BOULDER TV Repeater's REPEATER

May, 2019

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REPEATER STATUS: Don, N0YE, reports that the Boulder ATV repeater has a minor problem. Recently the back-up power generators at the site were tested. After the temporary loss of AC power, the TV repeater's Raspberry-Pi computer did not reset. The R-Pi is used to generate the video ID slide show. Don did a system master reset command which is supposed to remove DC power from all the various digital devices and then re-boot them. This did not reset the R-Pi. Otherwise, the repeater is functioning normally. It just does not do a video ID. The ID buried in the DVB-T meta-data is still there however for FCC ID purposes.

Don is now streaming the TV repeater's weekly, Thursday afternoon, ATV nets over the BATC server under his own call sign. Details about the repeater are available on our web site: www.kh6htv.com AN-43 gives all the technical details. If you have any questions about the current operations or status of the repeater, contact the assistant. trustee, Don, N0YE.

Future Newsletters: If you have contributions for future newsletters, please send them to me. Jim Andrews, KH6HTV, email = kh6htv@arrl.net

Boulder ATV Repeater in 2005 - then located in Chautauqua Park

SILENT KEY -- AA6TV It is with sincere regret that we announce the passing of our fellow ATV friend, Don Apte, AA6TV. Don was 69 when he died unexpectedly of a heart attack on the 4th of March. Don and his wife, Barbara, had lived for many years in San Jose, California and recently moved to Broomfield, Colorado, going into semi-retirement.

Don was born in San Francisco in 1950. He attended Cal Poly in San Luis Obispo, CA and graduated from San Jose State with a BS degree in Industrial Engineering in 1973. Don went on to work for many different companies during his lifetime including Hewlett Packard and Cal Eastern Laboratories and more recently working for Microwave Technology where he was the Director of Sales and Marketing for the past 16 years.

Don was a long time ham radio operator, AA6TV, holding the Extra class llicense. He belonged to Santa Clara County Amateur Radio Association (SCCARA) and the Radio Amateur Civil Emergency Service (RACES). He loved communicating with other people on the radio and helping them get setup in becoming a ham radio operator. He also enjoyed volunteering in the community and working with emergency response teams in the bay area. After moving to Colorado, Don immediately became active again in ARES, joining the Boulder ARES group, BCARES. Don especially loved amateur Television (ATV), as evidenced by his call sign, AA6TV. He became an active participant in the Boulder ATV group and was a regular at the weekly Boulder ham radio breakfast.

Don was an avid collector of electronic test instruments and also amateur radio gear. He especially collected many different pieces of HP/Agilent and Tektronix test equipment. The three car garage of his Broomfield home was filled floor to ceiling with boxes and storage shelves of his collection. He also reported that he still had a couple of containers of his collection, still in California. Unfortunately, for his beloved wife, Barbara, and his family, they now are faced with a monumental task of disposing of Don's collection.

Summits on the Air (SOTA) with ATV -- from Don, N0YE

To activate a summit, a QSO exchange must be done with at least four chasers. No repeaters can be used as part of the exchange. When doing 10 GHz contests, each participant has to have their own transmitter. So for the moment we will assume each participant has their own transmitter when activating a summit. The other end of a summit activation QSO is called a chaser. It is not clear if multiple chasers can share a transmitter.

During the exchange each player in the QSO must acknowledge the other. So for example, I would transmit an ATV CQ, the other party would transmit an ATV response, and then I would transmit an ATV acknowledgement. Again no repeaters would be involved. Cell phone, 2m, etc liaison can be used. I presume a 2m repeater would be OK.

I have activated about 15 summits so far using 20m gear in a small backpack. I have made contacts several times with a husband chaser and wife chaser where I assume they both used the same 20m radio. I have done Pikes Peak as a summit on 20m. And I have done Pikes Peak numerous times during 10 GHz contests. So I know where to set up, etc. I am choosing Pikes Peak because it has a clear view to the north including parts of Boulder County and Denver.

Some of you, to participate, will have to go mobile to have a line of sight view of Pikes Peak. That will be something to think about before you let me know if you will participate. My thinking is to do the SOTA activation some mid morning when the weather is warm enough and before possible lightning storms.

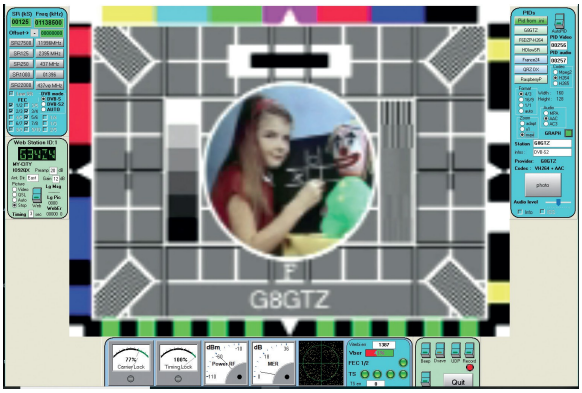
The Summit on the Air web page is: https://sota.org.uk/ At the moment, the rules PDFs are not accessible.

