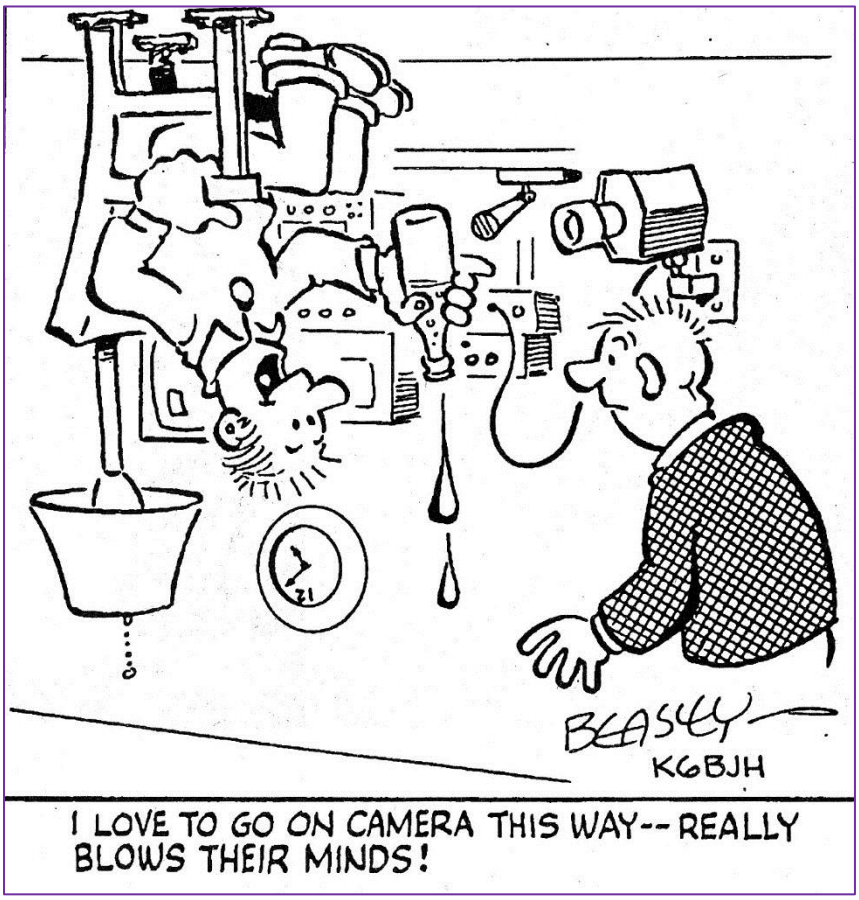
ATCO NEWSLETTER

VOLUME 34 NUMBER 2 **April 2017**

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.



ACTIVITIES ... from my Workbench

Hello again guys. Things have been moving along but slowly this time. The ##@@** yardwork always gets in the way of Ham activities but that's the way it SHOULD be! After all, "HAPPY WIFE, HAPPY LIFE"!

The overall ATV activity has been rather slow but now that we're emerging from the winter season, I'm sure things will pick up. I've noticed more check-ins on our Tuesday night net lately. That's good! I even notice a few **new** people checking in. That also is great. At last count, we had around 9 or 10 check-ins. That's up from the winter usual of 4 to 5.

The repeater is holding in there but I noticed the video IDer has been getting messed up lately. When I checked as to why this is happening, I found that the SOT personnel have been interrupting power every Monday morning to test their generator. They used to do a "hot swap" so the overall AC power wasn't interrupted but found that sometimes the phasing wasn't right and blew fuses. So, as a rule, they shut down the main power first then start the generator. As a result, the AC power stays down for a few minutes each time they test the generator. That normally wouldn't be a problem with us because I have the ID module on a small battery backup within our cabinet. However, I found the NiMH batteries are about 4 years old now and don't hold a charge. I've got new batteries there now so I'll reset my own clock to check again in another 4 years.

The next issue is the ongoing problem of receiver desense whenever we are using 147.48 at the same time 146.76 is on. It's been that way for some time but since there has been increased activity on 146.76, we have problems during our Tuesday net. I had a single cavity filter there with a 146.76 reject trap but that wasn't enough to prevent 147.48 desense. After all, the two signals are only 720KHz apart and the antennas are only about 10 feet away from each other. It was suggested to me that I go there and move our antenna so that it is directly below theirs. I immediately asked for volunteers to help and found no hands raised. The antennas are located such that they extend slightly beyond the building main structure about 650 feet above the street. They are accessed by crawling across wide flange beams which doesn't excite me in the least! Therefore, a new filter design was the better option. The result is a two-cavity filter with a reject trap across one of them. The trap is easy to build and amounts to about a 2-5pf ceramic capacitor across the input to output of one of the filters. I built it into a small block of aluminum with N connectors and installed a small ceramic trimmer between so I can adjust it. The resultant 65dB or so of 146.76 rejection is sufficient to not desense the 147.48 receiver. I notice a little interference when 146.76 is on but not enough to add yet another reject filter. The bandpass loss is about 3dB which is great for a dual cavity filter like this! Work done.

We also have problem with the DATV HiDes 438MHz receiver. It seems it doesn't like incoming weak analog signals. When there is not enough sync in the incoming signal, the receiver locks up and rejects any following valid input. We must then AC power cycle it to restore it to normal operation. Fortunately, we CAN do that remotely but it's pain in the ….to keep doing this. Dale, WB8CJW, found a solution recommended by Dave, AH2AR, in Dayton. They too had that problem and found a normal security DVR can be used as a "processing amplifier" to add sync to the output when it is weak coming in. Dave graciously donated a DVR to us for this purpose. I just need to repackage it slightly to fit in our repeater rack. As a side benefit, the Ethernet connection on the DVR can be connected to the MESH unit to give Repeater output to Mesh capability. All that is needed now is some way to **receive** Mesh signals. (Check out the article by N8NT for the answer).

That's all for now guys. See you at the Spring Event!
73,
…WA8RMC

ATCO DUES PAYMENT CHANGE

I want to personally apologize for the way we have handled the ATCO dues in the past. Money issues are sensitive so I've been quite concerned about our record keeping accuracy. I've always given the benefit of any doubt to the member but it is very clear that it is not enough. Since the beginning, we have collected dues on a January to January basis. While that may seem like a simple way to do it, it has complicating issues. Most important moving forward is the need to automate our process and have a single point of record keeping. So, Bob volunteered to do just that. I now believe we are on the right track…WA8RMC

Bob explains the new system as follows:

In order to make it easier for our members to know when their membership is expiring, a new version of the dues software has been implemented. Forget what you knew about how dues were determined in the past. We won't try to explain that. Here is the way the dues will be handled from now on.

There are still four ways for you to pay your dues:

1. Give cash or check to Art or myself.
2. Mail a check to me (N8NT) at 3569 Oarlock CT, Hilliard OH 43026
3. Pay your dues online using PayPal
4. Pay your dues at one of the ATCO events (cash or check)

In all cases once the dues are posted to the account your dues will be good for one year (365 days) – it will expire one year from the time we post it or the computer posts it to the account.

Here are some possible scenarios:

1. If your membership is expired and you pay your dues on any day after the expiration date your membership will expire 365 days after your dues post to our database.
2. If you choose to pay for more than one year, then your expiration date will be based on 365 days per every $10 you give us. So, if you send me $30 on February 19th 2017 your membership will expire on February 19th 2020.
3. If you paid last year (2016) on May 5th, your expiration date is May 5th 2017. If you pay before your expiration date, then your new expiration date will be the next year on the same month and day your current membership expires. For example, in this case, if you pay another $10 on Feb 10th, then your new expiration date would be May 5th 2018.

The website will now monitor all membership expiration dates and will send out an Email to each member whose membership has one month left – Email will be sent once a week for 4 weeks prior to the expiration date. If you fail to renew by the expiration date your membership will go into a lapsed status. If that happens we'll no longer send Emails but you can renew by sending in your dues at any time.

If you send us dues for more than one year, we'll assume you are paying for dues. If you want to send a donation along with your dues (say, $10 for dues and $10 for donation) please let us know. We can put donations into a separate account area.

You may check the status of your membership at any time by logging onto the website and clicking on the Members tab, then select My Account. A list of all of your payments that we know about will be shown to you. If paying by PayPal, you will see a PayPal ID in the notes.

The Emailing of the membership status is not officially done yet, but will be done by the time you get the next Newsletter (April) or earlier.

If we do not have an Email for you, then Art will get in touch with you. He and I will both get copies of the Email sent to members whose memberships are expiring.

If anyone has questions or concerns about the new system, email Art or myself.
…Bob N8NT

DARA ATV REPEATER UPDATE

The DVB-T repeater transmitter has been running 72 hours now (continuously) and there have been no bugs develop. I may be past the point of "infant mortality" so hopefully its now going for the long haul. Saying this will assuredly jinx myself! The output is on 428 MHz @ 2 MHz bandwidth QPSK. Input is 439 MHZ, QPSK @ 2 MHz bandwidth with a video PID value at 641.
Both analog and digital TV transmitters are working fine sharing the same transmit antenna using the in-line ferrite isolator-combiners. The repeater is currently "showing" 15 watts RF output (using a standard Bird 43).

We ran some tests through the repeater and the repeated digital signal coming in as DVB-T and leaving as DVB-T looks terrific. I am very surprised how clean and smooth-running the 2 MHz-wide SD quality video appears, especially comparing it to the analog links.

