Amateur Television Journal

April, 2025
2ed edition, issue #185

BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com

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

World-Wide DATV Contacts Sought for 10m or 6m, NB, DVB-S

Hi Jim --- I sincerely hope that you will be better soon.

I am the ATV manager for the Belgian UBA (Royal Belgian Amateur Radio Union) [www.uba.be] and I am also writing a monthly ATV newsletter to about 250 ATV OM's in Belgium, The Netherlands and the Nord of France. I have made mention of you and your newsletter recently inviting them to register with you.

Some smaller group of ATV enthusiast would like to try some D-ATV DVB-S or S2 connections across the Atlantic on the 10m band with SR 125ks or lower.. For the D-ATV DX tests we are not limiting to N. America, test requests from any place in the world are welcome and in the event of sporadic E test could be done also on the 6m band. Practically we make an appointment via email, and for the voice communication to agree on SR or transmission mode and frequency we go to the chat from the British BATC called "DX SPOT" or we use one of the "ZELLO" ATV talk channels.
Can you please mention this in you next newsletters? OM's interested for testing RX or TX can contact me at ***ON4VVV@UBA.BE***

73's, Frans Van De Velde, ON4VVV, Massemen-Wetteren, Belgium

Feed-Back on ATV Cross-Band Repeaters:

Hi Jim --- Sorry to hear and read about your recent illness. I hope your health recovery goes well.

Thanks again for your excellent work on the ATV newsletters ! I look forward to seeing that and enjoy your technical articles and details in those newsletters. Hopefully with the recent information on crossband ATV repeaters more HAM and groups may take an interest putting them on the air.

Crossband ATV is the way to go. I did that some time ago with an NTSC analog system. Being able to see your ATV signal while trransmitting on another band is the way to go and now with a triband antenna system thats great!

Take care, Dean Andrewjeski, K9PT, Mosinee, WI

Broadcast DTV Antenna Pre-Amp Help Wanted:

I have a passive off-air TV antenna and I'd like to add a preamp on the mast, preferably one that multiplexes DC up the downlead coax (Belden 1505A). I have about 14 dB of cable and splitter losses to overcome. There's lots of consumer level products out there so I'm hoping there are some expert folks here with a recommendation.

Thanks for any suggestions! 73, Mark Albert, KB9VKE, Algonquin, IL

Another Source for Inter-Active Discussion of DATV

This ATV Journal provides an outlet for readers to pose questions about ATV and get advice from other hams. There is another on-line resource which gives much more rapid feed-back. Check out ***https://groups.io/g/digitalatv/*** It is a Digital Amateur Television users group. Their web site says "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 DATAV users and those new to DATV." At present the site lists 571 members and 1,231 topics posted since it's founding in 2011. At the present time (4/8) there is a very informative discussion going on between our resident, professional, DTV expert Joel Wilhite, KD6W, Tucson, AZ and Wade Marshall , W7ITL, Tacoma, WA, over what causes "Freeze Framing".

Hi-Des HV-320 Modulator Fan Noise: Is the fan noise from your HV-320 annoying, especially when running it at 13.8Vdc? Try adding a 51 Ohm resistor in series with the fan. The fan resistance is about 170 Ohms. This seems to help lower the fan noise and still provide adequate cooling. The fan will still keep running until the supply voltage drops below 9 V. -- 73 de Jim, KH6HTV

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NEWS from San Diego, California ATV Group:

Mario, KD6ILO, has just sent us this photo. He says it is the new Ground Station Terminal which will be online soon for their CubeSats. It is mounted on pads on the roof of the lab. It is still awaiting installation of the transceiver terminal, testing and alignment. He also says their second CubeSat lauch is set for April 29th. It will be for FOR2 experiment.

Mario also reports that he is now streaming the video from his RF/FSO Gateway over the internet. It is DVB-TW, 4K, 433/6 MHz to 195.69 THz (1532nm channel). It can be received using VLC Media Player with the URL of ***http:// 72.197.31.56:8086/0.ts***

Progress Report -- NBTV for 10 meters

I have been doing a lot with GNU Radio to build the modulator and demodulator for this new NBTV hybrid transmission system. The OFDM works well and got parts of CDMA system working with spread spectrum, both have advantages for HF. The downside of the CDMA is that it needs a GPS reference to work, as it is spread in frequency and in time. To get this to work I needed to lock two HackRF units together with a common clock to do the testing, were each part of the video / audio has a preset PN code to recover the information. Therefore the OFDM is easier to use, to send and receive with a basic TX / RX set up with the HackRF.

Other than this, not much more has been done with GUI application as you can see on GitHub, so at this point now I am upscale the RF testing on 29 MHz and getting the equipment built for this band.