ULTIMATE OSCAR SATELLITE: (from CQ-TV magazine Spring, 2019)
The long-anticipated launch of the Qatari-owned Es'hail-2 broadcast satellite took place last November and the past two months have seen it being moved into its final intended orbit slot at 25.9 East. This spacecraft, as well as providing commercial systems for broadcast television, also has two transponders dedicated for amateur use. One is intended for narrowband signals and one for wideband DATV. This great facility has been made available through the Qatari Amateur Radio Society who have worked in collaboration with a team from AMSAT-DL in Germany.
https://amsat-uk.org/2019/02/10/qatar-oscar-100-web-receiver-now-live/
[Sorry hams in the North America -- this is a geostationary satellite parked over the other side of the globe. It will link hams from eastern Brazil to Thailand. See the above footprint.]

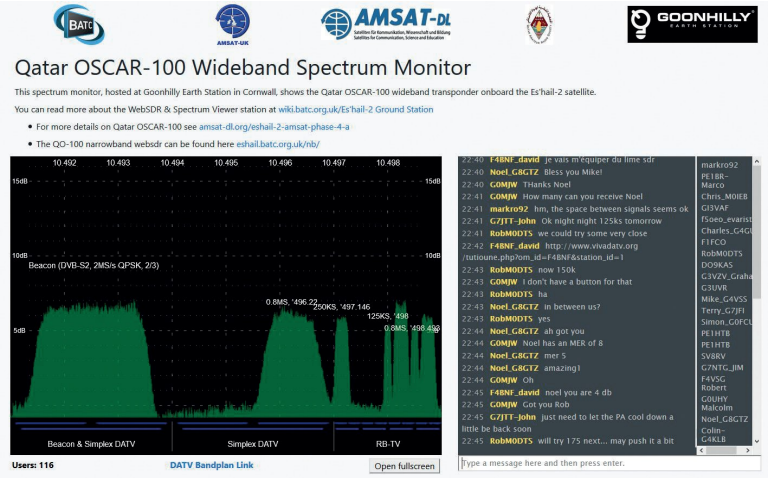
The new satellite is a commercial satellite, which also contains a pair of linear transponders for amateur radio. The uplink is in the 2.4 GHz band and the downlink is in the 10 GHz band. The narrowband transponder is 250 kHz wide and is intended for SSB voice

and narrowband digital modes. The wideband transponder is 8 MHz wide and intended for video and should be done using DBV-S2. For more details, go to: https://ukamsat.-files.wordpress.com/2018/11/amsat-uk_eshail-2_transponder_info.pdf

It is now possible to ”see” the transponder passband by the use of a webSDR system that has been established at the Goonhilly Earth Station in Cornwall UK. This is provided by the BATC and AMSAT-UK. The link to this is: https://eshail.batc.org.uk/wb/



Noel, G8GTZ, in the U.K. was the first to transmit a simplex reduced bandwidth TV (RBTV) signal that was received by others in the UK and Europe. More than 30 stations have already successfully transmitted their pictures through the transponder from countries including F, I, DL, PA, HB, ON and G and new stations are becoming active every day. There have seen multiple signals on the satellite – the screen grab of the spectrum monitor shows 6 different signals using a range of Symbol rates from 125ks, 333Ks, 1ms and 2ms simultaneously!



Most of the BATC's electronic magazine, CQ-TV, NO. 263, Spring, 2019, was dedicated to QO-100. There were articles on how to receive it on 10GHz; 2.4 GHz transmitters to access it; Antenna/Power requirements to access it; antennas; antenna feed horns, etc.

DVB-T vs. DVB-S

Recently on the Yahoo DATV users group site https://groups.yahoo.com/neo/groups/DigitalATV/info there has been a bit of controversy going on between the hams in Europe & Australia (DVB-S users), versus USA hams using DVB-T. Bottom Line -- Both systems work well and there are dedicated advocates for both.

On April 4th, I posted on the Yahoo site, the following:

To: Jean Pierre F6DZP & other ATV hams @yahoo
From: Jim, KH6HTV
Subject: DVB-T vs. DVB-S

Agreed, the USA ATV hams have been slow in getting on the DATV bandwagon. You hams in Europe lead the way by many years. Also agreed that the USA has a tendency to go it's own way, ignoring the technical advances made elsewhere on the planet.

Here in the USA we do have more spectrum available at 70cm than you have. We have 30 MHz (420-450. Enough space for five 6 MHz TV channels. We can NOT do video on the 2 meter band as you are doing in the U.K.

