ATCO NEWSLETTER

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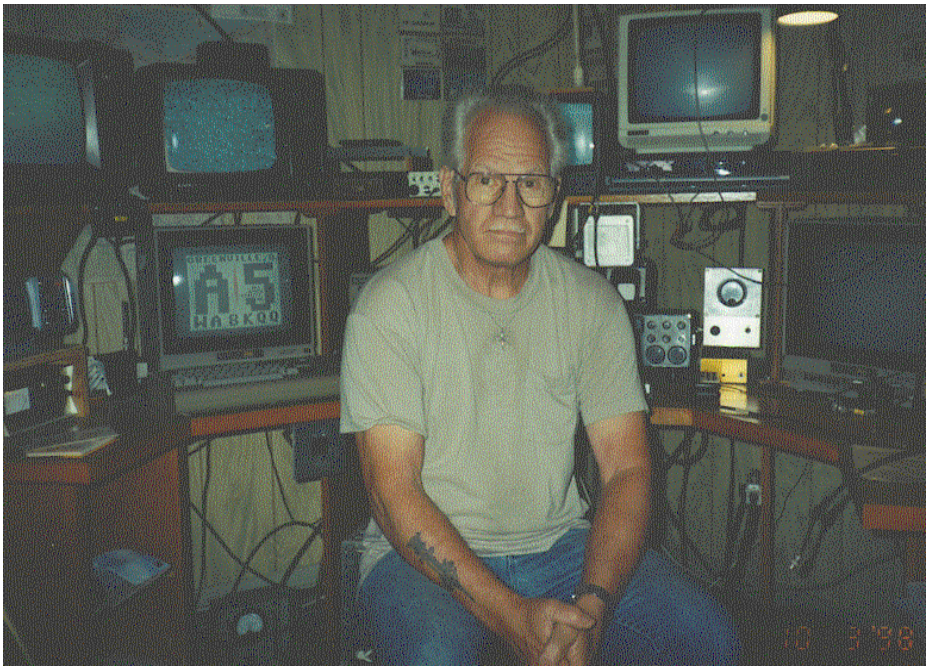
ATCO WA8RUT REPEATER UPDATE

Well, it sounds like a broken record but. . .the repeater keeps getting attention. The 2.4GHz input is now working up to speed making, what we believe, the first fully functional 2.4GHz inband repeater in the country! Problems have surfaced and have been corrected. What's next?

ATCO

HAM IN THE SPOTLIGHT

This time the "Candid Camera" catches Dale Waymire, WA8KQQ in Greenville, Ohio. Dale has been active in this hobby for quite some time as evidenced by the rather large collection of "stuff" in his shack and if you'd like to buy some of Dale's stuff, check out the classified inside! Dale has been quite active in ATV on both 70cm and 1280MHz for many years and has the homebrew antenna collection to prove it. I spotted a 96 element 1280MHz collinear antenna hanging in the garage because he didn't have enough room on the tower. For those of you who haven't seen Dale, point your beam just north of Dayton for a look at his powerful signal. Oh, by the way, Dale is one of the last hold out's using 300 ohm twinlead to feed his antennas (and with good success). If it works Dale, don't change it!



ACTIVITIES ... from my “workbench”

OK, it's time again for me to impress you with all of the things I've been working on and accomplished since last time. Now, if you believe even some of that, we must talk about some great snake infested swamp property I own that you can buy real cheap for an antenna farm!

Well, the repeater has been acting rather flaky lately. Now, it's not all our fault you see, for I tend to blame most (well part) of the problems with the ever increasing band popularity. The 439 MHz portion is, without a doubt, becoming difficult to receive an interference free picture part of the time. Lately, I've noticed what seems to be a weak P2-3 ATV picture received at one moment and have it jump up to P5 status seconds later. Our old "friend" named de-sense is toying with us again. De-sense is where a very strong signal just outside the band is received by the incoming preamp and drives it into saturation. The result is weak or no received signal on our intended frequency. What is needed is an amplifier that will handle large signal overloads without loosing linearity. I don't know how to design or buy a better one than we already have so if any of you have ideas, let's hear from you. I'm sure NASA knows how to do it but we don't have access to their brains right now. In any case, if we are to remain on the 439 band, we must be able to solve this dilemma. We'll work on it.

The 2.4 GHz portion is working superbly thanks to Ken and Dale's effort. The equipment is relatively new however, so breakdowns aren't expected for a few years yet. By the way, do you realize that I believe we're the first repeater in the country that has a fully functional 2.4GHz inband repeater. That is, we can receive a 2.433GHz signal and repeat it back on 2.41 lGHz! Read more about it in Ken's article later. In any case, the 2.4GHz portion doesn't need any improvements at this time.

The 1250MHz transmitter, however, has had problems. It's only one problem but it took a number of trips to the repeater site to diagnose it. It started when we noticed that it was off the air. Dale, WB8CJW, made a trip down there to find a power supply fault indicating. He reset it and everything was again working. Success? Well, NO! A couple of days later, it did the same thing. Again, a reset and it's back to normal. On the third time, I went down and finding the same thing, brought the power supply and 1250 transmitter home with me to check. I found the middle power supply module (there are three 4.5v supplies in series) defective. I replaced it and everything was ok. Right? Well, not yet. I returned it to its "home" and within 2 days...the same thing. Back home it came where I thoroughly tested it to find a temperature hot spot in the area of the middle supply. (a heat gun was able to duplicate the problem.) Now the supply has 2 fans in it with enough air flow to be able to sweep my driveway so I'm confident I found the real problem this time. Thinking back, the problems started shortly after installing the 2.4GHz amplifier. Not much of an additional heat load inside our closed cabinet but apparently just enough. I've noticed, also, that the ambient temperature in the repeater room seems a little hotter too. Oh well, pesky little problem but that's the way it goes sometimes.

The repeater controller is also giving us headaches. Dale found a bad IC that controls the audio channel so it will track the video. Replacement enabled proper audio but other problems surfaced so he (like myself) installed a backup controller and took the main one home for repair. At this time the backup unit is still in place which explains the different identification screen. When the main one is back in place it will have the ability to select a different video gain for each channel. Also, Dale is adding some features needed for the roof camera which will be installed shortly. Finally, he is changing the sync detect circuitry which, we hope, will minimize the random access on stray signals. Dale, I think I've covered all of the major topics. Correct me if not.

I'm still working on the camera. However, this time I'm happy to report that it's "finished" except for field test revelations. I've had it installed on my tower fully operational for about 3 weeks now. I can't vouch for its watertightness yet for it hasn't rained since installation but, alas, it's raining hard now so it'll come down this weekend for a final check. At that time I need to replace the curved Plexiglas window with a flat glass one because of excessive reflections with the curved surface. The control cable is already installed at the repeater so installation won't take too long. I hope to have it done by "Fall Event" time. Stay tuned.

Under investigation at this time is an IC I've found that should work as a video low pass filter for the repeater transmitter. It's a dip size IC that accepts video input and filters out any frequencies above 5MHz. This is needed because the raw video from the receiver with no video is rich in harmonics that are beyond 5MHz. This "clogs" the airwaves with unwanted signals and also causes the transmitter to draw excessive current (and the SWR goes up). This single IC has less than 1dB loss from DC to 5MHz, 10dB loss (8MHz and >30dB loss above 10MHz. The present filter starts to roll off too soon which explains why the 1250MHz output is B/W except for some strong signal inputs.

