

Boulder Amateur Television Club TV Repeater's REPEATER

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BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com

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ATV - Movers & Shakers !

Mike Collis -- WA6SVT

This month we feature Mike, WA6SVT. Mike is the head technical guru behind the southern California Amateur Television Network (ATN). Here is Mike's bio straight from www.qrz.com



I started in Ham Radio at age 12 as WN6SVT, the following year I upgraded to General and then a year later to Advanced. In High School I became interested in ATV and designed and built my own equipment. After high school I built an ATV repeater and that later evolved into a multi-state ATV club Amateur Television Network with a great team of dedicated ATVers as we built up a linked ATV repeater system.

Currently I am building up digital ATV equipment and teamed up with a few of our club members to put up the 2nd DATV repeater in the USA at Mt. Wilson, this repeater being the first one that can transmit full 1080i HD DATV. Our club website is www.ATN-TV.com . I was formerly the co-publisher of Amateur Television Quarterly Magazine (ATVQ) with Bill Brown WB8ELK.

My wife Laura is KJ6GFI and we have four kids at home but none licensed yet. We have a mountain top QTH at Jobs Peak overlooking both the coastal and desert side of the San Bernardino Mountains at 5380 ft. Our antennas are on our two green (tree with tower sections on top) towers at about 120 ft above ground. I am a broadcast Engineer for CBS Television in Los Angeles and work most of the time atop Mt. Wilson, 5710 ft above Los Angeles.

News from San Diego ATV

Mario, KD6ILO writes "In our SDATV Tech Shop in Ramona, we have been testing this ATSC/NTSC Receiver."



It is the Contemporary Research model 232-ATSC 4K. It is sold by B&H for \$961. Specs are ATSC, NTSC, Cable QAM (54-866 MHz) Video outputs of HDMI, component, composite & VGA. Upscales 1080P to 4K (3840x2160).

Dayton DATV Talk Available:

Mel, K0PFX, gave a talk on Digital Amateur TV at the 2022 Dayton Hamvention. His power-point slide presentation is available to be down-loaded from the St. Louis ATV group's web site:

<https://slatsatn.net/dayton-2022/>

Amateur Television in the U.K.

The Radio Society of Great Britain (RSGB) [U.K. equivalent of the ARRL] web site gives a great summary of the current status of ATV in the U.K.

<https://rsgb.org/main/technical/amateur-television/>

I am copying it here directly to inform our readers in the U.S.A. -- Jim, BATVC editor

Amateur radio encompasses a wide variety of modes and innovation. One of these fascinating areas is amateur television which covers all aspects of video production, editing, transmission and reception of television. It has often been at the forefront of the technology developments. Many amateur stations are now transmitting digital pictures (DATV) using the DVB broadcast standards; and using video streaming technologies to exchange pictures with ATV operators around the world.

Radio amateurs have been transmitting and receiving TV pictures for over 60 years. In most cases, simplified versions of the broadcast standards of the day have been used, perhaps tailored to a reduced bandwidth to fit within the amateur bands. All amateur bands above 432 MHz are suitable for amateur TV, along with the experimental NoV bands at 71 MHz and 146 MHz which facilitate DATV innovation at VHF.

Transmission Modes

Frequency modulation, as used for early commercial satellite TV transmissions, is still popular, in particular on 5.6 GHz, where re-purposed drone TV transmitters costing less than £20 can be used.

Digital television modes, as used for current commercial satellite TV transmissions, have proved to be very robust and efficient for amateur television transmissions. The DVB-S and DVB-S2 modes are both used and can be generated from software-defined radios driven by user-friendly Linux or Windows computers—including the Raspberry Pi. These transmissions can be received on a domestic satellite TV receiver—with an up-

converter or down-converter for bands other than 1296 MHz—or a specialized receiver such as the MiniTiouner.

