

**Boulder Amateur
Television Club
TV Repeater's
REPEATER**
November, 2022
issue #114



BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com



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

DATV SATELLITE for NORTH AMERICA ?

1) For the past seven months our team has been researching and looking into the feasibility study for a North American DATV Image Communications Satellite payload to cover the United States, Canada, parts of Mexico/Central America and the Caribbean . Part of our research team is also contacting satellite manufacturers of their future goals of payload launches and possible space onboard to include a Ham DATV payload. We've been talking to many of our contacts at JPL, Naval PostGraduate School {Monterey}, National Science Foundation {Funding}, SpaceX and Hughes Communications etc.

2) What is needed from the Amateur TV community is, would the community at large like to see a project like this proceed or is it just a waste of time? Again this is a project case study and not set in stone. The package would be all digital components made initially in the U.S. and Spain. It would be years before it can be planned, constructed. FCC certified , tested in a laboratory etc. Technology changes at the speed of light so do interest in the community at large. We as a group are behind as Europe DATV moves forward. It is time to pick up the pace if we plan to move forward with Amateur Radio Television.

3) What bandwidth? Uplink /Downlink band plan? Working with FCC also. But if interest is not there our research feasibility study will proceed as if it has a funding source for both components, in lab construction, Payload availability onboard a future planned telecom launch.

San Diego, California ATV Technical Studies Team.
Mario Badua ,KD6ILO, Oceanside, California

Editor's Note: *If you have any interest, comments, etc. in San Diego's proposal, please contact Mario at sandiegodatv@gmail.com*

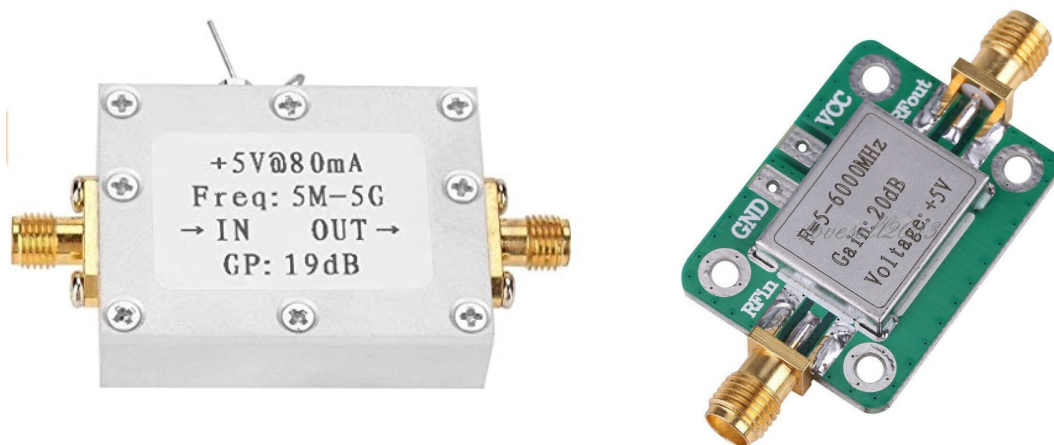
Low Cost Amplifiers for 5cm Band

Jim, KH6HTV

There are a couple of great MMICs today which have opened up the 5cm band for us experimentalists. They are the SBB5089 from Qorvo and the SE5004L from SkyWorks. What is making them of particular interest is the fact that the Chinese have picked up on them and are now making very low cost, complete pc board amplifiers with them. We will show you some of them here.

The key specs. for the SBB5089 are: 20 dB gain, +20 dBm (-1dB) output power, 50 MHz to 6 GHz, +5V @ 75mA. (\$4.83 at Mouser)

The key specs. for the SE5004 are: 5.15 - 5.85 GHz, 32 dB gain, +34 dBm (-1dB) output power, +25dBm (64QAM), +6dBm max input, +5V @ 300mA (idle current). (\$5.30 at Digi-Key). Thus the SBB5089 seems to be a good choice as a driver amplifier while the SE5004 as a final amplifier.

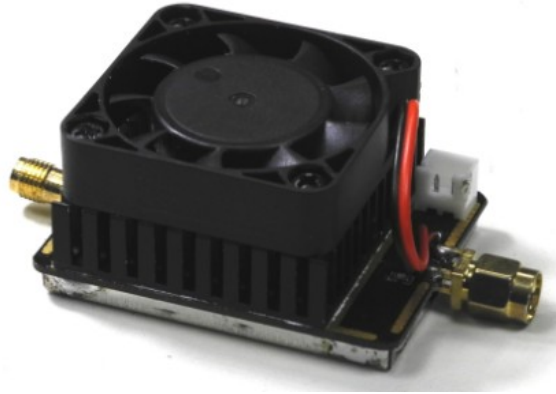


SBB5089: Here is the most commonly found pc board for this amplifier. It can be found on several major web sites, such as E-Bay, Ali-Express, etc. Prices range all over the place, so it pays to shop around. The version on the left in the metal enclosure is available from Amazon for \$20. For the pc board version on the right, I have found them listed for as low as \$4 and most typically \$10-12. Some delivery delay is to be expected as most are not USA stock, but are shipped from China.