73 de Grant Taylor, VE2XTV, North York, Ontario, Canada

Amateur Television in QST

K1CE

Your editor was recently interviewed by Rick Palm, K1CE. Rick is the Public Service columnist for ARRL's QST magazine. He also writes the ARRL's ARES newsletter which is distributed electronically. Rick previous worked for twenty years at ARRL headquarters as part of the administrative staff, prior to moving to Florida. He now lives in Fort White, Florida.

Rick has been aware for quite some time now about the unique use of ATV in ARES work by the Boulder, Colorado ARES group,

BCARES. So he recently decided to devote a future QST issue to ATV, hence his interview with your editor, Jim, KH6HTV.

As a result of Rick's interview, I have decided to include in this issue for our readers additional material describing how BCARES has utilized ATV to better serve the citizens of Boulder County, Colorado. I hope this might inspire other ARES groups to also seriously consider adding ATV to their Tool Box of communication services for use in emergencies.

BCARES & Amateur TV

Jim, KH6HTV

Boulder **C**ounty **A**mateur **R**adio **E**mergency **S**ervices, **BCARES,** was founded in 1976 after the worst natural disaster in Colorado's history. It was the Big Thompson River Flash Flood which killed over 150 people. In response to it, the Boulder County Sheriff' and Office of Civil Defense called the three Boulder County ham clubs together to organize an ARES group with direct support from the county. In the early years, then main BCARES contribution was providing reliable 2 meter FM voice communications. This was an era long before cell phones and most fire departments only had a simple radio in a fire truck and almost no hand-held radios. Moving into the 80s, BCARES was an early adopter of PACKET radio to enable transmitting written text messges from remote sites to the Emergency Operations Center, EOC. BCARES at that time, also had their own well equipted emergency communications van which was a converted Air Force surplus 6x6 heavy duty truck. It included police/fire radio, ham 2m stations, HF station with RTTY and also ATV receive capability. BCARES supports primarily the Sheriff's dept.

One of the key communications services provides to our public safety agencies is Television. We call it ATV, short for Amateur TeleVision. Visual images of the incident, be it a forest fire, CU student riot, political demonstration, SWAT operation, etc., provide the incident commander with situational awareness.

BCARES was first requested by Captain Bill McCaa, K0RZ, representing the Boulder County Sheriff to provide TV service way back in 1989. BCARES's first ATV use was in providing coverage of numerous anti-war protests and marches against the 1st Gulf War in 1990-91. BCARES had it's first TV repeater on the air by 1990 operating from Chautauqua Park with coverage over the eastern half, plains of Boulder County. By 1991, BCARES also had a portable ATV repeater for use in the mountainous, western portion of the county.

In the early 90s, there were huge impromtu Halloween celebrations occuring on the Boulder city downtown Pearl St. pedestrian mall with in excess of 40,000 people crowded into the mall. BCARES was activated to set up TV cameras on rooftops overlooking the crowds.

In 1995, the University of Colorado Police dept. requested BCARES provide ATV coverage of the home football games. BCARES supplied four TV camera teams transmitting simultaneous pictures on four, 70cm, 6 MHz, TV channels (57 thru 60) to the police command post. BCARES has supplied this up until 2018.

In 1997, the Sheriff requested BCARES assist the SWAT team with ATV. Thus a small, sub-unit of up to four, specially trained, volunteer, BCARES members became part of the SWAT team. This involvement continued up until 2024.

In 1997, major student rioting lasting for three nights broke adjacent to the University of Colorado campus. The riots were in response to the city of Boulder police dept. cracking down on numerous liquor fueled parties. SWAT teams were called in, plus BCARES was activated. TV cameras were both down at street level and on rooftops. BCARES members got to experience tear gas as a result.

With 1/2 of Boulder County being Rocky mountains and large national forest, forest fires were inevitable. Most every fire season BCARES was involved. We have also experienced flash floods, the worst being in 2013.

In 2010, BCARES longest duration operation was for a whole week providing video coverage from mountain tops of the Four Mile Canyon fire. This fire destroyed over 7,000 acres of forest and 160 homes. BCARES's video was credited by the Sheriff with saving several homes.

In 2013, BCARES's biggest ATV technical challenge was issued and was fulfilled. After the bombing of the Boston Marathon, there was tremendous concern by public safety officials that a copy-cat bomber would do the same to Boulder's, famous 10K race, the Bolder Boulder held on Memorial Day. Our race attracts over 50,000 runners. The Boulder Sheriff, Boulder Police, CU Police, OEM, and Dept. of Homeland Security tasked BCARES with providing video coverage of the race both at the starting line and the finish in the CU football stadium. They asked for a total of 8 cameras & TV transmitters. Plus the video was to be sent to both the EOC and also the police command post at the CU stadium. We were able to provide all of the 8 cameras requested. We set up a portable repeater on Flagstaff mountain and provided 23cm, FM-TV microwave links to both command posts.

