Boulder Amateur Television Club
TV Repeater's REPEATER

February, 2020
3ed Edition

BATVC web site: www.kh6htv.com

ATN web site: www.amateurtelevisionnetwork.org

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

AMATEUR TELEVISION NETWORK: The members of BATVC have just elected to join as the Colorado chapter of ATN. The incentive for this move was to support ATN in their efforts, along with the ARRL, to protect the amateur microwave bands. At present the 3 & 5 GHz bands are under attack at the FCC. By doing so, we present a more united front for ATV. The motion to join was almost unanimous with 16 voting "Yes", zero No votes, and 4 abstentions (i.e. no response).

ATN presently has active ATV chapters in: S. California, N. California, Arizona, Nevada, Delaware, Missouri, Kentucky, Ohio, Georgia, Florida & Washington. Each ATN chapter handles their own funding and has their own officers.. They all help each other on advice when asked and some chapters have donated older unused equipment to help a new chapter get on it's feet. So far ATN does not have a dedicated national meeting. The ATV dinner at Dayton hamvention has most of the chapters represented.

ATV Support Material for FCC: ATN & ARRL were preparing a brief to be filed with the FCC on WT Docket 19-348, "Facilitating Shared Use in the 3.1-3.55 GHz Band". Amateurs stand to potentially lose our entire 3 GHz band. Mike Collis, WA6SVT, of ATN and David Siddall, K3ZJ, of ARRL have asked us to provide background material of short public service articles and photos showing ATV. After providing this to Mike & David, I decided it would also be worthwhile sharing it with the members of BATVC. If you would like a copy of the ATN-FCC filing, contact Mike directly at: wa6svt@gmail.com Jim, KH6HTV, W0BTV trustee

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The Boulder County ARES (BCARES) has been providing ATV coverage for our Sheriff, Police & Fire depts. since 1989. It has been the #1 communication service they consistently request from BCARES, far more than voice and packet radio. BCARES's ATV has covered many various emergencies and public events. They have included: forest fires, floods, political demonstrations, university student riots, war protests, huge

crowd gatherings such as Halloween, etc. Starting in 1997, a smaller subset of BCARES members also are trained volunteers with the Sheriff's dept. SWAT team. They respond on all paged SWAT call-outs and are exposed to much more dangerous situations. They provide live video feeds to the SWAT commander in the mobile command post. BCARES also often participates in mutual training with the various served agencies.

I have available on my web site: www.kh6htv.com several resources which could be of potential use for this response to the FCC.

Forest Fires: These two articles from QST and CQ magazines are great summaries.
"*Boulder Hams Fight Forest Fires With Video*", Jim Andrews, KH6HTV, QST, May, 2011, pp. 76-77 https://kh6htv.files.wordpress.com/2020/02/qst-may-2011.pdf
"Colorado ARES Raise the Bar on Amateurs' Wildfire EmComm Response: Amateur TV Plays Vital Role" Richard Fisher, KI6SN, CQ, Sept. 201, pp. 13-18.
https://kh6htv.files.wordpress.com/2020/02/cq-sept-2012.pdf

General ARES-ATV: These two more items from my web site are also more general coverage of using ATV for ARES. I have pulled from them some relevant photos and attached at the rear to this memo. I have also gone back to old VHS/DVD recordings of BCARES ATV activities in the 1990s and grabbed a few images. These images from old analog, NTSC, VHS, etc. video are certainly not up to our present day hi-def., 1080P video capabilities.
"Add Television To Your ARES Tool Kit", Jim Andrews, KH6HTV, Application Note, AN-9, Oct. 2011, 5 pages https://kh6htv.files.wordpress.com/2014/10/an-9-ares-tool-kit.pdf
"ATV & Public Safety", Jim Andrews, KH6HTV, talk presented at 2013, ARRL Dayton convention. https://kh6htv.files.wordpress.com/2013/05/atvpublicsafetyrev1.pdf

High Definition, Digital TV: It should be noted that BCARES has since 2014, upgraded all it's ATV gear now over to digital ATV. Government funding was provided to enable this. The European broadcast, digital TV standard, DVB-T, is being used. Work is in progress to enable BCARES to use DVB-T on the higher microwave bands above 23cm for point-to-point links.

