Amateur Television Journal

November, 2025
2ed edition, issue #197

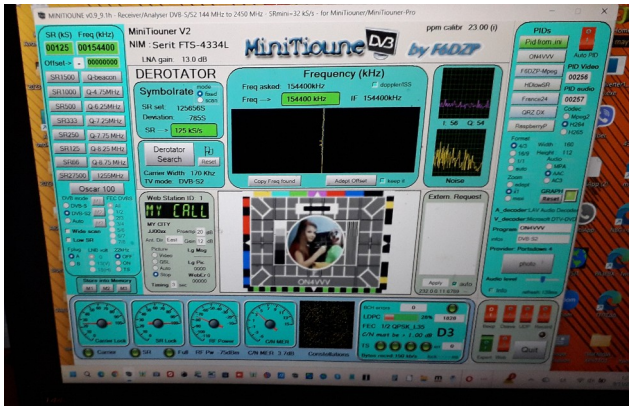
BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com

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

My name is Frans ON4VVV and I am busy with ATV and D-ATV here in Belgium. After the successful D-ATV contact over a distance of 1735km on 51.7 MHz a few months ago with Rino IT9GNJ during a sporadic E opening, I got the idea to try the same on 10m where reasonable conditions are more frequently happening.

Last weekend on Sunday morning I saw that the conditions on 10m were rather good, and I have sent a mail message to a number of contacts across the EU and I posted also a message on the BATC DX-SPOT. Immediately I got an answer from Rino in Catania Sicily but he could not see my signal at all, maybe because he has only a vertical omni-directional antenna while I am in horizontal polarisation.



The second reply came from my Friend Stavros SV1EBS in Athens Greece, immediately he could see my CW signal with S9. Second try with a D-ATV signal 125ks produced almost immediately a picture at his side, (see attached picture)

The contact remained rather stable for a long time: see film here.
https://www.youtube.com/watchv=t0PKCOGkYCg

Even in 250ks Stavros could see my picture for a short time all at the distance of **2124 km**.
My working conditions: a 4 element, mono-band beam at 19 AGL and 400Watts of D-ATV power from a homemade PA. The working conditions of Stavros for RX: a simple dipole for 10m and an upconverter in front of his “minitiouner”. This means that DX contacts in D-ATV on 10m are quite possible, and if the RX section uses a yagi antenna with 10dB gain even a TX power of only 40W should be enough.

All “OM’s” working with D-ATV, please keep an eye on the DX-SPOT on Sunday mornings to see my post, I will be there next time when I happen to be at home combined with good conditions on the 10m band (29.4MHz) You can also send an email to: ***on4vvv@uba.be***

Very best regards -- 73’s -- Frans ON4VVV, Massemen-Wetteren, Belgium

N8GGG

K0ARK

W0BTV Welcomes New/Old ATVers

The Boulder, Colorado ATV Repeater - W0BTV - welcomes two old-timers to the repeater. They are Larry, N8GGG and Allen, K0ARK.

Larry lives in north-east Westminster 23 km from the repeater. Our ATV Signals to his house are just grazing across several miles of flat terrain to the west. It has been a real struggle for Larry to receive signals from the ATV repeater. When they do arrive, they are at best 1 to 2 dB above digital threshold. When propagation conditions change, he loses the signal completely. So, his chances of transmitting to the repeater seem very slim. He recently skirted around this issue with the assistance of Bill, ABOMY, in Boulder. Now Larry sends his video via the internet to Bill. Then Bill patches it into his ATV transmitter and up-links it to W0BTV repeater. See the above photo of Larry. Larry has been successful otherwise on ATV on the 5.8 GHz band using FM-TV on some of our DX-peditions.

