

# Amateur Television Journal

**December, 2024  
issue #177**

**BATVC web site: [www.kh6htv.com](http://www.kh6htv.com)**

**ATN web site: [www.atn-tv.com](http://www.atn-tv.com)**



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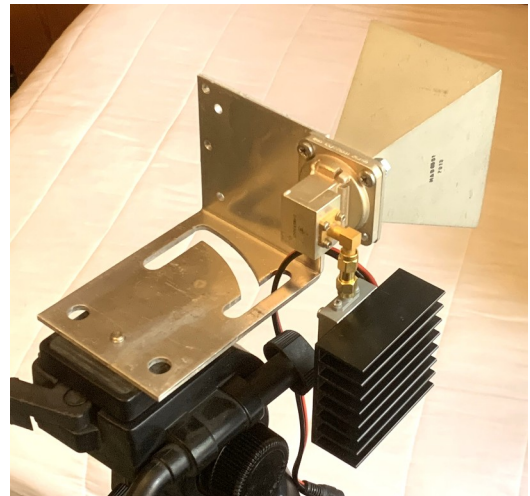


**Third BATVC Member - On the Air with 10GHz  
via W0BTV Repeater**

The most recent technical improvement to our Boulder, Colorado ATV repeater was the addition of a 10 GHz antenna and receiver. It went operational on Monday, Sept. 16th, with Bill, K0RZ, claiming the honors of first to put a signal thru it. Don, N0YE, followed only a couple of hours later. This was documented in our issue #172 of this ATV Journal. Until now, no one else has followed in their pioneering footsteps.

Both Bill and Don are old time microwavers from way back. They have had great home 10 GHz stations for SSB & CW for many years. They both have high gain dish antennas up on their towers on antenna rotators, plus use low loss waveguide as their feedlines. For them it was a straight forward modification to add DVB-T capability to their stations.

On Friday, Nov. 22ed, Jim, KH6HTV, joined this small fraternity of microwave ATV enthusiasts when he was finally also able to put a 10.380 GHz, DVB-T signal into W0BTV. Jim had previously described his DIY, 10 GHz, DVB-T Transceiver in issue #170 (9/2/24). However, at that time Jim was still missing a suitable transmit antenna to complete the rig. Searches for an X-band waveguide horn antenna on the internet only came up with very expensive horns costing many \$100s of bucks. Well, on the weekly ATV net on Thursday, 11/21, Don, N0YE, made Jim an offer he couldn't refuse. Don in rooting around in his infinitely deep, well-stocked, basement microwave warehouse came up with a suitable horn antenna for Jim. Plus Don had already gone to the trouble of mounting it on a custom bracket suitable for attaching to a camera tripod.



*KH6HTV horn antenna + power amp*

This photo shows the new horn antenna mounted on a tripod. The final RF power amplifier was mounted directly to the antenna, thus eliminating any coax cable feed-line losses. The DVB-T rf power from the amplifier was +17dBm (50mW avg.). The gain of the horn antenna had actually been measured by the BATVC gang at our August, antenna measuring outing. That was documented in issue #169 (8/23/24). The antenna gain is 16.6dBi. Thus the effective ERP was about +34dBm (2.5 Watts)

From Jim's present, temporary housing near Chautauqua Park he has zero access to the W0BTV repeater. Any ATV or HF activities must be done mobile. So, on Friday, he drove out east to a very good known location which was clear of all obstructions and had a clear line-of-sight view to the repeater. This was at Baseline Lake on the west side of Cherryvale Road. The distance to the repeater was 3.5 miles. If you go back to issue #172, page 8, we there published a pair of predicted RF coverage maps for the 10 GHz repeater receiver. Baseline Lake is the smaller lake found almost directly east of the repeater site. It is shown in the yellow (weak signal) shaded area for a 50mW transmitter and 17dBi horn antenna. The photo on the previous page shows the successful results of transmitting from this location. The 10 GHz transverter equipment was setup on the passenger seat along with a 70cm receiver and video monitor to receive the 423 MHz output from the repeater. The rf final amp and horn antenna were setup outside the car on a camera tripod. The Canon camcorder

was simply setting on the dash board looking out the window towards the lake. The monitor is showing the video image after being relayed thru the W0BTV repeater.

So, how strong was the signal into the repeater ? The repeater's receiver S meter reported getting a 14dB S/N signal. The receiver had been bench tested for sensitivity. For the digital parameters used, the sensitivity was -93dBm at digital threshold with a s/n of 8dB. Thus, we estimate the signal from Baseline lake was about -87dBm. Definitely in the weak signal area, but it still worked !