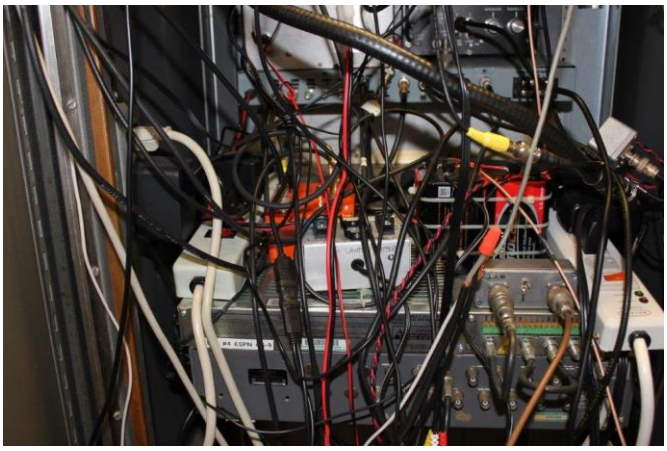
I am 8 miles away from the Dayton Amateur Radio Association repeater site, and with my ATV antenna simply laying on the floor of the deck, and looking through some building material (in cross-polarized fashion) at my home, it is still decoding the DVB-T signal. This is working much better than expected!

I am going to add some additional low pass filtering just to be on the safe side. There are some small Low Pass filters (SMA-style) that I picked up on e-bay that I am going to try. I will add it to the input and the output of the DARKO amplifier if it doesn't introduce other issues. Of course, I'll bench test it first. The transmit frequency is 428 MHz so this may slightly attenuate the output, but I can bring power up to account for any losses if I need to.

Quick summary of the current state of affairs with the DARA ATV Repeater in Dayton:

We are checking on a VSWR problem and will be removing (and hopefully, on the same day) reinstalling the 70cm Slot transmitter antenna mounted at the 150ft. level on the DARA tower. This is scheduled to happen on Thursday 9 March 2017.

Previously, we installed a DVB-T receiver at the DARA ATV site in June 2014. More recently we installed a DVB-T transmitter at the same site. The digital transmitter has been working well for the past three weeks, with some expected "growing pains" that have been resolved. With the addition of the digital transmitter, the DARA ATV repeater is currently somewhat unique within the ATV amateur radio community because the repeater's DVB-T 70 cm ATV transmitter is now sharing the same slot antenna as the 70 cm A5 transmitter at the site. We have a number of hams still using A5 and others getting involved in the digital realm, and it made sense to keep both systems in-place to satisfy all parties concerned. The simultaneous digital and analog transmissions (D2 on 428 MHz output and A5 on 421.250 MHz output) are being accomplished by use of additional filters and two ferrite isolator-combiners on each leg feeding the common transmit antenna. We will be providing more details about the arrangement in a future article



The DARA ATV repeater will be getting new cabinets and to state that the transfer of the ATV repeater system to the new enclosures is a major operation is somewhat of an understatement. (attached rat's nest photo!) Yes, it really does look this bad in one of the cabinets but the equipment has been working exceedingly well and has been relatively trouble free for years. It's time to straighten out this kludge of wiring and this should be happening within the next 90 days or so. And again, a much neater arrangement is likely to introduce new bugs!

As a sidebar, we saw a need to re-transmit analog video at the repeater by inputting the received analog composite video into the HiDes HV310 DVB-T Repeater transmitter. We noted that composite video containing weak horizontal sync pulses, or in some cases, "snow" (when a received A5 signal drops), if fed into the analog composite video input of the HV310, causes the HV310 to lock up/glitch or cease transmission. A simple fix to this "A5" interface issue is to feed the received A5 composite video signal into and out of a video DVR surveillance unit and by conditioning the video in such a manner, the DVR will add horizontal sync pulse and also time-base-correct the analog composite video sources entering the HV310's analog input line. The DVR does not need a hard disc drive to operate, and new DVRs are available on e-bay (less HDD) for as little as $35. To the purist, feeding analog video into a digital transmitter is somewhat akin to putting Flintstone tires on a Ferrari, however, this really does help bridge the gap between the A5 and D2 "crowds".
Cheers,
Dave P AH2AR

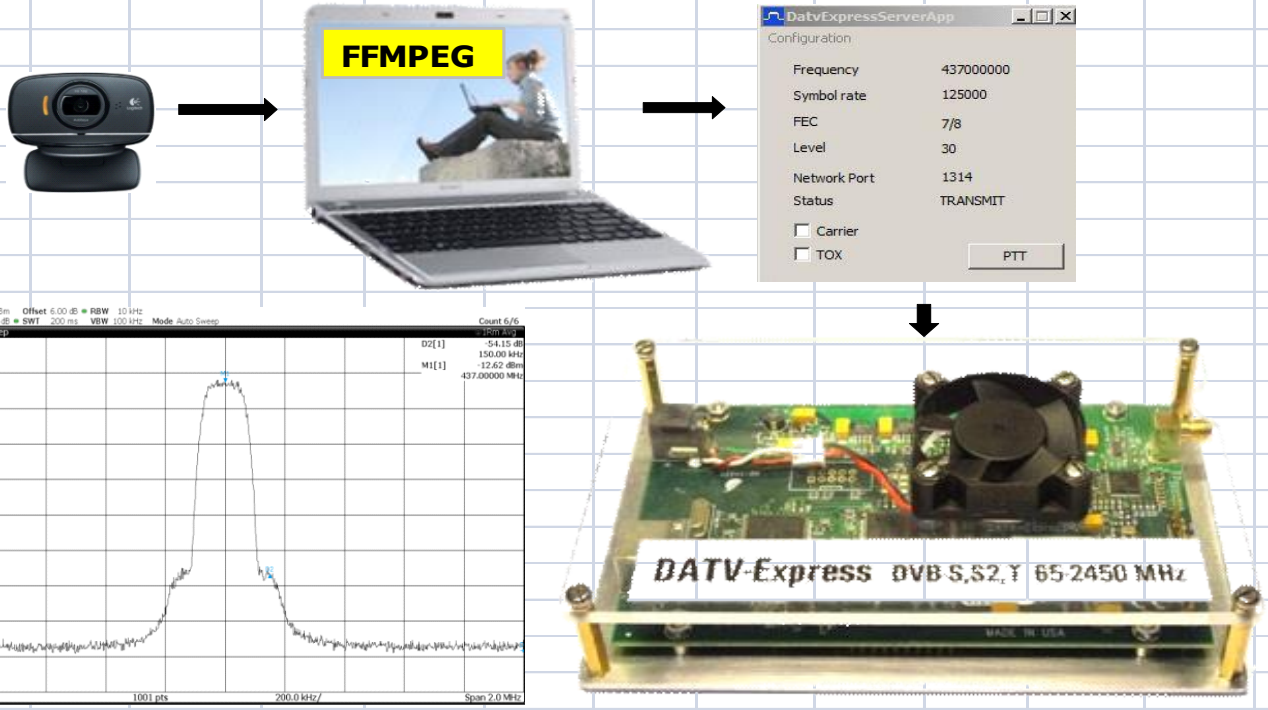
Thanks to Pierre Binggeli, HB9IAM, this article is possible. He took the time to professionally test the DATV-Express board and report his findings here. WA8RMC

DATV-Express, a high performance TX DVB-S, DVB-S2, DVB-T !

The DATV-Express team of Art WA8RMC, Charles G4GUO, Tom WB6P and Ken W6HHC, have realized a digital TX modulator of remarkable quality and very high performance.
It generates DVB-S high and low bandwidth standards, DVB-S2 and DVB-T between 65 - 2450 MHz,
The output is adjustable between -39 and 13 dBm depending on frequency and mode,
all on an 8x13 cm card connected to the PC in USB-2, and powered with 12 V <0.5 A !
https://datv-express.com/

For DVB-S Low SR, use the DATV-Express SERVER soft:

Low SR DVB-S between 125 and 500 kSymb/s, constellation QPSK, FEC 1/2 to 7/8 .
The video encoding H264 or MPEG2 is real-time on the PC by the software FFMPEG,
The signal is then streamed via the USB-2 port to the DATV-Express board.



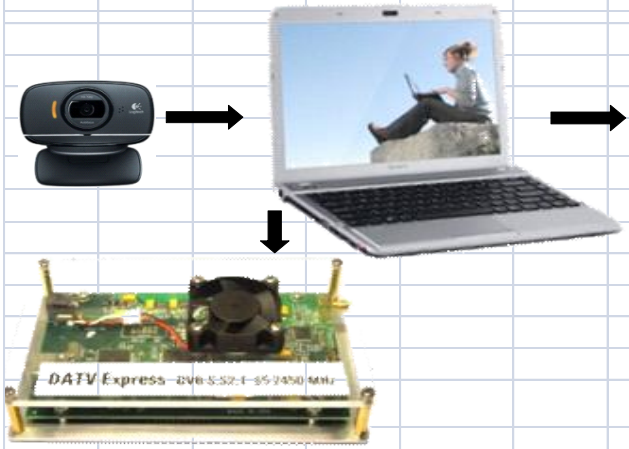
Note the quality of the spectrum with the lower shoulders of > 53dB!