That's all for now, folks! In the meantime be sure to make it to the Fall Event. Remember, prizes, food and good friends. See you there. ...Art WA8RMC

TECH TALK…Let's learn something technical

When I had the 1 250MHz FM repeater transmitter home for repair recently, I decided to see if the signal was linear as received at the receiver video output. Since I had my multiburst generator functional, it would serve as a good source to check for frequency linearity. The transmitter has a pre-emphasis network creating a rising video amplitude as the frequency increases. In contrast to that the receiver has a de-emphasis network that has a falling video amplitude as the frequency increases. If everything is correct, the canceling effect of the two causes video with constant amplitude as the frequency increases. My system was NOT linear. I later found that the pre-emphasis values I used were for a 625 line system used in Europe (I copied the values from a British publication...go figure). Since calculating new values was a chore, I called upon our resident all around ATV expert, Bill Parker W8DMR. The following topic resulted which I'd like to share with you thus becoming our technical article this time. Are you ready? Here we go!...WA8RMC.

PRE & DE EMPHASIS FOR FM ATV APPLICATIONS

About ten years ago, Amateur Television transmissions were usually made on the 70 cm band (420-450 MHz). And much like the broadcast commercial TV transmissions, amplitude modulation (AM) was also utilized by the ham TV operators. TV receivers that were readily available provided the AM type of demodulation. But . . .

Activity on the 2-meter band grew increasingly busy, FM voice repeaters and associated repeater links rapidly expanded. And later the 2-meter transmitter site via 70 cm. Today, many 70 cm FM voice relay links now occupy frequencies which are within the bandpass of the amateur television receivers! Needless to say, it is common now for the 70 cm ATVer to view much interference, loss of color, loss of sound, loss of sync, and other forms of picture degradation. In most metropolitan areas, it is extremely frustrating to say the least.

In many cases, TV amateurs are seeking relief of the 70 cm band, by moving to the SHF (microwave) bands, such as 1240 MHz and/or higher bands where FM video modulation is permitted. Amplitude modulation (AM) has certain advantages over frequency modulation (FM); and FM has certain advantages over AM. .Each type of modulation serves a useful function. In order to fully utilize video FM modulation, pre- and de- emphasis is employed. To better understand the advantage of using pre-emphasis, a brief comparison of the AM noise spectrum following demodulation versus FM noise spectrum following a demodulation is presented herein.

Figure 1 shows the noise spectrum located about a demodulated AM carrier. In the absence of distortion (linear), the noise is of constant amplitude with frequency. This characteristic is often referred to as "rectangular noise" spectrum. Figure 2. shows the noise spectrum located about a demodulated FM carrier. This characteristic is often referred to as "triangular noise" spectrum. As the modulation frequency is increased, the demodulated noise signal also increases.

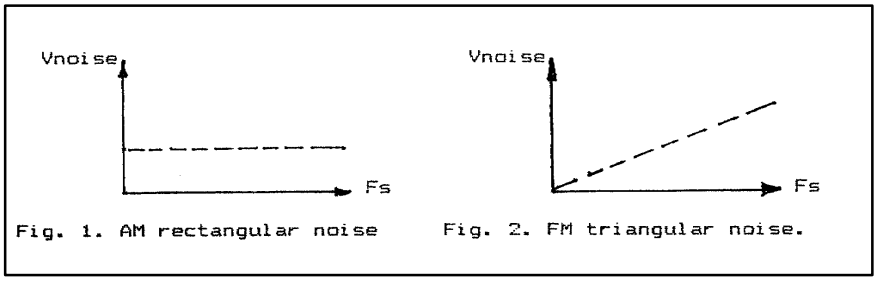


Fig. 1. AM rectangular noise

Fig. 2. FM triangular noise.

PRE & DE EMPHASIS MODULATION AMPLITUDES

Pre-emphasis increases the amplitude of the video signals above the crossover frequency of 716 KHz prior to application for frequency modulation (FM). Therefore, after the video signal has been recovered (demodulated) by the FM television receiver, de-emphasis should be applied when the video signal needs to represent the level of the original video signals faithfully.

A graph may be used to visualize just how the pre-emphasis (PE) and de-emphasis (DE) overcomes the deteriorating signal-to-noise ratio (SNR) by the FM demodulation process. The noise has a characteristic known as "triangular" noise, meaning the noise increases as the frequency of modulation spectrum, Fs, increases.

PE and DE helps maintain an adequate SNR for the video frequencies above 716 kHz. The frequency response of the DE network should be the compliment of the frequency response of the PE network so the amount of boost provided by

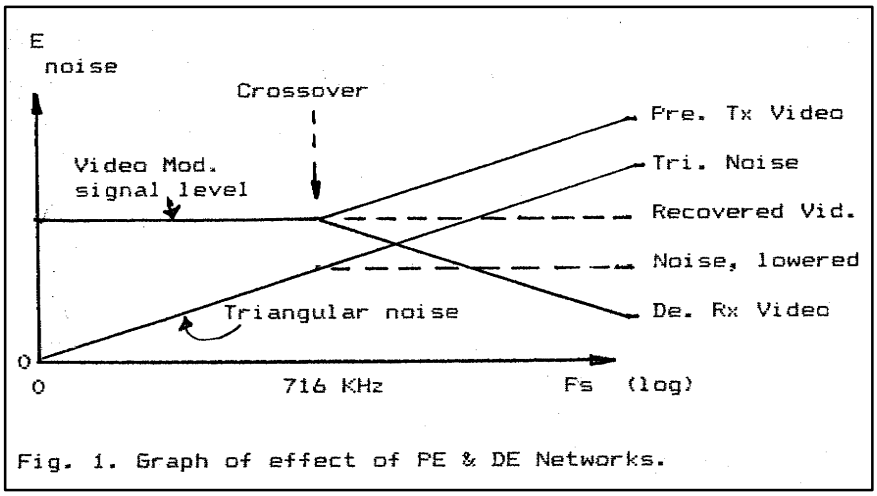


Fig. 1. Graph of effect of PE & DE Networks.

the PE network (+13 dB) should be equal to the amount of attenuation provided by the DE network (-13 dB). Figure 1 above depicts the following amplitude level changes.

a) The video modulation input signal level is boosted due to the pre-emphasis network located in the transmitter.
b) b) The triangular noise is lowered by the de-emphasis network located in the receiver.
c) c) The demodulated video level is lowered by the de-emphasis network. The signal-to-noise ratio from the crossover frequency to the desired video baseband upper limit is maintained.
d) d) The frequency response of the recovered video signal is proportional to that of the input video signal.

The fine detail in the video picture represents a higher video modulating frequency. The result of the FM triangular noise generated in the FM demodulating process produces a noisy picture, thus lowering the obtainable resolution. The solution to this problem is to emphasize the higher video frequencies (linearly) thus tending to equalize the signal to noise ratio across the band. Hence, the term, pre-emphasis (PE).

The FM TV receiver must contain a network that effectively counter matches the PE network in the transmitter. The receiver circuit should attenuate the higher modulating frequencies. Hence, the term, de-emphasis (DE). The DE network thus restores the relative amplitudes to those of the original video modulating signal. The networks have complementary characteristics so bridged T-networks are typically used.

The PE and DE circuits provide a picture quality that is easily noticed. The emphasis networks offer a means of improving the signal to noise ratio by about 13 to 14 dB, thus improving the quality of the picture. A comparison of AM versus FM video transmission advantages and disadvantages require more analysis and space than the brief description of the reason for the use of PE and DE networks. Such an analysis could be presented if interest warrants. Typical PE and DE networks with circuit values of frequency responses are included to help broaden the understanding and value of this interesting frequency modulation technique.