Allen lives 13.5 km east of the repeater in Lafayette on the Indian Peaks golf course. He is surrounded by an urban forest of large, mature trees. He has struggled for a very long time trying to get a 70cm signal into the W0BTV repeater. In the past he has been stymied by the severe RFI on 70cm at the repeater site. Most recently, the RFI mysteriously disappeared. So Allen once again has tried to access the repeater. He made several false starts with various positions on and around his house for his 70cm antenna. He finally has made it work and he is now able to send his smiling face across the airwaves. See the above photo. Let's hope next summer when the leaves come back to his neighborhood trees it will still work. Also let's hope the RFI at the repeater site never returns. Allen has been active with ATV through BCARES and the Boulder Sheriff's SWAT team for many, many years. But, working from his home QTH has never seemed to work for him. Allen is also the chairman / EC for Boulder County ARES (BCARES). Congratulations on finally making it work Allen.

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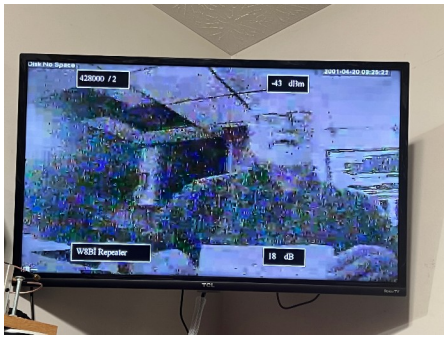
DARA Also Welcomes a New ATVer



Just a quick snapshot to share... Doc, KE8DOC transmitted a preliminary ATV signal with his recently acquired ATV gear at his QTH in Tipp City Ohio. The signal is about a P3 indicating a good path to the Dayton, Ohio, DARA ATV repeater. His analog A5 signal was repeated through the DVB-T system at the site. I am sure that more path tests will be forthcoming, and I am also certain that there is a P-5 picture that will be headed our way, just right around the corner! tnx to Dave, AH2AR

Ham Rocket Men - Launch DVB-T Transmitter

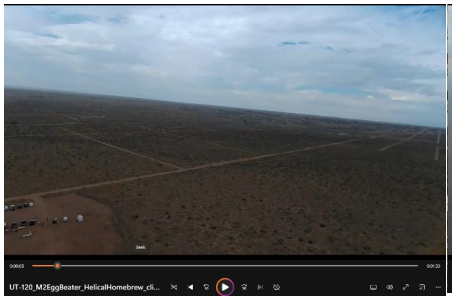
We have just gotten a report with photos and videos from Ken Goldstein, KD5HEH, in Albuquerque, New Mexico about their recent rocket launch on October 11th. ATVers Ken and Tony, KD5CRC, are members of the Albuquerque Rocket Society (***www.arsaq.org***). Ken said "This was a test flight to see how all of the video equipment worked in an actual test flight."

Ken and Tony had designed a custom DVB-T video transmitter around using a specially modified KH6HTV model 70-9B, 10 watt 70cm amplifier, along with a Hi-Des modulator.

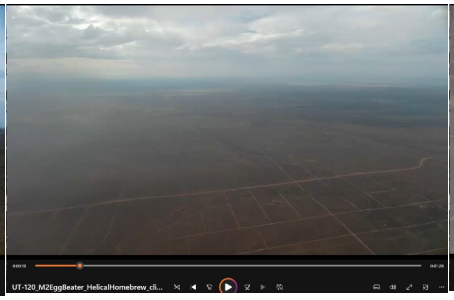
Ken reported major self-made RFI issues with their system. "The video transmit amp had to be set at 3 watts. When I raised it to 10 watts, the entire system stopped transmitting. I had to power the rocket package down and up again. I believe that the RF overloaded the other electronics. Even the VHF radio operated DTMF control board stopped responding with confirmation tones. The video transmits on the UHF band. I need to see if I can resolve this, but worse case we stick with 3 watts. RF was originally a problem with video cameras even at 3 watts. I tried 4 different cameras. GoPros were the worst when it came to RF causing the camera not to work. I wrapped the least affected camera in RF shielding tape which helped."

Part of their test was to evaluate various video receiving setups with different receivers and antennas. What they found worked best was the Hi-Des model UT-120, USB dongle, dual diversity receiver along with two different type antennas on the inputs. The best antenna combo for the diversity receiver was an M-Squared EggBeater antenna paired with a home-brew Helical antenna.
(*editor's note: see our issue #174, Nov. 2024 for an article entitled "Evaluation of Hi-Des model UT-120 Dual-Diversity, USB, DVB-T, TV Tuner Dongle"*)

Here are some screen grabs of the UT-120 recorded rocket video for the 1 minute, 38 second flight. Blow them up on your computer monitor to see the full details. It was obviously a very overcast day.