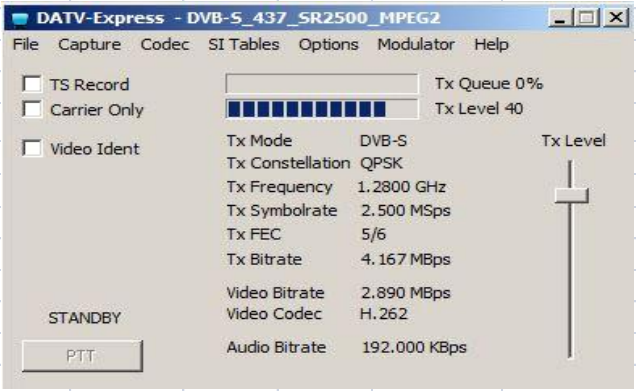
Measurements Spectrum FSW, power probe NRP-Z21 Rohde & Schwarz, MER with Minitioner

DVB-S	145	Shoulder	437	Shoulder	MER	1200	Shoulder	MER	2350	Shoulder	MER
Fec 5/6	MHz	SR 125	MHz	SR 125		MHz	SR 125		MHz	SR 125	
Level	dBm	dB	dBm	dB	dB	dBm	dB	dB	dBm	dB	dB
0	-27.55	-62	-28.90	-52	31	-31.89	-43	31	-38.10	-36	30
10	-23.85		-24.90			-28.02			-33.60		
20	-18.95		-19.80			-22.98			-27.76		
30	-14.00		-14.90			-18.25			-23.00		
40	-11.15	-62	-11.00	-54	31	-14.26	-45	31	-18.90	-36	31
50	-6.46		-6.05			-9.16			-13.78		
60	-1.65		-1.12			-4.29			-8.77		
70	1.36	-64	2.29	-54	31	-0.70	-45	31	-5.00	-39	31
80	5.83		7.25			4.32			0.24		
90	10.54		12.00	-48		9.06			4.96		
92	11.57	-58	13.04	-48	31	10.22	-45	31	6.11	-40	
100	Maximum before 2nd shoulders								10.06	-38	30

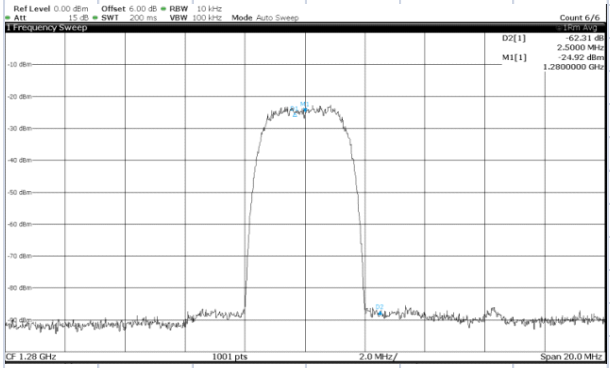
For DVB-S / S2 SR 125-8000, use the DATV-Express TRANSMITTER soft:

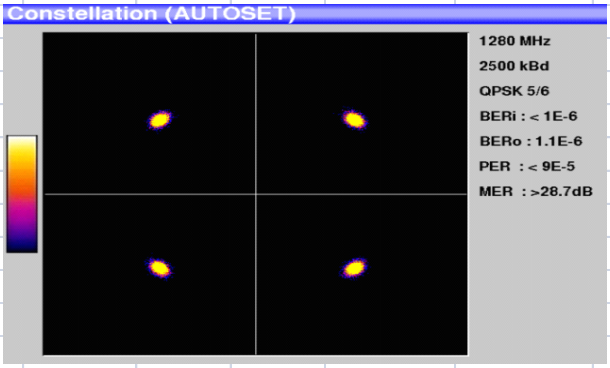
a) DVB-S modulation, SR between 125 and 8000 kSymb/s, constellation QPSK, FEC 1/4 to 7/8.
b) DVB-S2 modulation SR between 125 and 8000 kSymb/s, constellation QPSK, 8PSK, 16APSK, 32APS
FEC 3/5 à 9/10, RF shape filter Roll Off: 0.35, (0.20 and 0.25 currently not available), Pilot ON/OFF.
In both modes the H264 - MPEG2 encoding is performed using the Express -Transmitter soft



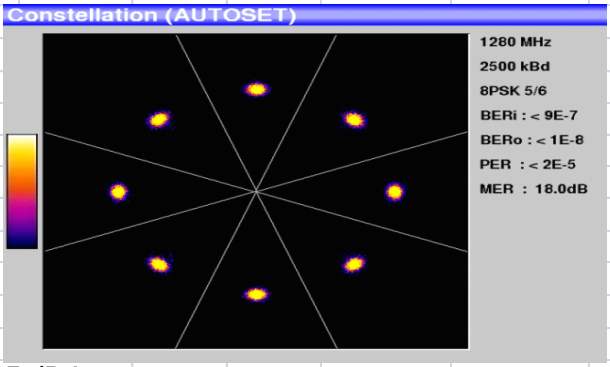


DVB-S FEC 5/6 Level	145 MHz dBm	Shoulder SR 2500 dB	437 MHz dBm	Shoulder SR 2500 dB	MER dB	1200 MHz dBm	Shoulder SR 2500 dB	MER dB	2350 MHz dBm	Shoulder SR 2500 dB	MER dB
0	-27.40	-50	-30.27	-34	-26	-33.25	-39	-31	-37.80	-35	-27
5	-22.92		25.38			-28.50			-32.86		
10	-18.12	-60	-20.49	-40	-26	-23.77	-51	-31	-27.83	-48	-31
15	-13.03		-15.41			-18.82			-22.71		
20	-9.47	-67	-10.69	-54	-26	-13.93	-57	-31	-17.88	-58	-31
25	-4.66		-5.65			-8.82			-12.47		
30	0.21	60	-0.72	-62	-26	-4.09	-64	-31	-7.84	-63	-31
35	3.26	-62	3.61			0.25	-65		-2.82		
39	6.95	-61	7.63			4.11	-64	-31	1.25	-62	
40	7.88	-60	8.50	-59	-26	7.01	-63	Maximum before 2nd shoulders			





Note the quality of the spectrum with the shoulders lower than 53dB !



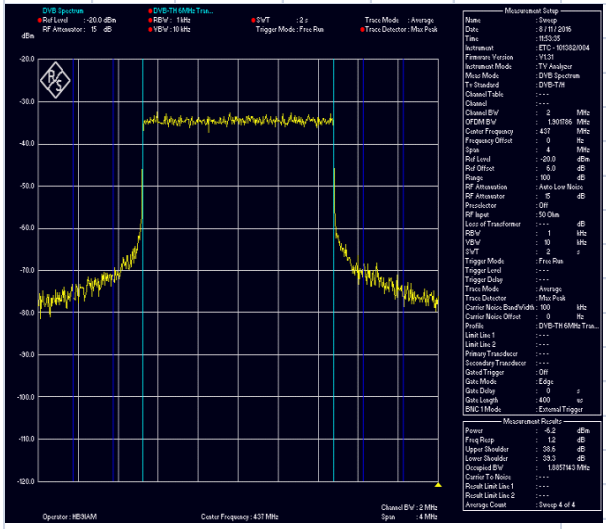
Measurements: Spectrum FSW Rohde & Schwarz
Power: sensor NRP-Z21 Rhode & Schwarz
Constellation and MER: SEFRAM 7875

MER measurement is quite difficult, Mintioune is optimistic, Kathrein MSK-200 does not rise >15 dB, Promax Explorer II+ >25 dB, SEFRAM 7875 >28 dB
Finally for a more realistic value I compare with the Rohde & Schwarz SFU generator output ...
The MER of the DVB-S2 constellation corresponds to >25 dB !

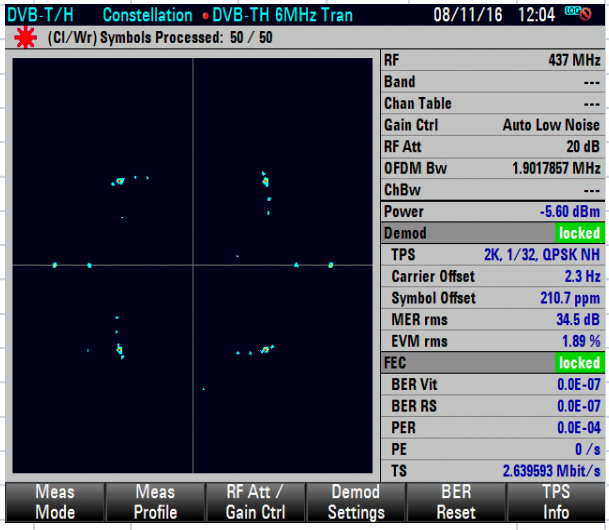
For DVB-T, use the DATV-Express TRANSMITTER soft:

This mode is experimental and limited by the speed of the USB-2 and the processor, a PC I5 @2.5 GHz already works in 2 K, 1 and 2 MHz of BW, QPSK modulation. For the 2 MHz, generally the flow must be reduced to 15 ips and the FEC and Guard intervall adapted to the available space in the TS
The H264 or MPEG2 encoding is performed using the Express-Transmitter soft

DVB-T 2 FEC 7/8 Level	145 MHz dBm	Shoulder BW 2MHz dB	MER dB	437 MHz dBm	Shoulder BW 2MHz dB	MER dB	1200 MHz dBm	Shoulder BW 2MHz dB	MER dB	2350 MHz dBm	Shoulder BW 2MHz dB	MER dB
0	-38.02	-38	-32	-39.90	-32	-28	-40.80	-28	-22	-41.80	-25	-19
5	-34.80	-40		-37.15			-38.80			-40.80		
10	-30.50	-39	-33	-33.35	-39	-33	-35.60	-36	-31	-38.90	-34	-24
15	-25.60	41		-28.70			-31.30			-35.50		
20	-22.20	40	-34	-24.30	-39	-34	-26.70	-39	-37	-31.35	-38	-25
25	-17.80	40		-19.30			-21.70			-26.25		
30	-13.10	40	-34	-14.40	-40	-35	-17.20	-40	-37	-21.70	-39	-25
35	-9.33	40		-10.00			-12.50			-16.80		
40	-4.83	41	-34	-5.30	-39	-35	-7.65	-41	-37	-11.90	-40	-24
45	0.00	40		-0.25			-2.80			-6.70		
47	1.82	40	-34	1.73	-39	-35	-0.90	-39	-37	-4.95	-40	-24