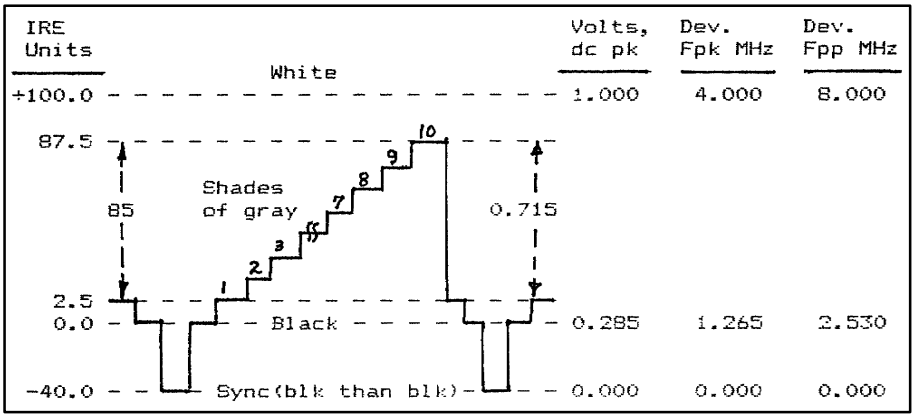
UNDERSTANDING FM TV MODULATION

The magnitude of the baseband video signal typically about 1.0 volt peak-to-peak) determines the amount of frequency shift or deviation the transmitter will experience. The frequencies contained in the baseband video signal along with the pre-emphasis circuit response determines the actual deviation. The ratio of the Deviation Peak (Dev pk) to the Baseband (Bb) is called the Modulation Index, M.I. The greater the M.I. number, the more radio spectrum required among other things.

As an example, the typical 1.0 volt of baseband video may be used to relate to the deviation frequencies generated. IRE video units also help quantize the factors which determine deviation needs.

Signal	IRE Units	Determination of Sync & Video Levels
Sync only	40	40/100 = 0.285 Volt, Sync peak
Video only	100	100/140 = 715 Volt, Video peak
Composite	140	140/140 = 1.000 Volt, Composite peak

With a Baseband of 4.0 MHz, a Dev pk - 4.0 MHz, then M.I. = 1.0, a shades-of-gray video waveform (without pre-emphasis) is shown:
Total bandwidth, due to the baseband high frequency modulation components is greater than Fpp (8.0 MHz.). The total Bandwidth, BW = 2 (4 MHz + 4 MHz) = 16.0 MHz.



PROPERLY SETTING FM TV TRANSMITTER DEVIATION

For purpose of illustration, the following typical FM TV System parameters were selected:
Let,

Desired Peak Deviation = 4.0 MHz. Baseband Video Max= 4.0 MHz. Modulation Index, M.I. = (Deviation Peak, in MHz) = Dev. Pk
(Baseband Video, in MHz) Bb.

M.I. = 4.0 MHz = 1.0 Note: An index greater than 1.0 will require greater RF spectrum.
4.0 MHz

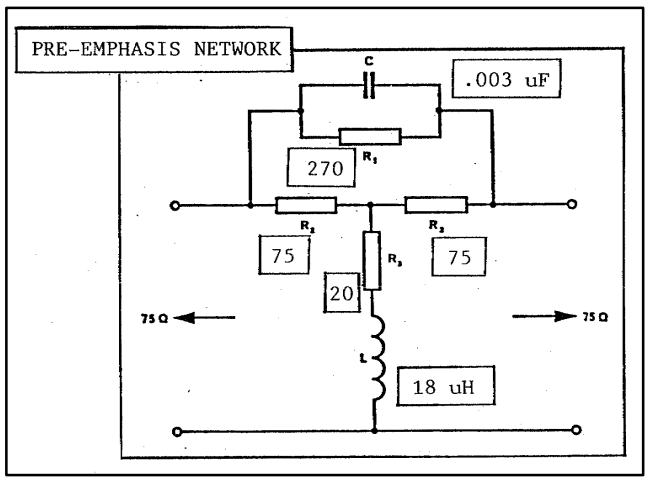
1. With a pre-emphasis network crossover frequency of 0.762 MHz (for a standard of 525 lines, 60 fields) and a 1.0 volt pk-pk input signal to yield a 4.0 MHz deviation, the Bessel function First Carrier Null for a M.I. of 2.42, will be 0.762 x 2.42 = 1.83 MHz peak deviation.

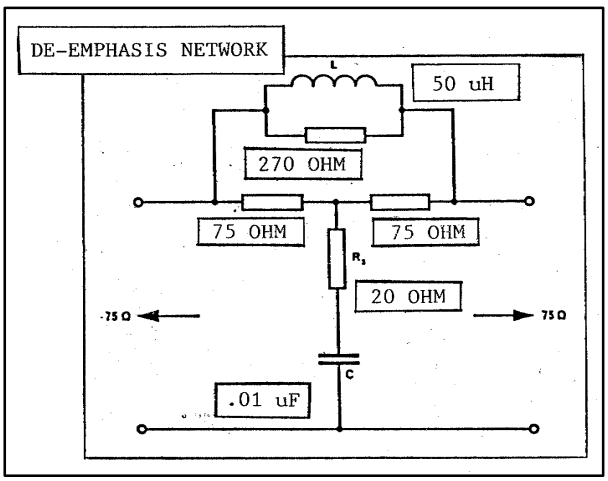
2. Solve for x: 1.83 MHz = 4.0 MHz (maximum peak deviation)
x 1.0 Vpp (maximum input level) The scaled value of x will be equal to 0.46 Volts, pk-pk.

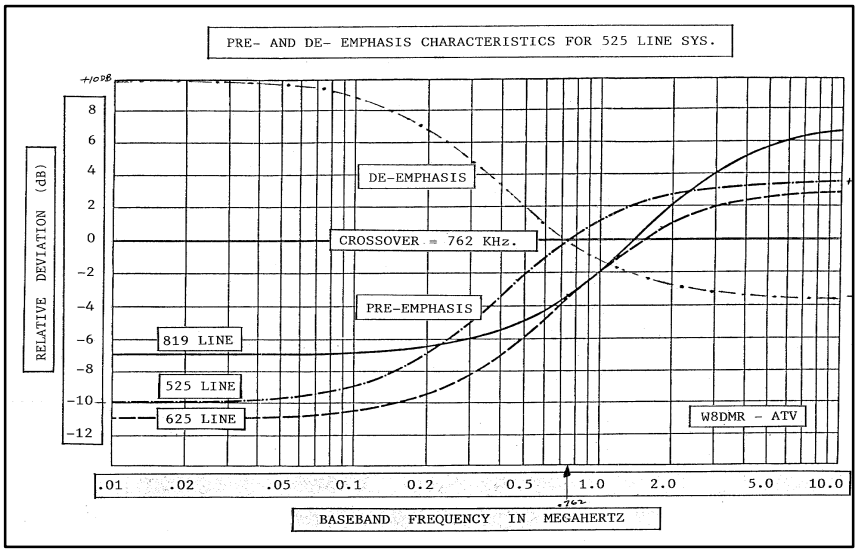
3. With a sinewave signal generator set for a frequency of 0.762 MHz and a level of 0.46 Volts pk-pk, increase the video gain control to until a First Carrier Null appears. The null may be observed by viewing a spectrum analyzer.

