ATCO NEWSLETTER

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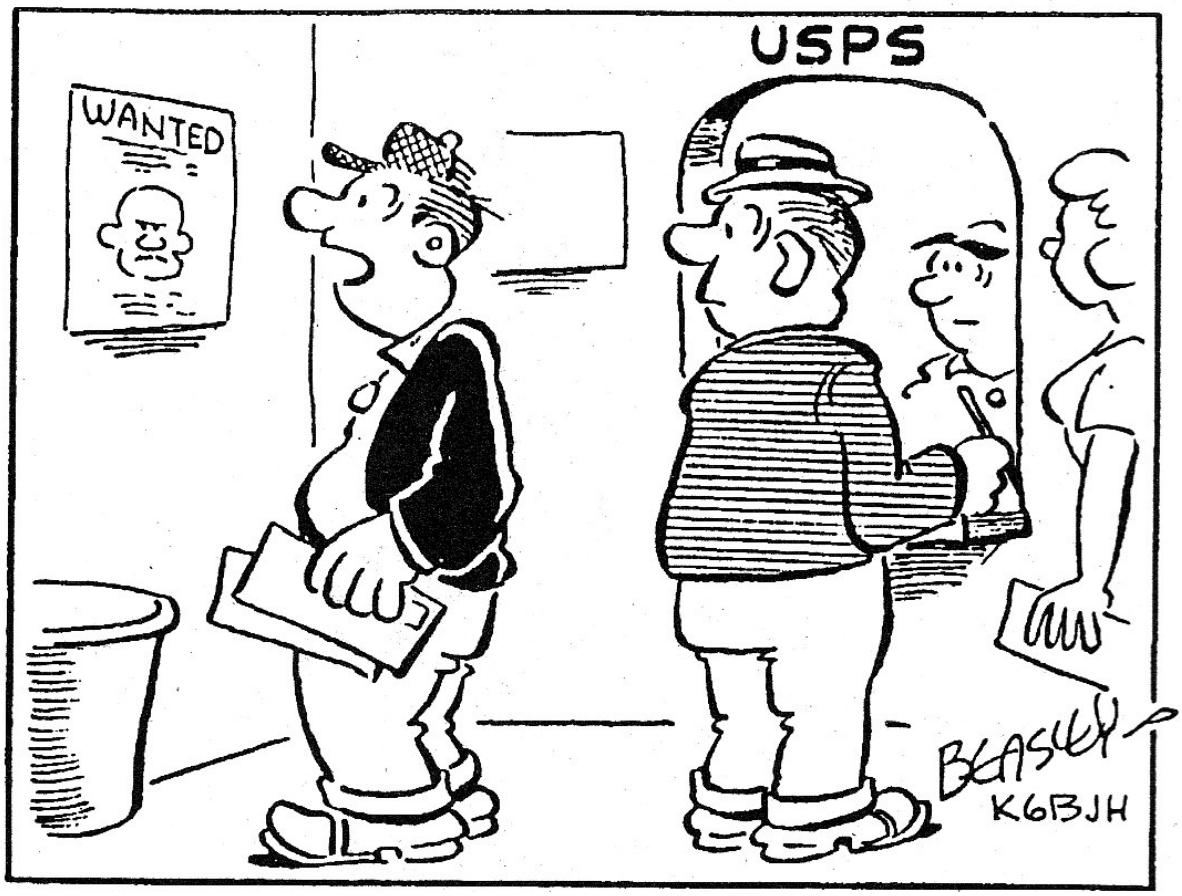
The ATCO newsletter is the official publication of a group of amateur television operators known as "AMATEUR TELEVISION IN CENTRAL OHIO Group Inc" and is published quarterly (January, April, July, and October)

ATCO SPOTLIGHT TOPIC

Thanks to Beasley, K6BJH (SK) and ATVQ Magazine for allowing us to share his cartoons. For the complete book on "The Best of Beasley" go to the ATVQ Magazine web site (http://atvquarterly.com/) available for purchase.



I think I know why Sam hasn't checked into the ATCO ATV net lately.

ACTIVITIES ... from my Workbench

Guys, it's now Fall and time to wrap up the antenna projects! I've still got a few things to do which were generated by a recent tower/antenna inspection at my QTH. My feed lines that pass by the rotor have insufficient slack and needs to be lengthened slightly and secured better. A tower section roller has come loose from its place allowing extra slack in the raiseable tower section so it too needs to be tightened. Everything else looks OK. My 2 meter beam is still resting against the house in the back waiting for a major repair which I now believe won't happen this year. If it was shorter, I could bring it into the basement but that isn't the case. (No, I'm not going to cut it in two just to get it there!)

Well, things are happening at the repeater. I knew that the almost two years of trouble free operation had to end sometime. Now is the time. Don't get me wrong, it's nothing serious, just little things, some of which I create when I'm there. For instance, one time when I was there removing the camera and controller, I inadvertently pulled another video cable out of the socket (Damn RCA connectors) and didn't check all other functions before leaving. After spending an hour or more listening to the loud air conditioning fans there, one tends to want to leave before checking everything.

The 147.48 input sensitivity has been poor for some time now so I decided to drag the spectrum analyzer and IFR test radio there to check it out. The sensitivity before retuning was about 7 microvolts to trigger the squelch. After retuning the GE Master 2 receiver and external cavity it is now about 1.5 microvolts. It could be better but I'm worried about making it TOO sensitive in light of the RF interference there.

I retuned the 1258MHz transmit filters and picked up a small amount of power. In the process, I rerouted some lines eliminating a couple of N fittings and shortening a jumper line. I checked the power out at the transmitter and found it to be just under 75 watts. Then I moved the Bird to the line going to the antenna and got about 28 watts. "Wow" I thought, that can't be right! However, when I did the math, a 1258MHz signal going through 7 feet of ½" Superflex, a DB Products isolator and then a 7 pole interdigital filter with 2.2dB loss worked out to be just about right.

I removed the 423MHz digital transmitter and took it over to Dale, WB8CJW, who reworked some parts and changed the bandwidth from 4MHz to 2MHz after some difficulty reprogramming it. The purpose in the change is to produce less interference to the Dayton 421MHz analog output when the band is open. I haven't heard from WB8LGA yet about it so I don't know if the bandwidth reduction helped. It DID make our 423MHz digital signal much less robust. It pixelates and freezes on occasion and is slow to respond to faster moving video but that's OK for now. I'll investigate moving the RF signal up the band a little and then returning to 4MHz bandwidth.

The 439MHz video input has interference on it producing a herringbone pattern on the received picture. I had time to look at the incoming signal but cannot do anything about it. There are some narrowband carriers and also what appears to be a video signal at or just above 439MHz. Also there are some 440-444MHz repeater carriers that pop in and out from time to time. I can't remove the repeater signals but I CAN retune the (2) 439MHz interdigital filters in the receive input line to a slightly lower frequency and adjust them for a sharper upper cutoff frequency. (Remember we use the lower sideband so the main input is below 439MHz). I readjusted the interdigital filters from an upper cutoff of about 442MHz to about 440MHz. That's about as low as I can go and still keep good sensitivity for the 438MHz digital input that shares the 439 antenna and filter. (Remember the 438 input occupies 436 to 440MHz)

I also had a report the 439 input didn't work. A trip to the repeater revealed a bad RCA connector on the video input line to the controller. The input jack was the problem but couldn't replace it without entirely removing it so I built up solder on the plug for a tighter fit. That worked. (DAMN RCA connectors!) I've had more than one issue with them. Most have been replaced with BNC connectors. Also reported was a buzz on the 1268MHz digital transmitted audio signal. That also was a bad RCA connector on the transmitter audio input cable.

Last but not least, the second channel video of the 1268MHz transmitter is not operating. I noted this some time ago but didn't troubleshoot it because it involved removing the transmitter to look inside as the video at the input connector is OK. When I opened it up and rocked the ribbon cable running from the second channel board to the main board, it started working. Everything else was OK. So now we have 2nd channel video on the 1288MHz digital transmitter. It is connected to the 439 analog receiver video output so when a 439 analog signal comes in it will be transmitted out on the 1268 2nd channel. I have future plans to put a live radar signal on this input. For now, I think everything is working normally. That's all folks!!!!!!!!!

See you at the Fall Event. **We will have Bill Parker, W8DMR, present a subject near and dear to his heart.** Plan to attend to find out what it is. I promise that you won't be disappointed. Bill told me that he has a gift for one of the participants. What could it be??? Also, you must see his electric car!
…See you there.
WA8RMC

AUGUST ATV QSO PARTY

As many of you know, we had a global QSO party last August originating with our host, Peter, VK3BFG in Australia contacting various ATV operators in the USA Europe and Australia via Skype. I was the primary contact for the ATCO group by taking local check-ins on our repeater and streaming them to Peter who then uplinked the video to his local repeater. The process was repeated with the ATVers in California to complete the USA contacts. Below are comments from some of the participants and viewers. Each year we have more participants so let's see more local guys next year. WA8RMC.

I responded to Peter as follows:
Thank you, Peter. I appreciate your effort to set this up for the rest of us. Working together, we can make it even better in the future. I am sorry, for what I feel is a weak performance among the ATCO group. I think we had 8 participants last year and only 5 this year. At least 4 who said they would be there didn't show up for one reason or another. A couple people here said it was difficult to connect using Skype. I think YouTube would be great in the future for those who just want to monitor activity and not send video. My attempt to send .avi files through Skype was a failure. Rather than converting the file on short notice, I simply played the .avi file on my laptop and pointed a camera at the laptop screen. The resolution suffered but otherwise played OK. In the future I'll use a transport stream.

Maybe BATC can set up a simple way to sequence the various video inputs using the BATC server. Personally, I find it difficult to handle Skype requests if it involves more than just you and me. If there was a way to log in anyone wanting to send video and stream the output upon command one at a time, that would simplify things.
WA8RMC

Peter says,
Hello Art, Don and Noel ..
Just a special thanks to you for anchoring the DATVQSO Party (and for Noel to fix GB3HV in time). We had a large number of participants overall, but the outstanding result was with U Tube. We had viewers in Antigua, Argentina, Austria, Australia, Belgium, Canada, Switzerland, Chile, China, France, Great Britain, Ireland, South Korea, New Zealand, Peru, Sweden, Slovenia, Turkey, United States. It really was a "world wide" event.

In total 655 people made connections, with a peak number of concurrent users at 39. Most, of course, were from Australia, USA and UK, but 24 connections were made from South Korea which was interesting. I am going to investigate using U Tube as a better way of sending video to anchors , while still using Skype as a 'back channel' for liaison.
… Regards Peter

Ken in California also responds,
I had a "blast" (aka – good time) watching the VK3RTV fifth yearly DATV QSO Party on Friday evening (California time). On my iPad, I watched the high-quality YouTube stream of the VK3RTV repeater output that was provided by Ralph VK3LL. This YouTube stream was very good at my end….and I did NOT encounter the "FLASH work around" that I need to use when watching BATC streaming on my iPad. Enjoyed watching the many VK's talking about shacks, BBQ events, and even kangaroos. Enjoyed seeing Art WA8RMC bring in ATV-ers from Ohio and seeing Don KE6BXT bring in ATVers from the W6ATN television network. A special feature was the live tour of a commercial television station on Mt Wilson that Mike WA6SVT sent. I had planned to send my received DATV transmission to my computer screen and then Skype the desktop video over to Peter VK3BFG in Melbourne...**BUT** I only succeeded in **OVERLOADING** my Win7 notebook computer by trying to run the DatvExpressServerApp and a GraphStudioNext graph (running software MPEG-2 encoders) and Skype and STB-video-display at the same time. I had terrible "drop out" on my transmitted DVB-S signals and the receiver would not LOCK. I then used my back-up plan to send "straight Skype" to Peter using just my web camera for my transmission feed to VK3RTV.

I want to thank Peter VK3BFG and all the many people who helped to make the VK3RTV DATV QSO Party a thoroughly enjoyable evening for me. Well done!
…Ken W6HHC

Clint Jeffrey says,
It was a terrific time by all, Peter VK3BFG certainly had his hands full particularly when his main computer crashed as a result of Skype!.... It was great seeing all you guys, I was primarily watching VK3RTV1 direct but the You Tube Hi Res broadcast by Ralph VK3LL was a 'winner' averaging 30 plus viewers most of the time! I would even suggest that in 'future' QSO Party's that we use the higher quality You Tube Video stream in place of Skype for the main TV broadcasts and only use Skype for establishing the main communication paths for the 'Backbone' so to speak. Leave the You Tube Steam for the main transmissions. That way both Vision and Sound will be kept to a good standard.

Apart from the odd computer glitch I believe it was Skype causing us the most grief particularly the Sound, where the vision was acceptable in most cases unfortunately the sound was a major let down. The Audio coming in from VK4 and VK2 and overseas was

loud or distorted in some cases and or to soft with not enough volume....I think utilizing You Tube Stream would fix most of these little issues...hopefully... Otherwise I thought it was hit and Peter has already acknowledged a record number of stations checking in...

Next year we hope that VK6 will join and hopefully ZL....if there are any other countries out there please join in for next year! How's that for a promote!
Clint Jeffrey – VK3CSJ and VK3EKH

NEW DATV REPEATER IN CALIFORNIA

W6CX, the ATV repeater run by the Mt. Diablo Amateur Radio Club, has switched to a digital output signal. The first weekly ATV net transmitted in digital format was Thursday, September 10, at 8 PM local time. The signal is in DVB-S format, with four sub channels available from the repeater (one of which is the live input video). Video quality from the DATV signal is excellent, whether the input is in AM, FM, or DVB-S mode. The first all-digital ATV signal on the net was from Jim K6SOE, who checked in with a DVB-S signal and had flawless video quality. There are a few details of the repeater that are still being adjusted or improved, so things should only get better from here.
…Chris W6ATV

Repeater signal details:
The Mt Diablo atv repeater "An old AM site" went digital Tx 2 months ago when we were given a harmonic modulator , encoder and receiver. As of now we have 1292.5 digital Rx, 1289.25 Am Rx, 1270 Fm Rx, 915 Fm Rx, 427.25 Am Rx Transmit is 1244.5 Digital 4 channels. Symbol rate 3.200 Msymbols/second FEC ¾. Channel 1 is ham TV input, Channel 2 is a tower camera steerable with DTMF on 2 meters, Channel 3 is local camera looking at the site and Channel 4 is color bars. The repeater can be seen on the BATC streaming-video Web site. A shortcut to that feed is www.w6cxatv.net/live

I also have a ham ATV repeater on Bear Mt near San Andreas it has DVB-S output on 1249 and inputs on 915 Fm and 1292.5 digital.
…Fred WB6ASU

SK REPORT

It is very sad for me to report that our long time friend and ATVer, Dick Goode W8RVH, has recently passed away. Dick has been very active with ATV for many years and will be greatly missed.