The specs. typically given and printed on the shield cover are optimistic. It is definitely not a flat frequency response up to 6 GHz with 20dB gain. But it still has usable gain up to 6 GHz. The Vcc supply voltage is +5Vdc and the current draw is about 80mA. This is not a low noise amp for use as an LNA.

I have used these as an LO amplifier at 4.4 GHz. I found the gain to be 15 dB. I got +13 dBm of power out at 4.4 GHz. For use as an amplifier at 5.8 GHz, I got 12 dB of gain, +8 dBm (-1dB gain compression) and +11 dBm (saturated output).

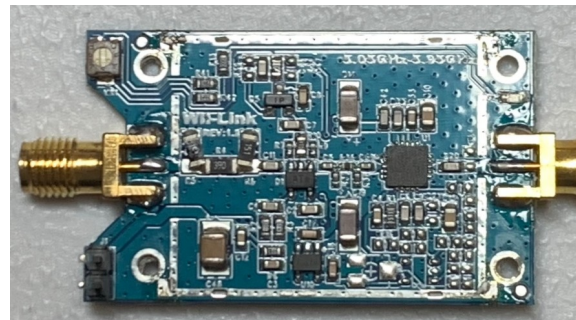
SE5004 - Amp #1: This is the first amplifier we Boulder hams discovered back in 2019. It was intended for use as an "After-Burner" for drone 5.8 GHz FM-TV transmitters. It was advertised to boost a 1/2 W transmitter up to 2 Watts.



We initially had reliability issues with them burning out. They could put out up to 5 Watts! We worked out the bugs in the heat sinking manufacturing defects and were able to use these reliably at 2 Watts output.

The W0BTV- ATV repeater has been using one now in continuous service as a 5.905 GHz, 2 Watt, beacon running 24/7 for over two years now.

This amplifier used two SE5004 MMICs in parallel with Wilkerson 3 dB power divider / combiners on the input and output. The SE5004 is a high gain MMIC with 32 dB of gain. In this amplifier, the designer included an 18 dB pi attenuator to kill the gain when used with a 1/2 W FM-TV transmitter as the driver. I have ripped out this attenuator to get a higher gain rf power amplifier for use in a 5.8 GHz Transverter. To read more about this amplifier I refer you to our ATV newsletter of Sept. 2020, issue # 56. Unfortunately, this amplifier has been discontinued and is no longer available.



SE5004 - Amp #2: This is the amplifier currently marketed on the internet as the "After-Burner" for drone 1/2 Watt, FM-TV transmitters. They claim 2 Watts output. It currently typically sells for \$25-30 on E-Bay.

The previous above amplifier had a single heat sink with a mini cooling fan. This one does not have a fan. The pc board is sandwiched between two small heat sinks. The small pc board on the top of the heat sink is a switching down-converter voltage regulator. It takes a +DC input from 6 to 23 Vdc and converts it to +5V for the amplifier. The photo on the right shows the top view of the amplifier pc board. The SMA

connector on the left is the input. The connector on the right is the rf output and is a reverse polarity SMA. The black rectangle close to the rf output is the 16 pin SE5004. This amplifier was also designed with an input attenuator. There are three 1206 SMD resistors next to the input SMA. They comprise a 6 dB attenuator. The output from this goes to a smaller, 5 pin IC. It's output goes to the SE5004 thru still another pi attenuator made of much smaller SMD resistors. I don't know what this IC is, nor the other components found on the pcb.

When I drove this amplifier with a 1/2 W, 5.8 GHz, FM-TV transmitter module, it put out just over 1 Watt. I then tested the small signal gain and found it was only 9 dB. I then removed the internal attenuator and tested the amplifier again. This time, I only got 15 dB gain. Thus the designers have intentionally thrown away most of the available 32 dB gain of the SE5004. Thus for the cost and hassle of adding an amplifier to an FM-TV module, one only achieved a 3 dB improvement in output power. Because of the intentional low gain, I give this amplifier a "**Do Not Buy**" recommendation.

