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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Newsletter Now National USA ATV Newsletter

This newsletter started out in 2018 for the local Boulder, Colorado ATV group of about 20 hams. Since then it has grown to become the "de-facto" national USA ATV newsletter. We now get contributions from other ATV groups across the US and overseas. This issue has a nice article from Japan about microwave DATV across the ocean. We welcome articles and other notes from elsewhere and will strive to publish them. Our distribution list has grown to over 450 ATV hams, plus others who download it direct from our web site. It is distributed via e-mail. If you have ATV friends who would like to receive it, simply send us their name, call sign and e-mail address. Also we offer free advertising for amateur radio/TV gear. To keep the size of the newsletter manageable and readable, I try to limit the number of pages in each issue to about a dozen. We publish at least monthly, and if the amount of material warrants, then even more often. All past 80+ issues are archived at: https://kh6htv.com/newsletter/

Jim, KH6HTV, editor

MICROWAVE OCEAN DUCTING of 5 & 10 GHz, Hi-Def, Digital TV
287 km (178 miles)

Fumio, JA0RUZ has recently reported to us:
Hello Jim --- Thank you for always sending us your newsletter. In Japan, we successfully communicated 287km on July 22nd with a 10.2GHz, full high-definition ATV.

Actual recorded live video of our DATV contacts are on YouTube.
JA4JKE / 4 → JA0RUZ / 9

https://www.youtube.com/watch?v=_M7Xrarg_yw
JA0RUZ / 9 → JA4JKE / 4
https://www.youtube.com/watch?v=wu5j8J0sWAM

In Japan, full high-definition video transmission with a bandwidth of 5.7MHz is not licensed unless it is in the band above 2.4GHz, so 5.7GHz and he uses microwave bands such as 10.2GHz. And since it is not necessary to narrow the bandwidth in the microwave band, the mode such as 6MHz bandwidth can be used as it is, so there is no need to extremely compress and narrow the bandwidth. If the propagation distance is 10.2GHz, 0.2W output and you can send and receive up to nearly 300km, you don't have to bother to narrow the band! And the video quality is almost the same as terrestrial TV broadcasting, and you can send and receive with full high definition.

73 de Fumio Sekizaki, JA0RUZ, ruz@cap.ocn.ne.jp

The following is from Fumio's Blog at:
https://blog.goo.ne.jp/ja0ruz/e/f6b734acac5d8f5b7d8d9a2a541b99db

10.2GHz ISDB-T method FHD-ATV Succeeded in communication of about 287km (Propagation of the Sea of Japan duct)

On July 22nd and 23rd, I went to Ishikawa and Toyama prefectures for the "10.2GHz Full HD ATV DX Challenge" using the Sea of Japan duct

On July 22, we left Nagano after 7 am, took the Hokuriku Expressway from Itoigawa IC via Hakuba, and arrived at Mt. Hodatsu from Kanazawa Morimoto IC via "Noto Satoyama Kaido". (Approximately 5 hours course including rest etc.)

From the perspective of Nagano people, this course is very nice and comfortable! !!

At the site, the JA9BPH station in Kanazawa City is operating to secure a place by raising some antennas, etc., and we ate together at noon before the start of construction , and since it arrived earlier than planned, we prepared with plenty of time. We waited for the preparation of 4 areas

When the test was started at 5GHz FM around 13:00, it was said that two 5GHz beacon stations permanently installed in 9 areas could be received by M5 even in Tottori City, which is about 270km away. This is amazing! !!

The JH9TJT station, which was first moved to the coastal edge of Ishikawa Prefecture, also communicated with Tottori via FS at 5.7GHz FM. I was delighted with the success of the Sea of Japan Duct DX QSO for the first time. Since I first experienced the Sea of Japan duct more than 20 years ago, I am still drowning in this excitement.