ADDITIONAL BCARES-ATV PHOTOS

1991 War Protest March

1999 Univ. of Colorado student riot

1999 Tear gassing of rioters

1999 Riot squad chasing rioters

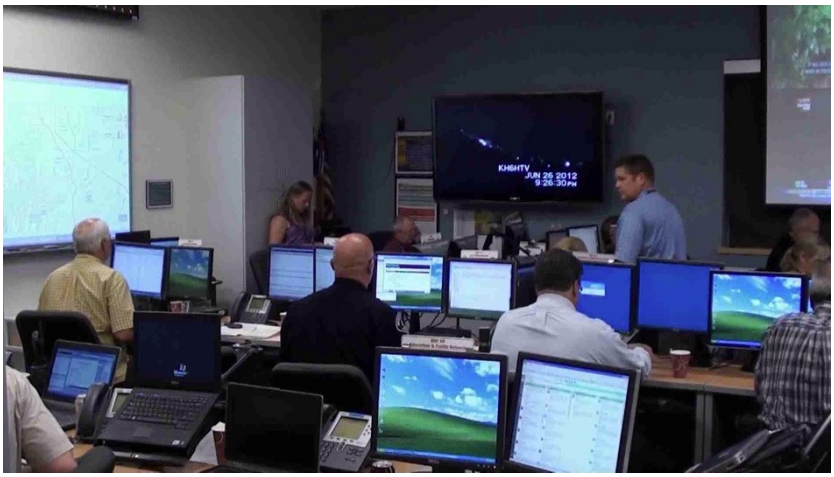
BCARES ATV was on the scene along with the Boulder police riot squad.

1998 Capture of Bank Robber in Left Hand Canyon by Boulder Sheriff SWAT team "live" on scene video by BCARES-SWAT video team. Note: The team at that time consisted of Jim, WA0NHD (now KH6HTV) & Jack, WM0G. Jack is now the ARRL section manager for Colorado.

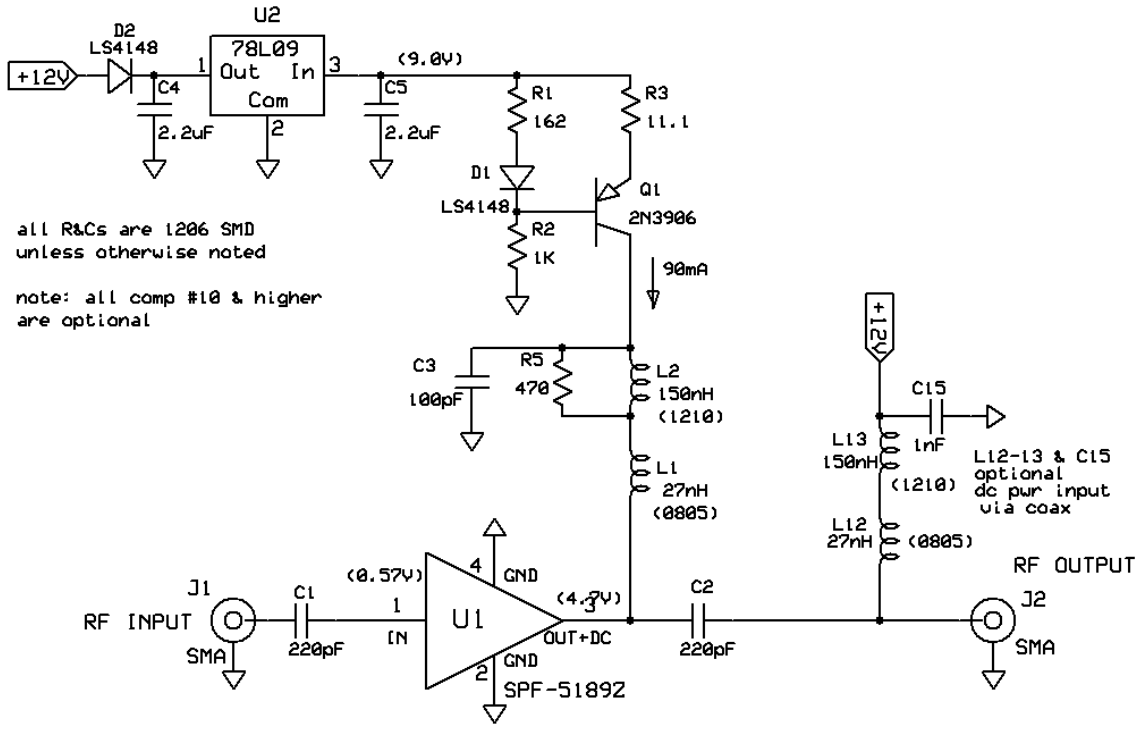
2002 BCARES-ATV, night vision TV camera images from Forest Fire on ridge line just above the city of Boulder. Image on the right shows fire fighters walking up the steep hillside to the fire.