SE5004 - Amp #3: This amplifier was ^{1W} a recent new discovery of mine. I found it on E-Bay and Ali-Express. It sells in the price range of \$13 to \$20. The photo tells pretty much the whole story of it. It only contains one single, active RF MMIC, the SE5004. The circuit is quite simple in comparison to the previous amplifier. Also seen on the top of the photo is a switching DC/DC voltage regulator. It accepts input of +6 to +23Vdc and provides +5V to the



SE5004. The pc board is mounted directly to a heat sink. The connectors are SMAs. The photo shows a pi attenuator on the rf input (R9,10&11), but the it is not present on the actual amplifier. R9 is simply a 0 Ω jumper.

I purchased three of these amplifiers to evaluate. One was DOA. The other two gave very disappointing results in terms of output power, well below spec. for the SE5004. I made my measurements on the Boulder 5cm, DVB-T frequency of 5.678 GHz. I powered them with +12Vdc. The idle currents were about 200mA. At full power out the current draw was about 1/2 Amp. The attached heat sink did a good job of cooling the amplifiers. I measured small signal gain of 29 and 30dB on the two functioning amplifiers. The -1dB gain compression point was +22dBm on one and +25dBm on the other. The max. saturated output power for both was +27dBm (i.e. 1/2 Watt). This was disappointing results for max. rf output power where the advertised spec. was 2 Watts (+33dBm). Yes, it worked as an amplifier, but not as powerful as hoped for.

SE5004 - Amp #4: This is another recently discovered 5.8 GHz amplifier. It is available on E-Bay and Ali-Express. Prices are in the \$20-25 range. The label says it all. It contains both an SBB5089 driver and an SE5005 final amplifier. The total gain is thus 40dB with a max. output rf power of 2 Watts. This amp requires an



input of +5Vdc via a USB type C connector. The RF connectors are SMA. The amplifier is enclosed in a nice metal box. It does not have a heat sink. A USB cable is included.

I purchased three of these amplifiers to evaluate. I powered the amplifiers with +12Vdc using a cigarette lighter to +5Vdc, USB power adapter. I made my measurements on the Boulder 5cm, DVB-T frequency of 5.678 GHz. I found some variation in results for the three amplifiers. Amp #4-1 had 43dB gain, +28dBm (P-1dB), and +32dBm (Psat). Current draw at 12Vdc was 470 to 770mA (idle to full power). Amp #4-2 had 44dB gain, +25dBm (P-1dB), +31dBm (Psat) and 250-750mA. Amp #4-3 had 40dB gain, +25dBm (P-1dB), +28dBm (Psat) and 300-560mA. The case ran very hot under operation. Too hot to touch. A heat sink is suggested with this amplifier. For my own personal use in my new 5.8 GHz Transverter, I plan to use this as the final amplifier. I have added a heat sink to it. I plan to mount it directly on the dish antenna.

SE5004 Conclusion: None of these Chinese amplifiers using the SE5004 came up to SkyWorks' specification of max. rf power output of +34dBm (2.5 Watts) (at -1dB gain compression). Some were way low ! I thus suspect that the Chinese were using floor sweepings, factory reject parts. Hence the low cost. This however didn't stop them from using SkyWorks' spec. of 2 Watts in their advertising. Bottom Line -- (1) You get what you pay for. (2) Never trust the Chinese advertising.

So, have I kindled any interest ? Time for you to start designing your 5cm, 5.8 GHz rig around some of these low cost amplifiers.

73 de Jim, KH6HTV, Boulder, Colorado

GOOD NEWS from Hi-Des:

After a long absence, Hi-Des has brought back their model HV-120 Receiver which covers the 70cm, 33cm and 23cm bands. It is again listed on their E-Bay store front (<https://www.ebay.com/str/HiDes168>) selling for \$259.

Other Hi-Des products of particular interest to ATVers currently listed on E-Bay include:

Modulators: HV-310 (\$279) & HV-320E (\$399)
 Receivers: HV-110 (\$119), HV-120-1.2G (\$259), & HV-122 (\$299 & up)
 Down-Converter: BD-300 (\$169)
 Repeater: BR-101EH (\$239)

Note: To find our more about the BR-101EH repeater, see our ATV newsletter issues #24 & #26 from Nov. 2019.