After that, 5.7GHz FHD-ATV could be done in both directions, and it was in the 10.2GHz band ...FM was FS, and it seemed a little weak to FHD-ATV, but I changed it to FHD-ATV and tested it. **After all there is no image ...**

After a while, I tried several times. Eventually, a glimpse of the image will appear even at 10.2GHz! ... maybe it can be done? ?? After a few more challenges, **I was persistent until around 16:00 and succeeded in two-way FHD video communication without any problems! !!** ..(However, the recorded data at this time becomes an "error", and the recorded video is lost ...) However, I managed to play the video that had no problem in the previous half, so I uploaded it to YouTube as evidence
https://www.youtube.com/watch?v=_M7Xrarg_yw

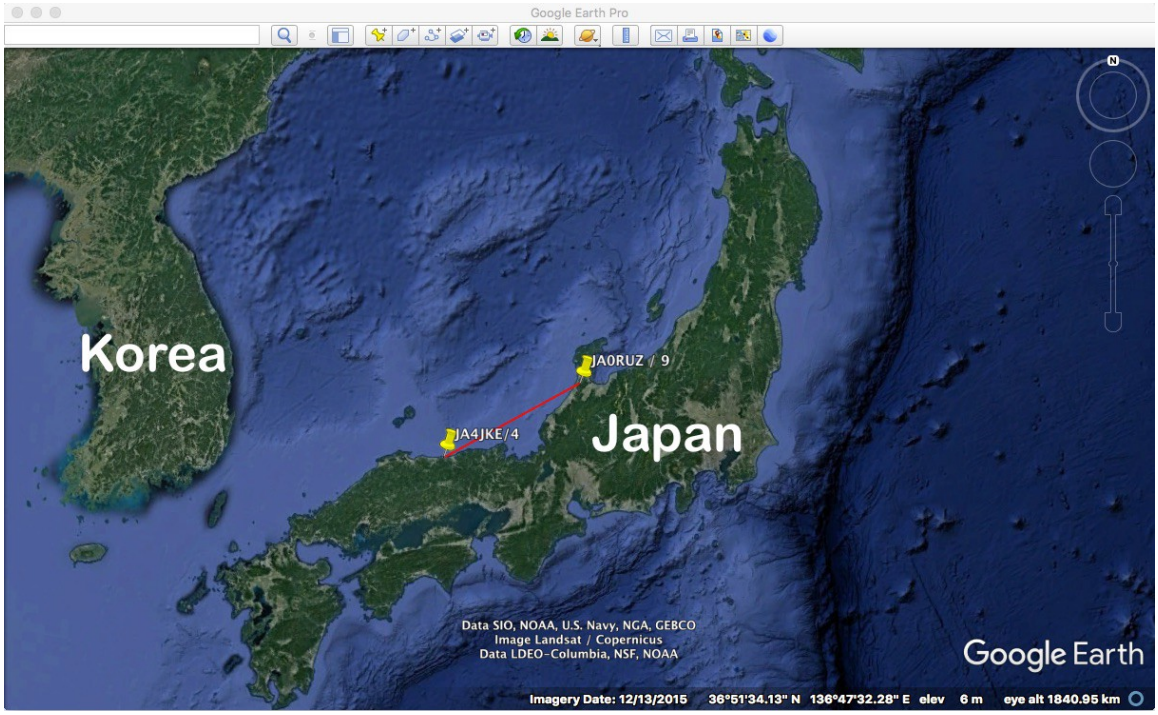
Added on July 31 This is a video in the reverse direction (JA0RUZ / 9 transmission JA4JKE / 4 reception). https://www.youtube.com/watch?v=wu5j8J0sWAM

In addition, the JA9SNG station (9 area 5.7G beacon operation) was also seen on the way, and communication was made with 4 areas and FS with only a small handy of 430 . This is also the real thrill of the Sea of Japan duct!

We do not think that communication recording in TV mode is "successful only by instantaneous communication" unlike voice, CW, and data. The hurdle is quite high because I think that it can be said that it is "success" when a normal image is "displayed continuously for several tens of seconds" .

I think it's strange to see "59 even when you can hardly hear it" that you often see in contests! !!

For the first time in the fifth year since the development of the 5.7GHz FHD-ATV, we were able to reach the successful communication of the 10.2GHz FHD-ATV Sea of Japan duct 287Km



This aerial photo from Google Earth Pro shows the locations of JA4JKE / 4 and JA0RUZ / 9 and the 287km rf path between the two sites. JA4JKE at 35.524254º x 134.017122º JA0RUZ at 36.778638º x 136.806837º

On the 23rd, at Iozen Hakakudo , Murakami City, Niigata Prefecture: I challenged about 300km, but the duct weakened and I ended up communicating with 5.7GHz FM FS. If the lid once upon a time before even this is Banbanzai, but requires a strong propagation as further 40dBm case of FHD-ATV and will. (At least -80dBm is required at 10GHz antenna output level)