Amateurs are currently experimenting with reduced bandwidth transmissions in bandwidths as low as 50kHz which can be decoded from weaker signals than the wider bandwidth transmissions. These signals are referred to as Reduced-Bandwidth TV (RB-TV) and typical symbol rates used are 500 KS, 333 KS, 250 KS, 125 KS and 66 KS.

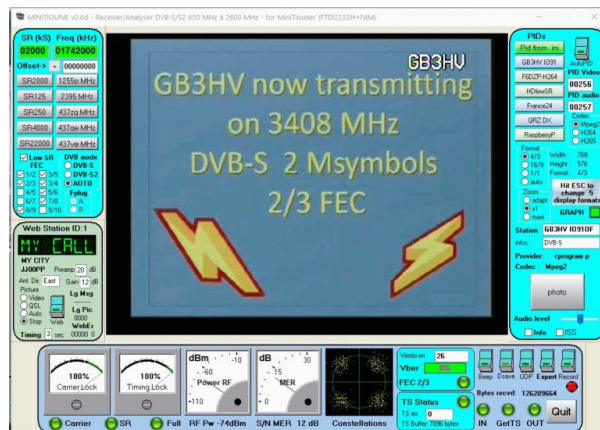
Receiving Digital Amateur TV

By far the most popular receive system is the MiniTiouner. This uses a satellite TV receiver module with a USB interface to a PC running a specialized DATV reception program written and made available for free use by F6DZP. The MiniTiouner hardware can be self-built or purchased as a pre-assembled unit. The hard-to-purchase components are available from the British Amateur Television Club shop for self-builders and the total parts cost is about £75.

The MiniTiouner covers 144 MHz to 2650 MHz and so, with the addition of pre-amplifiers, it will receive on four amateur bands directly and it can be used with down-converters for the other bands. The MiniTiouner software is designed to run on a Windows 10 PC—although the current versions works satisfactorily with Windows 7.



The MiniTiouner Hardware



The Comprehensive MiniTiouner Software

Transmitting Digital Amateur TV

The simplest option for transmitting digital ATV is to use the free-to-download DATV Express software with a software defined radio (SDR) such as the Analog Devices Pluto and the LimeSDR Mini. An alternative is to use the BATC Portsdown software on a Raspberry Pi with a LimeSDR Mini. Both of these solutions are broadband allowing the generation of signals anywhere in the frequency range 70 MHz to 3.4 GHz.



The BATC Portsdown Transmitter and LimeSDR

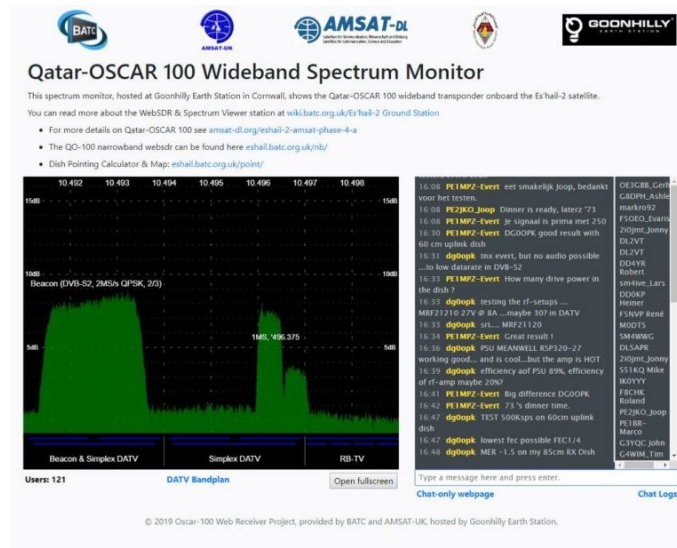
The signal from the SDR at about 0 dBm (1 mW) can either be amplified directly in a (very linear) power amplifier, or up-converted to the frequency required. For many microwave operators, existing transverters can be used with minimal modification. The MiniTiouner can be tuned to the normal receive IF, and the transmit signal generated at the same IF.