ブース No.B-14


→


XHEAD-2

アマチュア無線応用事例

XHEAD-2 を使うとアマチュア無線で FHD-ATV (フルハイビジョン ATV) が可能に

XHEAD-2 は通常の HDMI 形式の HD 動画を地デジ形式の電波に変換するコンバータ (デジタル変調器) です。

XHEAD2はHDMIのデジタル画像を OFDM 変調することにより、簡単に FHD-TV の電波を発生させられます。出力された地デジ周波数の電波を 5.6GHz などのアマチュアバンド周波数にアップコンバートすれば、フルスペックハイビジョンの ATV 運用が可能になります。7月にアマチュア局がすでに XHEAD2 を使用した機器で正式免許を受け、運用開始しています。ハムフェア 2018 の会場でもデモを行っています。

マイコンソフトホームページ <http://www.micomsoft.co.jp/>



OFDM 変調コンバータ [XHEAD-2]



▲ アルミのケースにうまく納め移動が容易になっている



▲ アップパータ部を引き出したところ



▲ ケース上部への実装状況。受信用の地デジ TV やそのリモコンなどが収められている。フタにモニターが装着されている



▲ フタを開め正面から見たところ

ブース No.J-05 西新潟クラブ & 東京マイクロエーブクラブにて実物展示中



JA0RGP 使用例



コンバータ部分がシンプル化して小型化

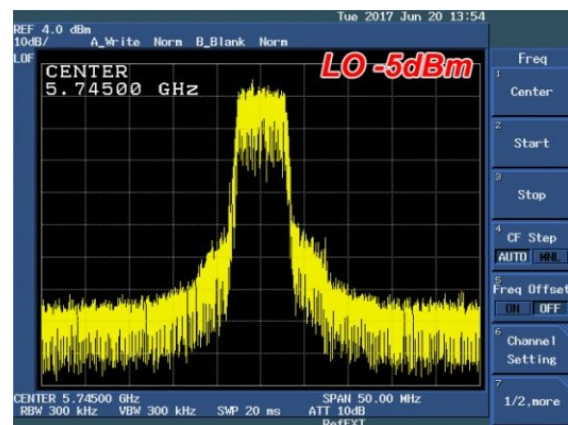
DATV NEWS from JAPAN

Hello Jim --- Thank you for sending me the ATV reports.

As I reported before, this current Full HD-ATV in Japan uses the 64QAM, OFDM, "ISDB-T" system developed in Japan. I think this method is almost similar to "DBV-T2" method. The advantages of this method are:

- ① Digital terrestrial TV broadcasting: Transmission and reception of "high-quality video (FHD-TV)" equivalent to that of terrestrial digital broadcasting is possible

- ② You can choose a commercially available FHD modulator starting at 40,000 yen
 : http://www.hides.com.tw/product_HV320j_eng.html
 : <https://ja.aliexpress.com/i/33022197427.html>
 : <https://www.micomsoft.co.jp/xhead-2.html>
 : https://aliexpress.com/item/4000033657746.html?spm=a2g0o.productlist.0.0.6498505a57bFqj&algo_pvid=f622a42a-9baa-4552-a426-81bb1ce2100a&algo_exp_id=f622a42a-9baa-45
- ③ STB can be decoded with a commercially available set-top box (STB) of about 3000 yen
 : <https://isdb-t.com/ja/category/isdb-t/isdb-t-for-home/>
 : <https://isdb-t.com/ja/product/digital-tv-isdb-t-isdb-c-receptor-tv-tuner-receiver/>
- ④ Recording of video etc. can also be recorded in FHD to "SD card / USB device etc."
- ⑤ A portable one-package set can be constructed for mobile operation.
- ⑥ No PC or other equipment is required on-site, and an "ultra-high brightness monitor" can be used, and the images are displayed clearly even under direct sunlight.
- ⑦ Immediate transmission and reception is possible with SW-ON at the mobile operation site. In addition, in Japan, D-ATV transmission is possible only with microwaves of 2.4 GHz or higher, so there is almost no shack operation, and it is operated outdoors with a good view. The FHD modulator output frequency is the 713MHz band, but the 700MHz band frequency is directly input to the transverters such as 5.7GHz, 10.2GHz, and 24GHz as an IF. And the station's first LO frequency is set to 5032MHz and 9512Mz. With such a configuration, reception can also be received directly at the STB.



A small manufacturer, COSMOWAVE, in Japan specializes in selling a 5.7GHz transverter like the one shown in photo, so FHD-ATV transceivers can be created relatively easily. <https://www.cosmowave.net/?pid=138242231>

Also, when I look at D-ATV reports from other countries, it is strange that there are many still images for some reason. Also, why are there so many videos of the communication recording video screen shot with a different camera? Is it possible to upload the received recorded video to YouTube etc. as it is?



Here is a picture of my 5.7GHz Full HD-ATV transceiver. With a 10.2 inch monitor, you can send, receive, record, playback and send back his Full-HD footage on his ISDB-T. It can be changed with one switch. Full HD-ATV communication of 110km was successful even with a small patch antenna directly attached to the transceiver in the photo.