For correct pre-emphasis frequency response, the network must be fed by a 75 ohm source as well as terminated by a 75 ohm load. For a M.I. of 1.0, using a Dev. Peak of 4.0 MHz, and a Baseband video of 4.0 MHz, the FM bandwidth will be: Bandwidth, BW = 2 (Fpk + Fbb) = I (4 + 4) = 16.0 MHz. F pk-pk. The total deviation, F pk-pk is the amount of spectrum expected to contain signals produced by the video modulation input. Pre-emphasis boosts the high frequency components approximately 13 dB relative to the low frequency components. Deviation is lowered for the low frequency components to allow for pre-emphasis of the high frequency components and still remain in the passband of the receiver which employs de-emphasis boosting the low frequency components.

Because the level of the low frequency components are reduced, any unwanted low frequency modulation signals generated in the video modulator (after the pre-emphasis circuitry) may be easily observed and/or heard via the receiver demodulation.







…Bill Parker, W8DMR

LATEST LMCC DISCUSSION

The ARRL has called upon the Land Mobile Communications Council (LMCC) to withdraw its request for reallocation of segments of the 420 to 450 MHz band to the Private Mobile Radio Service. Such a move would permit the FCC to focus its attention on portions of the LMCC petition that "might have more merit," the ARRL said. The League's suggestion is contained in reply comments filed July 16 with the FCC in response to the LMCC's petition for rulemaking, RM-9267, filed earlier this year. Amateur Radio shares the 70 cm band on a secondary basis with the federal government. The LMCC seeks immediate reallocation of the segments 420 to 430 and 440 to 450 MHz from the federal government to the PMRS.

Alternatively, the League asked that the FCC dismiss those portions of the LMCC petition dealing with the 420 to 450 MHz band as "plainly not deserving of further consideration."

The League said that comments from Amateur Radio operators--the vast majority of those filed in response to the LMCC petition-establish that the LMCC proposal for a PMRS allocation in the 70 cm band "was ill-conceived." Hams told the FCC that the band is heavily used and vital to amateur public service activities. The League noted among other commenters "a complete absence of support" for the 420 to 450MHz proposal in particular. Some commenters were altogether silent on the 420 to 450 MHz reallocation issue, while one LMCC member, the Association of Public Safety Communications Officials-International (APCO), opposed any reallocation in the band.

The League urged the FCC to pay close heed to the comments of the National Telecommunications and Information Administration. The NTIA said national security and other federal interests would preclude sharing on the band. Those comments, the League noted, were "clearly protective of its own use of the 420-450 MHz band, and that of the Amateur Service as well."

The League said the LMCC has failed to justify a 420 to 450 MHz reallocation. Comments filed so far, the ARRL said, disprove both the LMCC's "rank speculation" about possible federal reductions in the use of 420 to 450 MHz as well as its representations about amateur use of the band. "The record that has been developed shows that there is no compatibility between incumbent Federal and amateur facilities and new PMRS facilities," the League said. But the ARRL said it has no quarrel with the LMCC to the extent that it seeks to open discussion on the general issue of PMRS allocation needs.

A complete copy of the League's reply comments is available at http://www.arrl.org/news/bandthreatlRM-267/arrl-reply.pdf.
...Ron K3ZKO

IMPORTANT 70 CM LMCC DEVELOPMENT!

AAA SAYS LMCC "BACKING OFF" 70 CM REQUEST An official of the American Automobile Association says the Land Mobile Communications Council is backing away from its request that the FCC reallocate 420 to 430 MHz and 440 to 450 MHz from the federal government to the Private Mobile Radio Service (PMRS). And the AAA's Gary Ruark says he doubts the FCC will ever agree to the request in the face of strong support for continued Amateur Radio presence on the band. Amateur Radio has a secondary allocation on the band. The AAA is an LMCC member.

In an August 31 letter to San Diego SEC David Doan, KC6YSO, Ruark, said that strong support for ham radio from the Association of Public Safety Communications Offcials-lnternational (APCO) and the National Telecommunications & Information Administration caused the LMCC to back off its demand to reallocate the 70 cm subbands it had requested last spring. Because of that, Ruark said, "it is doubtful that the FCC would ever agree to that portion of the LMCC petition addressing sharing with amateur radio operators."

In June, AAA asked the LMCC to file supplemental comments with the FCC to withdraw the request to share the 70 cm band with Amateur Radio. The LMCC declined. "The decision was based on the perception that to change the language now could undermine the rest of the petition," Ruark explained. Ruark, the AAA's emergency road service technical communications specialist, said the AAA would be unable to get the LMCC to reverse its position "because there is not enough support to win a vote on the matter."

But Ruark said it was his understanding that the LMCC "would not continue to actively seek access to the amateur radio spectrum, and would forfeit that language during FCC negotiations in exchange for more important spectrum allocations."

A copy of Ruark's letter to Doan is available on the ARRLWeb page, http://www.arrl.org.
...Ron, K3ZKO

ARRL APPROVES PROPOSED AMATEUR LICENSE RESTRUCTURE

The ARRL Board has agreed to propose a simplified Amateur Radio licensing structure with four classes. Lengthy discussion and debate during the Board's meeting July 16-18 led to majority support for a plan for four written examination elements to establish amateurs' operational and technical qualifications instead of the present five, and two Morse code examination elements instead of the present three.

Under the plan adopted by the Board, the entry level to Amateur Radio would be known as Class D and would convey the privileges of the present Technician license. The written examination would be at the same level of difficulty as that of the present Technician examination, but consistent with the privileges of the license. All amateurs now licensed as Technicians would become Class D.

The next step would be known as Class C and would convey the privileges of the present General license, but with phone subbands expanded by 50 kHz on 75 and 15 meters and by 25 kHz on 40 meters. Class C would be the entry level to high frequency (HF) operating privileges. To upgrade from Class D to Class C, an amateur would pass a written examination on the operational and technical qualifications required for HF operation and a 5 word per minute Morse code examination. All amateurs now licensed as General, Technician Plus, and Novice would become Class C. The expansion of the telephony sub-bands would result from "refarming" of the Novice CW bands that are no longer required for their original purpose.

The third step would be known as Class B and would convey the privileges of the present Advanced license, but with phone subands expanded by 50 kHz on 75 and 15 meters and by 25 kHz on 40 meters. To upgrade from Class C to Class B, an amateur would pass a more advanced written examination similar in diff'culty to the present Element 4A and a 12 word per minute Morse code examination. All amateurs now licensed as Advanced would become Class B.

The final step would be known as Class A and would convey the full privileges of the present Amateur Extra Class, with telephony subbands expanded by 50 kHz on 75 and 15 meters and by 25 kHz on 40 meters. To upgrade from Class B to Class A, an amateur would be required to pass the most difficult written examination in the sequence. Consistent with the practice in many other countries, no additional Morse code examination would be required beyond 12 words per minute. All amateurs presently licensed as Amateur Extra Class would become Class A.

In their discussions, Board members emphasized that the objective is to rationalize and simplify the amateur licensing structure without reducing the requirements for any class of license. Where reductions in Morse code requirements are proposed, there would be a corresponding increase in written examination standards. On the other hand, Board members were adamant that simplifying the structure should not come at the expense of privileges already earned by amateurs. Therefore, present Novice and Technician Plus licensees, having earned entry-level HF operating privileges, would be granted the new entry-level HF license.