BCARES officers KI0HG & KB0LRS in Univ. of Colorado Police command post at CU football game. Note: Quad TV display of four operational TV cameras & ATV transmitters. We were using 70cm band and channels 57, 58, 59 & 60 simultaneously. A 13cm, 2.4 GHz, FM-TV link was also used to relay the quad video to another police operations center.

Boulder County EOC Command Center. Note: live BCARES ATV video of 2012 forest fire on main, center video monitor. Scene is dark because it was night time. Video was monitoring the fire on a ridgeline just above the city of Boulder.

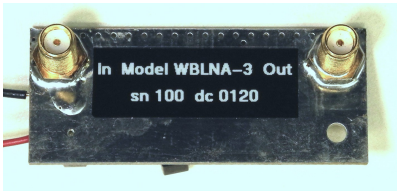


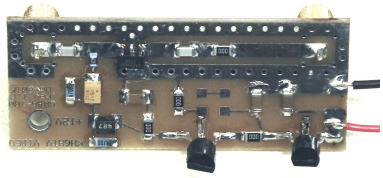
A NEW Wide-Band LNA: I have just developed a new, improved LNA covering from 6m to 13cm (50MHz - 2.4GHz) bands. I want to share the good news with you. It has particularly outstanding low noise performance on 2m thru 23cm with < 0.8dB Noise Figure. It is based upon an MMIC I recently discovered. The RFMD SPF-5189Z. It is a GaAs, pHEMT, LNA, MMIC. Unlike some of the other amplifiers I have designed in the past, this one does not have a flat, S21 gain frequency response. It does however have high linearity of OIP3 > +38dBm. It also has a high P(-1dB) gain compression of >+20dBm over it's useful frequency range. The schematic diagram of the LNA I designed using the SPF-5189Z is shown on the following page. Contrary to conventional design practice for such MMICs, I use a constant current source to power the IC. For the high P(-1dB) performance, the SPF-5189Z requires 90mA. Q1 is the current source. D1 is used for temperature compensation. I have designated this as my model WB-LNA-3. It far outperforms my previous LNAs the -1 & -2 and I have thus discontinued offering them. The following page shows my spec. sheet for this new LNA. It includes photos of the pc board and detailed performance data. I am electing to sell this new LNA, either as a bare pc board only (no components) for $11, as an assembled pc board, including SMA connectors for $36, or as a complete amplifier in an all metal enclosure, tested with calib. report for $65.



KH6HTV model WB-LNA-3 schematic diagram

Model WB-LNA-3
Wide-Band, Low Noise AMPLIFIER





The KH6HTV VIDEO Model WB-LNA-3 is a Wide-Band , Low Noise Amplifier with useful frequency response covering from 50 MHz to 2.4 GHz. It has very low NF < 0.8dB from 2m through 23cm. It is also capable of handling high input signals with Pout(-1dB) > +20dBm. The amplifier is available for sale, as a simple pc board, as an assembled pc board, or complete in a metal enclosure with test report.