Soon after Jim's first signal thru W0BTV, Bill, K0RZ, then came on the air also on 10 GHz. So, Jim then turned his antenna 180 degrees east towards Bill's QTH on Davidson Mesa. Bill reported that he was also able to copy Jim's signal P5/Q5 direct. We were both surprised however, that the W0BTV repeater still kept being keyed up intermittantly by Jim's signal with his antenna pointing in the opposite direction. Was it back-scatter from something ? -- or what ?

OK, so who will be #4 on 10 GHz via W0BTV ? We do know Bill, AB0MY, has a rig in progress. Hopefully we see him and others on the 10.380 GHz input as well in the near future.

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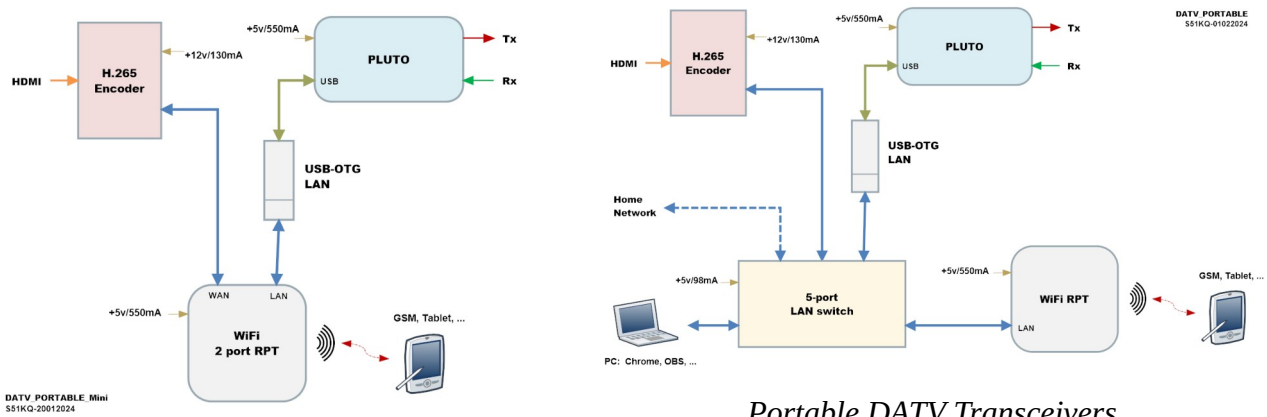


## **SLOVENIA ATV MEETING & PIZZA PARTY**

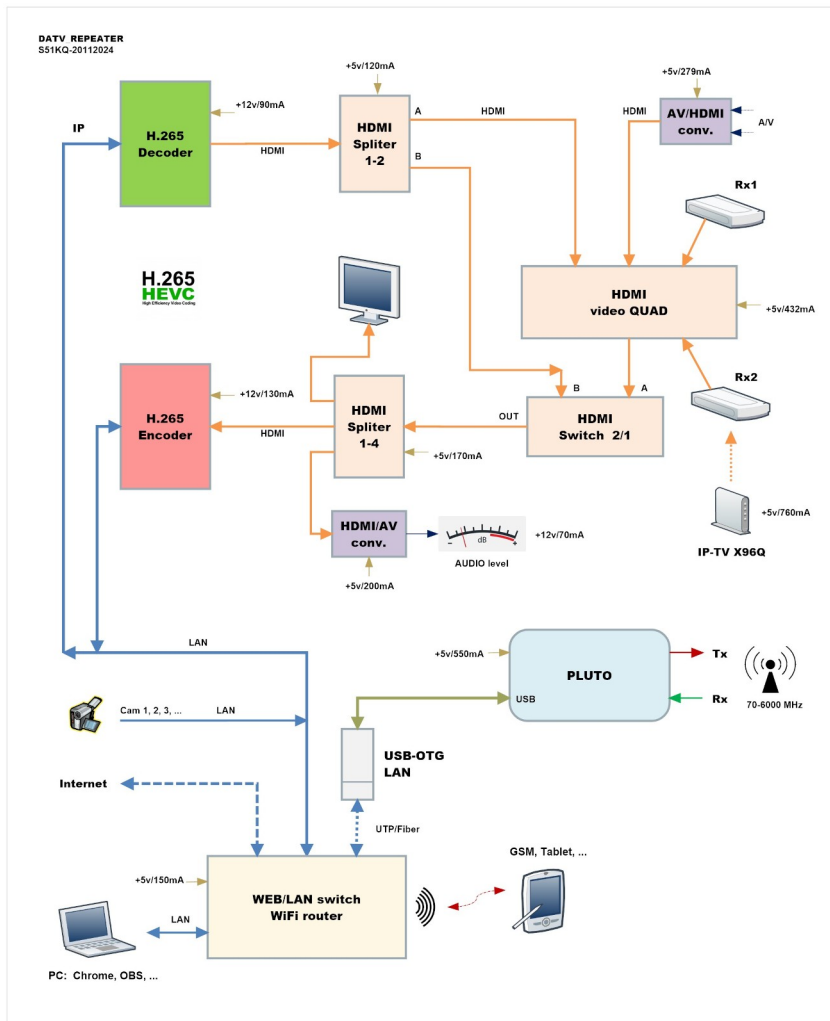
Hello Ciao --- Here are some photos from today's (Nov. 21st) ATV meeting in Kozina, Slovenia. There were 14 ATV hams from Slovenia and Italia present. They were: S58RU, S57W, S57UCB, S57KQ, S52OS, I3FIW, IW3RMR, IK3HHG, IZ3PVF, IU3OGL, S57M8L, S53KP, IV3WSJ & S56FPW. SDR designs for both portable DATV rig and also a DATV repeater were discussed. They are both based upon using a PLUTO SDR transceiver controlled via USB. Here are the relevant block diagrams. I have PDF instructions for the DATV-mini system. The script for the DATV repeater is expected to be compiled in the next months and will be available online or via email.