I attended his funeral service and then assisted, along with Jeff Gergal, WX8U, the removal of Dick's antennas from his farmhouse where Dick resided for over 30 years. Dick's two daughters had asked if we would do that for them so they could possibly sell them and help prepare the house for sale.

Dick was one of the early ATV pioneers and was involved with the creation of the Dayton ATV repeater.

RICHARD M. GOODE
June 4, 1921 - September 17, 2015
Richard M. Goode 94, of New Carlisle, Ohio passed away Thursday, September 17, 2015. He was born on June 4, 1921 in St. Paris, Ohio the son of the late Robert and Alta (Haynes) Goode. He retired as an electrical engineer from Wright Patt Air Force Base and was a member of the Asbury United Methodist Church, North Hampton, Ohio. He is survived by his two daughters, Elizabeth Ann & Michael Lubbers, Susan & Thomas Griffith; seven grandchildren; fifteen great grandchildren; and friends. In addition to his parents, he is preceded in death by his beloved wife, Elizabeth Goode and his brother, Robert Goode. A gathering of family and friends will be held from 10-11 AM, Friday, September 25, 2015 at the TROSTEL, CHAPMAN, DUNBAR & FRALEY FUNERAL HOME, New Carlisle, Ohio with funeral services following at 11 AM in the funeral home. Burial will take place at Evergreen Cemetery, St. Paris, Ohio. Memorial contributions may be made to Hospice of Dayton, 324 Wilmington Ave., Dayton, OH 45420.

DATV DISCUSSION……VERY INTERESTING!

A couple of weeks back Grant, ZL1WTT voiced his opinion about the DATV future and the observed lack of ATV/DATV USA repeaters. He goes on to suggest that wideband analog and digital modes should be used more here because there is more available spectrum than in the New Zealand/Australian vicinity. Also, he seems to feel we ought to be using more analog modes. Naturally, this brings a fire storm of supporters for each. Some are captured in the responses below. Enjoy the banter and then read my interpretation at the end.
…WA8RMC

Grant, ZL1WTT, starts off by saying:
Hi All,
I am very much old school designing and building my own ATV/DATV equipment with DATV been more software then hardware. I been experimenting DATV since 2006, it's no longer anything new to me. Inclusion is very important as in last few years I been working new ideas to try out with ATV. The biggest problem here in New Zealand is not having the spectrum available for ATV/DATV testing. So I don't understand why there so few ATV repeaters in the US and Canada, where there is so much spectrum space to do wideband modes such as ATV. I am working on many analog projects here at the moment, with analog enjoyment comes from seeing what you equipment is doing. Unlike digital, where this does not happen. You will find most ATVers will still use their analogue equipment long side their digital. There always must be band planning for both. I am not a supporter of narrow band DATV, you should always have room for those analogue and the wide band digital modes using 8MHz plus. I know this group is all about digital ATV, but what I would like to know is, how many on this group still enjoy using analogue ATV?
…Grant ZL1WTT

Hi All,
Well where can I start? There is something for everyone's pocket. Well there was until analog was seen as so "yesterday" and treated as a redundant fashion. From what I have noted, the only way to play digital the way it has escalated recently is to have worked in the broadcast industries, as an example, or any well heeled job on a good pension, or to have a full time job with lots of spare income for whatever reason. Now if anybody is offended by this, sorry but that's what the runes show when thrown, demographics :-) There are a lot of people out there that can't afford this kit, let alone SR Systems back a few years. The worse thing to happen in the UK was for "Some Repeater Keepers" to REMOVE or not ADD an analog input 23cm Rx. There are plenty of old timers and youngsters who find going Digital Tx or too expensive, and need to be helped to progress, or stay Analog, not to be bullied or coaxed Just Left To Play. Repeaters going Digital TX DVB-S in the UK is a great Idea, we have tons of old and new Sat Rxes out there for all and sundry. One frustration I have is that the development work on DATV Express, and other projects, can be a little "for your eyes only", and not passed on to a greater group of users as with the Windows GUI Express Server, never mind the manual or write up, we should be using it now, how long before DATV Express will be history like the DigiLite is becoming? Let's slow down time. New boards, new mini PCs etc. all means you have to spend more money, who has the money? Go to Start.....Me I'm looking after GB3GV, trying to keep up while we have extra income at home. The last update of GV before me was probably 20 years ago, all FM Analog with everyone happy playing waiting for the next good Tropo.
…73Peter G8DKC

Aloha Peter
I agree, we need to still maintain analog TV capability, especially on our repeaters. Here in Boulder, Colorado, USA, we have had an analog TV repeater since the late 70s. It operates under the call sign, W0BCR, and details about it can be found on Callsign Database by QRZ.COM. We have plans to add, not substitute, digital TV capability to our TV repeater. It will retain its basic ability to receive either VUSB-TV or FM-TV and broadcast, NTSC, 6MHz, VUSB-TV (70cm output). We will be adding the capability to receive DVB-T and also optionally re-broadcast any of the analog or digital inputs in DVB-T format.
…73 & good TV DX de Jim, KH6HTV

ATV and DATV can be used to greatly expand the knowledge base of Hams, and while others do take advantage of that fact, we still have a way to go. This is not a new mode, hardly, but it seems it needs a kick start to utilize some of the potential that this mode can truly provide. It's unfortunate that analog ATV is viewed as passé as it has the longest reach to the largest number of Hams, and can introduce Digital and other modes to further the "Hobby". The internet is a great resource, but we tend to rely upon it, and cell phones, and they can fail especially in times of disasters. A standard for DATV is needed and will surely be outdated in the time it takes to be established. So what would you want ATV and DATV to provide? What's presently available to you now? Ask questions and try to stump the members and learn for free here. There are a lot of opinions and knowledge here and all is valuable. An informative YouTube link that may be of interest to you is here. https://www.youtube.com/user/w2aew/videos Knowledge is power, but only if you share. Don't be afraid to ask, and embrace differences of opinions since they also hold merit and are valuable, if not to you but to others.
…Dennis Romo - KA7HQP

Now, Grant can't resist the urge to respond,
Hi all,
When I am showing or teaching radio, I get the guys to build analog equipment. This is so you can hear or see what is happening with RF, you need to start with a good understanding of radio basics. I have also now found a lot of everyday basic radio knowledge is not known, like it once was. This is in part due to training providers no longer teaching a lot radio theory. One of jobs is now working with digital radio communications. Having a very good understanding of analog has helped me out in this work no end. So the starting step for the next generation is a good working and understand of analog communications. From this platform you can move into digital systems. I am finding with younger guys, I don't need to spend too much time on the IP layer. So moving from this to data over radio is so much easier, been all part of layer one. In short jumping in to ATV at digital level, is not going to give you a lot of radio knowledge. It then becomes a case of plugging it in and hope it all works.
…Grant ZL1WTT

"There is something for everyone's pocket, well there was until analog was seen as so "yesterday" and treated as a redundant fashion." Forcing the price to ZERO for the truck load, since in most places there is a hazardous waste fee associated with disposal (here, $225US for a single TV), making it EASIER to get into ATV!!!!! I was speaking with an Engineer/DoD/Military fellow yesterday about UAVs and related. He had NOTHING good to say about digital video systems. Compared to analog the range is a fraction of the distance and lose a bit of the signal, lose the target, which happens more often than not. He said, which of course we know from the old analog TV signals, get a bit of fade, get a bit of snow, no worries. "These new mission critical digital video systems are worthless crap".
…Kurt

Hi all,
Here is my 2 cents worth. I do understand that analogue, either AM or FM, is simpler and a sensible way to start, however digital does offer some advantages and it is not so difficult or expensive to get into. Life is also somewhat different in the UK compared to some other countries. We don't have the luxury of a 70cm band that can carry PAL or NTSC ATV in analogue form. Therefore Digital is the only way to go on that band with reduced symbol rates. We have also just been given temporary access to a 1MHz band from 146-147 MHz which we can use for TV. On the higher bands we also have restrictions that mean that the frequencies that we have available to us are restricted and we don't have the same privileges to put on repeaters without approval, we have to go cap in hand to Ofcom, the CAA and the military, some of whom take months even years to approve frequencies (sometimes they just don't approve).

There have been several projects in the UK to investigate low symbol rate methods and equipment and of recent there have been projects like the Digithin (a DVB-S RBDATV solution based on a Raspberry PI) which is a relatively low cost transmitter, and the MiniTutione which is a very inexpensive way to get a DVB-S receiver that covers both 23 and 13cm at Symbol rates from 125K to 22M. OK, this requires the use of a computer, but there cannot be many Hams in this day and age without one (if you can read this then you must have!) Several members of my local club have built these and are in the process of getting to grips with this new mode.

Whether you like it or not DATV is here and is likely to stay. We have some standards e.g. DVB-S 4M symbols for standard TV and 333K for RB (although I think some others are looking at 250K). There is some DVB-T stuff about but do we need DVB-T? (This is meant to be provocative comment) Of course we do! Amateur radio is about experimentation, trying things out.....If you apply the same argument to voice then answer this, would you expect a D-star or DMR repeater to have an analogue input? I mean you could argue that your 30 UKP TYT handheld is a cheap way into ham radio and given this would you force all voice repeaters back onto FM, or propose that they should all be DSB AM and that you can't use one unless you have homebrewed your own Tx/Rx!

I think the important thing to remember is that you want to get people involved but not just at the basic level, if you want them to advance their knowledge then you have to provide facilities for them to do so. So yes it is about inclusion, but not to the point where advancement is stifled. Finally repeaters here in the UK are run generally through the time and effort of just a few people who put in time, money and their knowledge to run these. They don't demand that users pay to use their repeater. It is free to anyone to use. However they do often get some really nasty comments when a repeater is off the air for even just 10 min. To a certain extent I would say the repeater keepers/groups are entitled to decide for themselves what modes they run. If you want a say in this then either stick your hand in your pocket or join the group and contribute. Remember Amateur Radio is about pushing the boundaries, doing something different, adaptation etc. Now where was my old rock-bound 2m AM set. "This is G6CRF calling CQ tuning high to low". Stay calm.
…Terry Bailey G6CRF/G0CRF

Finally a sensible answer! I agree with all G6CRFs comments. I use both Digital and Analogue all the time. Apart from the bands where only a Digital signal will fit, it's a free choice what mode you use, I don't know any operators round here that have Digital equipment that don't also have Analogue! So why would they use Digital? I had read that a P3 Analogue signal was needed to receive a Digital one but on air I find it's nearer P1! (Maybe the front end of the Digital RXs being newer are better). The most important thing is you get on air! Regardless of what mode you decide to use. Activity breeds Activity. ATV is a great hobby and you won't find many hobbies where people are so helpful and friendly to each other.
…Colin Watts G4KLB

I think there are quite a few backward looking people here with little interest in innovation or change or DATV. Makes you wonder why they subscribe to a DATV group, unless they are hoping to upset people. I wouldn't worry as they won't stick around for long.

Meanwhile, the rest of us that do get it and realize innovation takes 99% failure for 1% success will just get on with moving forward, working hard and enjoying the challenge. Negative posts to the Digital ATV group won't prevent that. Not so long ago there were similar arguments over AM vs SSB and no doubt colour vs black and white. Besides, digital is necessary for fast scan TV as the only amateur bands where an analogue signal will fit are 23cms and up and the equipment is hardly expensive considering £300 will get you a DATV-Express able to transmit practically any modulation on 2m, 70cm, 23cm and 13cm. SDRs like the hackRF will get you all bands up to 6cms for not much more and will do all modes, including analogue TV with the right software.
…Mike

Whoa, Nellie! This is not a comparison between Digital and Analog, both have their place and rightly so. Mission critical digital systems can minimize the dreaded buffering and loss of lock by the way the encoder is set up at the expense of bandwidth. You could eliminate all B and P frames and send all I frames and have a very short GOP length, but there would be no compression and the data rates would be very large, so as always a compromise is in order. Digital can be sent in small bandwidths and still convey what is needed, and since we aren't commercial broadcasters, we can determine the perceived quality that we need to transmit. What we refer to as analog can be applied to all transmissions. While I have the benefit of working in an industry where I analyze mpeg, ATSC, QPSK, QAM, PSK and on and on, there still remains a large percentage of Hams where the resources are simply not available and yet could very well benefit and take advantage of the resources that are available to chosen few just by us providing it to them.

I'm very passionate about what I do and what I've learned and have no issue about sharing and making it available to others, providing they show an interest and it's not proprietary to my employer. I feel we owe it to the ranks of amateurs to let them in, as this group has advanced very much to the point that others have been left behind. ATV, Digital or Analog is only a transport for information. The content is up to us. We can go fishing, set our hooks and reel them in if we so choose. Advancement to better Digital encoding will never stop. Period! So just how old is that webpage and club newsletters? As always, Opinions, Comments, Questions are welcome.
…Dennis Romo - KA7HQP

Hi all,
Digital can be sent in small bandwidths and still convey what is needed, and since we are not commercial broadcasters, we can determine the perceived quality that we need to transmit. I strongly disagree with this above! I work with high bandwidth DATV, I experiment with data, multiplexing, HD and UHD services. We must stay with DVB standard, it's very important to understand this. DVB-T works in 6,7 and 8MHz channels. Therefore DVB-T/T2 receivers will cover all Ham bands from 50 to 1000MHz. Building ATV/DATV repeaters you will need to have hardware equipment at the repeaters sites, not bits of software. Other thing is digital TV sets are fixed to their country channel standards. By moving away from broadcast standards you end with nothing but a lot problems.