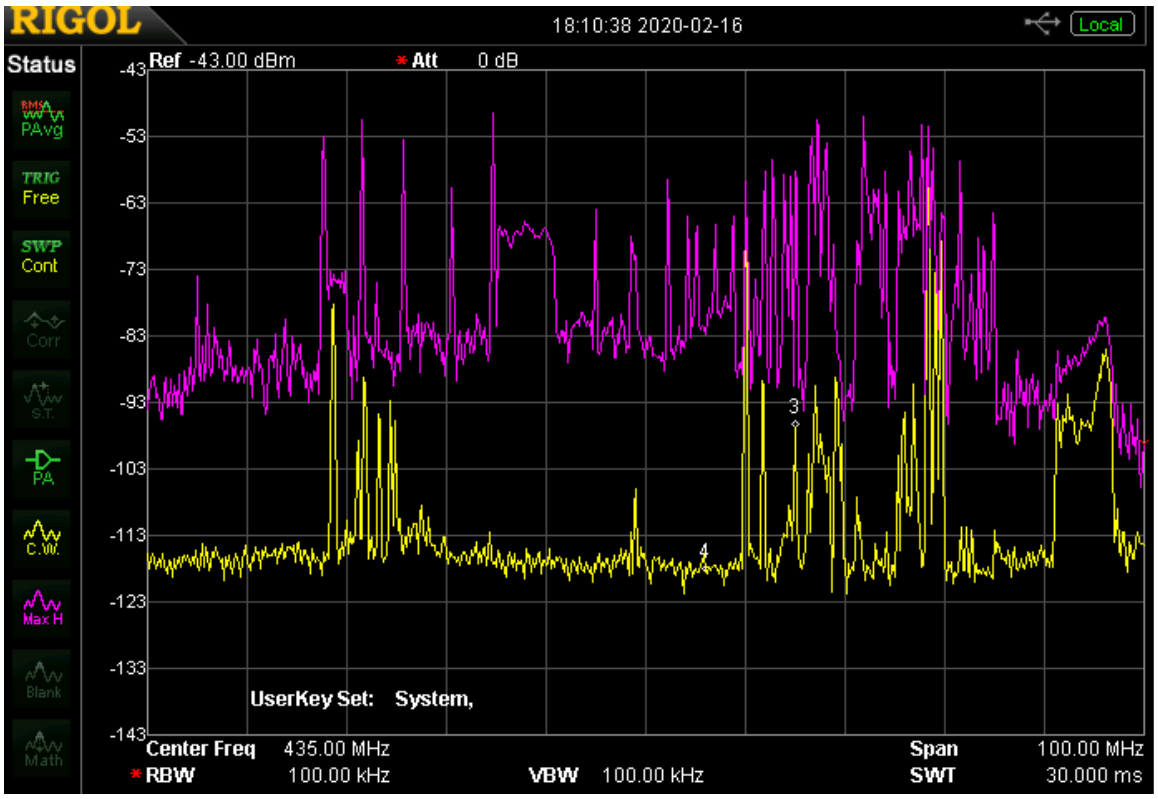
Typical Performance

Parameter	50MHz	144MHz	430MHz	915MHz	1.27GHz	2.4GHz
Noise Figure	1.7dB	0.6dB	0.5dB	0.8dB	0.8dB	1.6dB
S21 Gain	23dB	25dB	22dB	16dB	15dB	10dB
S11	-7dB	-8dB	-11dB	-14dB	-13dB	-10dB
S22	-17dB	-25dB	-23dB	-18dB	-24dB	-18dB
Pout(-1dB)	19 dBm	22 dBm	22 dBm	20 dBm	22 dBm	21 dBm

DC Supply Voltage	12 Vdc @ 100mA, +11 to +15 V range, internal voltage regulator
RF & DC connectors	SMA jacks (female) DC = solder terminal on feed-thru capacitor
Dimensions	2.2"x0.9" (pc board) - or - 1.5"x3.6"x1.25" die-cast enclosure

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

70cm SPECTRUM: I was recently in the hospital for 4 days. I had left my spectrum analyzer running during that time. One trace was set to Peak Hold capture. I was amazed to see the results when I returned to the ham shack and saw what had happened when one held absolutely everything that happened for a really long period of time. With the bandwidth set to 100kHz, it showed the 70cm ham band was totally used at least every 100kHz or less. Of note also near the center is the rectangular, 6 MHz wide spectrum of the Boulder ATV repeater, no doubt during the weekly ATV net.



70cm Spectrum as seen from KH6HTV QTH, 6 element Yagi antenna pointing west towards the city of Boulder. center frequency = 435 MHz, 100 MHz span, 10 MHz/div 10dB/div. 100kHz BW yellow trace is "live". magenta trace is Peak Hold for an extended period of 4 days.

News from San Diego: Thanks Jim, Nice work with getting your repeater back in service, a job well done. My best wishes also to the W0BTV members. WH6AV in Maui well be receiving one of my Analog ATV repeaters from me, he will be the SysOp and care taker and we will have an IPTV link to San Diego. He will have a small group of local users on Maui for starters and helpers, Digital will follow. Hilo has no sites available, Maui does. I do link up with him on a weekly bases via video conference linked also to our repeater here in San Diego. I also host WW7ATS ATV Group Seattle, WA on there Wednesday and Saturday night nets. IPTV linking has work well for not having a U.S. DATV Repeater in orbit.

Also I've sent a 5 Watt 4 CH 70cm AM ATV transmitter to Rick {WA6NUT} for a starter station as a gift, I had him check in with me via video conference in my shack to show him the unit as I got it ready for him. My work has kept me very busy I will be on the move for the next few weeks putting my pilots skills to work. Also running my community TV station {OCA-TV Cox CH. 1960} keeps me on my toes.

73 my warmest regards, Mario, KD6ILO

for more info: www.hamconcolorado.com

BATVC has submitted a request to HamCon to have a display table and also present a talk on DATV. Hopefully it will be accepted and we can talk up and sell our particular part of the ham radio hobby to other hams.

Future Newsletters: If you have contributions for future newsletters, please send them to me. We also encourage you to forward this newsletter on to other ham friends in your clubs.

Jim Andrews, KH6HTV, email = kh6htv@arrl.net