Adoption of the simplification plan marks the culmination of 30 months of work by the Board, during which time the input of literally thousands of ARRL members and other amateurs and prospective amateurs was considered. The Board debated a wide variety of options including both smaller and larger numbers of license classes, higher and lower qualification levels, and different privileges. Nine of the 15 Directors voted in favor of the plan, with six opposed. Following the meeting ARRL President Rod Stafford, W6ROD, observed, "The debate was at times contentious and the result was not unanimous. Some Board members preferred greater simplification; others were uncomfortable with some of the changes being proposed. However, every Board member, without exception, left the meeting knowing that each of his or her colleagues did what they believe is best for the future of Amateur Radio."

Members are urged to contact their ARRL directors to comment on this proposal. E-mail addresses are on page 10 of any issue of QST. Members also may comment on the proposal via the ARRL Web site, http://www.arrl.org or e-mail at restrux@arrl.org.
...Mon, 20 Jul 1998 Source unknown

FCC OPENS UP NEW HAM BAND ON 77GHZ...atv possibilities?

FCC 3rd report and order amends parts 2, 15, 97 for use above 40 GHz. Current 76-77GHZ amateur band operation is now suspended. It will be replaced by 77.5-78 GHz with Amateur as primary service. Reason for change was use of band by collision avoidance radar systems which would pre-empt amateur operation now secondary on 76-77 GHz. So now you can log yet another new band. Who will be first? I see that we moved up from secondary to primary, but we did so at the expense of losing half the frequency allocation! ...Henry KB9FOHAM@aol.com

IS FCC GOING TO TAKE AWAY HAM SPECTRUM ON 5.9GHZ?

The ARRL says the FCC is proposing too much spectrum at 5.9 GHz for deployment of Dedicated Short Range Communications (DSRC) systems for intelligent transportation system (ITS) applications. The League's comments follow a June 11 Notice of Proposed Rulemaking (ET Docket No 98-95) in which the FCC proposed setting aside 75 MHz--5.850 to 5.925 GHz for use by ITS on a co-primary basis. The Amateur Service has a secondary allocation at 5.650 to 5.925 GHz, sharing with government radar and nongovernment fixed satellite service uplinks.

The League suggested that if the FCC goes ahead with a 75 MHz allocation, it should compensate by elevating remaining Amateur and Amateur Satellite allocations at 5.650 to 5.725 and 5.825 to 5.850 GHz to nongovernment primary "to insure against future preemption by nongovernment services with higher allocation status."

The ARRL said it's not apparent from the FCC's NPRM that 75 MHz of spectrum is necessary. The DSRC allocation at 5 GHz in Europe is only 10 MHz wide, the League pointed out, and the FCC Notice does not account for the disparity "between that bandwidth and the claimed need for 75 MHz for unspecified future DSRC applications." The League said the Commission ought to explore the opportunities of frequency reuse and the availability of the 902-928 MHz band for some DSRC functions.

In earlier comments, the League questioned whether the 5.9 GHz band was appropriate for DSRC and urged the FCC to look into frequencies above 40 GHz, where DSRC systems could avoid interference from other users.

The League also recommended that the Commission mandate prior coordination between ITS America (a nonprofit ITS promotional organization) and the League or restrict DSRC facilities to those using "listen-before-transmit protocols and frequency-agile transmitters with roaming channel selection."

Possible ITS applications include various highway safety systems, enroute driver information systems, and systems where DSRC-equipped vehicles could be equipped to more quickly detect traffic congestion and dispatch emergency personnel or take other actions. ITS DSRC transmissions would be "narrowly focused and rapidly dissipating signals," according to ITS America. The FCC has proposed a maximum of 30 W EIRP for DSRC systems.

A complete copy of the League's comments is on the ARRLWeb at http://www.arrl.org/announce/RM-9096-cmt.html

A BALLOON GONE HAYWARE…so you think you have problems!!!

(It's not A TV related, but, what the heck, I think it's funny...Ed)

OTTAWA - A runaway weather balloon floating toward Britain over the North Atlantic is proving a tough target for some of Canada's top guns. The helium-filled balloon, a 25-story high unmanned research station used to measure ozone levels over Canada, was launched Monday from Vanscoy, Saskatchewan.

Instruments attached to the balloon were supposed to separate from it at the end of the test Monday, said Dale Sommerfeldt, vice president of Scientific Instrumentation Ltd. of Saskatoon, which coordinated the launch.

The termination device failed and the backup system failed and that's why the balloon is where it is right now," he said. Jet fighters trying to bring the balloon down fired more than 1,000 rounds into it Thursday, but it remained aloft. The air force hopes the now-leaking balloon will eventually come down.

Meanwhile, Nav Canada, the country's air traffic regulator, is rerouting air traffic around it. ' It's at an altitude and an area where transAtlantic flights pass nearby," Nav Canada spokesman Conrad Bellehumeur said Friday. ' It won't cause delays, it's just a matter of having planes travel 120 miles farther north or farther south."

Maj. Roland Lavoie, an air force spokesman stationed at 1 st Canadian Air Division in Winnipeg, Manitoba, said the air force will monitor the balloon until it enters another country's airspace.

The CF-18 fighters that caught up with the balloon over Newfoundland and failed to bring it down were equipped with air-to-air missiles, but Lavoie said the pilots refrained from using heavier firepower. "Citizens would not have appreciated having a missile blowing over their heads," he said. "Also, it might be overkill - spending a couple of hundred thousand dollars on a missile to shoot down a balloon that's drifting away.

...Rudy, W5HRH

NEED A COLOR CAMERA...CHEAP?

Tom has some good advice! I received the Phillips color camera from ATV Research and checked it out. It really does a good job in just normal room light, so it is good for use in the ATV shack. The lens really will focus down to zero distance. I got the 5V wall plug power supply for it, but you could run it off of an external 5V at 350 ma. For mobile and portable, if you are using one of our rigs in a diecast box, you could drill and mount a 4.0xl.7mm coaxial DC power jack and run it to a 7805 regulator mounted low on the side wall. The die cast box should easily dissipate the 3 watts left in the 7805 when connected to the 13.8 Vdc. The jack is not one you can get at Radio Shack, so you might want to cut it off end use a 2. lx5.5mm plug and jack which are available. I could not really see much change with the back light switch on or off. The negative video switch was interesting, but not useful unless you want to focus on some negative film. So for $ 135, in my opinion, I think it is a real good deal for ATV applications.
...Tom O'Hara W60RG P. C. Electronics tomsmb@aol.com

MORE FUN ON "OUR" 2.4GHz BAND

Our 2.4GHz band is becoming fun for all and we're not alone. Although I tried to receive the blimp to remote truck transmissions at the last OSU football game, I could not find any signals. This is not to say that they're not there, only I couldn't see them. I encourage anyone to try and report their findings at future OSU games this fall. How about some of you mobile 2.4GHz ATV'ers. Try driving around the stadium on game day or if you go to the game, set up a portable system to get some "special play" details that will dazzle the ones around you. The following is what some have seen in other cities.