73, Mijo, S51KQ, Vojnik, Slovenia





Portable DATV Transceivers



DATV Repeater - Block Diagram



Mijo, S51KQ, in his ham shack

## NEW HF/VHF/Low UHF RF POWER AMPLIFIER

Jim, KH6HTV



I have been searching for quite some time now for a really low cost rf power amplifier for the 70cm band, similar to those new 24V ones which have shown up in the past year for the 33, 23, & 13cm bands. I finally found one on E-Bay. Not the same, but a similar design. Quite inexpensive also. I paid only \$50 including shipping.

The key advertised specs are: 25 MHz - 1.2 GHz, 4 Watts, 40 dB gain, 24 Vdc, SMAs, includes attached heat sink and cooling fan.

The amp arrived today (11/24), so I immediately put it on the test bench to see how it performs. I used my Rigol spectrum analyzer with it's tracking generator to test the amplifier up to 1.5 GHz. This is what I found.

1. The DC idling current was 510 mA at +24Vdc.
2. The mid-band S21 gain was 42 dB.
3. The -3 dB band-width end points were 3.5 MHz at the low end and 1.17 GHz on the high end.
4. The max. saturated rf output power was typically about +37 dBm ( 5 Watts ) from 7 MHz up to the 900 MHz band. This was with an rf input power of about 0 dBm.
5. I also tested it on the 23 cm band (1270 MHz). I found it less useful there. The small signal gain was down by -9 dB to around -33 dB. The max. rf output power was also down to +29.5 dBm ( 0.9 Watts ).
6. This amplifier works far better at low frequencies than advertised. Thus, it is very useful on all of the HF ham bands, except for 160 meters. This amplifier with it's high gain, 5 Watt output and broad frequency coverage from the 80 meter band to the 33 cm band would be an ideal candidate for use as the final amplifier in an SDR radio such as the RadioBerry SDR rig, Tom, W0IVJ, showed us in the previous issue #175 (8 Nov.2024).

**DATV AMP:** My objective and hope when I originally saw the advertised specs of 25 MHz to 1.2 GHz was to find a good amplifier for ARES, portable DATV service on all three bands of 70, 33 & 23cm. What I found was an amplifier which satisfied this requirement on 70 and 33 cm bands, but not the 23 cm band. I ran DVB-T tests on all three bands. I used my Hi-Des HV-320 modulator as the driver and set the internal attenuator for the appropriate rf input drive level to have -30dB or better spectrum break point shoulders on the resultant rf output. I then measured the average DTV output power with my HP-432 thermistor rf power meter.