Operating Standards: The commonly used frequencies for DVD-S are: 71, 146.5, 437, 1255, 2395, 3405, 10367 and 24049 MHz. 5665 MHz is used for FM-TV. Talk back is usually on 144.75 MHz, FM voice, simplex.

Amateur TV by Satellite

The launch of Es'hail-2 with its wide-band transponder—also referred to as QO-100 or Qatar-OSCAR 100*—has enabled amateur TV the possibility of contacts between stations in the UK and Europe, Africa and parts of Asia and South America. Reception of these transmissions is relatively easy with an 80 cm dish, a commercial LNB and a MiniTiouner.

The QO-100 wide-band transponder has down-links between 10491 MHz and 10498 MHz using horizontal polarization, and a normal “Universal” LNB converts this down to 741-748 MHz when 18V is supplied to the LNB. This signal can then be directly demodulated by the MiniTiouner system. A good first signal to look for is the beacon on 10492.5 MHz. Once the beacon has been received, other signals found on the BATC/AMSAT-UK online spectrum monitor can be tuned in. The up-link for the wide-band transponder is from 2401.5 MHz to 2409.5 MHz Right Hand Circular Polarized. Up-link transmissions should be DVB-S or DVB-S2 at less than 2 MS. Typically 30 W into a 1.2 meter dish is required to up-link a 333 KS digital ATV signal.



The Online Spectrum Monitor for the Es 'hail-2 Wide-band Transponder

To find out more about the U.K. ATV hams approach to DATV, etc. -- check out the British Amateur Television Club's web site at: www.batc.org.uk



Where Can We Find an Inexpensive, Stand-Alone, DVB-S Modulator ?

The ATV folks in the U.K. have focused on DVB-S, while most USA, DATV hams have focused on DVB-T. A lot of the differences relate to the form factor we would like to see in our stations. As seen in the above article, the U.K. approach relies heavily upon using a PC computer to handle a lot of the computing horse power required for both the modulator/exciter and also the receiver for DVB-S. The BATC has done a "bang-up, good" job of developing and supplying their members with the necessary kits to assemble their DVB-S stations.

We here in Boulder, Colorado have definitely taken the approach we didn't want to be tied to requiring the use of a PC computer. Part of this was driven by the need to be able to take our gear out into the field for ARES, emergency situations. PC based gear is

fine, if it is only going to remain in a fixed location in the ham shack. It is much less desirable for lugging up and over mountains in a back pack. Prior to the advent of DATV, we already had 25+ years of ARES, ATV operations experience using analog TV gear for portable operations. So, if we didn't want to have a PC involved, this meant we needed instead stand-alone boxes for our transmitters and receivers. No high powered transmitters were available, so we needed at least a stand-alone DATV modulator and a separate linear power amplifier. Another requirement was it needed to be affordable. Affordable definitely meant less than \$1,000. We also really didn't want to have to assemble from scratch the equipment. We really wanted the low cost, appliance operator solution.

In 2014, the break-through occurred for us in our search. That was when we became aware of the DVB-T gear supplied by Hi-Des in Taiwan (www.hides.com.tw) At that time, stand-alone modulators and receivers were offered by Hi-Des at attractive prices of about \$500 and \$150 respectively. Plus they had the added advantage of 12 Vdc operation, ideal for portable usage. The rest is history, now most USA, digital ATV hams are using Hi-Des gear.

In the meantime, several other manufacturers are now also offering low cost, stand-alone DVB-T modulators and receivers. A driving factor for these is offering them to provide closed-circuit TV where the signals can be displayed on ordinary home TV receivers. Remember, that DVB-T is the terrestrial broadcast TV standard for most of the world. Here is just a sampling of low cost (< \$500, some much less) DVB-T modulators found by a quick surfing of the internet.