73 de JA0RUZ, Fumio Sekizaki, JAPAN

QO100 NEWS:

Just a new (info). It is possible to see retransmission from QO100 when people using Minitioune system linked to <https://phase4a.eu/> Quite nice !

73 de Francois, F1CHF,
Franconville, France



What is QO100 ? -- It is the Ultimate Amateur TV Repeater. It is a geostationary satellite at 25.9° East. It's foot-print covers Asia, Europe and Africa, but not the western hemisphere. It carries two "Phase 4" amateur radio transponders operating in the 2400 MHz and 10450 MHz bands. A 250 kHz bandwidth linear transponder intended for conventional analogue operations and an 8 MHz bandwidth transponder for experimental digital modulation schemes and DVB-S amateur television. Google it for a wealth of additional info.

TUNING 3+ GHz BRICKS

Since we no longer have any ham band in the 3 GHz range, the 3+ GHz bricks I have are of no value there. So I have taken a California Microwave brick that was set to operate around 3.6 to 3.9 GHz and have been able to re-tune it to 6518 MHz with an output of 9.4 dBm. It does have harmonics above and below that are over 1 GHz away. At the very

least this is an LO for on the bench testing. Using our DVB-T frequency of 5678 MHz, this LO allows an IF of 838 MHz which is in the range of our DVB-T gear.

Don - then writes later. I HAVE FOUND THE GROVE. I now have another brick tuned to 5280 MHz with +8 dBm out and no harmonics. I have yet another brick tuned to 5260 MHz with a whopping +20 dBm out and no harmonics. So I will revisit the earlier brick and re-tune it. I now feel good re-purposing these bricks from 3+ GHz to 5-6 GHz.

73 de Don Nelson, N0YE, Boulder, Colorado

NEW YORK ATV ? Charles, N2NOV, writes "Does anyone know of any analog or digital ATV activity in the New York City area ?" Charles is the NYC-ARECS/RACES Citywide Radio Officer / Skywarn Coordinator.

NEW ENGLAND ATV ? Skip, K1NKR writes "Glad to see some "noise" here in the Northeast! I've been DVB-T capable since 2015/16, initially with Fred, AB1OC but he's pretty much dropped out. He's been heavily committed with club, and now ARRL Division duties, plus after I moved 20 miles south we can't make the path any more.

I've currently got two stations, one complete and one still being built on a pw-priority basis, plus one receive-only set. My understanding is that there used to be a moderate amount (repeaters, etc.) of ATV activity in New England decades ago. All gone now. Haven't been able to gin up much interest around here." . *Skip, K1NKR lives in Marlborough, Massachusetts midway between Boston and Worcester on I-290*

CHICAGO ATV ? Wayne, W9BBB writes " Hi Jim,Just wanted to drop you a note to say thanks again for adding me to your Free ATV newspaper .Enjoy them very much and always look forward to another. Can't wait for the next. .Trying to get someone out my way to get some digital signals on the air .73"s my friend and hope things are working out for you and wife." *Wayne W9BBB, lives in Dwight, Illinois which is midway between Chicago and Bloomington on I-55.*

DigitalATV@groups.io

"The purpose of this group is to share knowledge & experiences using and developing DATV technology for amateur radio (ham radio) use. The group is for both experienced DATV users and those new to DATV."

This on-line "group" originally was on Yahoo.com until Yahoo discontinued hosting groups. It currently has 469 members. After 2019, it became rather dormant with very few postings. Recently, there has been a flurry of activity, mainly triggered by a discussion of ultra-narrow band-width ATV for use on the upper HF band of 10 meters. Not SSTV with single images, but "live" video. It was triggered off by Grant, VE3XTV. The following are some of the postings and replies. To read the complete, on-going string, go to the web site.

ATV on 10 meters ?

Grant, VE3XTV, North York, Ontario writes that he has been working on a new NBTV, 90 line system that could be transmitted on the 10m or 6m bands, as a way to do ATV over longer distances.

Grant used to live in New Zealand and was very active there with ATV. His call there was ZL1WTT. We used to hear a lot from him in ATV Quarterly magazine. His www.qrz.com bio says "Now using this call, based in North York not far from Toronto, now getting back into building ATV equipment and playing around on the microwave bands. For more information on ATV/DATV in the greater Toronto area and Ontario take a look at this Yahoo reflector at Ontario-ATV@yahoogroups.com"

Hi All -- Who would interested in working with NBTV? I working on a new 90 line system, as it seems impossible to find anyone locally that would be interested in doing ATV / DATV here in Toronto. Therefore I am working on a possible new long distance form of ATV that would be usable via Sky-wave, it will be using analog video processing and a new type of RF modulation. In many ways going back to basics of Television and taking a very new approach to get this idea to work. Where the only part that will be digital will be the Digital Signal Processing (DSP), I am using to process the video for the RF modulator and the de-modulator stage, as this is a return to technology used with ATV, to get around the limitations with digital modulation. This is very much a hardware project and for those who would be looking a software application to download will be out luck, as I need optimize this technology to maximize the spectrum efficiency.