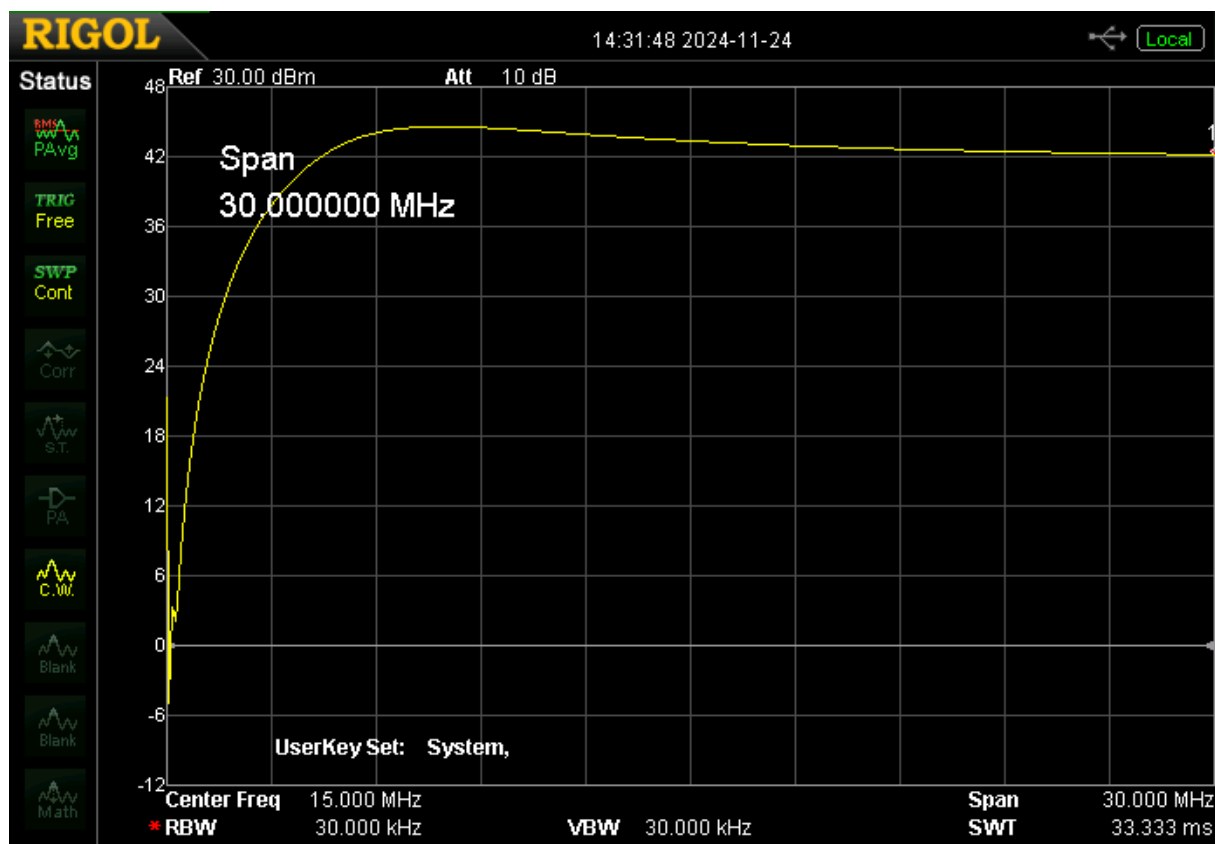
70cm DVB-T: RF power = +29.4dBm ( 870mW ), -33dB shoulders, 520mA @ 24Vdc