Maximum power output before 2nd shoulders



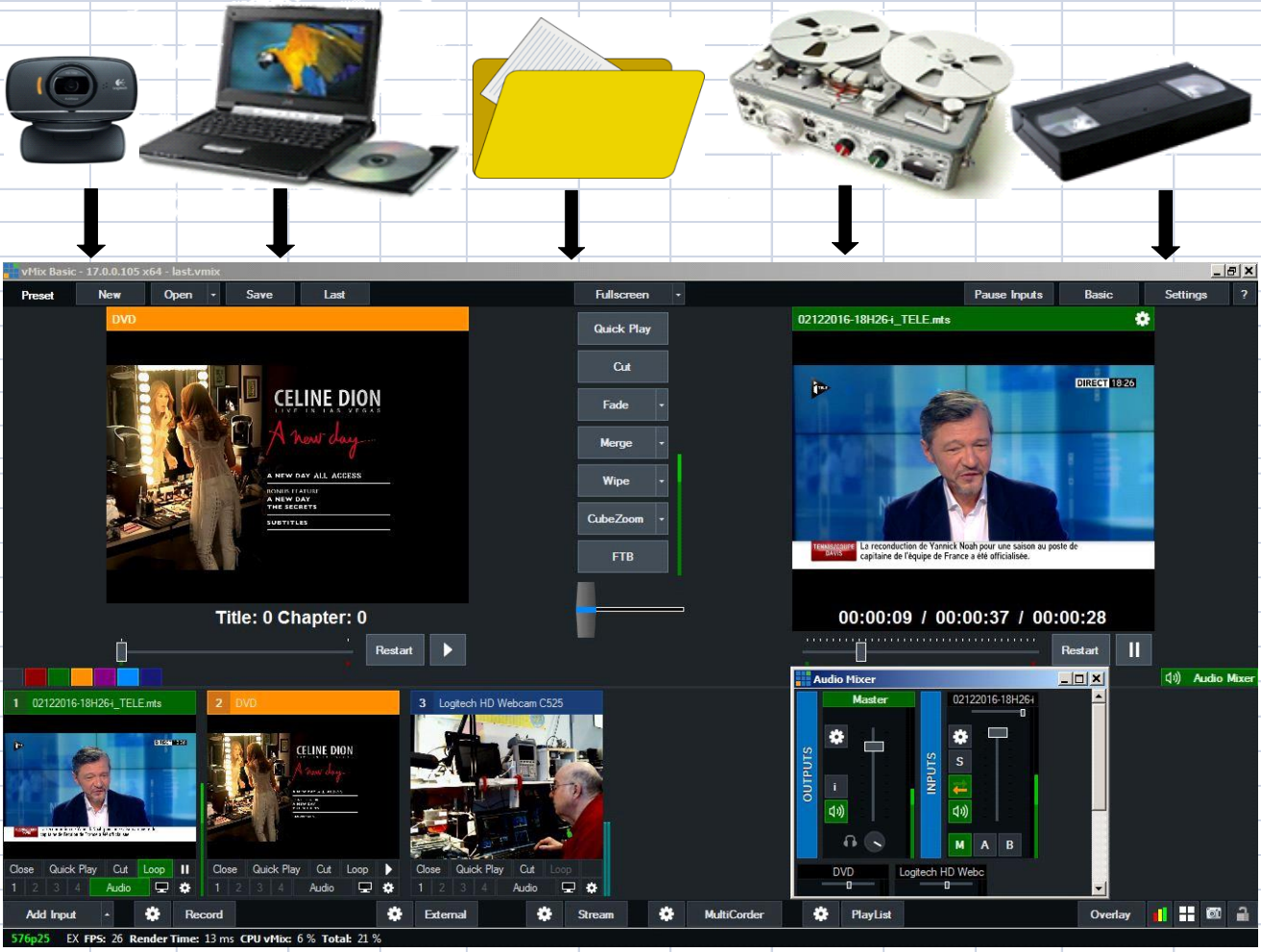
QPSK constellation with Pilots

Note the quality of the spectrum with the lower shoulders of> 38dB and the constellation MER> 34dB!

Spectrum Measurements, Constellation & MER: ETC Rohde & Schwarz, Power:NRP-Z21 Rohde & Schwarz

VMix: Mixing of sources for DATV-Express TRANSMITTER

Using the VMix video selection and effects application with the DATV-Express card create a 100% digital system performing in SD and HD, with a wide choice of sources of almost all formats, camera, DVD, video files, images, photos, graphics, Power Points, Audio CD, MP3, subtitle etc.



1 x PC
3 x software
1 x DATV-Express

That's all !

ATCO PIZZA PARTY / OTTERBEIN TOUR

On March 26th, we had our traditional ATCO mid-winter Pizza party. However, this time Troy, AC8XP volunteered to host it at the new Otterbein University Innovation STEAM Center, known officially as "The Point". This brand-new facility is designed to combine both industry and student knowledge so both can benefit from the facility resources provided there.

First, Troy, AC8XP introduced everyone. Then he hosted a tour of the facility including a robotics demo. by students and the various machines. After the tour, we had a great MESH presentation by Ken, W8RUT and Pizza catered by Jets Pizza. If you missed it, you passed up a great opportunity to learn about MESH and the new teaching tools available at the college level. The pictures below illustrate the fun we had. WA8RMC.

We started with an introduction by Troy

Troy shows building unfinished portion.

Here's a view of the machine shop.

This is a robot exercise. Left is the robot moving across the floor. Center, it attaches itself and automatically hoists to an elevated position. On the right are students controlling the action.

Jay is observing a numerically controlled milling machine.

After the tour, Ken, W8RUT, discusses the operation and benefits of a MESH network we are in the process of incorporating into the ATCO system.

Ahhh, finally, it's Pizza time and a round of friendly discussion.

GETTING TELEVISION OFF THE GROUND

From the CQ-DATV magazine reprinted with permission *http://cq-datv.mobi/ebooks.php available as a free download.*

By Trevor Brown

As Television engineering evolves and it changes from the nightmare engineering it once was, we now see new applications almost every day. Foremost are the dash board TV cameras in cars to record accidents, police and emergency services wearing body cameras, even battlefield footage from helmet cameras worn by soldiers. The applications are endless and we don't think twice about seeing pictures on our evening news from any of these sources.

Picture from Dave G3ZGZ home equipped Quadrocopter

This picture (Left) was taken by Dave G3ZGZ on a home equipped Quadrocopter (see CQ-DATV30). The picture shows the progression of an engineering works near his home in Lancashire, and to use Dave's words was the start of his "tripod in the sky".

Dave's tripod in the sky

This was upgraded to a Mobius "action camera" that for those who have not heard of it before is a small battery powered unit with 1080p recording capability. This was mounted under the quad on an antivibration mount and gave some outstanding still and video footage with a 5.8GHz video downlink. The results were stunning and commercial TV equipped Quadrocopters are now in almost every model and toy shop. This was not always the case.

The first time I saw a TV equipped model was at an ATV rally at Crick Post House, the architect behind the technology was Brian Parkinson and the camera used tube technology, but it was small and lightweight enough for a small model helicopter to lift and deliver live television back to the ground. https://www.youtube.com/watch?v=BzLMO2U8g6I. If we wind the clock back to 1946, the equipment was not always so user friendly. The picture shows RCA's block airborne television system on board a company plane for a public demonstration cloaked in Military secrecy.

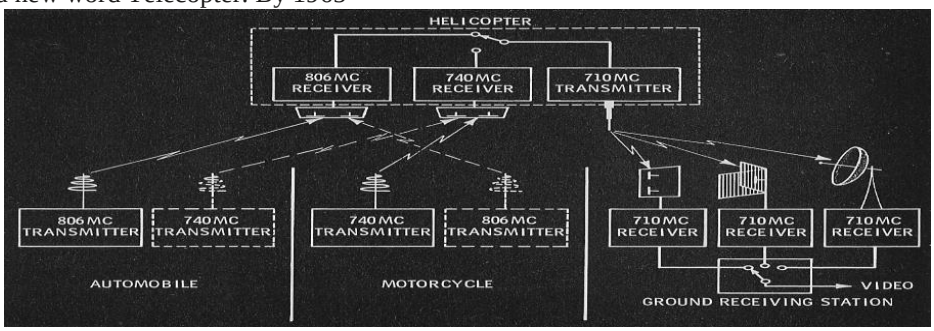
RCA's 1946 airborn television system

In the early or mid 1950's, CBS Engineers place RCA TK30 camera in helicopter

10 years later (1958) the news media were quick to get on board and this time replaced the plane with a helicopter. Just as well as you see from the picture the television camera (TK 30) was linked to a remote truck on the ground via 100ft camera cable which limited the height of the helicopter and mobility was limited to where the truck could follow the helicopter.

Helicopter with on board Transponder

On July 3, 1958 the first TV news helicopter, KTLA's Telecopter, appeared in L.A and changed the news forever and also introduced a new word Telecopter. By 1965 the technology had evolved to self-contained helicopters with all the equipment on board and RF links to the ground. This had even progressed to using the helicopter, not only as a picture source, but to provide an RF relay of other TV equipped vehicles.



Block diagram of the onboard Transponder

RTV (Radio Television Francaise) the French broadcasters were one of the first to embrace and develop this technology for coverage of the “Tour de France” a bicycle race like no other and with unique broadcasting problems requiring a bespoke engineering solution. A helicopter was used both for direct aerial shot and as a relay for signals transmitted from video cameras mounted on motorcycles. This has now grown to a multi motorbike, multi helicopter solution with fixed wing aircraft and even satellite relays.

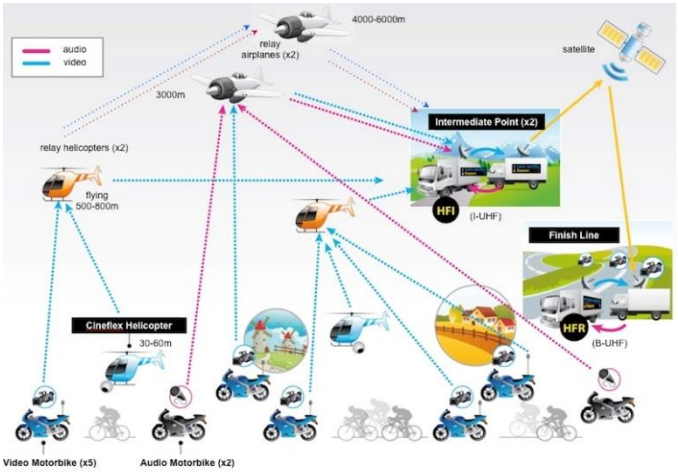
Fig. 1. Auto-top camera used in Italy.