As for analog using more bandwidth then digital this is also not true. Digital is more spectrum efficient! I been working with FM VSB transmissions, I got this working in 8MHz of bandwidth the same as our DVB-T standard. With NTSC having lower sound carrier and color carrier. This could fit into a 6MHz channel, the same as digital. We're not commercial broadcasters, but here in New Zealand we must meet the same transmission standards! For our DATV repeater output using DVB-T/T2. To do this we need to have hardware that is able to do this and operate within a standard 8MHz TV channel.
…Grant ZL1WTT

There might be the bandwidth in ZL to do 6MHz bandwidth on frequencies below 1200MHz, but this is certainly not true for the UK. I suppose you could do a slightly faster version of slow scan in analog, but 333K symbols using DVB-S and H264 produces a very reasonable picture in ½ MHz. Also it's quite noticeable how the range that the picture can be received goes up as you reduce the bandwidth. As regards cost, a DigiThin and MiniTiouner is about the same as a pair of Comtech analog boards. I personally have quite a bit of digital including a DATV-Express, however I still have analog as well, I'll transmit whatever the other station can receive, I just find digital more effective for my purposes, but that's just my perspective & may be different for others. If it comes down to inclusion, you have to include those who want to go beyond the basics. Ok soapbox away. Enjoy whatever you want to.
…Terry G6CRF/G0CRF

While I have the benefit of working in an industry where I analyze mpeg, ATSC, QPSK, QAM, PSK and on and on, there still remains a large percentage of Hams where the resources are simply not available and yet could very well benefit and take advantage of the resources that are available to chosen few just by us providing it to them. I'm very passionate about what I do and what I've learned and have no issue about sharing and making it available to others, providing they show an interest and it's not proprietary to my employer.
…Dennis Romo KA7HQP

I think most of us are willing to buy our own equipment. What the Digital ATV community could do to help many of us is provide introductory information in a usable form, which costs little but might involve some effort to collect, organize, and supplement. As a newcomer to DATV, I have found it daunting to try to understand the various possibilities for station architecture, equipment, and software. I've read introductory materials in various places, and I try to follow this group, but for whatever reason, I haven't yet found a primer that's both concise and relatively complete. Some of what I have encountered is either too technical for me to readily understand or so simplified as to be unhelpful. Some of the articles are quite old, and it's unclear whether it they are outdated. And for a newcomer, it's difficult to try integrate the available introductory information to synthesize an understanding of what things should go together and how they function. One set of information that would be extremely helpful would be some great block diagrams that show

the various functional components of a DATV station - call out the interfaces between these components and identify commercial, amateur-market, kit, surplus, or other products that can be used to implement each of the functional components. It wouldn't be necessary to elaborate all possible combinations, but a few examples would clear up a lot of confusion. The diagrams might vary with different particular digital TV systems. Information about compatibility, system limitations, and other "gotchas" would be useful. An wonderful example is Fig. 2 from W6HHC's superb article, Overview of DVB-T Modulation for Digital-ATV. A few more of those, covering other DTV systems, and supplemented with more equipment and software examples, would do wonders.
…Neil Ormos N9NL

Analog Television always conveyed digital signals. Horizontal Sync, Equalizing Pulses, Closed Captions. These are real clock pulses and data, and without these, what would TV be like. Content would be very interesting to try to view and not just a rolling picture, but brightness changes as the level of modulation changed and not as intended. Digital Television also contains analog signals. Multiple carriers are amplitude and phase modulated to transport Digital information. You don't run out and buy a Digital antenna for reception, or a Digital amplifier to amplify a Digital signal. Satellites do not have Digital transponders in them either.

Analog and Digital are not the same, but they do go hand in hand. Like it or not, when you embrace Digital, you also embrace Analog. The same goes for Analog. So when you analyze either signal, you look at both, Analog and Digital components. Either one goes bad and results will vary. That's the real "mumbo jumbo". Regarding giving away hardware to Hams that don't have the hardware resources, We have only to supply signals for the hardware that they presently have. In the United States of America, that's not that hard of a task for the willing. Worst case scenario, they might have to get a down converter as long as we support QAM, 8VSB, or NTSC. DVB, DVB-T, DVB-S, and DVB-S2 among other formats is for the advanced set and keep getting better as they continue to evolve. It's a non-stop game here. Other Countries may have spectrum and regulatory issues to contend with, but they do very well with their exposure in the internet and do supply very valuable content. They have very nice show- and-tells and updates on progression of advanced systems weekly. Online receivers are also nice to access and cover various bands, modes and located globally.
…Dennis Romo - KA7HQP

OK, here's my take on it! *Of course, everyone is entitled to their own opinion but let's put it into perspective. That is, consider the environmental, country demographics, population densities, government regulations and most important, societal preferences vary from place to place so what works in one area will not work in another. In general, the Ham population is an aging group. Many of us are retired so we have a completely different outlook than the post teenage population does. Today, (at least in the USA) younger people walk around affixed to their I-pod or tablet totally ignorant of the people around them so Ham Radio/TV doesn't normally fit into their lifestyle. When it does, they want Plug-and-Play arrangements.*

This brings me to the next topic. What's happening to the ATV market? Let me be clear, A "for Profit Company" will soon go out of business selling equipment solely to the Ham market. Additionally, the ***analog*** *ATV business is drying up mainly because, 1: Some long time business owners are retiring and 2: Governmental restrictions mandate conversion to digital. On the digital side, DATV is slow to materialize mainly because of the high cost of equipment. Remember, Hams are* ***CHEAP****! Also, there are very few Hams with the desire or technical ability to build their own. We all realize that digital TV technology is very difficult to understand compared to its analog counterpart. On the plus side, commercial RECEIVING equipment for DVB-S on the 23cm band is inexpensive and readily available.*

Why is DATV transmitting equipment so expensive? Well, the main problem is that existing equipment manufacturers want to protect their investment. There are only a small handful of digital TV IC manufacturers who have each spent millions of dollars developing their proprietary ASIC type of IC that goes into TVs and set top boxes. This ASIC sells for only a few dollars on the open market but it is worthless without their proprietary software and data sheets needed for equipment design. They vigorously protect that by restricting details to only their high volume set top box and TV manufacturers with whom they have tight non-disclosure agreements. An exception seems to be HiDes who makes stand alone DATV transmit and receive equipment but their primary market is still commercial set top boxes and TV equipment. It turns out they employ a few Ham ATV operators willing to modify their code just enough to make the units operate in the Ham TV spectrum. Kudos for them for without their involvement, the DATV market would suffer greatly. Other manufacturers are much less accommodating! Just try to get any information about one of the proprietary IC's. The manufacturer will not even return any Email or phone call. "Been there – Done that"!

I am the hardware designer for the DATV-Express DATV transmit board. Three of us ran up against the proprietary issue early on. For that reason we decided to design the required software from scratch which took over a year and a half to produce. Also, we let a Linux based computer do the data crunching eliminating the need for extensive FPGA software code in the DATV-Express board. Without that, a much more expensive FPGA IC would have been necessary and would have added significant software development time. IC designers spent the time and >$1,000,000 to develop software and create masks for a $3.00 ASIC IC in a stand-alone assembly instead of $30.00 for an FPGA and computer. So now hopefully you better understand where we stand in the DATV area but there is no simple answer that satisfies all markets. Yes, the digital world is much more complex and it takes sophisticated electronics to make it happen. But, there is no turning back. There is an analog market but it is diminishing. That said we should not discourage those who want to continue with it. In Columbus, Ohio USA our ATCO repeater has added DVB-S and DVB-T Rx and Tx operation but has NOT discontinued its analog capability. We'll remove our repeater analog equipment ***only*** *when it is no longer used.*
…WA8RMC

DATV – WEBCAMS & UDP/ DATVExpress on WINDOWS

Ever since December of 2014, I have been interested in using a web camera with DATV and the DATV-Express exciter board instead of my trusty but-old NTSC video camera. And for a very long time, the entire DATV-Express project team has wanted to avoid using Hauppauge video-capture units to perform MPEG encoding. Another "wish list" item asked for by hams using the DATV-Express board is to be able to send a video stream to the board over Ethernet or internet. Finally, many hams who want to use DATV do not want to learn how to use Linux…they like the Windows operating system. This article describes progress that has been made in all four areas mentioned above.

Testing UDP feature without Express_Server - The current DATV-Express software has been implemented with the desire to choose an UDP IP address for the video source that is sending a stream to the CPU running DATV-Express. See **Figure01** for the HW-Tab setting that is planned for this feature. The first set of tests that I tried sent UDP packets with video and audio stream over WiFi from a Windows PC to ODROID configured for UDP video source. I could **NOT** get this set-up to work. Charles G4GUO encouraged me to abandon this configuration for now and start testing the Express_Server code installed on ODROID U3

Testing UDP feature using Express_Server -
The Express_Server software was written by Charles G4GUO to better control the receiving of UDP packets by the computer connected to the DATV-Express transmitter board. In this test set-up shown in **Figure02**, A Windows computer has a LogiTech web camera attached and running software called GraphStudioNext to encode the webcam video and use a another piece of software called MajorUDP-Sender to aim the UDP packets to the IP address of the ODROID U3 computer. The ODROID computer is running Lubuntu OS, has the Express_Server software installed and is connected to the DATV-Express transmitter board by USB.

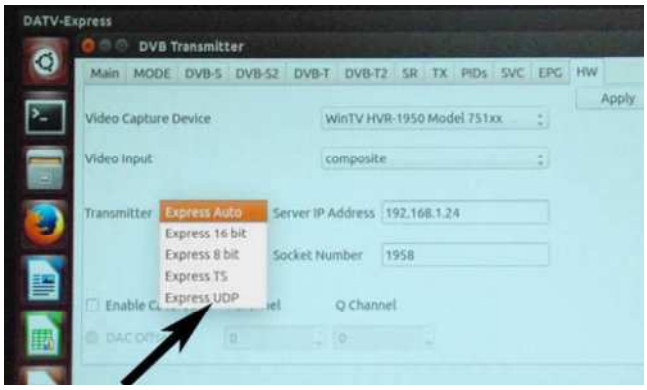


Fig01 – HW Tab in DATV-Express software GUI has a setting planned for UDP stream

The first testing configuration I tried with the Express_Server software used a LogiTech model C920 webcam, a video-editing software called vMix, encoders configured in a DirectShow Graph called GraphStudioNext installed on a Windows7 notebook computer (see **Figure03**). My initial tests tried to use my home WiFi between the Win7 notebook and the ODROID computer.

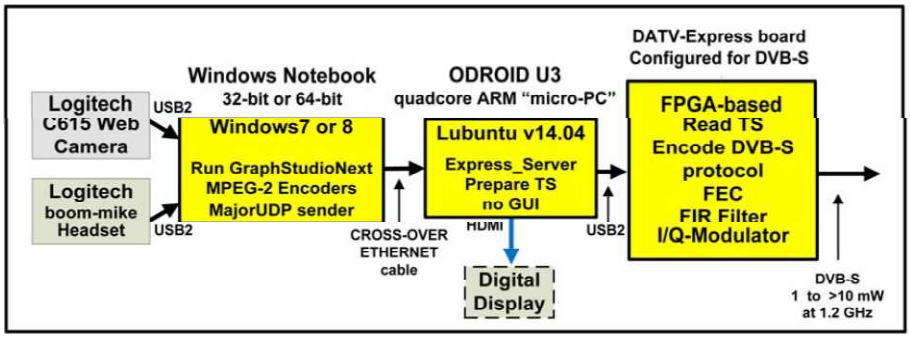


Fig02 – Block Diagram for sending LogiTech web cam video by UDP to ODROID running Express_Server

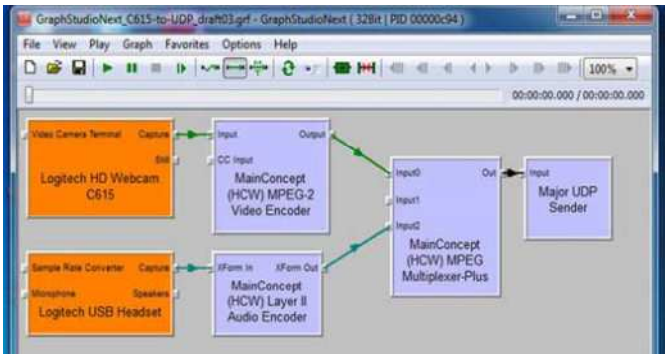


Fig03 - vMix manages the C920 video and GraphStudioNext allows MPEG2 encoding and aims the UDP packets to the Wi-Fi port on ODROID

Fig04 - Configuration of DirectShow filters using GraphStudioNext filter for using C615 webcam on Windows. The MajorUDP-Sender software block is aiming packets to ODROID IP address

There were two areas of problems with this first testing configuration that I tried on the Win7 computer:

1. The LogiTech model C920 webcam outputs video that has already encoded using H.264 video compression (aka MPEG-4). Initial tests showed close to 12 seconds of latency delays to receive the video on my receiver. When I reported my C920 results on a DATV internet forum, Jean Pierre F6DZP reminded me that my test set-up was forcing the Win7 computer to first decode the H.264 video stream back to a non-encoded stream and then finally using GraphStudioNext to encode to the MPEG-2 standard. F6DZP recommended that I try using an earlier non-H.264 webcam.

2. The free video editor I was using, vMix BASIC SD (Standard Definition) model, was nice (even allows "green screen" magic) but added a level of complexity that I did not really need. It turns out that Charles had used it in one of his testing set-ups only because it was an easy tool to use to overlay his call letters on top of the video stream…to use during a DATV contest. But vMix added some operational complexity and also prevented me from controlling directly the source-filters settings for the LogiTech equipment.
The next Win7 testing configuration I tried with the Express_Server software was to change the webcam to an older LogiTech model C615 that I owned and to eliminate the vMix video editing software. **Figure04** shows the configuration of "filters that I now used in GraphStudioNext (I use the latest free version, V0.7.0.430)."