33cm DVB-T: RF power = +28.6dBm ( 725mW ), -32dB shoulders, 520mA @ 24Vdc

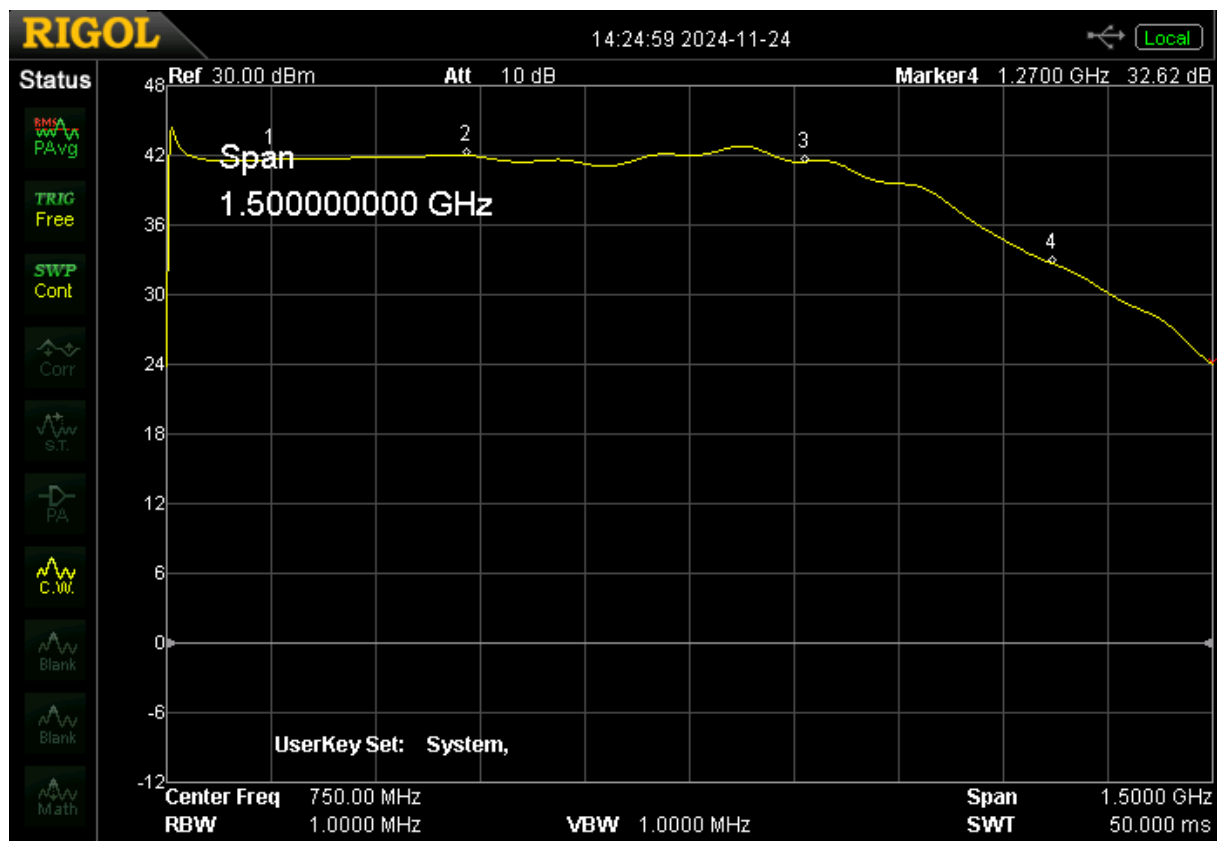
23cm DVB-T: RF power = +22.5dBm ( 180mW ), -33dB shoulders, 520mA @ 24Vdc

Thus we have a 70/33cm, 3/4 Watt, DATV amplifier which pulls 12.5 Watts dc power.

**24Vdc ?** Is the requirement of 24Vdc supply a disadvantage ? On the surface, yes, but it can actually be an advantage. As hams, most of us far prefer to power all of our equipment on 12 Vdc (or fully charged battery voltage of +13.8Vdc). In the past, needing 24 Volts was a distinct disadvantage. No more --- Just Google or search Amazon for "12 to 24 V converters". You will find a huge number of offerings there, most all at extremely low, reasonable prices. For this application, I found many in the \$7 to \$15 range. Now the advantage of using such a boost voltage converter is you end up with a 24V voltage regulator in the process. So no matter if the input voltage is +10V or +15Vdc, you still end up with a well regulated +24Vdc to apply to your amplifier. Right now, I have the amplifier putting out a DVB-T signal on 70cm and being powered by a 12/24V boost converter. It is drawing only 1.0 Amp at 13.8Vdc.



New Chinese Amplifier's small signal, S21 gain frequency response at low frequencies. Sweep from 0 to 30 MHz, Span = 30 MHz, center frequency = 15 MHz, 6dB/div & 3MHz/div. Pin = -20dBm This shows it is quite useful from 80 meter band and across the entire HF spectrum.