ABC on ATV! There are a number of broadcast video link channels in the 1900-2100MHz and 2450-2500MHz bands called RPU (Remote Pickup) channels. These come from news gathering trucks, stadium blimps, helicopters and race car cams etc. Its very interesting stuff when you can catch it. I live near Stanford University stadium and whenever I see the blimp hovering over a game, I breakout a special downconverter and modified (for narrowband FMTV) satellite receiver I threw together and tune into these bands. Tuning around the audio subcarriers sometimes reveals a talkback channel going from the blimp cam operator to the production truck. Note, however, that these are private transmissions and are not legal to retransmit on ATV. Have fun.
...Steve M. WF6R

Hi guys. Last night Monday Night Football was here in Detroit and on our ATV repeater we picked up the 2452.75 (channel 2 for you WavComm users) helicopter link. They zoomed in on the moon and on a group of people getting arrested in the parking lot but that didn't make it to prime time! So if you have an ABC event in your area check out the feed!
...Chris N8UDK Detroit Amateur Television Society (DATS)

CLASSIFIED SECTION...sell it or buy it by checking here first!

When items for sale are brought to our attention, we'll make sure it winds up with a notification here. This time we find Dale, WA8KQQ (front photo) cleaning house. He has the following list of "stuff'.

"I have a large collection of electronic devices that need to find a new home. I have a large amount of transmitting and receiving tubes of all kinds. I have precision resistors, all kinds of pots and pots with switches., wafer switches you have it. I have antique radio repair manuals, Sams photofacts and other books and manuals. Whole operating equipment as follows:

Polarad Spectrum Analyzer Model DU-2A with 3 plug-ins for 10-l000MHz, 910-4560MHz, 33000-44000MHz with manual.
Tek-Tronics dual trace scope model 535.
Audio oscillator TS-382 D/U 5-200 with multipliers X1-X10-X100-X1000.
B and K model 1077 TV analyst (flying spot scanner).
CMU 15 RCA 450MHz transmitter modifiable for ATV.

I have lots of things in the radio line that I do not need anymore. Will sell all for decent offer or by the piece. Thank you."

ATCO 2.4 GHz REPEATER UPDATE REPORT!

The 2.4 GHz input/outputs are Working Great!

Early this Spring, Dale, WB8CJW and I moved the 2.433 GHz Transmitter from the Bulletin Board site where it had been running over the winter months to the Repeater site. The improved height vastly improved the coverage of the 2.4 GHz transmitter! I have not yet heard of anyone who has tried to see the 2.4 GHz output with their Wavecom receiver and failed! In fact, using a unmodified Wavecom receiver with just the built in Patch antenna, I was able to get a good picture in my offce at work 4.5 miles away and I'm on a ground floor! Art, WA8RMC has done very well with a "Coffee" can about 13 miles away with a Wavecom receiver. Great success! I was able to see the output from 65 miles out while mobile early one morning, but I think the band was up. With all of this encouragement, we just had to add a repeater receiver on 2.4 GHz. In comparison, adding the 2.4 GHz transmitter was easy! The transmitter system on 2.433 GHz is an HF Technology HFT 2500 TX with 600 mw output driving a SSB Electronics 10 watt, 10 dB gain 2.4 amp to about 5.5 watts output. The antenna is a Comet GP 24 vertical feed with 40 ft of 7/8 hardline. The transmitting system was not cheap, but simple enough!

The problem

In order to add a receiver to the repeater on 2.4 GHz, we have to over come some problems, like what kind of receiver, the fact that "Wireless Cable" System Transmitters were just over on the next building, desense from our own 2.4 GHz transmitter. In addition we wanted to add a forth receiver to a repeater controller designed for 3 Rx inputs. Adding a 2.4 GHz receiver to the ATCO repeater was going to take some system design, a lot of "smarts" and more money. Dale, WB8CJW, provided the smarts and I provide most of the money and we shared system design.

The solution(s)

The first decision was what receiver to use. The answer was easy, a Wavecom RX on Channel 4 (2411 GHz). Dale repackaged a Wavecom Rx in a RF tight box. The first problem to over come is that when the Wavecom is first powered on, it defaults to channel 1, the output frequency of our transmitter! Dale's designed and built an ingenious little circuit to always step the RX to channel 4 on power up (see last ATCO newsletter for details). It works great! The next problem was how to add a 4th receiver to be scanned to a repeater controller designed for 3 scanned inputs? A number of approaches were considered, but the winning solution was to share one of the current inputs with the 2.4 GHz Rx. Using a P.C. Electronics Video Operated Relay (VOR), we normally pass the 2.4 GHz receiver video to the controller unless a 915 FMATV video (e.g. from the WX Radar or Bulletin board, etc link) presents itself and it will take priority. The next problems were desense from our own 2.4 TX and the Wireless Cable Transmitters next door. The solution was two 8-pole filters custom made and tuned by DCI. Not an easy tuning job to get 25 dB or more isolation for a pair of FMATV receiver and transmitter only 22 MHz apart! We wanted to keep the Wavecom chl and ch 4 pair to match existing Wavecom units owned by repeater users. DCI provided exactly what we wanted. The filters worked great! Next was the antenna. We (with WA8RMC on the "I" Beams) duplicated the Transmit antenna system (GP 24 and 7/8 Hardline) but hung the antenna up-side down (seal it really well if you do it!) directly below and a few feet down from the transmit antenna to get additional isolation. It worked Great!

It Works Great!!

So how's the system working? To coin a phase, it works great! Most everyone who has tried to get into the 2.4 GHz repeater r,eceiver has been successful! Most everyone is running modified Wavecom transmitters with 50-100 mw to loop yagis or conifer dish or Wireless Cable surplus Bar-B-Q grills or coffee cans or 5 dB vertical mobile antennas! Stations 15-20 miles away from the repeater site are routinely able to get into it with good signals. I was able to get in from 25 miles out while mobile (@ 65 MPH!) but I run 10 times more power mobile (1 watt!) using a 5 dB vertical antenna.

The more the Better!

Currently, about dozen stations in the Columbus area are receiving or receiving and transmitting 2.4 GHz. I believe about 25 Wavecom units have been purchased by local ATV'er so I expect to see more stations soon. So what's next for 2.4 GHz on the repeater? More power for the transmitter and a preamp on the receiver. After that, it's 10GHz or bust!

…73 & P5s Ken, WA8RUT

ATCO ANTENNA PARTY…fun and plots

Our first annual antenna party was held August 22 at the home of Ted, N8KQN. About 15 of were present who had a great time with lots of food and plenty of room to stretch out our antennas. It was an ideal location for this event. I call it our first annual party because we plan to have another one next year. If Ted will have us and we don't wear out our welcome, maybe he'll invite us back to his place.

We came with equipment to be able to measure and plot the patterns of 439 and 1280MHz antennas but time only permitted 439MHz measurements this year. Maybe next year more 1280 and possibly 2.4GHz antennas will be available. The equipment available will work up to 2.4GHz so guys, let's get busy for next year. All data was taken as follows: a reference antenna with signal source was set up at the end of the yard about 150 feet away. The antenna to be measured was attached to a portable mast with a rotor at the other end. The test antenna signal was then connected to a Boonton RF millivoltmeter and its dc output went to an A/D converter and into a computer. The computer program, created by KF8QU, started the rotor and read the digitized signal as the antenna rotated. The real time data was displayed in polar coordinate fashion on the CRT and when the rotation was complete the data was saved to a file for comparison and printing later. Pretty neat, huh? As we use it, some bugs are being found and refinements made so by next year perfection will be ours.