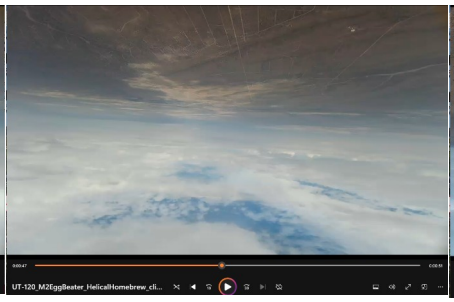
5 sec



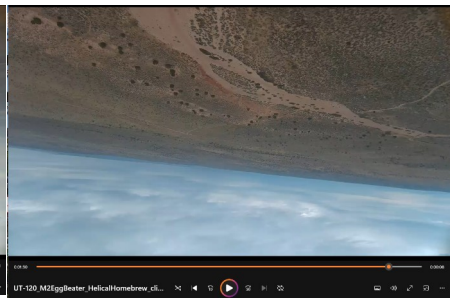
10 sec

26 sec

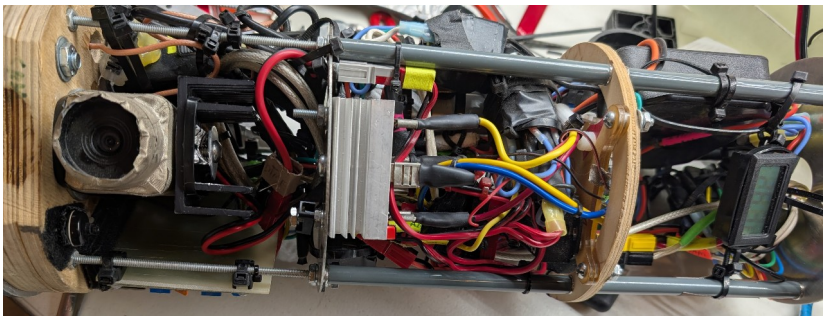
41 sec

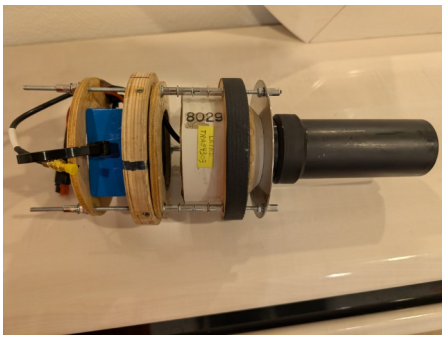


47 sec



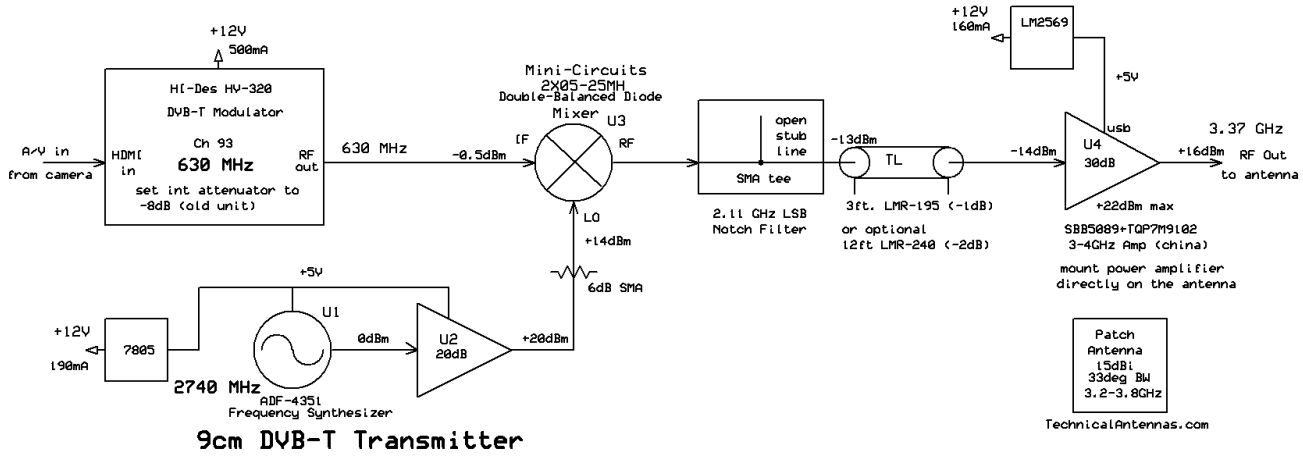
1 min 30 sec





The electronics package complete with video camera, ATV transmitter, battery and antenna