With the C615 camera, the latency was much improved (perhaps less than using Hauppauge video capture units), but the video would freeze after a minute or two while using a WiFi configuration between the two computers. I suspected perhaps buffer overflow somewhere? G4GUO encouraged me to switch to an ethernet "cable" connection…Charles pointed out he also had poor results with WiFi even though he had "line of sight".

I chose to use a "cross-over Ethernet" cable between the two computers. The only tricky part of the "cross-over ethernet" cable installation is that you have to configure both computers for static IP addresses. Setting Windows for a static IP address was straight forward through the Win Control Panel. But setting a static IP address on the ODROID was difficult to sort out …I had to "Google For It" and sort through adding the code below to the INTERFACES system file in the NETWORK folder.

auto eth0
iface eth0 inet static
address 192.168.1.10

netmask 255.255.0.0
gateway 192.168.1.20 (this is the static IP address of the Win7)

Confirm IP addresses are working by pinging from Win7 to ODROID at 192.168.1.10. The static IP addresses cable connection worked perfectly and video was stable in testing lasting more than 8 hours.

One significant difference when using the Express_Server software is that there is **NO** Graphic User Interface (GUI). There is only a command line user interface to show you the server is running (see **Figure05**). The configuration settings that you configure for DATV-Express board DVB-S parameter settings are editable in a text file called, **express.txt**.

There are two notes about express_server. First, I had to build the express_server software on the ODROID computer from source code that G4GUO makes available on his github (see URL at end of article). G4GUO points out that although I tested the express_server on an ODROID U3 (see **Figure02**), the Express_Server software will run on any linux system.

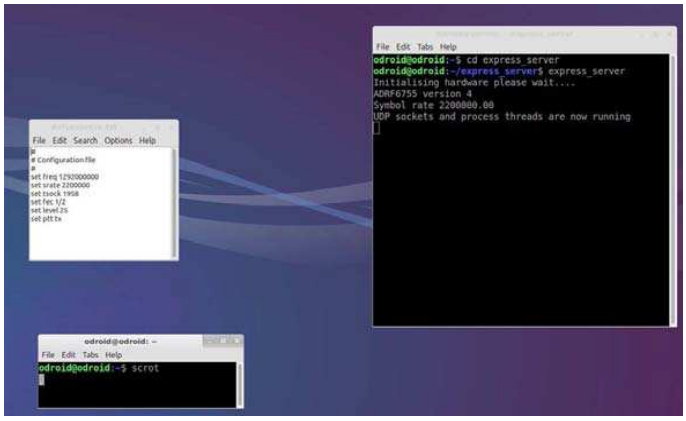


Fig05 – The express_server software is installed and runs (terminal window is on right) on ODROID. It captures incoming internet UDP packets and sends Transport Stream to DATV-Express board. The configuration settings text file is shown on left.

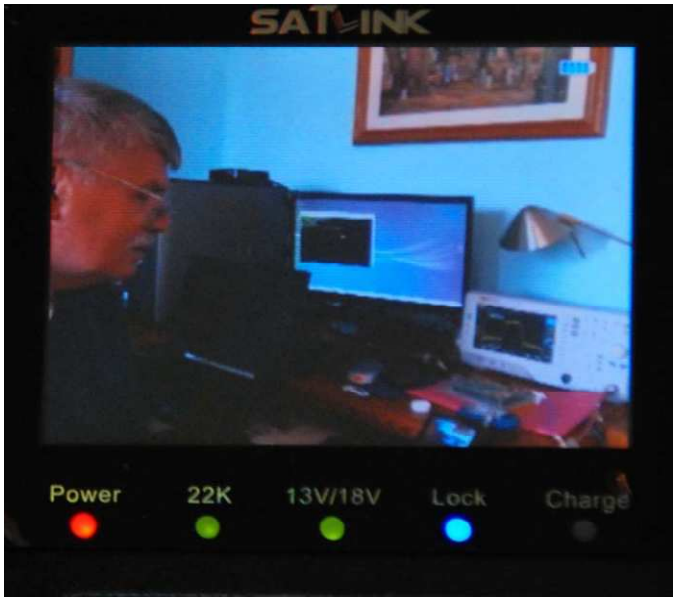


Fig06 - First stable video received using the express_server and cross-over Ethernet cable for UDP packets

Testing DatvExpressServerApp on Windows (no linux used)

A constant request by hams wanting to use the

DATV-Express transmitter board was "when will Windows be available?" I then tested the software that Charles G4GUO has written, called the DatvExpressServerApp, that allows the DATV-Express board to be connected directly to a Windows computer running Win7 or Win8. **Figure07** shows the block diagram for my testing setup.

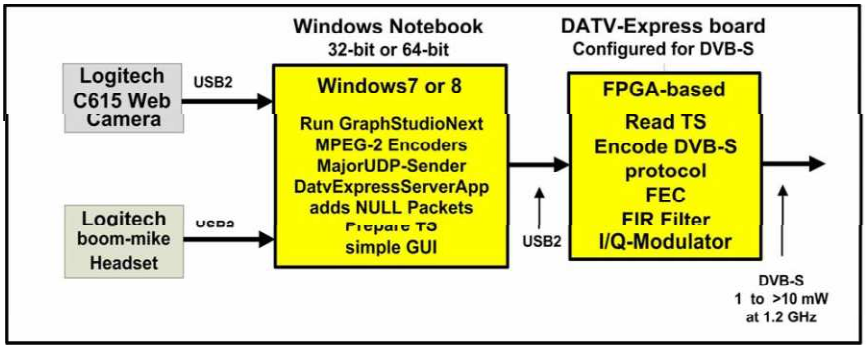


Fig07 – Block Diagram showing the DatvExpressServerApp software running completely on a Windows machine connected to DATV-Express board

This testing configuration uses the same GraphStudioNext set of filters that had been used in **Figure02** and **Figure04**. The only difference is that the Major UDP-Sender software now aims UDP packets to the internal loopback IP address on the Windows PC, 127.0.0.1. I did have to sort through installing libusb and driver for the DATV-Express board onto the Windows computer. Libusb(0).dll and the signed Windows driver are publicly available and comes from another Amateur Radio project (HPSDR). Make sure that you use the readme file for DatvExprssServerApp called HELP.txt. **Figure08** shows the simple GUI that DatvExpressServerApp provides on Windows.

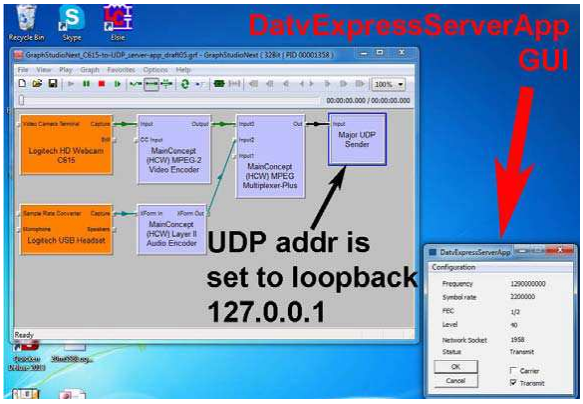


Fig08 - Windows running GraphStudioNext graphs and simple GUI for DatvExpressServerApp

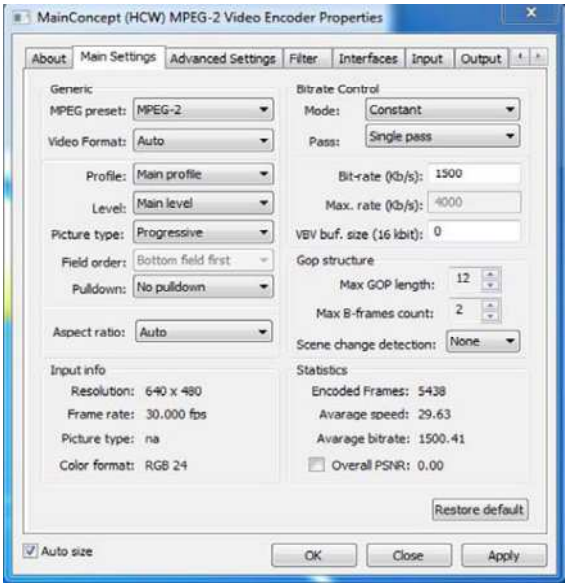


Fig09 – Properties of MainConcept video encoder filter used in my current testing using ConstantBitRate (CBR)

Again notice in **Figure07** that the Hauppauge video capture board/unit is not used by DatvExpressServerApp. The MPEG-2 audio and video encoder filters in Figure08 are from MainConcept (HCW). I obtained my copy of the three MainConcept filters from the Hauppauge installation CD-ROM that came with my Hauppauge usb-based video-capture unit. The properties display of the MainConcept filter in **Figure09** shows that I have currently set the CBR rate of the desired video bit-rate to 1500 Kbps to not overrun the SymbolRate of 2.20 MSymb/sec that I want to use.

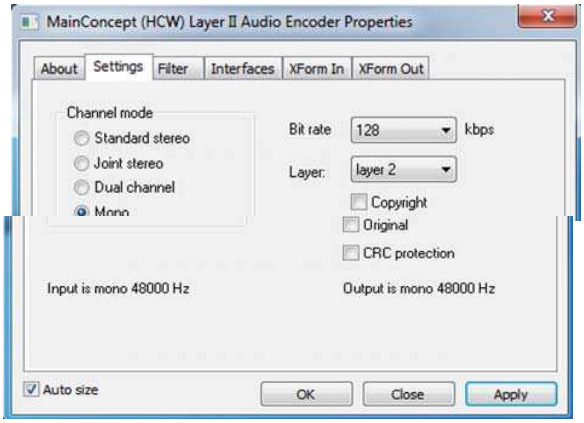


Fig10 – Properties of MainConcept audio encoder filter used in my current testing

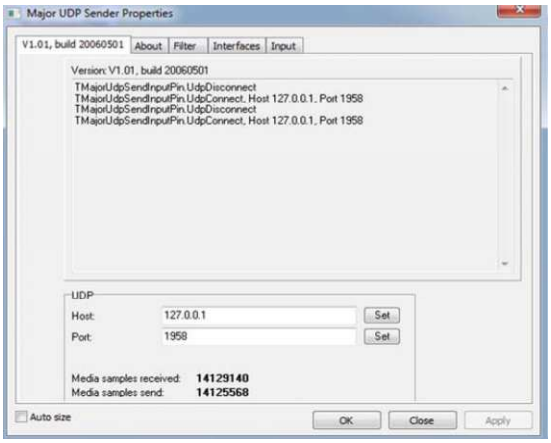


Fig11 – Properties of MajorUDP-Sender software with IP destination address aimed at loopback 127.0.0.1 and socket chosen for an arbitrary 1958

One small issue exists with the VideoPID and Audio PID. The MainConcept MPEG MUX filter defaults to values of 1001 and 1002 (as compared to values of VidPID = 256 and AudPID = 257 used for most DVB-S installations). You can change the PIDs to another set of values, but I have not determined how to SAVE those new values as default values.

Conclusions
This report is the result of a lot fun trying to break out of the NTSC/PAL camera, Hauppauge encoder boards, and Linux "handcuffs" that have somewhat limited the appeal and possible applications of the DATV-Express project hardware board. Using a USB-webcam from Logitech shows that endless cameras can be chosen with many possibilities for other camera interfaces rather than me being restricted to my hand-me-down old (becoming obsolete) home NTSC video camera. I can move to modern cameras now for DATV-Express. This report also provides a roadmap for using DirectShow filters as software encoders, like the Main Concept ones used in this report. The iron-clad hand-cuffs to Hauppauge video-encoders for many hams has been broken. It does not take too much imagination to see that other encoder filters for MPEG-4/H.264 can be found and substituted for the MPEG-2 encoders in this report to reduce the video-bit-stream-rate and allow smaller RF Bandwidths for DVB-S transmitters in SD (Standard Definition) mode. Or transmit HD video if your application really needs true HD with the corresponding increase in RF Bandwidth over SD.

The ability to send video UDP packet streams over Ethernet and even internet to the DATV-Express transmitter board (instead of being tied to the plugged-in-camera) opens up a thousand new possible applications that were not possible before.

Not being able to use the Windows operating system and being forced to deal with Linux has been a learning challenge and a "barrier" for many hams. The new DatvExpressServerApp software from Charles G4GUO will eventually allow Windows to be your choice if that is what you want. G4GUO is quick to point out that the DatvExpressServerApp software is still in a highly "experimental stage". But it is a great start. Other hams may be willing to volunteer to make improvements to the source code and add new features to DatvExpressServerApp in an open source spirit.

Finally, if any readers know how to change and save the default PID/PIS values for video and audio in the MainConcept MPEG MUX filter…please send me an e-mail. **Contact Info** – the author may be contacted at **W6HHC@ARRL.net**
…Ken W6HHC

NASA LAUNCHES NEW ULTRA HIGH DEFINITION TV

From CQ-DATV magazine 9/29/15

NASA, Harmonic launch first noncommercial UHD channel in North America. NASA is partnering with Harmonic, a worldwide leader in video delivery infrastructure, to launch NASA TV UHD, the first ever noncommercial consumer ultrahigh definition (UHD) channel in North America. The partnership is the result of a Space Act Agreement between Harmonic and the agency's Marshall Space Flight Center in Huntsville, Alabama. Credits: NASA TV/Mark Hailey

Using an end to end UHD video delivery system from Harmonic, NASA Television will have the capability to deliver linear 2160p60 video content, allowing viewers to enjoy footage on a wide range of television and internet connected devices. The new UHD channel is expected to launch on Nov. 1, 2015 following preliminary tests. "Partnering with Harmonic gives NASA an outlet for its UHD content, which has four times the resolution of HD and is the next iteration of digital television," said Robert Jacobs, deputy associate administrator for NASA's Office of Communications at the agency's headquarters in Washington.

Leveraging the 8 megapixel resolution of UHD, the channel will showcase the breathtaking beauty and grandeur of space. NASA TV UHD video will be sourced from high resolution images and video generated on the International Space Station and other current NASA missions, as well as re-mastered footage from historical missions. Harmonic currently is in discussions with pay TV operators to carry the channel on the satellite, cable and optical networks for consumer access. The channel also will stream on the Internet, which will require at least 13 MBps access connectivity to receive the signal and enjoy the UHD experience.