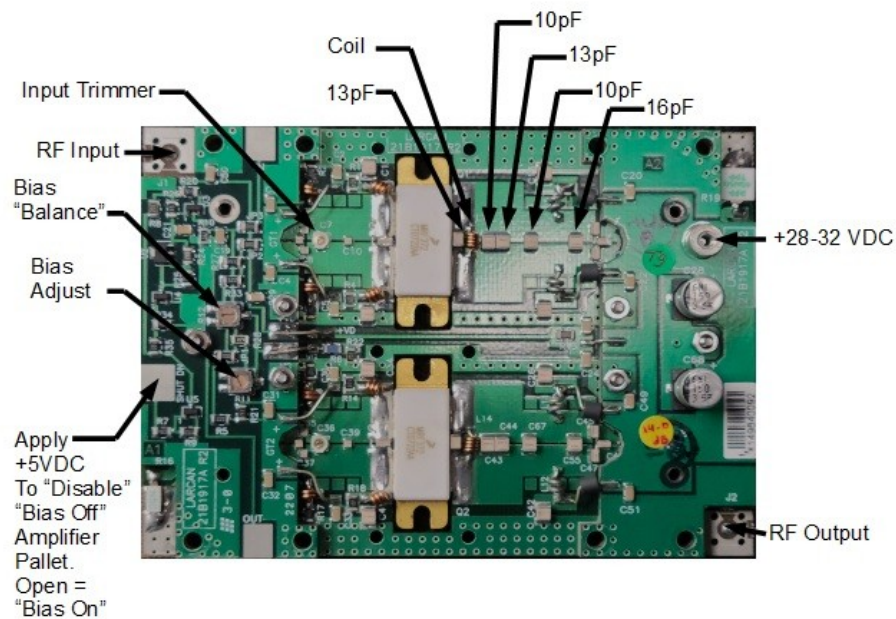


New Chinese Amplifier's small signal, S21 gain frequency response to 1.5GHz. Sweep from 0 to 1500 MHz, Span = 1.5GHz, center frequency = 750 MHz, 6dB/div & 150MHz/div. Pin = -20dBm Markers are: 1=150MHz, 2=430MHz, 3=915MHz & 4=1270MHz This shows it is quite useful from 80 meter (3.5-4MHz) band up to the 33cm (915MHz) band.

## Larkan 70cm Pallet Amplifier Mods

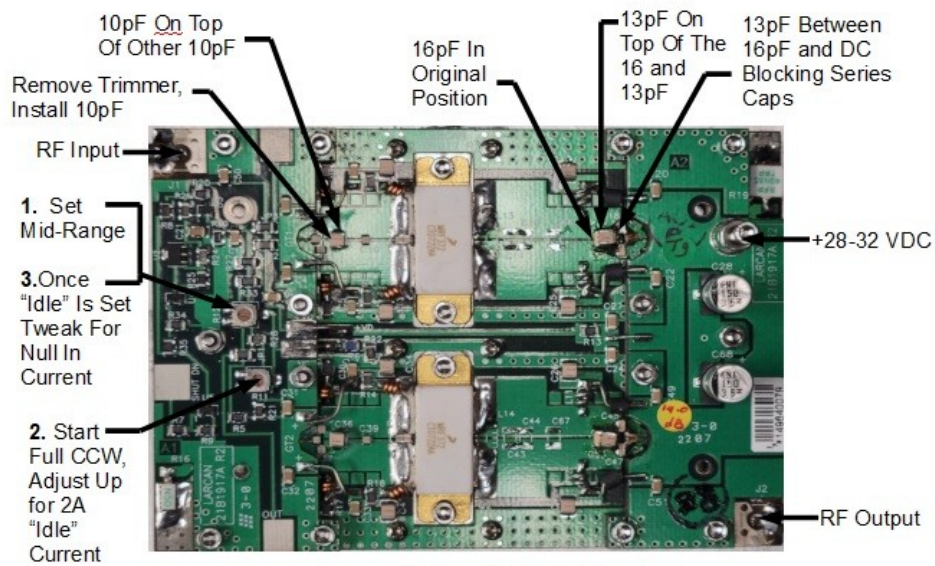
Dave, AH2AR, has recently sent us this email --- "Jim, This would make a great item to add to your ATV Journal. Please give Fred, K1FMS, the credit for these additional Larkan 70cm pallet amplifier modifications. Fred also attached the photos of how the mod was carried out. They are seeing 300+ watts output out of these \$10 surplus pallet amplifiers." What continued was a really long string of back & forth emails between Fred and Al, WB1BQE, on how to effectively mount on a heat sink these pallet amp boards. If interested in more details, contact Fred at n1dpmfred at gmail.

For reference, please see Dave's original article here in our ATV Journal about this boards. It was in issue #165, dated July, 2024 (available at <https://kh6htv.com/newsletter/> )