Fig. 2. Motorcycle camera uses vidicon.

Fig. 3. Multiple-antenna ground station.

The motor cycle cameras use VHF links to relay pictures to helicopters flying at ~600 meters altitude. The signal is then Retransmitted to aircraft flying at 30008000 meters (dependent on weather). These aircraft (some are unpressurised) need to circle very slowly therefore the turbulence can be highly uncomfortable for the pilots and technicians. If the weather turns bad then the use of the aircraft flying above the clouds becomes integral to the broadcast. In this case the GPS system on each bike becomes very important so that the aircraft can actually locate the motorbikes from 25,000 feet in the air.

Humble beginnings you may say, but as the technology evolves, so does its implementation. Perhaps a little corny to say the sky is the limit, but I think “The International Space station” would soon disprove that.

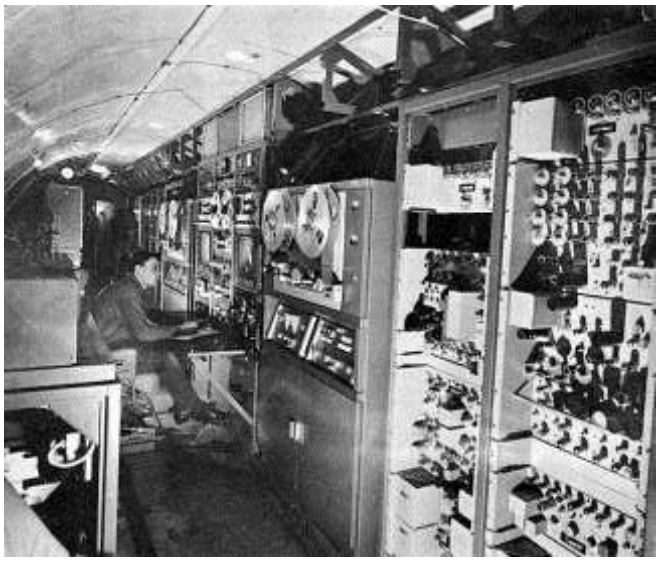


Modern coverage of the Tour de France

Project Jenny 1966

In October 1965, a US Navy aircraft equipped as an airborne broadcast station performed an airborne radio relay broadcast of the World Series over South Vietnam becoming the world’s first operational airborne broadcast station.

In February of 1966, television arrived on the scene in South Vietnam and another new page went into the broadcasting history book. TV shows were broadcast on Channel 11 for AFVN (the American Forces Vietnam Network), and on Channel 9 for THVN TV (the official station of the Republic of Vietnam).



Inside the Project Jenny Aircraft

TV was broadcast from U.S. Navy NC121J (Super Constellation) aircraft. These aircraft were known as Blue Eagles and operated as Project Jenny. The aircraft were assigned to the U.S. Navy aviation squadron VXN8 (originally OASU) home based at the Naval Air Test Centre, Patuxent River, Md. Two Blue Eagle aircraft were based at Tan Son Nhut AB in Saigon to provide TV broadcast services for AFVN and THVN. A third aircraft was based at DaNang AB to provide airborne PSYOPS. radio broadcast services for MACVSOG.

A slightly different spin was a project called Stratovision. This was the use of an aircraft flying at high altitudes, to bring television to small rural areas, so that they enjoyed the same benefits of the large metropolitan areas.

Stratovisions B29 Aircraft

The system proposed by Glenn L. Martin Co. and Westinghouse, advocated television coverage of small towns and rural areas as well as the large metropolitan centers. This would ultimately require 14 aircraft to cover 78% of the United States. The system was adopted for use for domestic broadcasting in the United States, but not on this scale, though it did find use by the military in Vietnam.

The Experimental Stratovision (a modified B29) flying at 25,000 feet over the Pittsburgh area rebroadcasting telecasts picked up from the east coast television network. Programmes from the ground were picked up by a tail aerial and rebroadcast on the antenna shown.

Stratovision technology reappeared in a project called MPATI's (Midwest Program on Airborne Television Instruction) in 1961 and ran until 1968.

MPATI's programming broadcast from two DC6AB aircraft based at Purdue University Airport in West Lafayette, Indiana. One of the two aircraft would go aloft for six to eight hours at a time flying at an altitude of 23,000 feet. From this position, the range of transmission was approximately 200 miles in diameter.

One of the two DC6AB Aircraft

When on station the plane would reduce speed, and then lower a forty-foot antenna mast which was now gyroscopically stabilized so that the antenna always aligned from the aircraft to the center of the earth. This stabilization feature helped to maintain polarization of the signals. Programming from the planes was always prerecorded and supported by a suite of two inch video tape duplicating equipment housed in the basement of the Stewart Centre. Frequently snowy pictures were what students saw from the low power transmitters of KS2XGA or KS2XGD channels 72 and 76 UHF respectively. The television equipment and transmitters were powered by a gas turbine electrical power plant in the aft end of the DC6 fuselage; equipment similar in design to auxiliary power units later jet transport aircraft use for engine starting.

DC6 with a forty foot gyroscopically stabilized antenna mast

Cockpit of a DC6 Used for the MPATI

Dave G3ZGZ's mark one Quadrocopter

Let's finish as we started, now we know all the history, development and projects involved in bringing you this: Dave G3ZGZ's home constructed Quadrocopter, no it does not relay GB3FY, the pictures are never snowy unlike the low power transmitters of KS2XGA or KS2XGD channels 72 and 76 UHF respectively. The controls don't look like this either. Dave has now uprated his Quadrocopter. The camera on this new rig is a 4K ultra HD version with a three axis stabilized gimbal. It can take stills or video with various resolutions and frame rates. The camera has a micro SD slot that will allow recording of the stills or video for later processing.

Dave G3ZGZ's latest 4K ultra HD equipped Quadrocopter

This is what is seen on the controllers screen.

Control to the quad is on the 2.4GHz band (normal R/C band) and video is digitally transmitted to the ground on 5.8GHz. The controller screen shows what the camera is seeing (very useful for framing a shot). The controller records the incoming video and telemetry for later analysis. The video recorded on the controller is a low resolution back up copy.

Telemetry includes the status of the GPS reception on both the quad and the controller (there is a “return to home“ function that will actually return to the controllers GPS location, rather than a take off point the controller also has a GPS built in). Altitude above ground, distance from the controller and the aircraft speed are also available together with the voltage of the flight battery.

Telemetry recorded on the controller includes much more information such as the pitch, yaw and roll angles of the aircraft and the flight mode being used.

Anchorsholme park in early July

The controller is similar to most R/C transmitters but with the color LCD screen. The image is what is being viewed by the camera and around this are telemetry data and also the settings buttons for the camera (touch screen).

The camera can have auto and manual settings for white balance, exposure time and aperture plus the resolution and frame rate of the image recorded. As for the Anchorsholme Park, that is how it looked in July. You can see the full story at https://youtu.be/cdlB1yzRQ_c

*T*hanks to Dave G3ZGZ & Ed Sharpe at Southwest Museum of Engineering, Communications and Computation. http://www.smecc.org/

Vmix VIDEO PRODUCTION SOFTWARE WITH A RASPBERRY PI

For NTSC composite video to Internet and Internet to NTSC composite video conversion applications, there are a number of ways to stream video ***TO*** *the internet. For standalone applications, A "Trendnet unit exists for single channel video and numerous security Digital Video Recorders (DVR) can handle 4, 8 and even 16 video channels. For computer assisted applications, the popular Vmix software handles this task with ease. However, if it is desired to* ***RECEIVE*** *streamed video and convert it to composite video, there is no standalone easy way to do this. However, Bob, N8NT, has now found a way to use the Raspberry Pi computer to handle this task. It is still preliminary and some refinements can still be made but he demonstrates how this can be done. This is important if we want to link MESH video data to the ATCO repeater. Read on….WA8RMC*

vMix is a Software Video Mixer and Switcher with features including LIVE mixing, switching and recording video sources including cameras, video files, DVDs, images, PowerPoint and much more. Vmix allows the resulting video to be streamed to multiple internet streams simultaneously. The raspberry PI is a credit card sized computer that is quite powerful and can be used as a media server.

But why would a Ham care about this? Well, at ATCO, we are interested in broadcasting our video signals but until now it required a myriad of hardware to be able to take different sources of video operating at different resolutions and easily mix and choose the video sources and send out the resulting video to our TV transmitters.

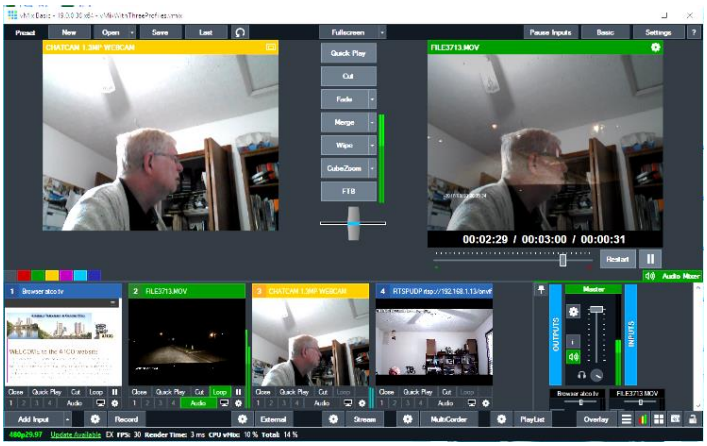
Enter the Raspberry PI. This simple yet powerful device has two very important and useful ports, an Ethernet port and a composite video port as well as analog audio. Since we now have software that can generate a video stream (vMix) and a Pi computer for $35.00, that has an internet port for inputting a video stream and a composite video output port which can serve as a source to be used as input to a video transmitter, then all we have to do is figure out how to hook it up.