"As NASA reaches new heights and reveals the unknown, the NASA TV UHD channel can bring that journey to life in every home. And as organizations at the forefront of innovation, together we are leading the adoption of this exciting technology," said Peter Alexander, chief marketing officer at Harmonic. "As the leader in UHD development, Harmonic provides a complete solution for Ultra HD video production and delivery, enabling content and service providers to offer better video quality at a low total cost of ownership." For more information on NASA TV programming, visit: *http://www.nasa.gov/nasatv*

ATCO AND BROADBAND-HAMNET- BBHN

BBHN, what is it?
Broadband-Hamnet™ (formerly called HSMM-Mesh™) is a high speed, self discovering, and self configuring, fault tolerant, wireless computer network that can run for days from a car battery, or indefinitely with the addition of a solar array or other power source. It uses existing inexpensive hardware for wireless Internet but is re-purposed for Ham Radio use focusing on emergency communications.

Is it just another PACKET, PSK 31, JT 65, RTTY, etc…?
No. It is very high speed. "The entire ARRL Handbook can be transferred in about 35 seconds" according to one mesh expert. Packet (or any other Amateur digital mode) can't do that…

What Ham Bands does it operate?
In its current form it is built using specific wireless routers and operates on channels of the 900 MHz , 2.4, 3.4 & 5.7 GHz ISM bands, which overlaps with a portion of the amateur radio bands. Linksys Routers on 2.4GHz have been the mainstay in the past few years but now software for some Ubiquiti equipment has been released or is in Beta form as of this writing which allows Hams to operate as Part 97 radios away from the WiFi crowd.

What can you do with BBHN?
This system can provide the following services:

- VoIP/SIP Phone service (possibly Skype, FaceTime, and iChat)
- Internet Relay Chat (IRC)
- Email
- Windows File Sharing (SMB/CIFS by both URL and UNC)
- Web Pages (HTTP, both intranet and internet)
- File Transfers (FTP)
- IP Cameras for video communication
- Local Wifi (by attaching an access point to the mesh node)
- Local 3G/4G Cell Phone Service (by attaching a 3G/4G extender to the mesh node)
- Remote Desktop/VNC (for remote control of workstations and servers)
- **In short, just about anything else you can do with an IP network**

Why do we need a second "Internet".. the web works just fine (most of the time…)
The World Wide Web works in a hieratical fashion. If your Internet Service Provider (ISP) goes down, the internet is down for all who are connected. BBHN is peer to peer. That is, it can be from a single user to another single user either directly or indirectly via other nodes in the system. If one node fails, it automatically re-routes the data or service (items in the above list are call 'Services') using the other peer nodes. That way a person that cannot communicate directly with an intended node, is automatically re-routed via other nearby nodes to the intended destination. Like packet, but automatically at high speeds.

Today, Ham Radio plays a crucial role to support the first and second responders to weather and non- weather related disasters and emergencies –that is how we are known and it helps us justify our very existence. We provide voice communication via 2 or 440 MHZ locally and use HF for long range communication. We as ATVers can provide real time video locally via our ATV repeater including weather RADAR to the Agencies that need it. If the internet goes down during a disaster, the data networks that support the first/second responder agencies are lost. These networks move large volume of data that it just is not practical via a two meter rig! How about video and providing First Person Video (FPV) at a local disaster site? I only know of 2 operational mobile or portable stations in Central Ohio that has that capability. BBHN can provide the capability which anyone with a Smart phone could provide HD video and audio from the disaster location to anyone who needs it via BBHN! Bob, W8ERD, has already demonstrated that capability. We could route that video/audio via the ATV repeater if needed.

Since the BBHN node equipment is relatively inexpensive, the following sites could be equipped ahead of time to support drills, special events and emergencies. County EOC, Fire/EMS Houses, Hospitals, Red Cross Building, Shelter Locations, Schools (if not already shelter locations), Airport, National Guard Barracks, EMA, etc.

"If you build it, they will come…."
Our "Field of Dreams" is building a BBHN (Mesh) network that covers the entire county and can "tunnel" outside of the county to locations such as Ohio EMA, National Red Cross and other long distance agencies via public or private networks to a supported local BBHN. Our BBHN network would have IP phone support, video/audio, File transfer, chat rooms, Ham and disaster support web sites and bulletin boards. In addition, it could be used by any ham for any legal purpose, much the same way you use your 2 meter rig or ATV rig every day in a non-emergency support. We would also use the BBHN network to support special events such as weather nets, parades, marathons, 5K walks, bike rides, fireworks, etc. same as today, but with high speed data/video capability. The list continues….
What is the status of building our "Field of Dreams"?

I know of two major initiatives to build the BBHN-Mesh networks. The two counties met on 22 March, 2015 at ABB (the ATCO meeting place) to discuss plans and show various capabilities.

One in Franklin County effort is headed by Kevin, W8KHW, Tom, KA8ZNY, John, N8PVC, and others. The last word I have is that they are busy securing sites for the Franklin County Backbone on 5 GHz and have already installed some backbone components.

The second in Delaware County is also quite active in building its field of dreams. The Delaware County Amateur Radio Association and Delaware ARES are sponsoring the effort with active support from Stan, N8BHL, Bob, W8ERD, Ken, W8SMK, John, and W8NX. Bob, W8ERD has picked up the leadership role to guide us to the future.

The following was posted in the DELARA September Newsletter.

MESH Design Committee Set

DELARA and Delaware ARES are at the forefront of MESH networking development. There are several network nodes now active on members' towers, and we are awaiting confirmation that we will be able to mount nodes on county-owned towers! This will allow us to form a solid, working MESH network with a goal of covering the entire county. This network will be valuable in handling special events, such as parades and other public activities, since it is able to relay voice and video as well as file content. It will become extremely important in times of real emergency, since it is self-contained and does not rely on the Internet or cellular service. Several fire chiefs have become very interested after seeing the system. In order to keep the project moving, those most closely involved are forming a MESH Design Committee to work out any questions about equipment, applications, or the general progress of the system. The committee will include John Beal, W8NX, Ken Bird, W8SMK, Ken Morris, W8RUT, Bob Dixon, W8ERD, and Terry Meredith, W8ARE.
Did you notice all of the people on committee, but 1, are also an ATVer? We'll work on Bob.

The DELARA Field of Dreams plan calls for establishing a node on each of the nine (9) so called "911" tower as well as the Delaware EOC, Sheriff office, Red Cross, and various selected shelters, including the YMCA. The "911" towers are ~190 foot towers scattered across the county. See figure 1. The agreement with the County Public Safety leadership is expected to be signed soon. Installation will begin shortly thereafter.

Note that all of the "911" towers and Served Agencies will have the call sign N8DCA-xxxx (DCA = Delaware Country ARES). Hardware (Antenna, Node, ESD protection, Ethernet cable, tower off-set bracket, etc) is 95% procured for 5 of the 10 key sites and are awaiting installation. A professional tower installer has been selected for the initial installations.

The month of October should be a big month of the Delaware County "Field of Dreams". Taking the baseball analogy a bit further, a fielded ball team and how each player handles their assignment reminds me of a Mesh Network…. with "Murphy" at bat!!

So what does all this Mesh stuff have to do with ATCO, an ATV group?
In January of 2015, The ATCO breakfast Club (every Saturdays at 8am various locations) there was a discussion about how do we grow our ATV club and attract more young people (so called 'millennials'-- those born around the1980's & 90s and later and were issued an IP address at birth instead of a SSN!)

We decided we needed to add more content using computers to attract young people) and although our current work with DATV did involve a lot of computer work, it was simply is not enough.

Somewhere in the discussion, the word 'Mesh' was mentioned, but we did not know much about it. All I knew at the time was a 3 minute conversation with Ken, W8SMK, some weeks earlier on the topic. The following week I dug into to mesh topics and although still a Mesh Novice, I reported my findings at the next breakfast. We decided it was worthwhile to pursue a little further. I purchased a couple of Linksys WRT 54G routers and loaded them with mesh software from the BBHN web site. All that proved how little I actually knew about wireless networking, but I love a challenge and I was up for it.

Art took on the assignment to talk to Kevin, W8KHW and I went after the Delaware guys to learn more. On March 22, ATCO sponsored a Central Ohio BBHN forum for those involved to share plans and technical ideas. Demonstrations were also shown as well.

On an experimental basis a node was installed (and later a second node) at our ATCO repeater site as a tool to learn more. We are still learning how to operate receivers in an extremely high RF environment. Once we get the system running, we will go after those millennials with a targeted marketing campaign.

Stay tuned for some "How-To Mesh" articles in the future, including "Meshing 101", Mesh Software page layout, mobiling with mesh, expected distances, What does line of sight really mean, antenna types, Mesh Radios, IP Phones, Ham Chat, Video on Mesh, file sharing, evolving standards, and much more. Stay tuned.
… de Ken, W8RUT

FIRST CONTACT- MESH MOBILE TO MOBILE

Do you remember the thrill of your first Ham contact? If you are like many of us it was a long, long time ago. In my case I was 13 years old and I started calling CQ on 40 meters 7180 kc CW while I was still taking my new license out of the envelope from the FCC! My first rig consisting of a Hallicrafters SX 110 receiver, EICO 720 CW Transmitter and a 40 meter dipole was about to make its first contact! I was so nervous that I did not copy anything that the Maryland ham who answered me, except for his call! I can only imagine what I sent was just about as bad! A few weeks later, I ran across that same ham and we had a wonderful QSO. Bill told me that his first contact was very similar, down to the last detail. He had been a ham for some 10years.

Fast forward some 50 years+ and Terry, W8ARE and I were recognized for having a 'First Contact'. In this case it was a first contact type. Terry, W8ARE had just finished configuring one of his BBHN Mesh Nodes with an IP Phone. An IP phone is just like the phone in your home, except it uses the Mesh network to transport the phone signal. Much like cell sites do today, except we are using the Ham Mesh network as our communication medium. Terry, not being sure he configured everything correctly, loaded up his phone and Mesh equipment in his car and drove over to my house for me to have a look at his configuration. I had added an IP phone to my SUV mobile node a couple of days earlier. When Terry arrived, he stepped out of his car and handed me his cordless IP phone to checkout his configuration. Since I am a 'tune for maximum smoke kind of guy', instead of checking his configuration, I entered the IP address of my mobile phone into his phone. I immediately I could hear my mobile phone ringing! I handed Terry his phone back (I had to walk over to answer my phone!). When I answered, Terry's voice was crystal clear. We were both smiling, ear to ear, because it worked the first time! Since we both had our phones installed in our respective vehicles, we decide to go mobile. Terry turned south toward his home and I turned north out of my driveway. We were both traveling about 50 mph in opposite directions (100 mph vector wise) and his crystal clear voice held the same as if we were still in my driveway.

A Mesh Mobile to Mobile First Contact. I don't know if I was as thrilled as that 13 year old boy, but the smile on my face was just the same…..
Ken-W8RUT

ARRL ASKS FCC TO CLARIFY THAT HAMS MAY MODIFY NON-AMATEUR GEAR FOR AMATEUR USE

This proposal is intended to impact the MESH network equipment on 2.4GHz because the Umbiquiti units are now software modified for use on 2.98GHz which is outside the commercial 2.4GHz WiFi band now supplied. Ed.

The ARRL has asked the FCC to make clear that Amateur Radio licensees may modify non-amateur equipment for use on Amateur Radio frequencies. Some hams have expressed concerns that recently proposed rules would inhibit post-sale modification of Wi-Fi equipment, now sometimes altered for use on Amateur Radio frequencies. The ARRL made its point in comments filed on October 8 on a *Notice of Proposed Rule Making* (*NPRM*) in ET Docket 15-170 and RM-11673. The proceeding mostly addresses proposed amendments to FCC rules regarding authorization of RF equipment.

"The Commission should clarify...that the ability of licensed radio amateurs to modify and adapt non-amateur equipment for use in the Amateur Service is beneficial, is permitted, and is not restricted by any rule of general applicability adopted in this proceeding," the League said in its comments. The ARRL said proposed rules requiring manufacturers to include security features to prevent network devices from being modified were "problematic," to the extent that they would preclude hams from adapting network equipment for ham radio applications.

"The Amateur Radio Service has a very long tradition of modification and adaptation of commercial communications equipment," the ARRL pointed out in its comments, asserting that amateur licensees should be permitted to modify any previously authorized equipment for use under Amateur Service rules. The proceeding attracted many comments regarding this aspect of the proceeding, although the proposed rules differ only slightly from the current rules.

The ARRL also urged the FCC not to apply any limitations proposed for software defined radios to SDRs intended for use exclusively in the Amateur Radio Service, "as has been the policy for the past 10 years."

…Bob Dixon W8ERD

NOSTALGIA TIME – DO YOU REMEMBER THIS??????

This time Phil Morrison, W8MA, found an historic electronic item on the next page. How many of you remember either using or seeing this? Maybe one of "the old timers" might even still have one stashed away in their junk box.

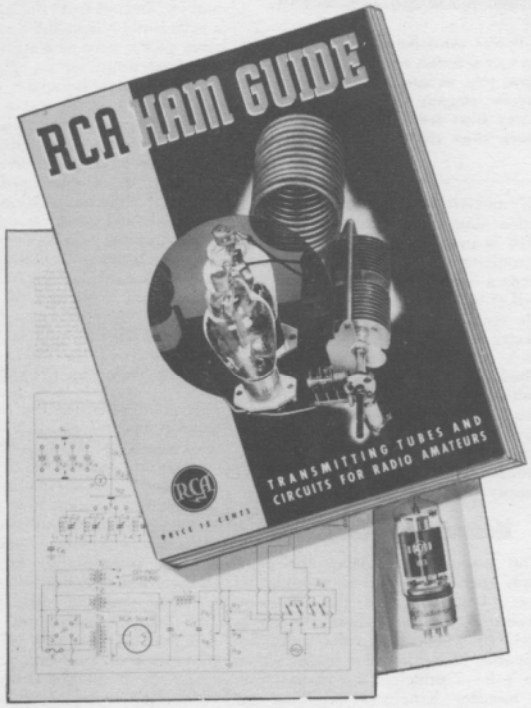
I didn't ever own or see an Iconoscope tube like the one shown on the next page but I still DO have an old full size 1850 Iconoscope tube in its original carton from an old film chain TV camera. I thought that someday I'd build a circuit around it but those thoughts are dimming now. Maybe I'll donate it to the TV museum in Hilliard. A picture of it is on the right. For comparison, below are two "modern" image orthicon tubes used in the 50s-80s cameras.
…WA8RMC

HAM TIPS *from* RCA

Published by RCA Manufacturing Company, Inc., Camden, N. J., U. S. A.