**Stock Larcan UHF-TV Pallet**

2024 K1FMS

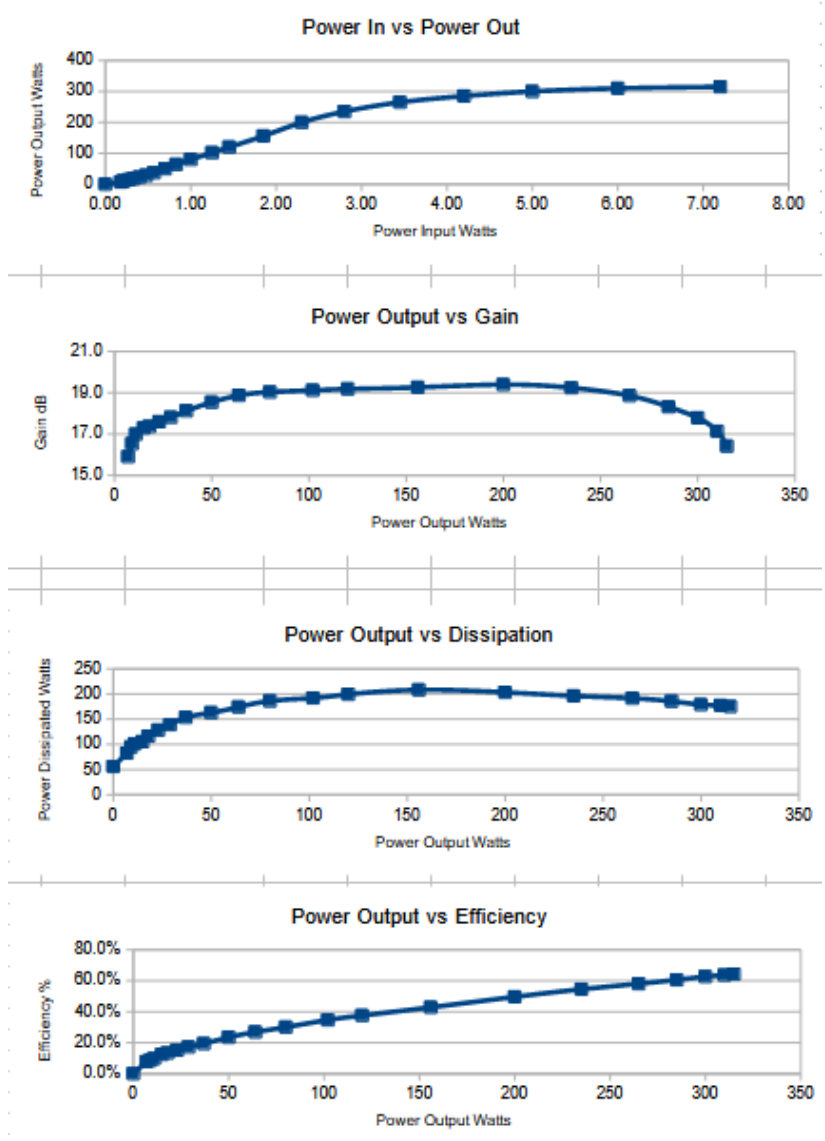


Unused Parts 2x Trimmers  
2x Coils

**Retuned for 432 MHz Larcan UHF-TV Pallet**

2024 K1FMS





### Larkin 70cm Pallet Amplifier Performance

Note: Above photos and data plots reprinted with permission from Fred, K1FMS



**Club Call Sign: WW7ATS**

**Net Audio Coordination on SeaTac Repeater:  
147.08+ MHz, CTCSS: 103.5**

Nets: Wednesday and Saturday at 20:00 Pacific Timezone  
Greater Seattle Area, Washington

**Analog Video Frequencies**  
434 MHz Input - Horizontal Polarization  
1253.25 MHz Output - Vertical Polarization

**Digital Video Frequencies**  
435.5 MHz Input - Horizontal Polarization  
1255.5 MHz Output - Vertical Polarization

**Western Washington Amateur Television Society**

The Western Washington Amateur Television Society (WWATS) is a group of amateur radio operators in the Puget Sound area with a common interest in amateur television. We transmit and receive fast-scan full color video pictures and have an ATV repeater on Cougar Mountain east of Seattle. We are currently in the process of transitioning from analog video to digital video. Check out their web site at: <https://www.qsl.net/ww7ats/>

## A USB TV Tuner Dongle That really works for ATV !

We have just received this from Carlos Picoto, AD7NP

"Hey Jim, on the topic of USB dongle receiver. I found one that works fine and prepared these instructions that Wade was able to replicate."

<https://github.com/cpicoto/ww7ats>

With Carlos' permission, we are reprinting them here for our readers.

*(note: with this dongle, Carlos is able now to receive DVB-T signals on the 23cm band and play it on a Windows computer.)*



DVB-C, DVB-T, ATSC, DAB, FM, \$26

### Instructions on how to receive the Western Washington Amateur Television Society with a USB Dongle Carlos, AD7NP

You can use an Astrometa RTL based dongle, as the one available at the following links.