Grant Taylor, VE3XTV, North York, Ontario, Canada

Can I ask if you can state the occupied bandwidth required and if you think the modulation mode will be legal under US and Canadian rules? I assume this can be called slow scan TV, correct?

Bob, K3NSC, Pittsburgh, PA

Grant's Reply: As for the question of bandwidth, we need focus on spectrum efficiency, as this is technology I have developed over the last five years, that will provide for higher level of analog compression than what was possible with AM-VSB transmission within a 6 MHz channel. The limitation is always the what possible within the Shannon Hartley bandwidth theorem, as this is a very real issue I been running up against in working with this type of NBTV modulation.

Editor's note: Grant really didn't directly answer the band-width question.

Another reader said --- "I certainly would be interested if it were not just another iteration of SSTV. (ie still pictures) "

Grant's Reply was --- "100% with you on that, this has moving pictures at 120 x 96 x 12.5 (W x H x FR), whereby the processing will scale up the image to 240 x 192 x 25. I also have plans to up scale to PAL 576i and to have a HDMI output for 576i / 576p as well.

Here is a link to what is possible with 96x64 pixels: Show and Tell: TinyTV 2 and TinyTV Mini! (<https://www.youtube.com/watch?v=3IINdW6yQxE>) "

Reply from BATC-UK Whilst I commend any form of innovation and experimentation, I am concerned that Grant has not properly evaluated the extreme Reduced-Bandwidth DATV techniques that have already been tested terrestrially and on QO-100 in Europe. There have been numerous tests conducted using 35kS QPSK, 8PSK and 16 APSK DVB-S2. This mode is easily capable of transmitting slow moving SD or 720p H265 images in about 50kHz of bandwidth. Even at wider bandwidths, there have been some notable DX successes. For example, a 125kS, QPSK, DVB-S2 contact over 1700km using sporadic-E on 50 MHz (Netherlands to Italy). DVB-S2 operates very close to the Shannon limit and (in its extreme narrow bandwidth forms) has proved to be very robust in multi-path situations. The modulation is easy to generate with a PC (or Raspberry Pi) and an SDR, and the MiniTiouner series of tuners take care of demodulation and error correction; Windows MiniTione software operates down to 35kS.

Some BATC members have built DVB-S2 equipment for 29 MHz (where there is an IARU R1 bandplan allocation for "wideband" digital modes), but there has not been sufficient interest in the band amongst the ATV Community for widespread testing yet.

Could I suggest that, before developing a new standard, the group evaluates extreme RB-TV, DVB-S2 which seems to meet many of the key requirements?

Dave Crump, G8GKQ, Salisbury, England

 I've spent the last week listening to the New York FM voice repeater on 29.620 MHz. At times it is fully quieting on FM at S9++ and that's on a wire antenna not optimized for 10mts - there's currently a lot of G stations working through it. do realize that there is a lot of phase distortion at times but I can't help but think it would decode on 150ks DATV, particularly if DVB-T.

So the question is how do we go about getting a 29 MHz DATV beacon on the air on the East Coast of the USA?

FYI - IARU region 1 has allocated 29.00 to 29.510 for experimental wideband digital and seems the ARRL bandplan has that band allocated to phone and image.

It wouldn't need to be on 24 / 7 if we had remote control so that we could turn it on when we heard the voice repeater on 29.620MHz.

Now is the right time in the sunspot cycle to be doing this and I'm sure we could provide some funds for the beacon build via the BATC bursary fund...

73, Noel Matthews, G8GTZ, Basingstoke, England

EDITOR's reply: *50 kHz sounds quite narrow. But unfortunately, at least here in the USA, the FCC does not allow that on our HF bands. They even have "heart-burn" over using some of the various digital texting modes within a much narrower SSB or AM voice channel band-width. The folks in the U.K. are lucky that the OFCOM authorities there are allowing them to experiment on the much wider 10 meter, 6m & 4m bands.*

U.K. Beacon ? --- Those of us in the US are not allowed to transmit DVB-T on 29 Mhz. How about a test in the opposite direction? I'm on the east coast of the US with a working Knucker receiver. I believe it only goes down to 44 MHz, but with some sort of a frequency converter, I could probably listen on 29 MHz. Are there any operators or beacons in England currently sending DVB-T on 10 meters? and what frequencies would one listen on?

