletter



Art Towslee, WA8RMC, the editor of the ATCO Newsletter, writes --- "This is a free Newsletter so if you know anyone that would like to be included in these mailings, let me know by replying to this memo along with their name and Email address.

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The ATCO newsletter is the official publication of a group of amateur television operators known as "AMATEUR TELEVISION IN CENTRAL OHIO Group Inc" published quarterly (January, April, July, October)

Also, if you have any information that is newsworthy, please forward it to me. It need not be in good form, a hand written memo will do. I will clean it up if necessary. I'm always interested in what other people and clubs are up to." Art's email is: art.towslee@gmail.com

NICE AWARD !

TNX Mario & San Diego DATV Society

Technical Award 2026:

In recognition of your Boulder Amateur Television Club and members outstanding technical achievement, innovative contributions, and pioneering advancements in the field of Amateur Radio Television (ATV) technology and engineering.

We thank you very much for your programming each week and throughout the year. 73 de Mario, KD6ILO



W8DMR – SK:

Its 'with a heavy heart that I was informed of W8DMR Bill Parker's passing on 24 July 2026. If you did not know Bill, to say that he was very heavily involved in ATV and amateur radio would definitely be an understatement, Because Bill provided many lasting contributions to the Amateur Radio Community. Beyond his personal technical builds, Bill dedicated

his time to expanding the reach of the hobby through publications and local leadership. Bill was a key contributor to publications like SPECOM Journal, ATVQ and Radio-Electronics. His step-by-step guides took the intimidation out of home-brewing and modifying ATV gear and he enjoyed presenting talks regarding other electronics hobbyist interests. Based out of Columbus, Ohio, Bill was deeply involved with the Dayton Hamvention ATV Forums, collaborating with others to showcase ATV projects. Known as a true "Elmer", Bill spent countless hours responding to letters from amateur builders, distributing handout materials at regional club meetings, and helping clubs establish operational local ATV repeaters. Bill will be sorely missed.

Tnx to Dave, AH2AR, for sending this

Greetings from KH6 islands:

You are getting this issue of the ATV Journal from the Hawaiian Islands, rather than Colorado. Janet & I are visiting our son, Steve, and wife, Victoria, in their new home on the island of Maui. Writing this from their tropical paradise backyard. They lost their home in the August, 2023, Lahaina fire and relocated to Florida. They didn't like Florida so they sold the Florida house and found a lovely home back here on Maui. They moved back this past winter.

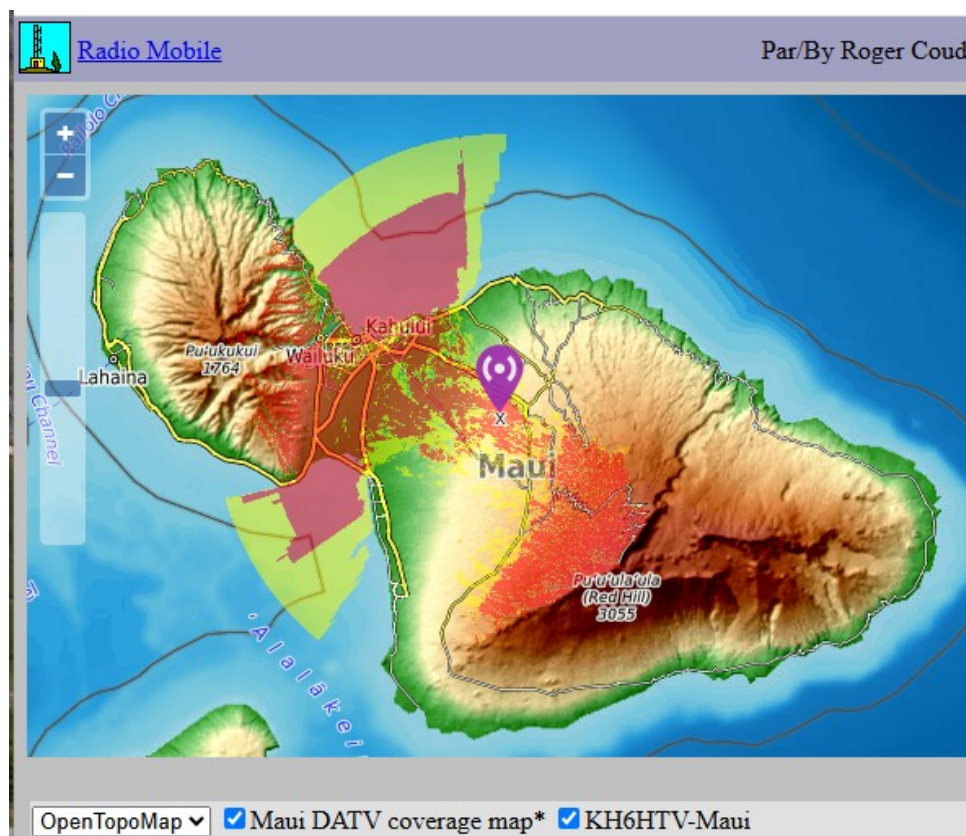


Being here brings back many fond memories of the time Janet & I lived here (2001-2019) as ½ year "Snow Birds" in retirement. We gave up on Maui due to lack of quality medical care on the island. But I sorely miss the island and its life style.

Writing this ATV newsletter from Hawaii – I felt appropriate to again emphasize the importance of making ATV a group effort. When I lived here on Maui, I tried to encourage other hams to also consider ATV. I gave several talks over the years to the local ham club about ATV and also its use for ARES. But I was a prophet crying in the wilderness. I had setup my 70cm, DATV station in our home in Pukalani, Maui. I would transmit a DTV beacon from my QTH, but had zero viewers. I myself was the only viewer. I drove over the island with a receiver in my car simply to verify the coverage area of my DVB-T signal. It worked well into the central valley. We lived at 1200 ft. elevation on the slopes of the 10,000 ft. Mt. Haleakala. See following Radio Mobile coverage map plot.

But the moral of the story – ***"It takes two to tango"***. If you are interested in getting into ham TV (ATV), don't try to do it by yourself. You need to interest at least one other buddy to do it with and preferably at least ½ dozen or more like minded hams. With no one to share your pictures with, you will soon lose interest in ATV.

73 de Jim, KH6HTV, Maui, Hawaii



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).

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