VOL. 3—No. 3 CAMDEN, N. J. JUNE-JULY, 1940

NEW RCA-1847 MAKES HAM TELEVISION PRACTICAL



NEW RCA HAM GUIDE RECEIVES WIDE PRAISE

Contains 48 Illustrated Pages of Xmtg-Tube Circuits and Data

Here is the transmitting guide amateurs from coast-to coast are acclaiming! Written specifically for the *amateur*, this new book contains forty-eight pages of authoritative technical data on RCA's most popular amateur tubes such as the 802, 806, 807, 808, 809, 810, 811, 812, 828, etc. Carefully proved circuits are shown with each tube in order to utilize the tube to its best advantage. Six complete pages are devoted to the general design and operation of amateur transmitters.

Two complete transmitters are described in detail from mike- and key-to-tank. These descriptions include pictures and complete circuits. One transmitter is a complete 5-band cathode-modulated 'phone/c-w rig working from 10 to 160 meters. Power input is 220 watts on 'phone and 450 watts on c.w. The other transmitter is a plate-modulated outfit with 310 watts input on 'phone and 450 watts on c.w. It also operates from 10 to 160 meters. The design of these transmitters is simple and straightforward.

All in all, this 8½" x 11" book contains over 70 illustrations and more than 30 up-to-the-minute transmitting circuits. It is easy to read and completely different in style. You can obtain a copy of the RCA HAM GUIDE from your RCA Transmitting Tube Distributor, or by sending 15 cents direct to the Commercial Engineering Section, RCA Manufacturing Co., Inc., Harrison, N. J.

LOW-PRICED ICONOSCOPE OPENS NEW FIELDS FOR AMATEUR PIONEERS

Acclaimed at Chicago Parts Show where it was demonstrated in typical equipment

The fond dream of transmitting and receiving pictures via Ham Television on Ham bands is now a reality.

June 11 to 14 were banner days for Ham Television when, for the first time, RCA engineers demonstrated really practical amateur television transmission and reception at the Chicago Radio Parts Show. The equipment used will be described. Running continuously for 10 to 12 hours at a stretch under the call of W10XEL, this gear clearly demonstrated to hundreds of enthusiastic amateurs, engineers, dealers, and distributors the practicability of good quality television communication with simplified and economical apparatus. Demonstrations were conducted on the 12th floor of the Blackstone Hotel overlooking Lake Michigan where it was possible not only to televise indoor subjects but also to pick up panoramic scenes from off the lake and along the boulevard as well. Even skeptics and those "in the know" on television were frankly amazed at the faithful reproduction and stability of the pictures along with the simplicity of the complete equipment.

"MINI-IKE" PAVES THE WAY

Amateur Iconoscope RCA-1847 is the famous television camera "eye" that changes light variations into electrical variations. It is 7⅝" long and has a 2-inch face on which the images are focused. Amateur net price for the 1847 is only $24.50. This pick-up tube—engineered by the same men who produced the larger Iconoscopes—completes the tube line required to get started in Ham Television.

Small Brother to Big "Ikes"

The advent of the new amateur Iconoscope RCA-1847 now makes it possible to construct at a cost within the price range of a present-day amateur transmitter a complete television system. This "Mini-Ike" is a smaller, much simplified version of the larger and more familiar Iconoscope Television camera tubes used in large Television studio cameras. It is 7⅝" long, has a 2-inch face, and is capable of producing a clear, 120-line, 30-frame-per-second picture that is well suited for transmission in the 2½- or 1¼- meter amateur band. RCA-1847 operates at relatively low voltage, employs inexpensive electrostatic deflection circuits, does not require keystone correcting circuits, and can utilize low-cost, short-focal-length lenses. The tube is now available through RCA Transmitting Tube Distributors at the amateur net price of $24.50.

How the 1847 Works

The principal parts of the 1847 are its mosaic, signal electrode, collector, and electron gun. The position of these parts in the 1847 is illustrated

(*Continued on page 2, column 1*)

New RCA-1847 Makes Ham Television Practical

(*Continued from page 1, column 4*)

in the diagram below. The mosaic consists of a large number of small photosensitive particles deposited on one face of a transparent sheet of insulating material. The particles are spaced a very small distance apart so as to be insulated from each other. On the opposite face of the insulating sheet is the signal electrode, a transparent conductive film. This electrode makes contact with a band of conductive material on the inner surface of the bulb. Another band of conductive material is mounted on the external surface of the bulb, directly over the internal band. The capacitance between the two bands, in series with the capacitance between the signal electrode and mosaic, provides coupling between the mosaic and the signal-electrode terminal.

In the operation of the 1847, an image of a scene is focused on the mosaic and the beam of electrons provided by the electron gun is made to scan the image. As the beam moves over the image, there is generated across the signal-electrode load resistor a voltage whose magnitude at any instant depends on the image brightness at the point where the beam is striking at that instant. This voltage is used as the video signal for Television transmission of the scene viewed by the Iconoscope.

How Much Illumination is Needed?

The lighting equipment required for operation of the 1847 can be simple. Inside-silvered lamps are a convenient form of light source. When an f:2.3 lens is used, adequate lighting of photographs, drawings and other still subjects can be provided by a single 200-watt, inside-silvered, spot-light bulb. A value of 1.5 focal lengths is generally suitable for the distance from the lens to the subject. For this spacing, the illumination on the subject should be not less than about 3,000 foot candles.* The 200-watt bulb described above can provide this illumination on the subject when the bulb is about 15 inches from the subject. For televising "living talent" it is generally desirable to have a larger spacing between the lens and subject so that the lens will have a larger field of view. When this spacing is approximately 10 focal lengths or greater, the necessary illumination on the subject is 1500 foot candles.

Gear Uses B. C. L. Parts

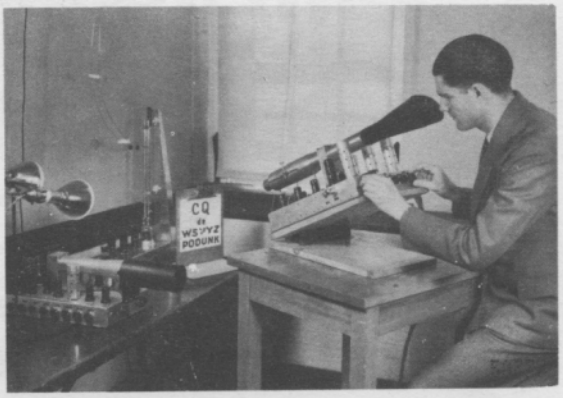
Major equipment required for the operation of an amateur television system includes a television receiver, a pick-up camera and monitor unit, and an ultra-high-frequency transmitter. Such equipment has been built in our laboratory by our engineers and described in detail in a series of articles recently published in the May, June and July issues of QST. A feature of all of this apparatus is that *standard broadcast receiver parts are used almost exclusively throughout the circuits.*

Receiver is Straightforward Super

The Television receiver itself is a superheterodyne and is designed to cover the 112-116 Mc amateur Television band. The output of the receiver terminates in a 3-inch Kinescope, type 3AP4/906-P4, which produces bright pictures in black and white. The tube line-up is as follows: A 956 Acorn type pentode is used as the first detector with a 6J5 oscillator. There are two i-f's using 6AC7/1852's. The second detector utilizes one diode section of a 6H6 and is followed by one 6AC7/1852 video stage. The other half of the 6H6 is used as a detector for synchronizing purposes only. This diode feeds a 6SC7 double triode, the first half of which is used as amplifier and the second half as sync separator. Multivibrators containing one 6SC7 each are the scanning oscillators. The Kinescope anode potential of 1500 volts is obtained inexpensively from a small receiver power transformer with two 5U4-G's in a voltage-doubling circuit. The remainder of the tubes are operated from a low-voltage 5Y3-G supply.

*A foot candle is the amount of illumination produced by a standard candle at a distance of one foot.

"CALLING CQ-VIDEO"



This is a complete Ham Television station. It was constructed to illustrate the practicability of radio amateur Television transmission and reception on 2½ meters. Demonstrated in actual operation, this equipment was hit of the Chicago Radio Parts Show. Most amateurs already have many of the required components. But even though you start from "scratch," it is possible to duplicate this system for no more than the cost of an ordinary medium-power transmitter.

Modulator Contains "Ike"

The modulator furnishes the complete television signal for modulating the r-f amplifier of the television transmitter. It consists of the RCA-1847 Iconoscope, a video amplifier capable of raising the initial signal to a level sufficient for modulation, a monitor Kinescope, scanning circuits for the Iconoscope and monitor, blanking and synchronizing signal generators, a high-voltage supply for the Iconoscope and monitor, and a low-voltage regulated supply. The scanning frequencies are 30 frames per second and 3600 lines per second. The video channel width thus required is about 200 kc., which, of course, means 400 kc. on the air with double sideband modulation. Inasmuch as the entire 2½-meter amateur band (for which this equipment is intended) is only 4000 kc. wide, it is apparent that the channel width must be restricted to the minimum value needed for reasonable definition.

Xmtr Uses Twin Beam 829

The r-f transmitter proper is of simple and straightforward design. It has no frills or doodads. Although the rig employs a 40-meter crystal, only four r-f stages are required. The tube line-up begins with a 6L6 Tri-tet crystal oscillator, followed by a 6L6 5-meter doubler and then a 6L6 2½-meter doubler. Output from the last doubler is sufficient to drive fully an 829 twin beam power tube as a straight push-pull final amplifier on 2½ meters. This transmitter is capable of kicking out a carrier of 20 watts or better with video grid modulation and, incidentally, makes an excellent 'phone transmitter having considerably greater carrier output when used with conventional plate modulation.

Actual field tests conducted with this television gear have been made with the receiver located about 1½ miles from the transmitter. It is anticipated that distances of 10 to 15 miles can easily be covered with this same equipment.

We Scan the Crystal Ball

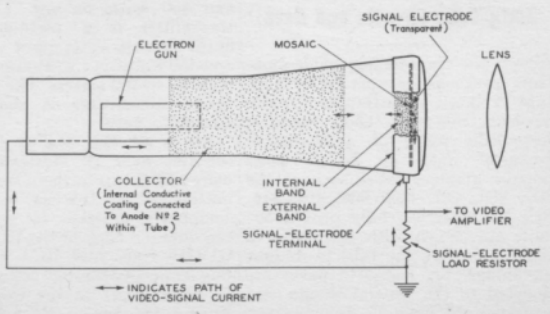
Television provides the next major development of amateur radio and once again the Ham is in an ideal position to go places. In this new art, amateur Television provides rich opportunity to gain new experience in circuit applications and to work with the fascinating principles of lighting, photography and optics—all thrown in one. For those who have felt that amateur radio is growing dull, here is the answer.

A new booklet, just off the press, contains complete data on how actually to build the complete Television station described in these columns. Get a copy from your nearest RCA Transmitting Tube Distributor, or write to the RCA Manufacturing Company, Inc., Commercial Engineering Section, Harrison, New Jersey.

THORIATED-TUNGSTEN FILAMENTS REVIVED

Thoriated-tungsten filaments of RCA transmitting tubes possess the capability, in many cases, of being reactivated after their emission has dropped off as a result of temporary tube overloads. The reactivation treatment is not 100 per cent effective but is worth trying when your hopes for saving "low" tubes have faded. The reactivation schedule is as follows: Operate the filament at rated voltage for 10 minutes or more *without* voltage applied to any of the other tube electrodes. The process may be accelerated by raising the filament voltage above its rated value by a small amount for a few minutes. The maximum voltage that should be used is 7.5 volts for 6.3-volt types, 9 volts for 7.5-volt types, 12 volts for 10-volt types, and 13 volts for 11-volt types.

FUNCTIONAL DIAGRAM OF THE 1847 MINI-IKE



Form IG2481

Printed in U. S. A.

W8DMR AND AN LED SHOP LIGHT

This article IS ATV related because without proper lighting, ATV would be useless! Bill is on the lookout for energy efficient lighting. Has anyone else done something similar? Let us know.

Six to eight months ago I purchased two 48", LED lamps only, for light fixture above my test bench, ~$25 plus tax per each at Lowe's.

Recently, a Sunday Dispatch ad listed: 48 inch, two tube, LED overhead workshop lamp fixture. Output of 3,300 Lumen; 4200 Kelvin, bright white light output. [For comparison sake, a 100 Watt LED screw-in lamp output is typically, ~1600 Lumen. It comes with hanging chains, 125 VAC, 5 Ft. cord, 3-pin connector, plus Off-On switch w/ pull chain. Priced $29.95 each, plus tax. Purchased five of them. Three now installed in Pat's sewing area. Each lamp has a white-plastic light diffuser. Pat likes' em. I plan to install the other two today in my hobby area. Menard's Stock No. 348-1426

Name Brand: LED SHOP LIGHT, by SMART Electrician. Carbon steel construction, long lasting 50,000 Hrs at essentially the same brightness level with little aging effect. Low heat. Haven't looked inside yet to observe the SPS adapter/starter module. May yet do that on one of them.

LED power consumption. Older type fixture, >100 Watt consumed due to ballast & end filaments. "Energy Savings, $ 59.99 over the life of the lamp." is printed on the carton. While removing the old fixtures, observed the LED fixture weighs much less than the old (no heavy iron- core ballast). The Sales Pitch being, "No bulbs to replace, thus saving YOU time & money". Fluorescent glass tubes were stated to last typically ~20,000 Hrs.