John Kozak. K0ZAK, Reisterstown, Maryland

Comments from Holland: --- I fully agree what Dave is telling of what we are doing in Europe on the QO100 but we use the same techniques also at 23cm 70cm, 2m, 4m and 10meter. I am a very active DATV amateur on the QO100 satellite with DVB-S2 as well as SSB. The footprint of the QO100 is covering from the North Pole to the South Pole as well as from Brazil to India /Indonesia and all in between.

The most common symbol rate used at the satellite is 333K/s but experiments have been done down to 25K/s with good audio and video. The only important thing with low symbol rates is that your complete station needs to be GPSDO locked, otherwise you can't receive the signal. Tests have also be done with DVB-T on the satellite with small symbol rates down to 35K/s.

If you are interested in my station setup, please visit my QRZ.com page. There you will find NB (SSB) and WB (DATV) setups. The most common used SDR transceiver is the Adalm Pluto. Have also a look at the AMSAT .DL forum or the BATC forum where you can find a lot of information around QO100 setups.

73' Jaap Schekkerman, PA2JSA, Amersfoort, The Netherlands

MILITARY TRIALS of HF-TV: --- Rockwell-Collins performed a series of experiments on long distance data transmission, including video, over the HF bands for the military in both the USA (2011) and the U.K (2012).

They demonstrated data streaming over a 1320 km path in 2011 between Cedar Rapids, Iowa and Ottawa, Ontario on the 30 meter band. The experiments also included other sites in Texas and New Mexico and the Netherlands. They demonstrated full motion, color, H.264 video over HF between Iowa and New Mexico for 75 minutes without sync loss. This was at 15frames/sec. in an 18 kHz band-width.. , See: https://web.archive.org/web/20150615112253/http://hfindustry.com/meetings_presentations/presentation_materials/2011_sept_hfia/presentations/3_Rockwell_WBHF_High_Order_QAM_OTA_Results.pdf

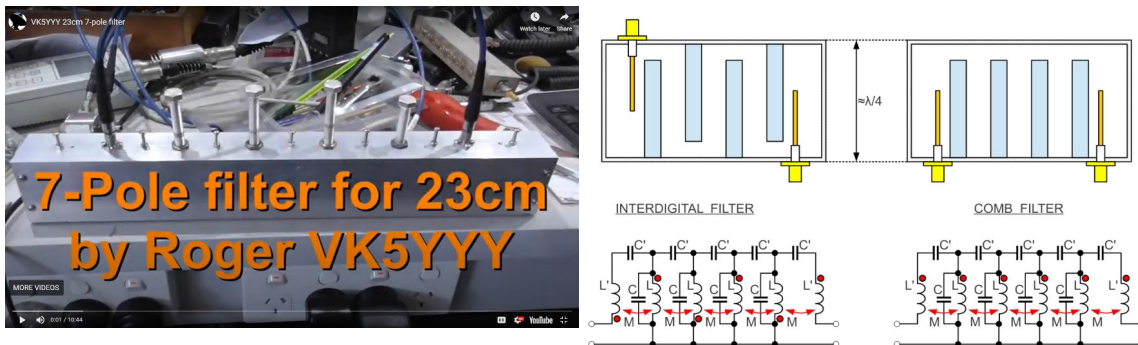
Trials in the UK on HF using 3.613 kHz among others took place in 2012 between Blandford and Portsmouth (Portsdown), and Arbroath and Portsmouth it showed that color video could be streamed at 15 fps in bandwidths of 24 kHz and as little as 18 kHz.

https://web.archive.org/web/20150604230233/http://www.hfindustry.com/meetings_presentations/presentation_materials/2012_sept_hfia/presentations/RC_WBHF_UK_Trial_2012.pdf

73, Trevor Essex, M5AKA, Chelmsford, England

EDITOR's QUESTION ? --- I have been confused for a long time. Perhaps someone at BATC can help answer this question. In all of the documentation and correspondence coming from the ATV hams in Europe, they always talk about what symbol rates they are using, such as the above mentions of 333ks/s, 150ks/s, 35ks/s, 25ks/s, etc. But they never say what the occupied band-widths are. **What is the correlation between your symbol rate and bandwidth ?**

I do know at least for DVB-T, there can be a dramatic difference. When we set up our DVB-T modulators, we have independent control over the band-width and the video data rate. For example, with our Hi-Des modulators we can set the occupied bandwidth anywhere from 1 to 8 MHz. We can then select the constellation (QPSK, 16QAM, or 64QAM), FFT (2K or 8K), Code Rate (1/2 to 7/8), and Guard Interval (1/4 to 1/32). Once these are set, the theoretical maximum modulation data rate is computed and displayed. For example at 6 MHz BW, 64QAM, the max. is 23.75 Mbps while for 6 MHz, QPSK, it is 7.92 Mbps. But we then are allowed to independently set the max. data rate to any value less than this. To typically allow for the audio data rate and overhead, we usually set it to about 80% of the theoretical max.