In 2015, BCARES moved into the modern digital age with High-Definition (1080P) digital TV (DATV). After one single demo of DATV at a CU football game that year, the CU police chief immediately wrote out a check to BCARES for $10,000 to convert immediately to digital. All of the older, analog, NTSC, TV gear was replaced. The new digital equipment performed far superior to the older analog TV. Perfect, hi-def, 1080P pictures resulted and the coverage areas were greatly enhanced.

In 2016, the BCARES, ATV repeater was converted from analog to digital. In 2018, the repeater was moved to it's current location at NCAR. This is the same site, as used by BARC for their 2m & 70cm

FM voice repeaters. The W0BTV, DATV repeater has wide-area coverage over the eastern half of Boulder County, plus portions of Larimer, Weld, Arapahoe, Broomfield, and Denver counties. It extends from the Wyoming border on the north, to DIA airport on the east and south-east Denver. For more details, see www.qrz.com -- w0btv.

In years past, ATV was far and away the most often requested communications service of BCARES. But the demand has fallen off considerably in the past couple of years, being only for a couple of forest fires. However, other hams and ARES groups do need to be aware that perhaps technology has perhaps passed us by. When we started in 1990, TV was a very unique service which BCARES offered. Today video has become somewhat "Ho-Hum". Today every person carries in their pocket a combo TV camera, TV screen, TV transmitter and receiver and digital video recorder. It is your Cell Phone.

That being said -- Boulder County must still feel that ATV is yet a valuable service offered by BCARES to our various police/fire agencies. Recently, the county gave a large grant of $30,000 to BCARES to enhance it's TV coverage of the county and also upgrade some other radio systems.

ADDITIONAL READING MATERIAL: All of these items listed below are available to be downloaded in .pdf format from my web site: ***www.kh6htv.com*** -- click on the tab for "Application Notes" to find them.

BCARES occasionally holds ATV training classes for members. Matt Holiday, K0DVB, prepared the current training class material. It emphasizes digital TV. Matt's power-point slides are available here to be down-loaded in .pdf format. They are:

DVB-T Training part-1.pdf (2018) 77 slides covering topics of Operations of DATV. Topics include BCARES TV equipment, and TV camera operation

DVB-T Training part-2.pdf (2018) 78 slides -- covering the technical details of how digital TV works

Other recommended reading material includes:

ATV Public Safety.pdf (2013) 48 slides --- This was a talk presented by Jim Andrews, KH6HTV, at the 2013 Dayton Amateur Radio Convention. It gives a good overview of how BCARES uses ATV in support of public safety.

DTV-Microhams.pdf (2020) 57 slides --- Entitled "Amateur High-Definition Digital Television". This was a talk presented by Jim Andrews, KH6HTV to the 2020 MicroHams Digital Conference, Seattle, Washington. It provides a good overview of TV starting with analog TV and then digital TV. This talk is also available as a free DVD with audio commentary. The DVD runs for 45 minutes. The talk is also still available on-line as a You Tube video. ***https://www.youtube.com/watch?v=wgh2ZWabdKE***

BCARES-ATV Photos: I have searched thru my computer files for an assortment of photos showing ATV operations from the past. I no longer have any videos or photos for the the first 15-20 years as

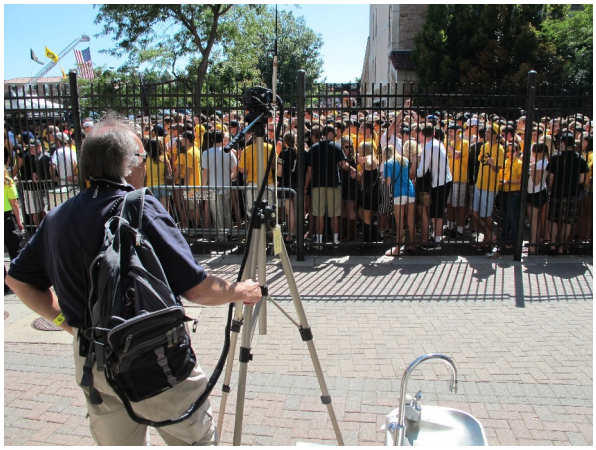
they were all on DVDs. My massive DVD collection of home videos, plus a large archive of past BCARES events were all destroyed in the 2021 Boulder Praire Fire Storm which destroyed over 1000+ homes, mine included.