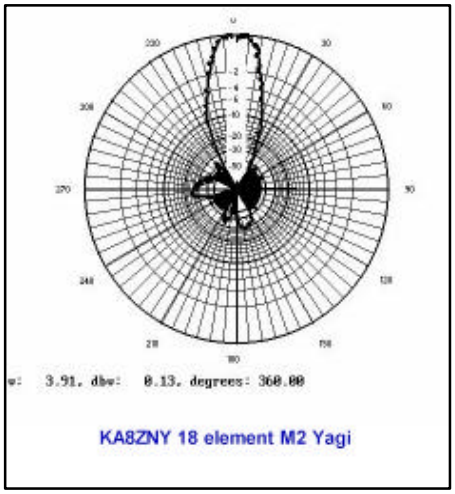
The pictures (taken by KF8QU's digital camera) captured some of the activity while the plots display that some antennas work very well while others need some refinement! Plots show pattern only here because all were normalized on forward gain. See you next year!

N8KQN ready to unload a BIG antenna from the test jig...

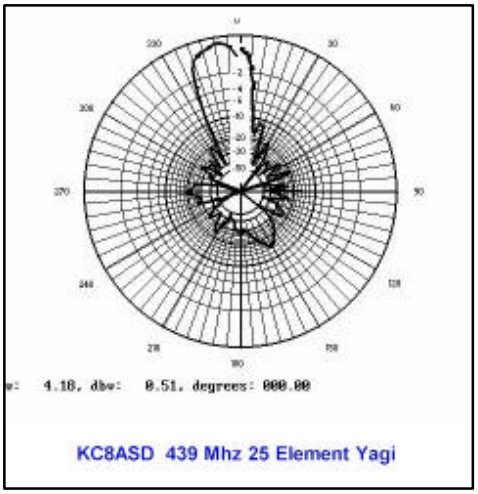
WA8RMC clamping another test antenna to the test jig

The raising of an antenna...

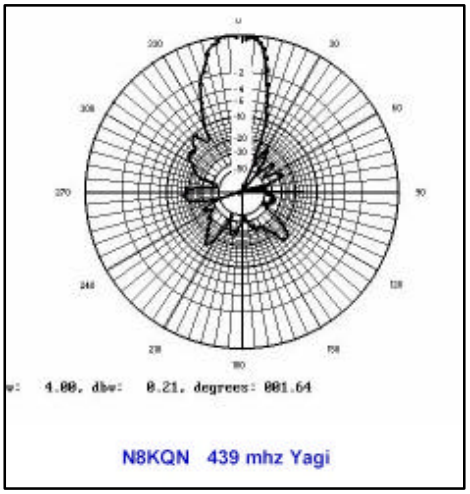
KS4GL & W8DMR discussing KS4GL's cloverleaf



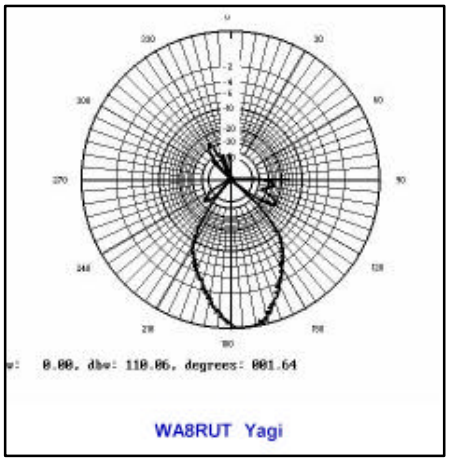
KA8ZNY 18 element M2 Yagi



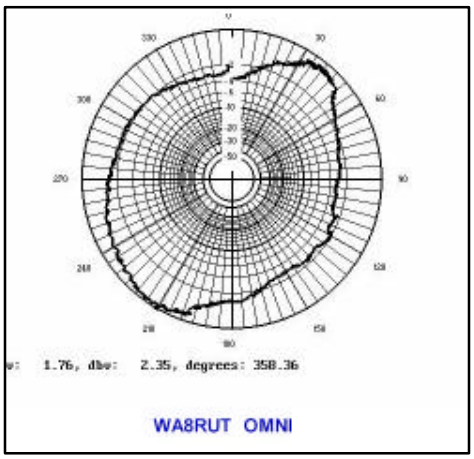
KC8ASD 439 Mhz 25 Element Yagi



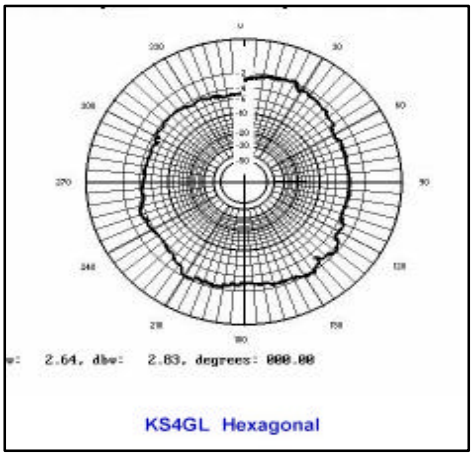
N8KQN 439 mhz Yagi



WA8RUT Yagi



WA8RUT OMNI



KS4GL Hexagonal

THE ATCO FALL EVENT IS ALMOST HERE!

Well guys, it's just about that time of year again. The ATCO Fall Event will be held on Sunday October l 8 at the ABB shelter house as was done last year. See map on next page. As always, there will be plenty of free food available, door prizes club news and most important, good friends with similar interests! The fun will start at about noon but formally we won't get started till about l :00PM.

Some of the topics we plan to cover are as follows:
1.) I talked to Ron Curry, WA3GSS the other day and invited his Ashland, Kentucky guys to join us so if he (they) can make it, we'll see if they can give us an update on the status of their repeater.
2.) I believe some of the guys from Dayton will be here also so lets see if an update from their direction is in order.
3.) There has been interest in a link between repeaters so I'm sure that a discussion here will prove to be interesting.
4.) Ken is prepared to discuss the status and future plans for the 2.4GHz portion of our repeater.
5.) It's officer election time again, so we need to vote according to our charter.

The present officers on the ballot are as follows:
President - Art Towslee WA8RMC
Vice president - Ken Morris WA8RUT
Secretary - Rick White WA3DTO
Treasurer - Bob Tournoux

NEW MEMBER SECTION

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 the lifeblood of our group so it's important that we actively recruit new faces aggressively.

Rick Heskett KB8EAA Columbus, Ohio 43229
Bud Nichols KC8ASD Hilliard, Ohio 43026
Harry Covault K8GCS Kettering, Ohio 45440

HAMFEST CALENDAR

This section is reserved for upcoming hamfests for as far in advance as we know about them. 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. I maintain some fliers that compile this list so for additional info Email me at towslee@ee.net. This list will be amended as further information becomes available.

October 25 Marion ARC, Marion, OH Karen Eckard, N8KE 6583 South Street Meeker, Marion, OH 43302 614-499-3565
November 1 Massillon ARC, Massillon, OH Don Wade, W8DEA 7300 Sunset Strip, A-7, North Canton, OH 44720 330-497-7232
November 14- 15 Fort Wayne, IN Doug Jones, N9NNT & Jim Boyer, KB9IH PO Box 10342, Fort Wayne, IN 46851 219484-3317
January 24 Tusco ARC, Dover, OH Howard Blind, KD8KF 6288 Echo Lake Rd. NE, New Philadelphia, OH 44663 330-364-5258
February 7 Northern Ohio ARS, Lorain, OH Mike Willemin, W8EU 331 Courtland St., Elyria, OH 44035-3116 440-324-4574
February 27-28 Cincinnati, OH William Tittle, KA8LAY 3038 Bracken Woods Ln., Cincinnati, OH 45211-7338 513-661-1861
February 28 Teays ARC, Circleville, OH Roy Ulko, KG8EK 132 West Main St., Circleville, OH 43113-1620 740-477-8310

ATV EQUIPMENT SUPPLIERS

Below is a list of manufacturers of ATV equipment that I have found. There is no endorsement of any of the manufacturers listed below so buyer beware. If I or anyone else that I know of, has had any trouble with a manufacturer, it won't be listed. As I get more info, I'll add manufacturers. Likewise, if I hear of any trouble, it'll be removed. Good luck and keep me advised. WA8RMC

Michael Kohlstadt, KD6UJS
has a limited supply of used but working Pacific Monolithics 2.4ghz downconverters and power supplies which will work fine for viewing the repeater.
Phone: 408-926-0430.