I'm not employed by Menard's, but do enjoy sharing what L.E.D. has to offer, hi. Suggestion: When opening the lamp carton, OPEN the end WITHOUT the Lot Number on it (1517G). The lamp assembly slides out much easier compared to using the other carton end. The fixture is packaged in a bright yellow carton, making it easier to locate. Hi.
…Bill, W8DMR

ATCO

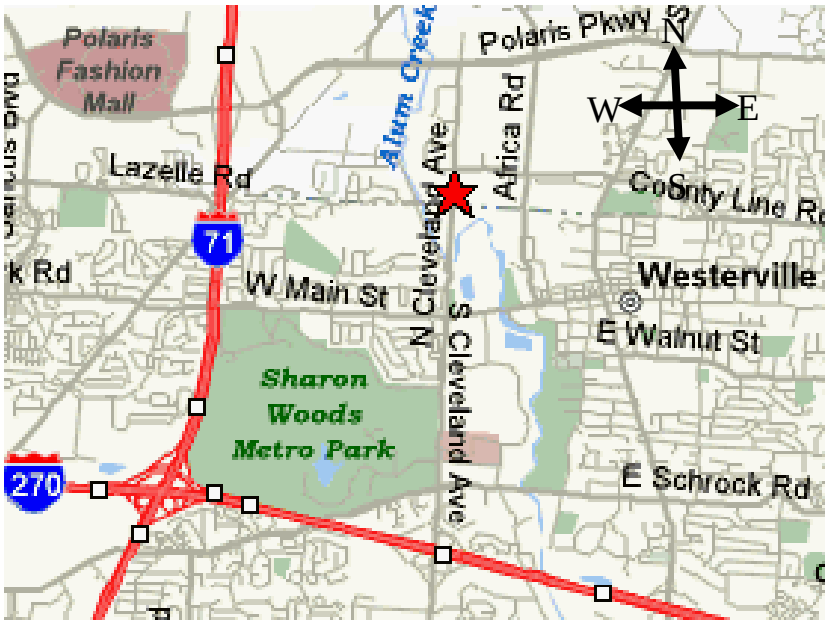
2015 FALL EVENT

12:30 PM Lunch/meeting
Sunday November 1, 2015
ABB PROCESS AUTOMATION
CAFETERIA

579 EXECUTIVE CAMPUS DRIVE
FOR MORE DETAILS, CONTACT
ART - WA8RMC 891-9273

LUNCH PROVIDED - DOOR PRIZES -
BRING A FRIEND AND SEE OLD BUDDIES
MINI HAMFEST - SHOW AND TELL

DIRECTIONS TO THE ATCO FALL EVENT



From I-70 WEST Bound:
Take I-270 Northbound around and turning to the west to Cleveland Ave. Exit north onto Cleveland Ave and travel north about 2 miles to Executive Campus drive. (It's the next street past Westar Crossing Street). Turn left (west) to the ABB building at the end of the street.

From I-70 EAST Bound:
Take I-270 Northbound around and turning to the east past SR 315 and past I-71. Get off on the Cleveland Ave second exit and travel north (to Westerville). Continue north on Cleveland past Schrock Road and then past Main Street. Continue north about ½ mile past Main Street to Executive Campus Drive. (It's the next street past Westar Crossing Street). Turn left (west) to the ABB building at the end of the street

From I-71 NORTH bound toward Columbus:
Drive through Columbus on I-71 to I-270 on the north side. Take I-270 east to the first exit, Cleveland Ave. Get off the Cleveland Ave second exit and travel north (to Westerville). Continue north past Schrock Road and then past Main street. Continue north about ½ mile past Main Street to Executive Campus Drive. (It's the next street past Westar Crossing Street) Turn left (west) to the ABB building at the end of the street.

From I-71 traveling SOUTH bound toward Columbus (North of I-270):
Exit the Polaris Ave exit and travel east about 1 mile to Cleveland Ave. Turn right on Cleveland Ave to Executive Campus Drive. Turn right again on Executive Campus Drive. ABB is on the right side of the street about half way around the semi-circle.

CONSTRUCTION ARTICLE INDEX

The following list is an index of all construction related material that has appeared in the ATCO Newsletter since its inception in the early '80's. This is a handy reference for that particular construction article that you knew existed but didn't want to wade through each issue to find it. All Newsletters below are also listed in order in the ATCO homepage under "Newsletters".CTRL Click on www.atco.tv. Once you locate the Newsletter section, the displayed list can then be re-sorted as needed by clicking on the "date" in the header.

…Bob N8OCQ

Issue	Page(s)	Article
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Vol 2 I	4	439 Beam
Vol 2 II	8,9	439 Parabolic Ant
Vol 2 II	9	Video Modulator
Vol 2 III	7	1296 Ant 45 Ele loop yagi
Vol 2 III	10	RF Power Indicator (in-line) for 1296 MHZ
Vol 2 SE	2,3	Diode Multiplier for 23 CM
Vol 2 SE	4,5	1296 MHZ 10 Watt Solid State Linear Amp
Vol 4 I	3	RF/Video Line Sampler
Vol 4 II	3	P-Unit Meter
Vol 4 II	7,10,11	UHF Gated Noise Source
Vol 4 II	12	420 – 450 Broom Handle Rhombic Ant
Vol 4 III	4,8	25 Element 1.26 Loop Yagi
Vol 4 IIII	6	Video Modulator (Tube Type)
Vol 5 I	3	Video Modulator One Transistor
Vol 5 II	4,7	900 MHZ Yagi Ant
Vol 5 II	6	Video Modulator for 2C39 Final
Vol 5 III	3	440 MHZ Hidden Transmitter Finder
Vol 6 I	3	Video Line Amp
Vol 6 I	8	25 Ele 910 MHz Loop Yagi
Vol 6 II	4,6,7	Microwave Oven ATV Xmiter
Vol 6 II	5	Matching a Quad Driven Ele
Vol 6 II	8	Power Divider for 33CM
Vol 9 IIII	5,7	16 Ele Loop Yagi for 439.25 MHz
Vol 10		No Articles
Vol 11 II	4,5,6	439 48 Ele Collinear Ant
Vol 11 IIII	7	1280 MHZ Cavity Filter
Vol 12 I	6,7,8	439 & 1200 Horz Polarized Mobile Ant
Vol 12 II	5,6,7	ATV Line Sampler
Vol 12 II	10	439 & 1280 Interdigital Filter(s)
Vol 12 III	6,7,8	439 Cheap Attic Ant
Vol 13 I	9, 10	High Level Modulator for ATV
Vol 13 II	5	VGA to NTSC Converter for Computer
Vol 13 III	9, 10	AM Video Modulator
Vol 13 IIII	4	1200 MHZ Transistor Linear Amp
Vol 13 IIII	6	900 & 1200 MHz Loop Yagis
Vol 14 IIII	8	439 31 EleYagi
Vol 14 IIII	12, 13	1250 MHZ FM ATV 3 Watt Xmiter
Vol 15 I	16	427.25 Horz J-Pole Ant
Vol 15 II	14	2400 MHZ Loop Yagi
Vol 15 III	8	Wavecom Modification
Vol 15 III	12,13,14	2.4 Gig Antenna's
Vol 16 II	20	2.4 Gig Helix Ant
Vol 16 IIII	4	1280 MHZ Loop Yagi
Vol 17 I	14, 15	Video Amp (Multi Output)
Vol 18		No Articles
Vol 19 IIII	4	Pwr Supply for 28 Volt Ant Relay
Vol 20 III	9, 10	Video Sampler
Vol 21 I	4	RF Pwr Amp for 900/1200 MHZ
Vol 21 II	14	10-14 Volt Doubler for 28 Volt Ant Relays
Vol 21 III	5	S-Video To Composite Adaptor
Vol 21 IIII	3,4	Video Noise Rejection Amp
Vol 21 IIII	14,15,16,17	"S" Meter For Comtech Boards
Vol 22 I		No Articles
Vol 22 II	10	1260 MHZ Cavity Filter
Vol 22 III		No Articles
Vol 22 IIII		No Articles
Vol 23 I		No Articles
Vol 23 II	5,6	Linear 60 Watt For 70CM
Vol 23 II	8,9	Video Modulator Update
Vol 23 III		No Articles
Vol 23 IIII		No Articles
Vol 24 I	13	RF Sniffer For 2.4 GIG
Vol 24 II		No Articles
Vol 24 III	3	Quantum 1500 Rec Tuner Mod
Vol 24 IIII	9	Battery Recharge Ckt
Vol 25 I		No Articles
Vol 25 II	6,7	Comtech TX Module Improvement
Vol 25 III	11	Comtech TX Module Improvement Correction
Vol 26 I	6	Isolator (Circulator) Mod. 850 To 1260 MHz
Vol 26 II	5,6	Comtech 1200 MHz rec. module improvements
Vol 26 III		No Articles
Vol 26 IIII	9	Remote Touch Tone Decoder For Your Shack
Vol 27 I	10	ATV Low Pass Filter (427 Mhz)
Vol 27 II	15	PictureTel Camera Data Cable Wiring
Vol 27 II	10	ATV Low Pass Filter (427 Mhz)
Vol 27 II	15	PictureTel Camera Data Cable Wiring
Vol 27 III		No articles
Vol 27 IIII		No articles
Vol 28 I	11	Super 1280 MHz amplifier
Vol 28 II		No articles
Vol 28 III		No articles
Vol 28 IIII		WB8LGA Antenna switching system
Vol 29 I		No articles
Vol 29 II		1280 MHz Hi Gain Panel Antenna
Vol 29 III		No articles
Vol 29 IIII		No articles
Vol 30 I		No articles
Vol 30 II		No articles
Vol 30 III		No articles
Vol 30 IIII		No articles
Vol 31 I		No articles
Vol 31 II		No articles
Vol 31 III		No articles
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Vol 32 II	7	DVB-T power amplifiers
Vol 32 III		No articles
Vol 32 IIII		No articles

This is the complete list for construction articles shown in past ATCO newsletters. The page numbers listed may not match the actual page in the Newsletter. They are the numbers shown in the PDF file. Some early issues are missing. Art did not have a copy of every year. This list is complete through Volume 32 IIII.

…Bob N8OCQ

LOCAL HAMFEST SCHEDULE

This section is reserved for upcoming Hamfests. They are limited to Ohio and vicinity easily accessible in one day. Anyone aware of an event incorrectly or not listed here; notify me so it can be corrected. This list will be amended, as further information becomes available. To see additional details for each Hamfest, Control Click on the blue title and the magic of the Internet will give you the details complete with a map! To search the ARRL Hamfest database for more details, CTL click ARRLWeb: Hamfest and Convention Calendar …WA8RMC.

10/25/2015 | Massillon ARC Hamfest
Location: Massillon, OH
Type: ARRL Hamfest
Sponsor: Massillon Amateur Radio Club
Website: http://www.w8np.org

11/07/2015 | Georgetown Ohio Hamfest
Location: Georgetown, OH
Type: ARRL Hamfest
Sponsor: Grant Amateur Radio Club
Website: http://garcohio.net

11/14/2015 | Indiana State Convention (Fort Wayne Hamfest & Computer Expo)
Location: Fort Wayne, IN
Type: ARRL Convention
Sponsor: Allen County Amateur Radio Technical Society
Website: http://www.fortwaynehamfest.com

12/05/2015 | Fulton County ARC Winterfest
Location: Delta, OH
Type: ARRL Hamfest
Sponsor: Fulton County Amateur Radio Club
Website: http://k8bxq.org/hamfest

01/17/2016 | SCARF Hamfest
Location: Nelsonville, OH
Type: ARRL Hamfest
Sponsor: Sunday Creek Amateur Radio Federation

01/24/2016 | Tusco ARC Hamfest
Location: Strasburg, OH
Type: ARRL Hamfest
Sponsor: Tusco Amateur Radio Club
Website: http://www.tuscoarc.org

02/21/2016 | Mansfield Mid Winter Hamfest
Location: Mansfield, OH
Type: ARRL Hamfest
Sponsor: InterCity Amateur Radio Club
Website: http://www.W8WE.org

03/06/2016 | NOARS Winter Hamfest
Location: Elyria, OH
Type: ARRL Hamfest
Sponsor: Northern Ohio Amateur Radio Society (NOARS)
Website: http://www.noars.net

TUESDAY NITE NET ON 147.48 MHz SIMPLEX

Every Tuesday night @ 9:00PM WA8RMC hosts a net for the purpose of ATV topic discussion. There is no need to belong to the club to participate, only a genuine interest in ATV. All are invited. For those who check in, the general rules are as follows: Out-of-town and video check-ins have priority. A list of available check-ins is taken first then a roundtable discussion is hosted by WA8RMC. After all participants have been heard, WA8RMC will give status and news if any followed by late check-in requests or comments. We usually chat for about ½ hour so please join us locally or via internet at www.BATC.tv then ATV repeaters thenWR8ATV.

ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (01/15/15)……	$ 1979.02
RECEIPTS(dues)……	$ 10.00
Postage costs……	$ (9.94)
W8RVH funeral flowers……	$ (98.91)
CLOSING BALANCE ( )……	$ 1880.17

ATCO REPEATER TECHNICAL DATA SUMMARY

Location:	Downtown Columbus, Ohio
Coordinates:	82 degrees 59 minutes 53 seconds (longitude) 39 degrees 57 minutes 45 seconds (latitude)
Elevation:	630 feet above the average street level (1460 feet above sea level)

TV Transmitters:	423.00 MHz DVB-T, 10 W cont, FEC=7/8, Guard=1/32, Const=QPSK, FFT=2K, BW=4MHz, PMT=4095, PCR=256, Video=256, audio=257
	427.25 MHz Analog VSB AM, 50 watts average 100 watts sync tip (Analog TV on cable channel 58)
	1258 MHz 40 watts FM analog
	1268 MHz DVB-S QPSK 20W continuous. SR=3.125MS, FEC=3/4, PMT=32,Video=162,Teletext=304,PCR=133,Audio=88,Service =5004)
	10.350 GHz: 1 watt continuous analog FM
Link transmitter:	446.350 MHz: 5 watts NBFM 5 kHz audio This input is used for control signals.