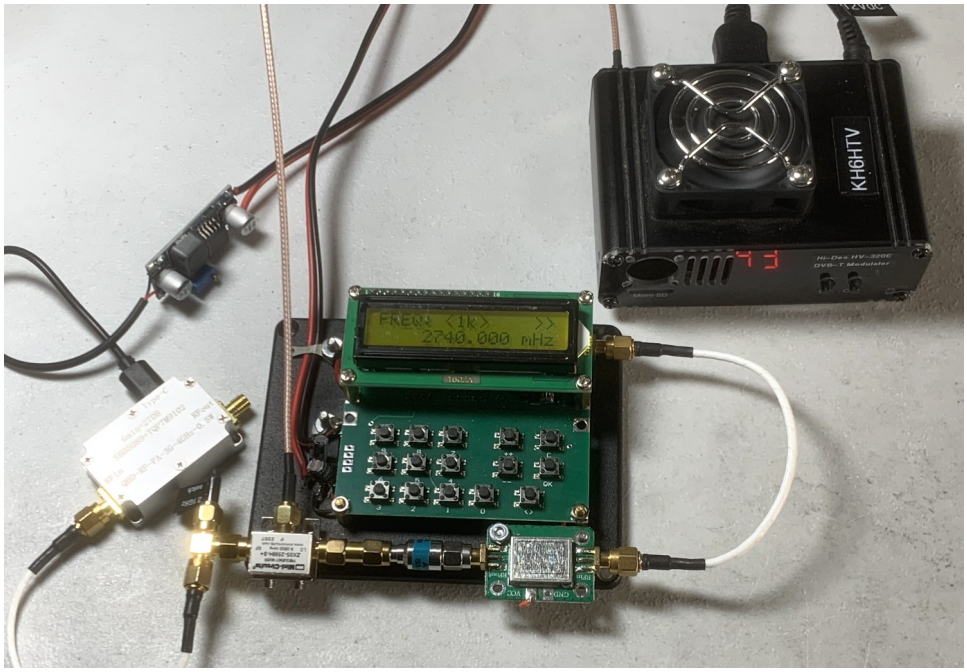
The Launch Pad Ground Station



9 cm DVB-T Transmitter & Receiver

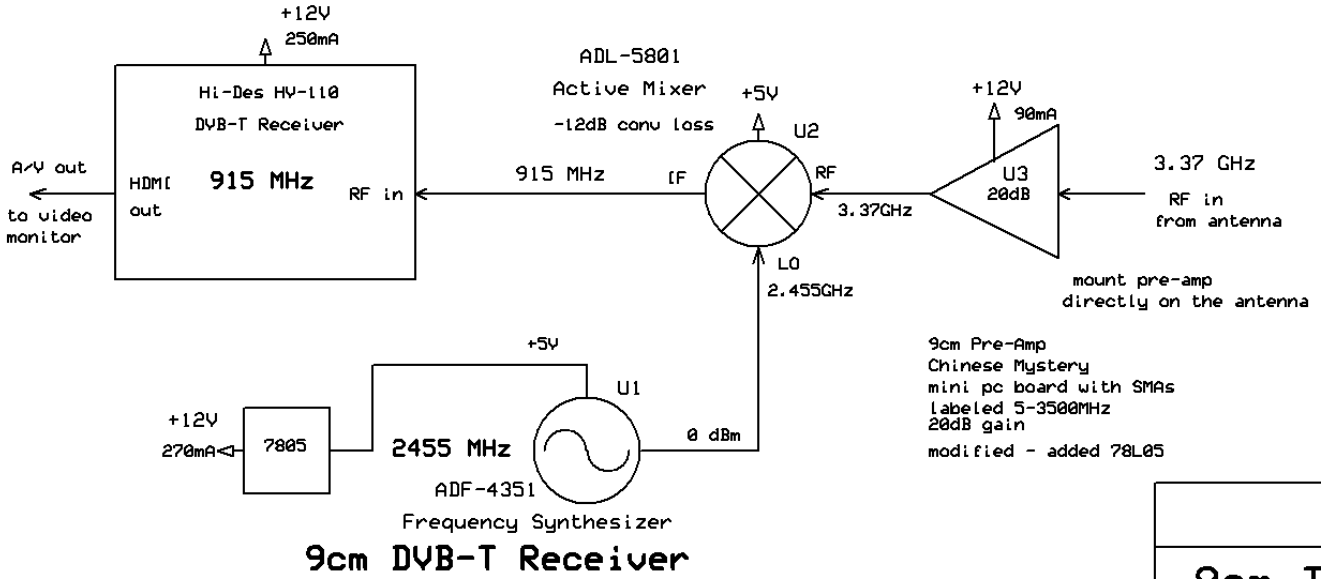
Jim, KH6HTV

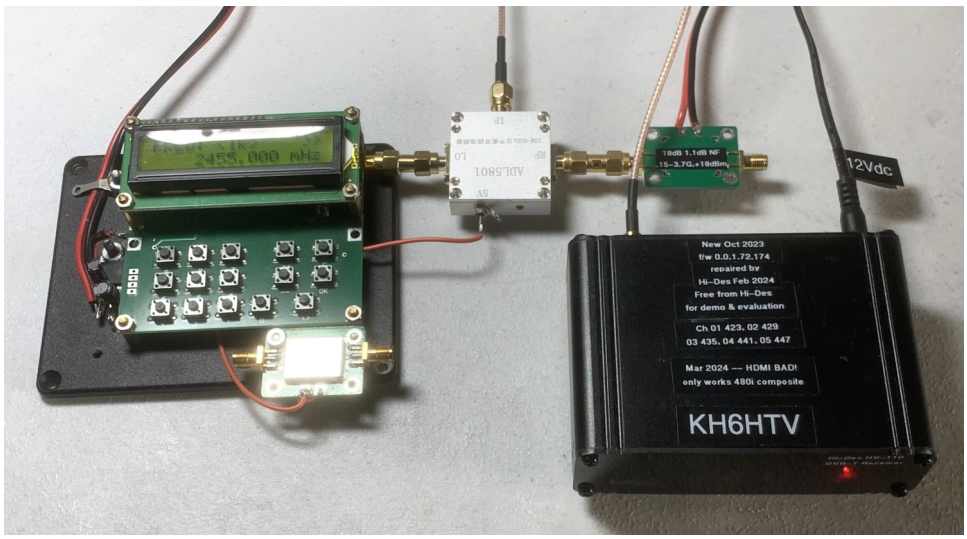
I am on a quest to claim "Worked All Bands - DVB-T". I have personally set an upper limit at the 3 cm, 10 GHz band. The last one which still eludes me is the 9 cm, 3.4 GHz band. I need a separately configured rig for each band. Here I want to document the rig I have lashed together for the 9 cm band, last frontier.