Since the duct is a natural phenomenon, we have no choice but to grasp the luck as well as the quality of the equipment. But there is still more fun to do, so the challenge will continue! !! Hi

When I accessed the Hijiriyama repeater (JR0WS: 439.38MHz) in Nagano, which I tested, I opened it at 53 and was able to communicate with stations in Nagano city without noise. In addition, there is 1292.30MHz, but it is abandoned because it has the same fre-

quency as the Oyabe repeater. (Several people such as us also manage and operate the JR0WS Holy Mountain Repeater)

This is also a challenge with partner stations, but FHD-ATV, which has very few partner stations and can only QRV a small number of stations, is difficult to record! !!

Fumio, JA0RUZ

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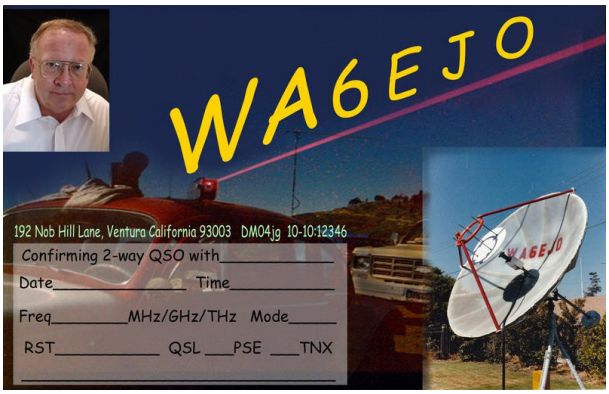
Jim, I would like to explain a little about Japanese D-ATV.

When I started FHD D-ATV in Japan, I adopted the same "ISDB-T system" as Japanese commercial broadcasting stations and the same as terrestrial digital TV broadcasting. There are two video formats, MPEG-4 and MPEG-2, but now I mainly use MPEG-2. MPEG-4 is the easiest way to make a transceiver.

Also, in Japan, the ISDB-T system D-ATV is licensed for a 5.7MHz bandwidth only in the microwave band above the 2.4GHz band. By transmitting in microwaves, there is no need to compress and narrow the bandwidth. Also, with microwaves, it is possible to fly 500km 700km in calculation even if the power is small due to the antenna gain. (But I can't get that line of sight) Also, the transmission power of Japanese amateur stations is only allowed up to 1W (mobile station) in the 1.2GHz band and up to 2W in the 2.4GHz to 24GHz band. And even if the same amplifier is used, the OFDM / 64QAM signal can only be output cleanly with a power that is about 13 dBm to 16 dBm lower than that of FM etc. due to its characteristics.
It is such a Japanese D-ATV. I look forward to working with you. Thank you.

JA0RUZ. Fumio

Spot Light on An ATV Ham



Steve, WA6EJO, of Ventura, California has an interesting ham radio career. His qrz.com bio includes -- " Pioneered Amateur Radio Laser communications. Did some mountaintop VHF, UHF, Microwave contesting with the Los Padres group, W6OAL, et al. 2M, 220, 432, 1296, 10 GHz & 474THz." Note that last entry was not MHz, nor GHz, but **THz** ! 474 THz is a very short wavelength of only 633 nanometers. So short that it is actually visible with the human eye. Steve's early DX with light was 15 miles in 1979 up to 58 miles in 1991 all using HeNe lasers and photomultiplier tube receivers.

Steve has also been quite active in microwaves, including organizing conferences and writing articles for ham radio magazines, plus ATV. He unfortunately lost everything in a recent (2017) forest fire. I became acquainted with Steve when he ordered a replace-

ment 70cm linear amplifier from me. In recent correspondence with Steve I inquired about what he was up to. His reply e-mails below are worth sharing with others.

Hi Jim --- Except for repairing the Oat Mt. repeater 919.25 transmitter zero progress on this end. Still waiting for HiDes to make a HV-200E for me. Have not taken your 70cm amp out of the box yet. I did get panel antenna for 1.2 GHz from Mt. Wilson output which is giving me a P5, ATV signal, surprising for a 9-inch square panel! I wonder if there's a panel for 70cm - I haven't found one yet. Otherwise working on optical transceivers.