It turns out that the solution is simple but getting to that solution is no easy task. Being stubborn I thought I should be able to accomplish that and now that I have done it, I want to let you know how to do it yourself.

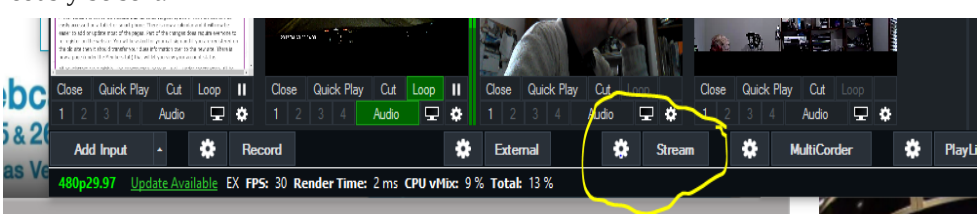
First, get somewhat familiar with vMix - Art had a good article in one of the past Newsletters. There is also some good information online at http://vmix.com and the software can be downloaded for free. It is designed to support as few as 1 input and as many as a thousand or more, but if you need more than 4 inputs you will need to pay. There is a second tier which only costs about $60 which will do high definition. If you have a lot of money and a lot of cameras then you can pay them a lot of money to get the pro versions.

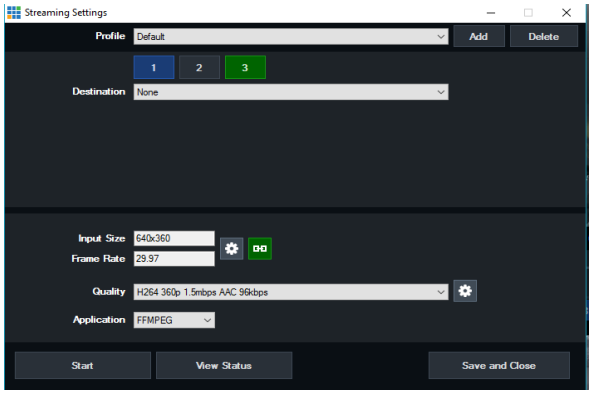
One might wonder why they give this away. The answer is that they want people to use it instead of purchasing hardware. I also believe they are pushing a new protocol called NDI which is used for transmitting video over IP. They actually output their streams as both an rtmp stream and as an NDI stream. You can read more about that at http://ndicentral.com.

Finally, I'll give a step-by-step guide to setting up a system that will let you connect multiple video sources to a powerful video switcher that can stream to a Raspberry Pi where you can than transmit the video to any transmitter that takes a composite video input.

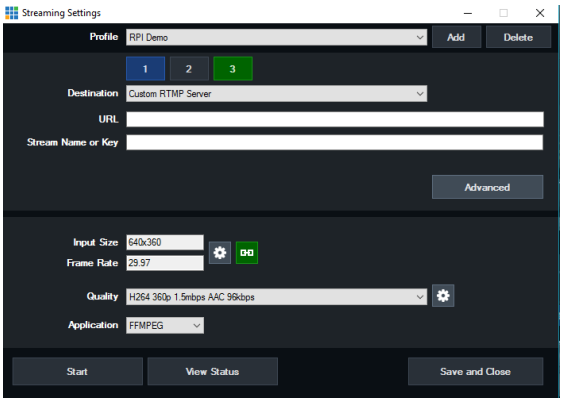


1. Download and install vMix software onto your PC.
2. Add 1 or more video sources using the Add Input at the bottom left of the vMix screen. If you want to see the video move around a lot, you could select one input as an mp4 movie file. I chose an mp4 movie file as one input and an IP camera that I have as a second input and finally I used the browser as my 3rd input - I chose the atco.tv page to display.
3. This step defines the streaming set up that will be used.
4. In the figure at right you can see 4 video sources at the bottom, a.) a browser input - atco.tv, b.) a movie file, c.) my web camera plugged into a USB port on my PC and d.) another camera which is actually an IP stream.
5. On the top left is the preview monitor showing my web cam which is selected. On the top right is the Production monitor view - it shows what is going out of the vMix software. This is what will be transmitted out of the raspberry pi's composite video port. You can read the vMix documentation to see how to set up the inputs.
6. This next part of the shows how to set up the output streams. I'll actually show only one setting, but you can set up to 3 stream destinations that the stream will simultaneously be sent.
7. To get going, click on the gear icon next to the Stream button (circled in yellow at right) which will open up the stream settings dialog box. Clicking on that icon will open up a dialog that looks like the following below:





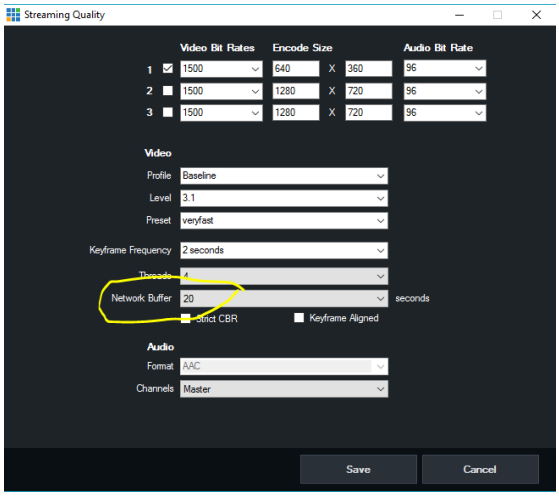
Choose a name for the profile. I will call it RPI Demo. Click the Add button next to the profile name. Type RPI Demo into the box then click the OK button.
Now, in the destination box, click the down arrow to expand and look for Custom RTMP Server then choose that.



For the URL type the following: rtmp://192.168.1.11/live
For the Stream Name or Key type the following: livestream

Note: The IP address will be the IP address of your raspberry pi.
In the right box you can change the Input Size to 640 x 480 or you can leave it alone but the video size might be different. More on this later.

Leave the Application at FFMPEG. Click the gear icon next to the Quality selector box. This is VERY IMPORTANT. You will get a new dialog box named Streaming Quality. Change the Network Buffer from 20 seconds to 60. Just change the 20 that is showing to 60 then click the Save button. Then click the Save and Close button on the Streaming Settings dialog box. Don't lose the setup for the next time, so click the Save button (it is above the Preview monitor) and give it a name you will remember for the next time. That's it for vMix set up.



Raspberry PI
Setting this up is a little more complex. I'll be brief here and mention just the main points. You need money, but not much.

a. Download and install the two codecs that come from raspberrypi.com. These allow playing mpeg formats. Cost is about $4.00.
b. Download and install mistserver from https://mistserver.org - there is a free version but I am not certain it will work. I signed up for the non-commercial license which costs $9 per month.
c. Fast internet connection - if you intend to stream to one of the many streaming servers such as Ustream, YouTube, Twitch etc. You will need to connect your raspberry pi to the internet. Mine is connected to a 10/100 switch, part of my 1 gigabit network.

Note! I mention IP address 192.168.1.11 in a few places below. This is my Raspberry PI IP address. Replace it with yours.

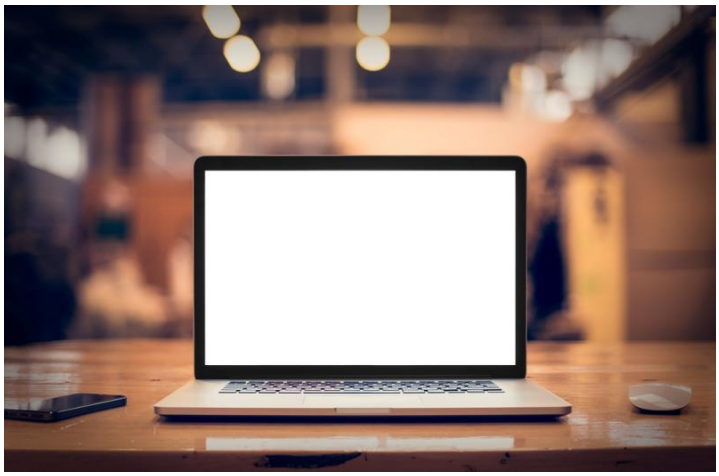
You need a Raspberry Pi version 3. (It might work with version 2, but I've only tried with version 3)
Run either Ubuntu Mate or Raspian. Enable SSH in order to remote into the Raspberry PI using putty. (Download putty.exe from the web if you do not have it)
Do not connect an HDMI cable to your PI. It will disable the composite port if you do.
Reboot the PI - I assume you have something connected to the composite port. I have a small LCD monitor I picked up at Amazon.
Log in to your PI and then make sure you have these two programs: Omxplayer and mistserver
Omxplayer should be part of the standard RPI install. If not get it by running the command line command: apt-get install omxplayer
Mistserver can be downloaded from https://mistserver.org but you may need the non-commercial licensed version. It costs $9.99 per month. I am going to be testing another streaming server later that I believe is totally free.
Unfortunately, the free version will NOT work. It does not come with the RTSP protocol installed so it will not be able to push the stream over to the PI.
Set up the mistserver with a stream with a stream name of: livestream and set the source to: push:// Then hit the save button.
Finally, start the streaming from the vMIX software by clicking on the Stream button at the bottom of the screen. It should turn red.
On the Raspberry Pi command line type the following: **omxplayer --live rtsp://192.168.1.11:5554/livestream –video fifo 20**
After about 3 seconds you should see the same output appear on the device connected to your composite video connector as you see on the vMix output display (top right)

Tidbits…
I was able to send my video stream to three places at once: Raspberry Pi composite video, twitch and batc.tv
I don't know if it is possible to do this without paying the $9 / month for the streaming server software that needs to be installed on the Raspberry Pi. I'm assuming I can get the nginx streaming software to work in its place. If anyone is able to accomplish it, let us know.