2022 - Sunshine Canyon Fire --- BCARES live video being displayed on large screen monitor in the Boulder County EOC

2012 -- Four Mile Canyon Fire -- various images as seen by BCARES video cameras

2010 --- Four Mile Canyon Fire left: Allen, K0ARK's mobile ham station with 50 ft crank up tower mounted on a trailer, including a tower mounted video camera. Sitting on Magnolia Road lookout watching the fire. right: Joey, NV0N, and Allen, K0ARK, watching the fire and radioing in a report to the EOC.

2010 --- Four Mile Canyon Fire -- left: Jim, KH6HTV, with BCARES video camera and 70cm transmitter on the summit of Flagstaff Mtn, monitoring the fire. Video being transmitted to the EOC back in city of Boulder. right: video from Flagstaff Mtn of slurry bomber dropping fire retardant on the forest fire.



Univdersity of Colorado Football Games --- BCARES camera crews in action monitoring the crowds. We used portable video pack-sets consisting of a video camcorder, camera tripod, 70cm VUSB-TV transmitter, HT whip antenna mounted on the camera tripod plus a large 12Vdc battery to provide power for 100% duty cyle transmissions for several hours. We always used two person camera teams for safety. One person operated the video camera. The other person was a safety lookout and also did the 2 meter FM radio communications with Net Control.

BCARES ATV in CU Football Stadium ----- left: ATV Net Control Station -- located in the CU Police command post in a press-box of the CU football stadium. Shown are Dave, KI0HG, and Mark, K0LRS, net controllers. Quad video display of 70cm ATV, VUSB-TV channels 57, 58, 59 & 60 with BCARES video. right: In more recent years, we also provided coverage of huge rock concerts held in the CU stadium. Shown here was a recent Grateful Dead concert.

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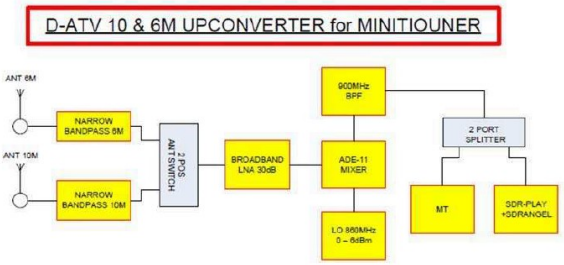
More News from Europe:

Frans, ON4VVV, has just sent out his latest issue of his newsletter for ATV hams in Belgium and Holland.

ATV at DWINGELO Telescope: This is a large, 25 meter, radio telescope located near Dwingeloo, Netherlands.
https://en.wikipedia.org/wiki/Dwingeloo_Radio_Observatory)
It is no longer used for official purposes, but is now used by radio amateurs.

Jaap PA0T, Jan PA3FXB and Erik PA1ET write: "During the DATV activity contest in the weekend of 19 and 20 April we want to activate the 25 meter Dwingeloo dish again. This also gives the small D-ATV stations in the far surroundings the opportunity to increase their best DX. The dish can unfortunately only receive with terrestrial connections, transmitting is not allowed at a low radiation angle. We are active on 70 cm, the gain of the dish is 36 dB. On request we can also receive on 23 cm or 13 cm, the gain is of course much higher there (48, resp. 55 dB). The Dwingeloo dish is under the call PI9RD QRV on Sunday April 20 from 6:00 - 10:30 UTC, so 8:00 - 12:30 local time. Appointments can be made via the chat on DXSpot.tv. We are also active via the well-known channels on Zello. We hope to see many stations in the Netherlands and abroad."

Up-Converter: The newsletter also contains a nice article from ON4VVV describing his latest project building an Up-Converter from 10m & 6m to 900 MHz band for receiving DVB-S signals. He used an inexpensive MAX2870 frequency synthesizer board for his LO. He also encountered similar issues which we have experienced with LO phase noise.



W0BTV 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/*

W0BTV 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

St. Louis Amateur Television Society (SLATS) -- Want Ads

check out all the goodies available on their web site: ***www.slatsatn.net***
here are a few of the items listed.

ROWETEL.com, SM-1000 HF Digital Voice Adapter (for SSB radios) $50
ICOM IC-2820H, VHF/UHF, 50 W, 50W transceiver with DV/GPS $500
ICOM IC-706mK2g transceiver $500
FLEX 6700 SDR, 100 W radio $3,500
ICOM IC-7000 HF rig with LDG-7000 Auto Antenna Tuner $900
ALINCO DR06, 6m, FM, 50W mobile transceiver $100
COMET CF-706 DUPLEXER, HF+6m / 2m-70cm $40
ACOM 10 port HF-60MHz High Power Antenna Switch $400
Hi-Des UT-120, DVB-T, USB dual diversity receiver $25
MOTOROLA SU42 SPIRIT PRO, 450MHz, HTs, $20 ea