73, Steve WA6EJO

Hi Jim,

Funny you should bring up the light stuff. That was so long ago and I'm just getting back into it! I have a pair of working optical transceivers now but working on refinements.

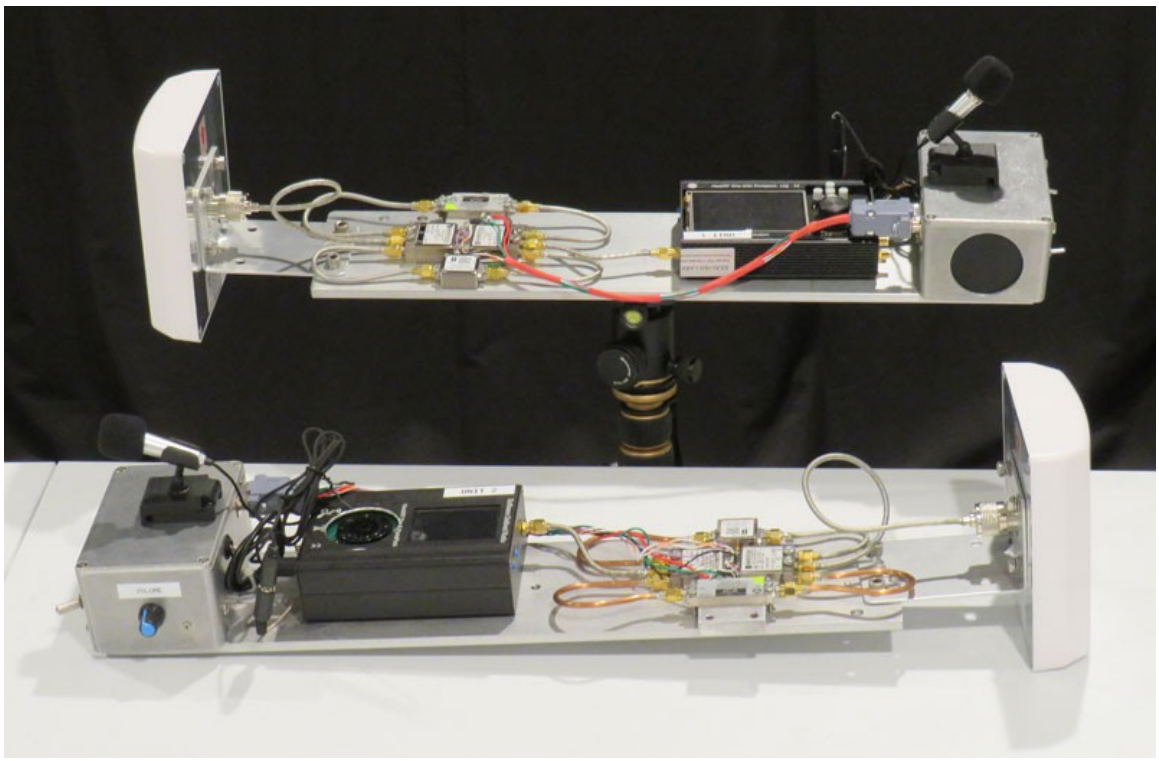
No more lasers due to the ARRL limit of 5 mW. Now using LEDs as there is no power limit. Goal is ARRL contest points, not distance records.

I'm working with two wavelengths, visible red ~630nm and infrared 850nm. 940nm so far has been disappointing. Silicon photodiode receivers.

One goal is to see if I can get something practical to work at least a few miles in daylight. I started with the brightest T1-3/4 5mm LEDs I could find, VLCS5830 624nm 65cd 8-degree beamwidth and SFH4550 850nm 70mW 6-degree beamwidth. They are impressive. I'm using those in groups of 15 and 17 press-fit in precisely drilled holes so that alignment is maintained. I can copy both wavelengths in full daylight at one mile.
Not wanting to reinvent the wheel I'm adapting the excellent circuit designs of KA7OEI: < http://www.modulatedlight.org/optical_comms/optical_rx2.html >. Simple AM voice. The receiver circuit is amazing at being able to receive signals in the presence of background light.

Now I have discovered the 'star' PCB-mounted LEDs and special lenses for them that result in incredible brightness, 6 times the energy at the receive end over my very bright T1-3/4 arrays. I'm waiting for a couple other IR LED versions to arrive before deciding on what ones to use. Beamwidths are around 8-degrees, 2-degrees with added lenses after the cone lenses.