SUMMARY
The key to getting this all to work consists of three things:
a. software on the PI that can receive RTMP video streams
b. change the network buffering time from 20 to 60 seconds in the vMix Streaming Settings
c. run omxplayer on the PI.
…N8NT Bob Tournoux

COMPUTER PIONEER ROBERT W. TAYLOR DIES AT 85

Mon, 04/17/2017 - 8:44am by The Associated Press.



Robert W. Taylor, who was instrumental in creating the internet and the modern personal computer, has died. He was 85.

Taylor, who had Parkinson's disease, died Thursday at his home in the San Francisco Peninsula community of Woodside, his son, Kurt Taylor, told the Los Angeles Times (http://lat.ms/2oerEuc) and the New York Times (http://nyti.ms/2nNyf2F).

In 1961, Taylor was a project manager for NASA when he directed funding to Douglas Engelbart at the Stanford Research Institute, who helped develop the modern computer mouse.

He was working for the Pentagon's Advanced Research Projects Agency in 1966 when he shepherded the single computer network creation to link ARPA-sponsored researchers at companies & institutions around the country.

Taylor was frustrated that he had to use three separate terminals to communicate with the researchers through their computer systems.

ARPANET, as it was known, evolved into the internet. As Taylor predicted, the limited communications tool morphed into a system that supplies people with fingertip access to everything from encyclopedias to investment advice.

A few years later, Taylor went on to work at the Xerox Corp.'s famous Palo Alto Research Center, or PARC, where he was oversaw a team that helped create the Alto, a pioneering personal computer.

The Alto supplied each researcher with an individual workstation instead of sharing time on a room-sized mainframe. It was designed to use a graphical user interface, which enabled the user to command the device through icons, windows and menus instead of typing text commands in computer language.

The technology inspired Microsoft's Windows software and the Apple computers. Taylor's engineering team also helped develop the Ethernet and a word processing program that became Microsoft Word.

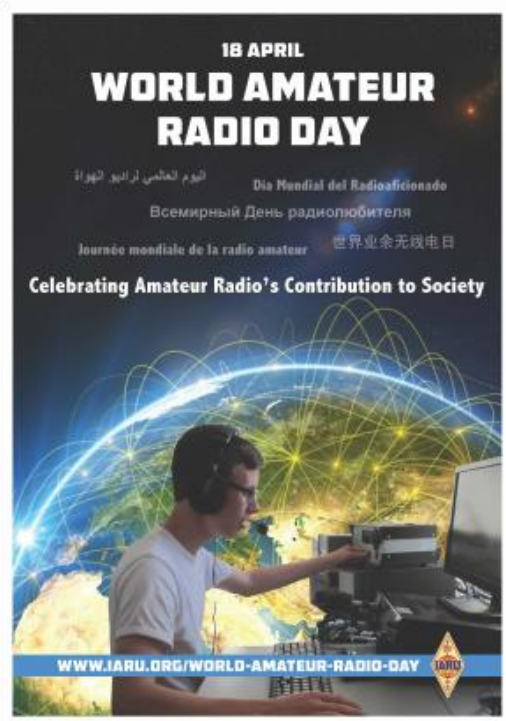
"Any way you look at it, from kick-starting the internet to launching the personal computer revolution, Bob Taylor was a key architect of our modern world," Leslie Berlin, a historian at the Stanford University Silicon Valley Archives project, told the New York Times.

In 1999, Taylor was awarded the National Medal of Technology and Innovation. In 2004, he and other PARC researchers were awarded the Draper Prize from the National Academy of Engineering for development of "the first practical networked personal computers."

In the 1990s, Taylor ran the Systems Research Center in Palo Alto for Digital Equipment Corporation. The lab helped create AltaVista, one of the first internet search engines. Taylor retired in 1996.

In addition to Kurt, he is survived by his sons Erik and Derek and three grandchildren.

WORLD AMATEUR RADIO DAY



Every April 18, radio amateurs worldwide take to the airwaves in celebration of World Amateur Radio Day. It was on that day in 1925 that the International Amateur Radio Union was formed in Paris.

Amateur Radio experimenters were the first to discover that the short-wave spectrum — far from being a wasteland — could support worldwide propagation. In the rush to use these shorter wavelengths, Amateur Radio was "in grave danger of being pushed aside," the IARU's history has noted. Amateur Radio pioneers met in Paris in 1925 and created the IARU to support Amateur Radio worldwide.

Just two years later, at the International Radiotelegraph Conference, Amateur Radio gained the allocations still recognized today — 160, 80, 40, 20, and 10 meters. Since its founding, the IARU has worked tirelessly to defend and expand the frequency allocations for Amateur Radio. Thanks to the support of enlightened administrations in every part of the globe, radio amateurs are now able to experiment and communicate in frequency bands strategically located throughout the radio spectrum. From the 25 countries that formed the IARU in 1925, the IARU has grown to include 160 member-societies in three regions. IARU Region 1 includes Europe, Africa, the Middle East, and Northern Asia. Region 2 covers the Americas, and Region 3 is comprised of Australia, New Zealand, the Pacific island nations, and most of Asia. The International Telecommunication Union (ITU) has recognized the IARU as representing the interests of Amateur Radio.

Today, Amateur Radio is more popular than ever, with over 3,000,000 licensed operators!

World Amateur Radio Day is the day when IARU Member-Societies can show our capabilities to the public and enjoy global friendship with other Amateurs worldwide.

We have provided a poster for World Amateur Radio Day. Any club may download it and use it to promote WARD in their area. The poster comes in two sizes: **61cm x 91cm** and a **small (A4) flyer**.

Groups should promote their WARD activity on social media by using the hash tag **#WorldAmateurRadioDay** on Twitter and Facebook. IARU will list all WARD activities on this page. To have your WARD activity listed, send an email to ARRL Public Relations Manager **Sean Kutzko, KX9X.**

April 18 is the day for all of Amateur Radio to celebrate and tell the world about the science we can help teach, the community service we can provide and the fun we have. We hope you will join in the fun and education that is World Amateur Radio Day!

Activation Information:
India: 8T1WRD – 0001 through 2359 India Standard Time. 7.155/14.205 MHz. **http://www.amateurradioday.com**
Poland: SP2YMS & SP9YFF. Special certificate available. **http://www.sp9yff.pl/**
Puerto Rico: KP4FD – HF and VHF. Electronic certificate via **kp4fd.ward@gmail.com**
EchoLink: World Radio Network: Special WARD IRLP/ECHOLINK Net
16:00 -17:30 (12 NOON EST, 9AM PST) UTC via the World Conference server (IRLP 9251) W2JLD, Net Control. Stations around the world are encouraged to check in.
World Friendship Net: Special WARD IRLP/ECHOLINK Net: 00:00 - 01:30 (8PM EST, 5 PM PST) UTC via the World Conference Server (IRLP 9251)W2JLD & KM4OOC, WH6DWF, Net Control. Stations around the world are encouraged to check in.

About: Since 1925, the International Amateur Radio Union (IARU) has been the watchdog and spokesman for the world Amateur Radio community. **Learn More**

Having Trouble? If you are having trouble finding a page on our site, please try the "Search" at the top of the page or visit the Site Map.

Contact The International Amateur Radio Union P.O. Box 310905 Newington, Connecticut 06131-0905 U.S.A. Contact Us

http://www.iaru.org/world-amateur-radio-day.html

DAYTON HAMVENTION DETAILS

Below is the Fast Scan ATV forum Hamvention schedule for this year. We have been assigned room 2 from 12:15 to 1:15 on Saturday.

The schedule is as follows:

Time	Presenter	Call	Topics
12:15 -12:20	Art Towslee	WA8RMC	Welcome statement and general comments.
12:20 -12:30	Gordon West	WB6NOA	Lively greeting then focus on MAGAZINES FOR SPREADING THE ATV ACTIVITIES. I will also offer to be the conduit for CQ Magazine. and 6 minute features from our members on HAM NATION .
12:30 -12:50	Mike Collis	WA6SVT	Introduction to ATV. The "Basics of analog and digital ATV" will be covered. What you can do with ATV and how to get your own ATV station on the air.
12:50 - 1:10	Art Towslee	WA8RMC	DATV DVB-S encoding and how it may be better than DVB-T.
1:10 - 1:15	Art Towslee	WA8RMC	Wrap up and questions.

ATV Friday Night dinner.

The ATV Friday Night Dinner will be at China Garden Buffet restaurant starting at 6:30PM on 112 Woodman Drive in Dayton, Ohio 45431 (Airway Shopping Center). Buffet Dinner $11.99 (937-781-9999). We have dinner then presentations about various ATV topics with door prizes concluding about 9:30PM. All are invited.

China Garden Buffet
Located in Airway Shopping center at:
112 Woodman Drive
Riverside, Ohio 45431
937-781-9999

Directions to the ATV Friday Night dinner and conference 2016.