9 cm, DVB-T, 40 mW, Transmitter

The block diagram and photo above show my 9 cm, DVB-T transmitter. I start off with a Hi-Des model HV-320 creating a 630 MHz, DVB-T, IF signal. I then up-convert it to 3.370 GHz using a Mini-Circuits double-balanced diode mixer. For the LO I use an Analog Devices model ADF-4351, 4.4 GHz frequency synthesizer set to 2.740 GHz. The resultant RF output from the mixer is a double side-band signal with rf at 2.11 GHz (LSB) and the desired USB of 3.37 GHz. I use a notch filter at 2.11 to eliminate the LSB. The mixer output is a quite weak signal at -13dBm. I then amplify it with a low cost Chinese amplifier by 30 dB up to a +16 dBm (average power), 40 mW, DVB-T signal. I will normally mount the power amplifier directly on the antenna eliminating any additional coax feed line loss. For an antenna, I will use a 15 dBi patch antenna from Technical Antennas mounted on a camera tripod.





9 cm DVB-T Receiver

For the 9 cm receiver, I use a similar arrangement. Above is shown the block diagram and the actual equipment used. I am again using as the LO an Analog Devices ADF-4351 frequency synthesizer. To avoid desensing the receiver when transmitting, I am using different LO and IF frequencies. The IF chosen was 915 MHz with an LO on 2.455 GHz. This time, the mixer is an active mixer capable of working all the way up to 6 GHz. It is an Analog Devices ADL-5801. Scrounging thru my junk box, I came across a mystery pc board Chinese amplifier labeled as 20dB 5-3500MHz. I found that it worked quite well as a pre-amp. Again like the transmitter, I plan to mount the pre-amp directly at the antenna to eliminate feed-line loss. I measured the digital threshold sensitivity of the mixer/LO alone at a crummy -80dBm. Adding the pre-amp improved things a whole lot pulling the sensitivity down to -91dBm. This was using "Normal" digital parameters of (1080P, H.264, 5.5Mbps - QPSK, 5/6 code (FEC) and 1/16 Guard (sync)). Using aggressive forward error correction (FEC) of 1/2 improves things by an additional 3 dB down to -94dBm.

73 de Jim Andrews, KH6HTV, Boulder, Colorado

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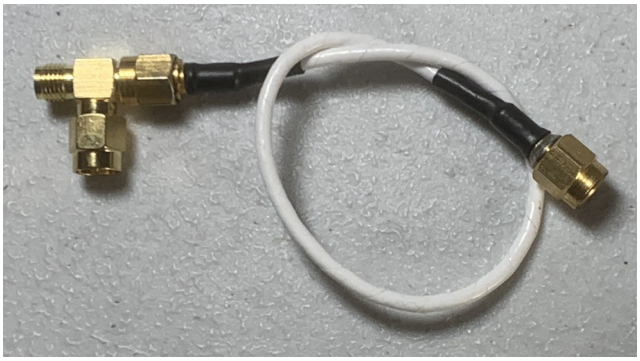
Simple Band-Stop Notch Filter