For selection of which modulation method to use for DATV ? It has been shown that the USA broadcast standard of ATSC, 8-VSB was not as good as the systems developed in Europe, either DVB-S or DVB-T. As a matter of fact, the new system coming on line in the USA, version 3.0, actually takes the COFDM approach and is not backwardly compatible to ATSC 1.0

When we (i.e. USA DATV hams) started looking at digital ham TV, modulators for the USA ATSC were very expensive and out of reach of ordinary ham's budgets. When we in the USA did finally really get excited about DATV was with the introduction of quality DVB-T equipment from Hi-Des in Taiwan (www.hides.com.tw) This gear was reasonably priced and it worked great. One could finally get on the air with DATV for the cost of an entry level HF transceiver. It also had the distinct advantage that one could be an "appliance operator". One did not have to build from scratch, nor be a computer expert to get on the air. When I started first with Hi-Des, DVB-T gear in 2014, that was NOT the case for DVB-S transmitters.

I have read lots of scientific technical literature about the development of DTV. It is obvious that the very smart RF engineers in Europe put a lot of thought into developing the various DVB systems of -C (cable), -S (satellite) and -T (terrestrial) and optimized each for it's specific propagation requirements. For most ATV hams, we are doing Terrestrial with it's attendent "multi-path" being a major limitation. Thus, it seemed natural for us to thus adopt DVB-T. For your OSCAR, satellite, DTV, then Yes, DVB-S was designed for such DTV links.

You also mentioned narrow bandwidths. In response to requests from ATV hams, Hi-Des added these capabilities and we can also work DVB-T with considerably narrower bandwidths than commercial broadcast of 6 to 8 MHz. Several USA ATV groups are in fact using 2 & 4MHz BWs.

You made the statement *" DVB-T cannot be used for DX, only for repeater or local contact."* I definitely dispute this. We too have been able to transmit DVB-T over long distances. I myself have done a DTV-Xpedition of 123 km and successfully accessed and also received hi-def (1080P), 6MHz, DVB-T signals on 70cm and 23cm with the Boulder, Colorado DATV repeater. The limit was set by spherical geometery, not the modulation method. This was the farthest distance possible as predicted by the RF Prop program, Radio Mobile. In Colorado, it is a very dry climate, and we normally never get tropo ducting far over the horizon.

73 de Jim, KH6HTV (www.kh6htv.com)

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a reply from Jean Pierre, F6DZP (f6dzp@yahoo.fr),
I am not going to argue the advantages or disadvantages of one digital system vs. another.as some people prefer USB or FM , playing DATV everyone has their own preferences and I don't see anything to say. It 's a hobby, anyone plays as he want.
Jean replied to a statemnt ---" this was primarily due to the low cost and ready availability of the DVB-T hardware" Yes, If you want only work with an equipment already made and sold by a company, Hides offer an interesting solution that allows people to experiment.

In Europe we have started to build our own DVB-S transceiver in 2007-2008 and there was also a company (SRsystem) that offer a complete DVB-S TX solution but at higher price (700$). Since these years many project and kits have been offered for the community for very low price. Today, just using a LimeSDR-mini or an Adalm Pluto, we can work DVB-S, DVB-S2 and DVB-T with the same software on a PC or a RaspberryPI. These two hardwares are now the most used equipment for DATV. Cost is not very high and you can play all modes.

For receiving DVB-S/S2 we can use standard satellite STB, but for lower bandwidth I have developed a mini tuner called "MiniTiouner" that can receive down to SR 32kS/s (45kHz of bandwidth) The software Minitioune is free. The hardware can be found at the BATC shop, REF shop in Europe, or can be home made as I have given all schematics and requires mainly 3 components . (There is also a US shop that sell a "MiniTiouner-Express" for 75$) Minitioune is also firstly a measurement instrument, it displays RFlevel in DBm, MER, constellations ... so you know why you can receive or not. I don't think that we are talking of "High price"
http://www.vivadatv.org/viewtopic.php?f=86&t=600 or https://wiki.batc.org.uk/MiniTioune

Anyway, take pleasure with your DATV station, playing the mode you prefer, that 's the most important.

I then got this e-mail from Mike, WA6SVT, in sounthern California, further elaborating on the DX, long distance capabilities of DVB-T *(remember, Mike visited the Boulder ATV group last summer at our picnic)*

Hi Jim ---- I read your response and fully agree with your assessment! I do not know where the EU and VK ATVers think that DVB-T will not work past line of sight and thus limited to local or repeater contacts.

There are nearly dally contacts using QPSK at 2 MHz BW, DVB-T from Bowling Green, Kentucky to just north of Columbus, Ohio and another ATVer in the middle at Cincinnati, Ohio. Those three stations work several hundred miles. All have large antenna arrays and run a couple of hundred watts.