19 min (12.7 miles)
Via US-35 W
Greene County Fairgrounds
210 Fairground Rd, Xenia, OH 45385
Take Fairground Rd, Hawkins Rd and Dayton Xenia Rd to US-35 W in Beavercreek Township
3.8 mi
Follow US-35 W to Woodman Dr in Riverside. Take the OH-835/Woodman Dr exit from US-35 W
7.3 mi
Drive to Woodman Dr/Wright Brothers Pkwy
1.5 mi
110 Woodman Dr in Airway Shopping center
Riverside, OH 45431

Dinner is $11.59 buffet and starts approximately 6:30PM. After dinner we will have speakers and a round table discussion and wrap it up at 9:30PM. Call me on my cell at 614-580-4793 if there are any questions.
SEE YOU THERE!! Art…WA8RMC

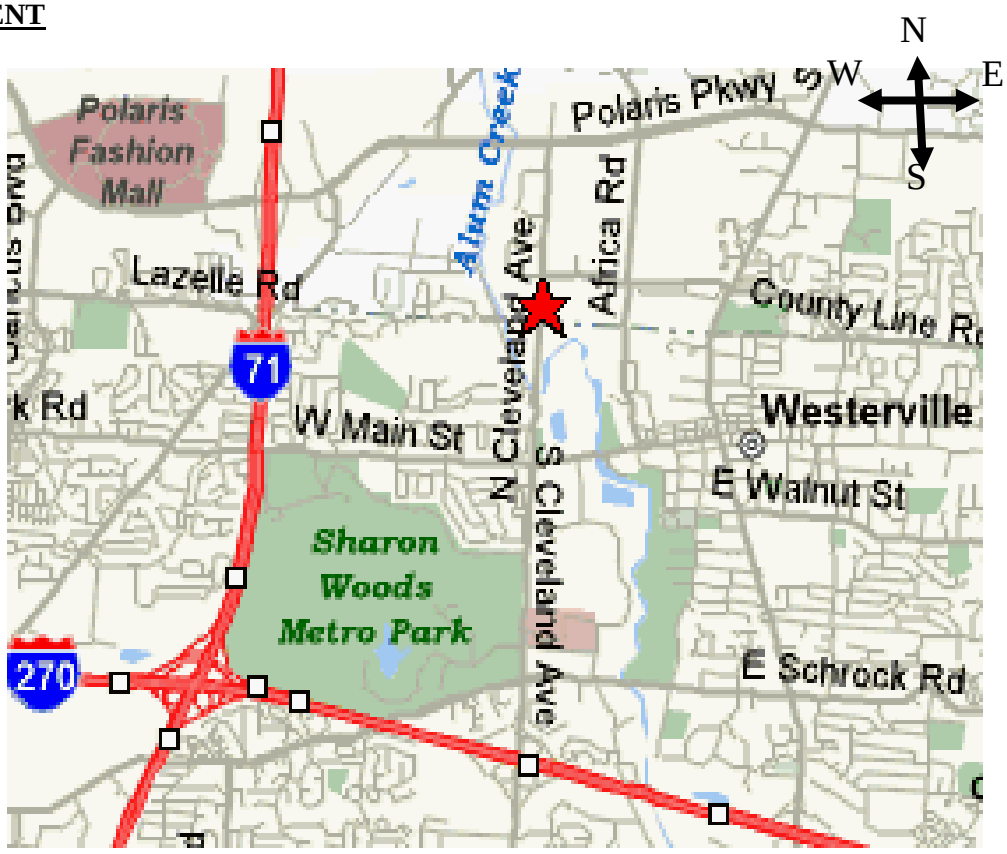
A T C O
2017 SPRING EVENT

12 Noon – SUNDAY (For hamfest)
(Lunch starts about 12:30 PM)
May 7, 2017
ABB PROCESS AUTOMATION CAFETERIA
579 EXECUTIVE CAMPUS DRIVE, WESTERVILLE
FOR MORE DETAILS, CONTACT
ART – WA8RMC - 891-9273
FREE LUNCH PROVIDED – DOOR PRIZES
BRING A FRIEND AND SEE OLD BUDDIES
MINI HAMFEST – SHOW AND TELL

DIRECTIONS TO THE ATCO 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.

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.

04/29/2017 | Jackson County Amateur Radio Club Hamfest
Location: Jackson, OH
Type: ARRL Hamfest
Sponsor: Jackson County Amateur Radio Club
Website: http://jacksoncountyarc.org/page3.html

04/30/2017 | Athens Hamfest
Location: Athens, OH
Type: ARRL Hamfest
Sponsor: Athens County Amateur Radio Association
Website: http://ac-ara.org/

05/19, 20, 21/2017 | 2017 Dayton Hamvention
Location: Xenia, OH
Type: non-ARRL Hamfest
Sponsor: Dayton Amateur Radio Association
Website: http://www.hamvention.org

06/03/2017 | Fulton County Amateur Radio Summer Swap
Location: Wauseon, OH
Type: ARRL Hamfest
Sponsor: Fulton County Amateur Radio Club
Website: http://k8bxq.org/hamfest

06/10/2017 | Union County ARC TailGate & TrunkFest
Location: Marysville, OH
Type: ARRL Hamfest
Sponsor: Union County Amateur Radio Club
Website: http://ohiohams.net

06/17/2017 | Milford Hamfest 27th Annual
Location: Milford, OH
Type: ARRL Hamfest
Sponsor: Milford Amateur Radio Club
Website: http://www.w8mrc.com

07/08/2017 | GARS Germantown Hamfest
Location: Germantown, OH
Type: ARRL Hamfest
Sponsor: Germantown Amateur Radio Society (GARS)
Website: http://GARSohio.org

07/09/2017 | 20/9 Radio Club Hamfest/Computer & Electronics Show
Location: Austintown, OH
Type: ARRL Hamfest
Sponsor: 20/9 Amateur Radio Club
Website: http://20over9.org

07/16/2017 | Van Wert Hamfest
Location: Van Wert, OH
Type: ARRL Hamfest
Sponsor: Van Wert Amateur Radio Club
Website: http://w8fy.org

07/30/2017 | Portage Hamfair '17
Location: Ravenna, OH
Type: ARRL Hamfest
Sponsor: Portage Amateur Radio Club
Website: http://hamfair.com

08/05/2017 | Columbus, Ohio Hamfest
Location: Grove City, OH
Type: ARRL Hamfest
Sponsor: Voice of Aladdin Amateur Radio Club (W8FEZ)
Website: http://columbushamfest.com

08/20/2017 | Warren ARA Tailgatefest
Location: Cortland, OH
Type: ARRL Hamfest
Sponsor: Warren Amateur Radio Association
Website: http://w8vtd.org

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 (01/22/17)	$ 1629.72
RECEIPTS(dues)	$ 165.00
Pizza Party/Tech event food	$ (107.23)
Web site expenses	$ (197.99)
PayPal fee	$ (2.36)
CLOSING BALANCE (01/22/17)	$ 1487.14

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=2MHz, PMT=4095, PCR=256, Video=256, audio=257
427.25 MHz Analog VSB AM, 50 watts average 100 watts sync tip (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)
2395 MHz Mesh Net transceiver 600mw output (channel 1 -2). ID is WR8ATV-2
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, 10.350 GHz xmitters video ID 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
2395 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)
2395.00 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni (Used for experimental Mesh Net operation)
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 April 2017

Call	Name	Address	City	St	Zip	Phone
KD8ACU	Robert Vieth	3180 North Star Rd	Upper Arlington	OH	43221	614-457-9511
AH2AR	Dave Pelaez	1348 Leaf Tree Lane	Vandalia	OH	45377	937-264-9812
W8ARE	Larry Meredith III	6070 Langton Circle	Westerville	OH	43082-8964	
VK3BFG	Peter Cossins					
N9BNN	Michael Glass	6836 N. Caldwell Rd	Lebanon	IN	46052	
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
N8CXI	Garry Cotter	2367 Northglen Drive	Columbus	OH	43224	
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	301-772-7382
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
W8DMR	Bill Parker	2738 Florbunda Dr	Columbus	OH	43209	
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
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	
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	OH	43147	
WA8HFK, KC8HIP	Frank & Pat Amore	P.O. Box 2252	Helendale	CA	92342	614-777-4621
WA8HNS	Mike Gray	5029 St Rt 41 NW	Washington Ct Hs	OH	43160-8740	740-335-5133
K8KDR, KC8NKB	Matt & Nancy Gilbert	5167 Drumcliff Ct.	Columbus	OH	43221-5207	614-771-7259
W8KHP	Allan Vinegar	2043 Treetop Lane	Hebron	Ky	41048	
WA8KKN	Chuck Wood	5322 Spruce Lane	Westerville	OH	3082-9005	614-523-3494
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	OH	45331	937-548-2492
N8LRG	Phillip Humphries	30856 Coshocton Road	Walhonding	OH	43843	614-3543744
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
WU8O	Tom Walter	15704 St Rt 161 West	Plain City	OH	43064	614-733-0722
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	
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
W8RUT, N8KCB	Ken & Chris Morris	2895 Sunbury Rd	Galina	OH	43021	
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	
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	James Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
KB9VGD	Gary Oaks	472 Storle Ave	Burlington	WI	53105-1028	
KC8WRI	Tom Bloomer	PO Box 595	Grove City	OH	43123	
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	OH	43224-3011	
AC8XP, KE8GTT	Troy and Shamus Bonte	5210 Smothers Road	Westerville	OH	43081	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	
KC8YPD	Joe Ebright	3497 Ontario St	Columbus	OH	43224	
KD8YYP	Anna Reed	818 Northwest Blvd	Columbus	OH	43212	
WB8YTZ	Joe Coffman	233 S. Hamilton Rd	Gahanna	OH	43230-3347	
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	513-218-3876
N8ZM	Tom Holmes	1055 Wilderness Bluff	Tipp City	OH	45371	

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, 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	Repeater trustees:	Art Towslee WA8RMC
V. President:	Ken Morris W8RUT		Ken Morris W8RUT
Treasurer:	Bob Tournoux N8NT		Dale Elshoff WB8CJW
Secretary:	Mark Cring N8COO	Statutory agent:	Stan Diggs AA8XA
Corporate trustees:	Same as officers	Newsletter editor:	Art Towslee WA8RMC

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.

KB9VGD Gary Oaks Burlington, WI
KE8GTT Shamus Bonte

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.