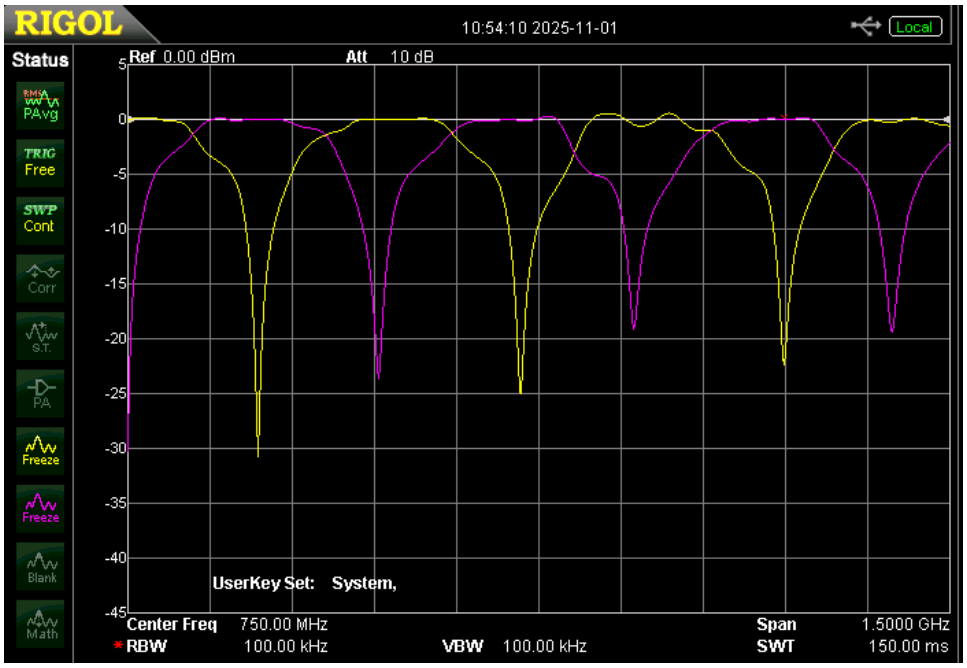
Jim, KH6HTV



Most times when we need filters for our projects, they become major design, construction projects. Sometimes however the KISS principle really works for us. For my 9 cm transmitter, I needed to filter out the lower sideband. It hit me that with the wide seperation between the LSB and USB, I could probably accomplish it with a very simple stub line, notch filter.

Go back to your basic transmission line theory for the answer. Recall that a transmission line can be used as an impedance transformer. Terminate one end in Z1. Then at a specific frequency, move back up the line and the resultant input impedance continually changes as you rotate around the Smith chart. For example, if we put a short circuit (Z = 0 Ω) on the end of cable, then move up the cable 1/4 wavelength, the short is magically transformed to an open circuit (Z = ∞ Ω). Move another 1/4 wavelength to 1/2 λ and you are back to a short, etc.

So we can assemble our filter using nothing more than a simple coaxial tee and an extra piece of coax cable of the suitable length for our desired frequency. The screen grab photo on the next page shows an example of the insertion loss vs. frquency for a simple notch filter using an SMA tee and a short length (≈ 8") SMA coaxial cable. The yellow trace is with an open circuit at the far end of the cable. The magenta trace is with a short circuit. It is especially easy to build and tune the open circuit notch filter. Simply use a scrap piece of coax which had one bad connector. Cut off the bad connector and leave the coax too long to start with. Set up a swept S21 vs. Freq. measurment and watch the response. Then using your diagonal cutters start trimming off small increments of the far end of the cable until you hit exactly the desired notch frequency.



S21 Insertion Loss vs. Frequency of simple SMA Notch Filter
sweep from DC to 1.5GHz, 5dB/div & 150 MHz/div

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FEED-BACK: "Sale of 3.4GHz Band"

(editor's note: This is the portion of the 9cm ham band we recently lost. See how valuable it is ! Use it or lose it.)"

---- So well said, thank you. We tried very hard to get comments and communications and experiments for 3 GHz, and it was not a great feeling when it went the other way. I hope readers take this clear message to heart and find the time and energy to build innovative and fun things for the bands we currently have.

-Michelle Thompson, W5NYV, San Diego, California

BCARES gets New DATV Repeater

W0BCR-TVR repeater

The Boulder County Amateur Radio Emergency Services (**BCARES**) in Boulder, Colorado recently purchased a new 70 cm in-band, DVB-T television repeater. The exact location where it will be installed is still under negotiation. The new site will be chosen to enhance the coverage of Boulder County beyond what is presently covered by the present W0BTV repeater in the city of Boulder.
The new repeater was purchased using funds from a $30,000 grant BCARES received from Boulder County to enhance their communications networks within the county. The repeater was custom built for BCARES by Jim, KH6HTV. It is documented in his application note, AN-71.

BARC Coin

At our recent Boulder Amateur Radio Club (BARC) this was circulating around. So this is what a Bit Coin looks like! Guess I prefer to call it a BARC-coin. We members do play around with lots of electronic circuits --- kh6htv

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/*

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. 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*).

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 800+, 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. 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

Quality Products & Application Notes for the Amateur Radio/TV market www.kh6htv.com

KH6HTV VIDEO is a manufacturer of quality amateur TV products for the 70cm & 23cm bands. The product line includes: RF linear power amplifiers, pre-amplifiers, down-converter, DATV receiver, band-pass filters, antennas & bias tees. Check out our web site: www.kh6htv.com for details plus a wealth of application notes on ATV, both analog and digital.