The ATN repeater at Mt. Wilson, California has an ATVer from Arcadia (Norm Hill) use DVB-T at 2 MHz B/W get into Mt. Wilson with Mt. Harvard blocking his path. Our Snow Peak repeater has two hams that have hills or mountains blocking the path, Nathan Haltman has a ridge near Snow Peak in the way and his dad Earl is in the Cathedral City cove with a 800 ft blockage (hill) two blocks away. In this case both use DVB-T at 12 watts at 2 MHz BW on 434 MHz and receive the DVB-T output on 1242 MHz. P5 all the way. I have been able to receive the repeater output mobile almost all the way to Yuma Arizona about 130 miles away.

DVB-S in USA -- from Ron, N6GKJ, Lodi, CA (north of Stockton)

Hi guys,To hard to pass on this .... Can you build a DVB-T anything system for less than $200? Include Rx and Tx PA? And make it small? Portable? Run without a laptop or PC? This is my DVB-S Portsdown Transmitter. It is quite small, drives a DEMI 1.2Ghz PA to 18w. My Rx is a small FTA Rx that I bought off eBay for $25. My build cost is less than $250 including the antennas(home built cheap)

Each year I give a talk at Pacificon, our West Coast ARRL Convention. Every year there are guys who do their best to bash DVB-S in favor of DVB-T. But we are having amazing results with DVB-S. some of our guys run less than 100mw and put perfect picture into the hill every time. Our repeater system is growing in complexity at a rapid pace. We have many inputs, our tx has 4 carriers, does about 40 watts of clean power out of our filter. The receivers on the hill are surplus commercial units along with our tx.

How do you do all that on DVB-T anything? The parts to replicate it would cost more than you could afford. In simplex modes DVB-T anything has a place. Can you buy a DVB-T Rx that will give you a COR when it sees a valid signal? Can't use horizontal sync because the Rx put out video always.

For a repeater system... DVB-S is the most economical way to go. We prove it every week on W6CX (note: the W6CX TV repeaters is located on Mt. Diablo, 30 miles east of San Francisco, CA)

ATSC 3.0 & DVB-T2 UpDate:

from Dan, WA3ATV, Trevose, PA (near Philladelphia)

As Jim mentioned, here in the US, the FCC has recently approved a new standard for over-the-air, terrestrial digital television. Tests have proven that this new standard (ATSC 3.0) is far more robust than our current digital broadcast standard. It is also more robust than DVB-T and DVB-T2. The bottom line is that off-the-shelf, receivers capable of receiving ATSC 3.0 will soon be available. Depending on how manufacturers implement the tuners, it may even be possible to tune directly to 70 cm US amateur frequencies to receive DATV signals using a regular consumer grade TV set. This was previously the case here in the days of analog ATV signals. In my opinion - and this is my opinion only - regardless of the merits of methods of transmission employed here or elsewhere in the world, ATSC 3.0 will eventually become the standard for DTV here in the US. Again, this has nothing to do with the technical merits of one system vs. another. Rather, it will be a matter of practicality. Low-cost, off-the-shelf, consumer receivers for ATCS 3.0 will be readily available.

from Ron, W6RZ, Mountain View, CA

ATSC 3.0 is essentially identical to DVB-T2. It has some tweaks (mostly non-uniform constellations) that give it a 0.5 to 1 dB S/N advantage over DVB-T2. Otherwise, it's a virtual clone. However, unlike ATSC 3.0, you can experiment with DVB-T2 today. There's a full DVB-T2 transmitter implementation in GNU Radio (written by myself) and receivers are available (that tune 70 cm).

http://www.hauppauge.com/pages/webstore2/webstore_solohd_euro.html

(note: Ron's link is for a USB TV tuner dongle which receives DVB-T, DVB-T2 & DVB-C. Price = 50 euros)

I like to be standards agnostic. I've added as many standards as I could to GNU Radio. Currently, it has transmitters for ATSC, DVB-S, DVB-S2, DVB-S2X, DVB-T, DVB-T2 and cable 64 and 256QAM. There are receivers for ATSC and DVB-T. When receivers become available for ATSC 3.0, I will most certainly consider adding an ATSC 3.0 transmitter. My latest experiments have been with high order DVB-S2X constellations using a new DVB-S2X demodulator from Germany. https://www.digital-devices.eu/shop/en/tv-cards/tv-cards-for-pcie/340/8-tuner-tv-card-dd-max-sx8-4/8-dvb-s2/dvb-s2x-full-spectrum?c=156 (note: this link is for a very expensive 400 euros tuner card for large tower PC)

For more info about GNU Radio go to: https://www.gnuradio.org/ If you have more questions for Ron about GNU Radio, his e-mail is: w6rz@comcast.net

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