BAND-PASS FILTER FEED-BACK: Claudio, I2NDT writes "In the latest bulletin, Mario KD6ILO reported a You-Tube video: That is John's VK2ATU channel! On the same topic there is also another interesting video by Roger, VK5YYY: <https://www.youtube.com/watch?v=U53KLwSoGCY> Both videos are based on this paper made by S53MV, Matiaz Vidmar, a well known "Microwave" here in the EU! "Practical Cavity Filters for the Frequency Range 1 GHz ... 4 GHz" <http://s53mv.s5tech.net/cavity/cavity.html>

ATCO NEWS: The ATCO repeater is now back up and running after a rather significant antenna feed-line retrofit. The facility where we have our "antenna farm" is changing the roof entry fittings which required us to replace all 9 of our feed-lines. Sounds simple but it was a difficult process that took about a month to accomplish. At this time everything is back to normal except for a problem with the DATV 423MHz transmitter. It didn't power up correctly so I need to return to either fix it on site or pack it up under my arm for some home bench surgery. It's a HiDes HV100R unit that worked

OK before but can lose some setup if left unpowered for an extended period. We'll see. So, in the meantime, the 423 continuous signal is off the air.

Come to the ATCO Fall Event and socialize with us. ATCO will have complementary food (And not just sandwiches / pop!). I'm planning to have chicken or pulled pork, potato salad, baked beans, Cole slaw and a variety of pop. (Sorry, no beer). Don't forget, the Fall Event will be on Sunday November 13 from 1 to 4 PM at the Westerville Library. More details in the Ham Ads page of this Newsletter.

73 de Art, WA8RMC, Westerville, Ohio

ATN - Arizona: ATN-AZ has started holding monthly, in-person, social meetings for it's members and guests. They held the first meeting on Sunday, Oct. 30th. The next meeting is scheduled for Nov. 13th, 6pm. They are holding their meetings in the meeting room at Denny's Restaurant in Tempe. The address is 825 S. 48th St. For more info, contact Rod Fritz, WB9KMO, at wb9kmo@gmail.com Rod says "If you can't be there in person, please join us on www.whereby.com/atn1

SAN DIEGO, CA NEWS: Good to hear of the great activities in the area of amateur TV image communications from single operators to club activities on DATV. It took our San Diego DATV Society eleven years from six(6) members in 2009 to now 62 very active. Experimenting in all areas of the ham TV spectrum. DVB-T2, DVB-S2 and ATSC 1.0 |3.0 using modified [THOR] modulators thanks to our engineer staff and programming team.

Mario Badua Jr., KD6ILO

FEED-BACK:

Jim, These newsletters are incredible. There is still much I do not understand, but I learn something new every time I read them. 73, Stephen, KC1LPZ, Framingham, MA

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.**



**Amateur
Television
in
Central Ohio**

ATCO
2022 FALL EVENT
Sunday November 13, 2022
1:00 PM Lunch/meeting
WESTERVILLE LIBRARY
MEETING ROOM "A"
126 S State St, Westerville, OH 43081
FOR MORE DETAILS, CONTACT
ART - WA8RMC 891-9273
LUNCH PROVIDED - DOOR PRIZES -
BRING A FRIEND AND SEE OLD BUDDIES
MINI HAMFEST - SHOW AND TELL

The screenshot shows the Hana Wireless website with a navigation menu and a grid of six antenna products. The products are:

- HW-DCGD9-15-NF - 900MHz 15dBi Grid Parabolic Antenna**: \$99.95
- HW-GD9-18-NF - 900MHz 18dBi Grid Parabolic Antenna**: \$279.95
- HW-DCGD24-19NF - 2.4-2.5GHz 19dBi Grid Dish Antenna**: \$49.95
- HW-DCGD24-24NF - 2.4-2.5GHz 24dBi Grid Dish Antenna**: \$59.95
- HW-DCGD58-27NF - 5.8GHz 27dBi Grid Dish Antenna**: \$289.95
- HW-DCGD58-30NF - 5.8GHz 30dBi Grid Dish Antenna**: \$72.95

DISH ANTENNAS: Larry, N8GGG, has found another potential, low cost source of dish antennas, Hana Wireless. Some are also sold on Amazon and E-Bay.