The same has happened for DVB-T, set-top box receivers. They are now available from many manufacturers at dirt cheap prices. We have even found some for as low as \$15 in single piece quantities.

Note: With the exception of the gear from Hi-Des, all of the other DVB-T products only work on 6, 7 or 8 MHz band-widths.



Now try to do the same internet search for DVB-S modulators. Will you find any comparable to the above DVB-T units? The answer is a resounding NO! What you will find instead are very expensive (>> \$1 K), rack mount units intended for satellite up-link stations.

Bottom Line -- If you really want to get into doing DVB-S, you need to plan on sticking with the gear available from the BATC in the U.K. Also, if you want to do narrow-band, digital ATV with bandwidths less than 6 MHz, your choices are only BATC for DVB-S or Hi-Des for DVB-T.

Jim Andrews, KH6HTV, Boulder, Colorado

WOBTV 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/>

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. 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* or *ab0my*. 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.

REMINDER -- THE BOULDER, COLORADO AMATEUR RADIO SWAP-FEST IS COMING SOON ! SUNDAY, OCTOBER 2ED AT THE BOULDER COUNTY FAIRGROUNDS IN LONGMONT.



SLATS

ST. LOUIS AMATEUR TELEVISION SOCIETY

Buy - Sell - Trade - Giveaway

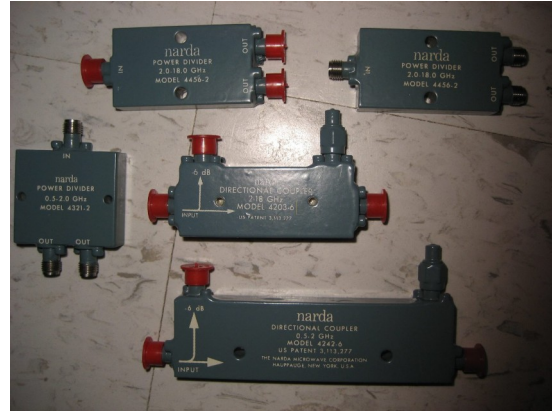


(web site: http://www.slatsatn.net/?page_id=713)
Check it out. New items listed every week



WWW.SLATSATN.NET

Items like: Microwave Test Equipment,
Flex Radio 3000 , Antenna Bridge, Hi Freq Probe,
Marconi Power Meter, 23cm Trnsvrtr, NTSC TEST EQUIP!



Examples of some of the microwave components offered for sale on the SLATS web site



Model UWBA-103 ULTRA - WIDE - BAND 20 dB, 3 GHz AMPLIFIER

The KH6HTV VIDEO Model UWBA-103 is an Ultra-Wide-Band Amplifier with a flat frequency response extending from the low frequency, kHz range up to microwaves (GHz). It is intended for use as an instrumentation amplifier with



instruments such as spectrum analyzers and oscilloscopes, but also can be used for amateur radio and commercial telecommunications applications. This amplifier features 20 dB gain, +20 dBm output, -3 dB BW of 3 GHz and usable gain to 8 GHz.

Price is \$65 each

Typical Key Performance Parameters

Frequency	430 MHz	1.25 GHz	2.4 GHz	3.5 GHz	5.8 GHz
S21 Gain	20 dB	19 dB	18 dB	16.5 dB	12 dB
Pout(-1dB)	+20 dBm	+19 dBm	+18.5 dBm	+16 dBm	+9 dBm
Pout(sat)	+22 dBm	+20 dBm	+19.5 dBm	+17.5 dBm	+11 dBm

Parameter		Parameter	
Bandwidth (-3 dB)	3 GHz	Low Freq. (-3 dB)	250 kHz
Noise Figure	4 to 4.5 dB	DC supply Voltage	11-15 V range, 80mA
RF connectors	SMA	DC connector	solder feed-thru cap

KH6HTV-VIDEO www.kh6htv.com e-mail: kh6htv@arri.net Boulder, Colorado, USA