So after doing what I did in the 70s and spending 22 years as senior test engineer at Advanced Photonix developing test equipment for custom LEDs and photodiodes I can't seem to get enough of this stuff. I know we had some of your PSPL equipment at work.



Previous project was a pair of HackRF One Portapack microwave transceivers. These do 2.4, 3.4, and 5.6 GHz. Takes two panel antennas to cover the three bands. 175mW to 550mW out depending on the band. 1 dB NF preamps. They are fussy to set up to transceiver with a lot of menu selecting and button pushing needed. Need someone to write custom code to make operating easier.

That's about it on this end. -- 73, Steve WA6EJO

Editor's Note: -- We hope that after Steve gets his optical transceivers working with AM voice, he will then use them to transmit and receive AM, analog video and perhaps even digital video.

ATV at QSO Today: Rod, WB9KMO, & Roland, KC6JPG, of ATN will be presenting a talk entitled ***"Amateur Television -- The Original Social Network"***. It is scheduled to be presented on Saturday, August 14th at 3pm (MDT) [21:00 UTC]. Rod & Roland's intro is "Amateur Television is new and improved beyond what you might imagine. The technology is current and so is the content. Let us show you what we do on ATV today and how much fun we have. This social network has evolved into something truly amazing !"

New ATVer in the Dayton Area

Pictured is Bill McCoy's (W8CWM) call-sign being relayed through the Dayton, Ohio, W8BI ATV repeater. Bill is located in Englewood, Ohio. Yes, A5 ATV is still alive and well within the Midwest region! Bill is using a restored MBM 88 element J-Beam at 30 ft, paired with a TC-70-10 PC Electronics ATV transceiver.

The DARA ATV repeater provides simultaneous inputs and outputs on 70 cm digital (DVB-T) and A5 (analog), along with a 1258 MHz DVB-T input and 1280 MHz FM output also cross band repeated through the 70cm ATV system.

On Sunday, August 1st, Bill's 7 watt 70cm A5 signal was received by WB8LGA in Marengo, Ohio, a line of sight distance of 87 miles. Dale (WB8CJW) also was able to receive Bill in Powell Ohio, a distance of 67 miles.

73 de Dave, AH2AR, DARA, Dayton, OH

More Low Cost DATV Receivers:

The North East Victoria (Australia) Amateur Radio Club's latest August newsletter is chuck full of almost 32 pages devoted to DATV this month. Included is an article from Mick, VK3CH, discussing several low cost receivers for both DVB-S and DVB-T. They use both modes there with their repeater. Of special interest is another Chinese combo receiver which Mick says will work on the amateur 70cm band. It is the **Vmade C5 HD Combo T2&S2**. A quick google search shows it available from AliExpress for about $20.

From Gary, WB5PJB:

"It is always interesting to see some hams become aware of something new in the hobby that they didn't know existed. --- From Twitter I found this."

I've been reading a fascinating thing on the League's website called "An Introduction to #AmateurTV / Fast-Scan TV" by KH6HTV. I wasn't aware until recently that UHF channels 57 - 61 are within the 70cm amateur band! 😁 Lifelong learning! arrl.org/atv-fast-scan-... #hamr

W0BTV Details:

Inputs: 439.25MHz, analog NTSC, VUSB-TV; 441MHz/6MHz BW, DVB-T & 1243MHz/6MHz BW, DVB-T
Outputs: Channel 57 --- 423MHz/6MHz BW, DVB-T, or optional 421.25MHz, 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/*

W0BTV ATV Net: We hold a social ATV net on Thursday afternoon at 3 pm local Mountain time. 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*. We use the Boulder ARES (BCARES) 2 meter FM voice repeater for intercom. 146.760 MHz (-600kHz, 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 over 450. 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.**

Tnx NEVARC News

Model 23-8
FM TELEVISION
MODULATOR

The model 23-8 is a 23cm, analog (NTSC or PAL), FM-TV modulator. With 50mW (+17dBm) rf output it is ideal to drive high power amplifiers for an FM-TV transmitter. Frequency synthesized on 3 channels. For more details: www.kh6htv.com

https://kh6htv.files.wordpress.com/2011/09/model-23-8-specs-april-2017.pdf