<https://www.amazon.com/Dongle-DVB-T2-DVB-T-Digital-Receiver/dp/B07TY5L32G>

<https://www.aliexpress.us/item/3256801626129865.html>

<https://www.aliexpress.us/item/3256806959029656.html>

Install the drivers and application from the Astrometa website

[http://www.astrometa.com.tw/integrated\\_en.html](http://www.astrometa.com.tw/integrated_en.html)

Specifically the driver AMDVBT2\_Setup\_200917 and the application TVR\_Setup\_5.0.0  
Once both are installed in your systems go to the application folder, located in your system drive, in this example C: and edit the file FreqInfo.ini.

Before you are able to save the file as a regular user you will need to change the permissions in file explorer to allow users to write this file.

C:\Program Files (x86)\Astrometa\TVR\FreqInfo.ini

Locate the line under the DVB-T/T2 section that looks like

44=UK,Antenna,UHF,474,858,8

And replace with

44=WWATS,Antenna,UHF,1255,1261,6

Save the file.

*(editor's note: this line would vary depending upon your own particular desired frequencies, etc.)*

**TVRplayer:** Now launch the TVRplayer application from your desktop.

Select scan from the menu and select WWATS to scan the 1255Mhz repeater output.

If you have a good signal you should be able to see the WWATS repeater image.

**VLC:** Alternatively you can use VLC as the viewer application after you installed the driver and application above. Download the latest version of VLC from <https://www.videolan.org/vlc/>

Option 1-Command line option: vlc dvb-t://frequency=1255000000 :dvb-bandwidth=6 :dvb-adapter=0

Option 2-You can also download the WWATS.xspf file in this repo, save it do the desktop and use

it as a shortcut to launch the repeater viewer

Option 3-Start a session directly from VLC

From the Media menu use Open Capture Device,

select TV - digital instead of Direcshow,

leave Tuner card as 0,

select DVB-T if not selected already

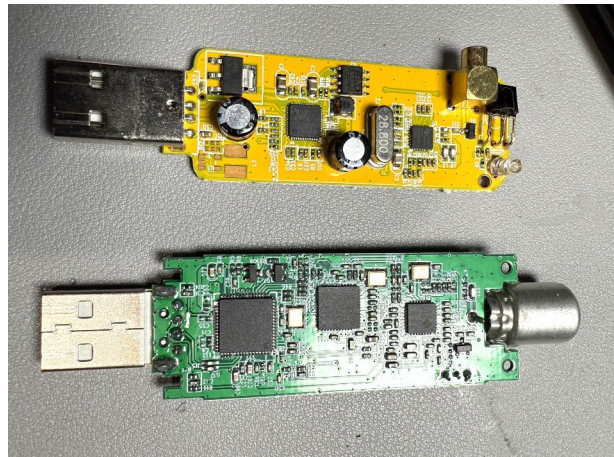
enter 1255000 into Transponder/multiplex frequency (only 3 zeros not 6)

Select 6Mhz for Bandwidth

Press the Play Button to start receiving

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THANK YOU CARLOS !

Carlos has followed up with some additional info he had discovered about this new USB TV Tuner dongle. He has opened it up and found that the internal guts are considerably different from the usual USB tuner dongle. He found an additional big IC besides the customary two found in the others. He has sent us this photo. The older dongle is the tan board on the top while the new dongle is the green board on the bottom.



**WOBTV 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/>

**WOBTV 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**



**MOTOROLA SU42 SPIRIT PRO TWO-WAY RADIOS**



**ICOM IC-451 A/E ALL MODE TRANSCEIVER**

The St. Louis Amateur TV Society (SLATS) always has interesting ham "goodies" either for sale or to give away listed on their web site.

Here are a couple of new listings for the month of December. Check them out at: <https://slatsatn.net/listing-of-items-for-sale/>



**Model 23-12B**  
**23 cm, 50 dB, 15/10/2 Watt**  
**RF LINEAR**  
**POWER AMPLIFIER**



*Standard configuration with optional heat sink and fan.*



*optional rear panel connections, front view*



*optional rear panel connections*

The KH6HTV-VIDEO Model 23-12B, RF Power Amplifier is for use in the amateur radio 23 cm band. It is a Class A-B amplifier designed for linear service. It can produce a 2 Watt, high-definition (1080P), digital TV (DTV) signal. It can also be used to produce an 10 Watt (pep), analog TV or SSB signal, or 15 Watts for FM/CW service. For DTV service with it's low DC current draw of only 0.9 Amp at 13.8 Vdc, it is ideal for in the field battery operations, such as for ARES emergency operations. With it's optional heat sink and fan it is rated for 100% dutv cvcle under extreme thermal conditions.

**\$300** [www.kh6htv.com](http://www.kh6htv.com)