Identification:	423, 427, 1258, 1268 MHz, 10.350Ghz transmitters video identify every 10 min. with active video and information bulletin board every 30 minutes.
	423 MHz digital, 1268 MHz digital & 10.350 GHz analog - Continuous transmission of ATCO & WR8ATV with no input signal present.

Transmit antennas:	423.00 MHz – 8 element Lindsay horizontally polarized 6dBd gain "omni"
	427.25 MHz - Dual slot horizontally polarized 7 dBd gain "omni" major lobe east/west, 5dBd gain north/south
	1258 MHz - Diamond vertically polarized 12 dBd gain omni
	1268 MHz - Diamond vertically polarized 12 dBd gain omni
	2397 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni (Used for experimental Mesh Net operation)
	10.350 GHz - Commercial 40 slot waveguide slot horizontally polarized 16 dBd gain omni

Receivers:	147.480 MHz - F1 audio input with touch tone control. (Input here = output on 446.350)
	438.000 MHz - DVB-T QPSK, 2K BW. Receiver will auto configure for FEC's and PID's. (Input here = output on all TV transmitters)
	439.250 MHz - A5 NTSC video with FM subcarrier audio, **lower sideband**. (Input here = output on all TV transmitters)
	449.975 MHz - F1 audio input aux touch tone control. 131.8 Hz PL tone. (Input here = output on 446.350).
	1288.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
	1288.00 MHz - DVB-S QPSK digital SR=4.167Msps, FEC=7/8. PIDs: PMT=133, PCR=33, Video=33, Audio=49 (Input here feeds all TV transmitters and also goes directly to 1268 MHz DVB-S digital output channel 2.)
	2398.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
	10.450 GHz - F5 video analog NTSC. (Input here = output on all TV transmitters)

Receive antennas:	147.480 MHz - Vert. polar. Diamond 6dBd dual band (Shared with 446.350 MHz link output transmitter)
	438.00/439.250 MHz - Horizontally polarized dual slot 7 dBd gain major lobe west (Shared with 438 & 439 receivers)
	1288.00 MHz - Diamond vertically polarized 12 dBd gain omni (shared with analog and DVB-S receivers)
	2398.00 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni
	10.450 GHz - Commercial 40 slot waveguide horizontally polarized 16 dBd gain omni

Auto mode Input control:	Touch Tone	Result (if third digit is * function turns ON, if it is # function turns OFF)
	00*	turn transmitters **on** (enter manual mode-keeps transmitters on till 00# sequence is pressed)
	00#	turn transmitters **off** (exit manual mode and return to auto scan mode)
	264	Select Channel 4 Doppler radar. (Stays on for 5 minutes) Select # to shut down before timeout.
	004	Select 10.450 GHz receiver. **(Always exit by selecting 001)**
	003	Select room camera **(Always exit by selecting 001)**
	002	Select roof camera. Select room cam first then 002 for roof cam. (**Always exit by selecting 001**)
	001	Select 2398 MHz receiver then 00# for auto scan to continue

Manual mode Functions:		
	00* then 1 for Ch. 1	Select 439.25analog /438digital receiver (if video present on digital, it is selected. Otherwise analog)
	00* then 2 for Ch. 2	Select 1280 digital receiver
	00* then 3 for Ch. 3	Select 1280 analog receiver
	00* then 4 for Ch. 4	Select 2398 receiver
	00* then 5 for Ch. 5	Select video ID (17 identification screens)
	01* or 01#	Channel 1 439.25 MHz scan enable (hit 01* to scan this channel & 01# to disable it)
	02* or 02#	Channel 2 1288 MHz digital receiver scan enable
	03* or 03#	Channel 3 1288 MHz analog receiver scan enable
	04* or 04#	Channel 4 2398 MHz scan enable
	A1* or A1#	Manual mode select for 439.25 receiver audio
	A2* or A2#	Manual mode select for 1288 digital receiver audio
	A3* or A3#	Manual mode select for 1288 analog receiver audio
	A4* or A4#	Manual mode select for 2398 receiver audio
	C0* or C0#	Beacon mode – transmit ID for twenty seconds every ten minutes
	C1* or C1#	C1* to turn off 438 MHz DVB-T Tx, C1# to enable it (Must be in manual mode to enable this function).
	C2* or C2#	C2* to turn off 423 MHz DVB-T Rx, C2# to enable it (Must be in manual mode to enable this function).

Note: The DVB-T Tx and Rx units can lock up when they lose video or see bad video. When this happens, power must be cycled. To do this select C1* or C2* to turn off power. A few seconds later select C1# or C2# whichever appropriate to restore power to selected unit. Wait about 15 to 30 seconds to see restored operation. (Example: To reset the DVB-T receiver enter C2*,wait a few seconds then C2#)

ATCO MEMBERS as of October 2015

Call	Name	Address	City	St	Zip	Phone
KD8ACU	Robert Vieth	3180 North Star Rd	Upper Arlington	OH	43221	614-457-9511
KC3AM	Dave Stepnowski	735 W Birchtree Ln	Claymont	DE	19703	
AH2AR	Dave Pelaez	1348 Leaf Tree Lane	Vandalia	OH	45377	937-264-9812
W8ARE	Larry Meredith III	6070 Langton Circle	Westerville	OH	43082-8964	
N8ASB	Daun Yeagley	1353 Gurneyville Road	Willmington	OH	45177	
NN8B	Don Kemp	6384 Camp Blvd.	Hanoverton	OH	44423	
K9BIF	Charlie Short	PO Box 554	Goshen	IN	46527-0554	
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	OH	43065	614-210-0551
N8COO	C Mark Cring	2844 Sussex Place Dr.	Grove City	OH	43123	614-836-2521
N1CTF	John Chartkoff	2288 Notingham Road	Upper Arlington	OH	43221	
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	301-772-7382
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	OH	42616	419-691-1625
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	OH	43026	614-405-1710
KB8EMD	Larry Baker	4330 Chippewa Trail	Jamestown	OH	45335-1210	
KC8EVR	Lester Broadie	108 N Burgess	Columbus	OH	43204	
N8FRT	Tom Flanagan	6156 Jolliff St.	Galloway	OH	43119	
W8FTX	George Biundo	3675 Inverary Drive	Columbus	OH	43228	614-274-7261
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	OH	43147	
WA8HFK,KC8HIP	Frank & Pat Amore	P.O. Box 2252	Helendale	CA	92342	614-777-4621
W6HHC	Ken Konechy	340 S. Craig Dr.	Orange	CA	92869	
WA8HNS	Mike Gray	5029 St Rt 41 NW	Washington Ct Hs	OH	43160-8740	740-335-5133
N8HRC	John Hempstead	1190 County Road 9	Brellefontaine	OH	43311	
W4HTB	Henry Cantrell	905 Wrenwood Dr.	Bowling Green	KY	42103	270-781-9624
WB2IIR	Michael Anthony	370 Georgia Drive	Brick	NJ	08723	
K8KDR,KC8NKB	Matt & Nancy Gilbert	5167 Drumcliff Ct.	Columbus	OH	43221-5207	614-771-7259
W8KHP	Allan Vinegar	2043 Treetop Lane	Hebron	Ky	41048	
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	OH	45331	937-548-2492
N8LRG	Phillip Humphries	30856 Coshocton Road	Walhonding	OH	43843	614-3543744
WB8LGA	Charles Beener	2540 State Route 61	Marengo	OH	43334	
W8MA	Phil Morrison	154 Llewellyn Ave	Westerville	OH	43081	
KA8MFD	Ross McCoy	227 S Boundary St PO Box 9	Edison	OH	43320	
KA8MID	Bill Dean	2630 Green Ridge Rd	Peebles	OH	45660	
N8NT	Bob Tournoux	3569 Oarlock Ct	Hilliard	OH	43026	614-876-2127
W8NX, KA8LTG	John & Linda Beal	5001 State Rt. 37 East	Delaware	OH	43015	740-369-5856
N0OBG	Jim Conley	33 Meadowbrook C C Est	Ballwin	MO	63011	
W6ORG,WB6YSS	Tom, Maryann O'Hara	2522 Paxson Lane	Arcadia	CA	91007-8537	626-447-4565
N8OCQ	Bob Hodge Sr.	3750 Dort Place	Columbus	OH	43227-2022	
KC8QJR	Adam Burley	931 West High Street	Mount Vernon	OH	43050	
KE8PN	James Easley	1507 Michigan Ave	Columbus	OH	43201	614-421-1492
WA8RMC	Art Towslee	438 Maplebrooke Dr W	Westerville	OH	43082	614-891-9273
W8RRJ,W8WTB	John Hull	580 E. Walnut St.	Westerville	OH	43081	614-882-6527
W8RUT,N8KCB	Ken & Chris Morris	2895 Sunbury Rd	Galina	OH	43021	
W8RVH	Richard Goode	9 Master Street Apt A	Springfield	OH	45504	937-478-6488
KB8RVI	David Jenkins	1941 Red Forest Lane	Galloway	OH	43119	614-853-0679
W8RWR	Bob Rector	135 S. Algonquin Ave	Columbus	OH	43204-1904	614-276-1689
W8RXX,KA8IWB	John & Laura Perone	3477 Africa Road	Galena	OH	43021	614-579-0522
WA6RZW	Ed Mersich	34401 Columbine Trl West	Elizabeth	CO	80107	
KB8SSH	Mike Cotts	3424 Homecroft Dr	Columbus	OH	43224	614-371-7380
WA6SVT	Mike Collis	PO Box 1594	Crestline	CA	92325	
W8TIP	Gene Hawkins	1720 Liberty Street	Toledo	OH	43605	
KD8TIZ	Bob Holden	5161 Goose Lane Rd	Alexandria	OH	43001-9730	614-562-8441
K8TPY, K8FRB	Jeff & Dianna Patton	3886 Agler Road	Columbus	OH	43219	
NR8TV	Dave Kibler	243 Dwyer Rd	Greenfield	OH	45123	937-981-1392
W8URI	William Heiden	5898 Township Rd #103	Mount Gilead	OH	43338	419-947-1121
KB8UWI	Milton McFarland	115 N. Walnut St.	New Castle	PA	16101	
WA8UZP,KD8YYP	James & Anna Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
KC8WRI	Tom Bloomer	PO Box 595	Grove City	OH	43123	
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	OH	43224-3011	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	
KC8YPD	Joe Ebright	3497 Ontario St	Columbus	OH	43224	
N8YZ	DaveTkach	2063 Torchwood Loop S	Columbus	OH	43229	614-882-0771
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	OH	43125	614-202-9042
W8ZCF	Ferrel Winder	6686 Hitching Post Ln.	Cincinnati	OH	45230	
N8ZM	Tom Holmes	1055 Wilderness Bluff	Tipp City	OH	45371	

NEW MEMBER(S)

Let's welcome the new members to our group! If any of you know anyone who might be interested, let one of us know so we can flood them with information. New members are our group's lifeblood so it's important we aggressively recruit new faces.
No new members this time.

ATCO MEMBERSHIP INFORMATION

Membership in ATCO (Amateur Television in Central Ohio) is open to any licensed radio amateur who has an interest in amateur television. The annual dues are $10 per person payable on January 1 of each year. Additional members within an immediate family and at the same address are included at no extra cost.

ATCO publishes this Newsletter quarterly in January, April, July, and October. It is sent to each member without additional cost. All Newsletters are sent via Email unless the member does not have an internet connection.

The membership period is from January 1ST to December 31ST. New members joining before August will receive all ATCO Newsletters published during the current year prior to the date they join ATCO. For example, a new member joining in June will receive the January and April issues in addition to the July and October issues. For those joining after August 1ST, they can elect to receive a complementary October issue with the membership commencing the following year or get the previous (3) Newsletters. Your support of ATCO is welcomed and encouraged.

Membership expiration notices will be sent out in January in lieu of Newsletters for those with an expired membership.

NOTE: Dues records on your individual portion of the ATCO website are listed as the date money is received and shows due one year from that date. The actual expiration is on January of the following year to keep the dues clock consistent with the beginning of each year.

ATCO MEMBERSHIP APPLICATION

RENEWAL ○ NEW MEMBER ○ DATE _____
CALL _____
OK TO PUBLISH PHONE # IN NEWSLETTER YES ○ NO ○
HOME PHONE _____
NAME_____
INTERNET Email ADDRESS_____
ADDRESS _____
CITY _____ STATE _____ ZIP _____-_____
FCC LICENSED OPERATORS IN THE IMMEDIATE FAMILY
_____
_____
COMMENTS_____
_____
_____
_____
ANNUAL DUES PAYMENT OF $10.00 ENCLOSED CHECK ○ MONEY ORDER ○

Make check payable to ATCO or Bob Tournoux & mail to: Bob Tournoux N8NT 3569 Oarlock CT Hilliard, Ohio 43026. Or, if you prefer, pay dues via the Internet with your credit card. Go to www.atco.tv and fill out the "pay ATCO dues" section. Alternately, you can use the ATCO web site www.atco.tv/PayDues.aspx directly. Credit card payment is made through "PayPal" but you DO NOT need to join PayPal to send your dues. Simply DO NOT fill out the password details and there will be no "PayPal" involvement.

ATCO CLUB OFFICERS

President: Art Towslee WA8RMC
V. President: Ken Morris W8RUT
Treasurer: Bob Tournoux N8NT
Secretary: Mark Cring N8COO
Corporate trustees: Same as officers

Repeater trustees: Art Towslee WA8RMC
Ken Morris W8RUT
Dale Elshoff WB8CJW
Statutory agent: Tom Bloomer KC8WRI
Newsletter editor: Art Towslee WA8RMC

ATCO Newsletter
c/o Art Towslee -WA8RMC
438 Maplebrooke Dr. W
Westerville, Ohio 43082

FIRST CLASS MAIL

REMEMBER...CLUB DUES ARE NEEDED.
CHECK THE
MEMBERS PAGE OF ATCO WEBSITE FOR THE EXPIRATION DATE.
SEND N8NT A CHECK OR USE PAYPAL IF EXPIRED.