Down East Microwave
Antennas, Power Amplifiers, Deluxe Downconverters, microwave parts.
954 Rt. 519 Frenchtown, NJ 08825
Phone: 908-996-3584
Fax: 908-996-3702

HF Technologies Inc.
FMTV Transmitters, Receivers
457 Santa Fe Trail
Cary, IL 60013
Phone: 708-639-4336

PC Electronics
ATV Transmitters, Receivers Manufacturer/Reseller
2522 Paxson Ln.
Arcadia, CA 91009-8537
Phone: 626-447-4565
Fax: 818-447-0489
tom@hamtv.com
www.hamtv.com

Phillips-Tech Electronics
MMDS, ITFS downconverters and antenna systems
P.O. Box 8533
Scottsdale, AZ 85252
Phone: 602-947-7700
Fax: 602-947-7799

R. Myers Communications
Good, single unit, source for 2.4GHz dishes
P.O. Box 17108
Fountain Hills, AZ 85269-7108
Phone: 602-837-6492
Fax: 602-837-6872

SHF Microwave Parts Company
10GHz Gunn oscillators and Antennas
7102 W. 500 S.
LA PORTE, INDIANA, 46350
Fax: 219-785-4552

Wyman Research Inc.
FMTV Transmitters, Receivers
Box 95, RR 1
Waldron, IN 46162
Phone: 765-525-6452

DCI Communications
Interdigital filters and cavities
Box 293, 29 Hummingbird Bay
White City, SK, Canada S0G5B0
Phone: 306-781-4451

ATV Research Inc.
TV cameras & related parts
1301 Broadway PO Box 620
Dakota City, NE 68731-0620
Phone: 402-987-3771
Homepage: www.atvresearch.com
Email: atc@pionet.net

GEKCO Inc
TV test signal circuit boards
PO Box 642
Issaquah, Wa 98027-0642
Phone: 425-392-0638
Email: sales@gekco.com
Homepage: www.gekco.com

M2
Antennas
7560 N. Del Mar Ave.
Fresno, Ca 93711
Phone: 209-432-8873

ATV Quarterly (ATVQ)
ATV magazine publisher
5931 Alma Drive
Rockford, Il. 61108
Phone 815-398-2683
FAX 815-398-2688
Email: atvq@aol.com
http://www.cris.com/~Gharlan

Spectrum International
J-Beams, KVG, Micromodules,VSB filters
John Beanland
Phone:978-263-2145.
Email: Spectrum@ma.ultranet.com

Note: Additional commercial vendors may be viewed on the Internet at http://bro.net/explorer/vendor.html

INTERNET INFO

If you have access to the INTERNET, you may be interested to know of some of the HAM related information that is available. Most addresses listed below are case sensitive, so type exactly as shown below. (If anyone has comments or would like additional listings contact me via Email at towslee@ee.net).

http://psycho.psy.ohio-state.edu/atco	ATCO ATV home page.
http://www.bright.net/~rmeeksjr/atv_day.htm	Ohio, Dayton ATV group
http://fly.hiwaay.net/~bbrown/index.htm	Alabama, Huntsville,Tennessee Valley ATV (Bill Brown WB8ELK)
http://www.hayden.edu/Guests/AATV	Arizona, Phoenix Amateurs
http://www.citynight.com/atv	California, San Francisco ATV
http://www.ladas.com/ATN	California, **A**mateur **T**elevision **N**etwork in Central / Southern
http://w6yx.stanford.edu/~stevem/atv	California, South Bay ATV Group Stanford University
http://www.qsl.net/wb6izg	California, southern ATV Sights and Sounds
http://home1.gte/k4lk	Florida, Tampa Bay ATV Society (TBATS)
http://www.mindspring.com/~rwf/aatn1.html	Georgia, Atlanta ATV
http://ww2.netnitco.net/users/stealth/kens.htm	Indiana KB9I homepage
www.mychoice.net/fminton/silatvg.htm	Southern Illinois Amateur Television group
http://www.smart.net/~brats	Maryland**,** Baltimore Radio Amateur Television Society (BRATS)
http://www.murphysoftware.com/dats	Michigan, Detroit DATS ATV
http://www.njin.net/~magliaco/atv.html	New Jersey, Brookdale ARC in Lincroft
http://www.intercenter.net/triatv/atv-web.htm	N. Carolina, Raleigh.Triangle ATV club
http://www.navicom.com/~satva/satvainf.htm	Oregon, Silverton, Salem ATV Assoc (SATVA)
http://www.lloydio.com/oatva.html	Oregon, Portland ATV (OATVA)
http://www.webczar.com/atv	Oklahoma, Tulsa Amateur TV (TARC)
http://members.aol.com/n3kkm/w3hzu.html	Pennsylvania, York Keystone VHF Club
http:www.usaor.net/users/ka3fzf/index.htm	Pennsylvania, Pittsburg Amateur Television in Pittsburg
http://www.voicenet.com/~theojkat/w3phl.html	Pennsylvania, Phila. Area ATV
http://www.geocities.com/Hollywood/5842	Tennessee, East ATV
http://www.stevens.com/HATS/home.html	Texas, Houston ATV
http://uugate.ampr.utah.edu/utah_atv/utah_atv.html	Utah ATV
http://www.bchfs.org/metrovision/atv.htm	Virginia, Alexandria
http://www.qsl.net/w7twu	Washington, Western Washington Television Society (WWATS)
http://scott-inc.com/wb9neq.htm	Airborn ATV from WB9NEQ in Bowling Green, Kentucky
http://www.premiernet.net/~hcantrl/	Kentucky, Bowling Green (CKATS)
http://www.ecn.net.au/~sbloxham/index.html	Australia, ATV, VK4GY (large list of other ATV & ham radio sites)
http://ourworld.compuserve.com/homepages/batc	British ATV club (BATC)
http://www.sfn.saskatoon.sk.ca/recreation/hamburg/hamatv.html	Saskatoon, Canada ATV
http://www.gpfn.sk.ca/hobbies/rara/atv3.html	Regina, Canada ATV
http://www.inside.co.uk/scart.htm	UK,Great Britain ATV (SCART)
http://www.cmo.ch/swissatv	Swiss ATV

NOTE: If you're a regular Internet browser, maybe you'd like to be kept up to date on all of the ATV related news generated Nationally. If so, subscribe to the "ATV Internet mailing list" to receive the bulletins automatically. If you'd like to SEND a message to all other subscribers this can be done also. It's free to all. To *subscribe*, send Email to "listserv@tallahassee.net" and include in the message the line SUBSCRIBE ATV.To *send a message* address it to "ATV@tallahassee.net". To be *removed* from list, send Email to "listserv@tallahassee.net and include in the message "UNSUBSCRIBE ATV".
The following addresses are helpful in searching for many different Ham Radio items on the INTERNET.

http://www.cris.com/~Gharlan	ATVQ Magazine home page. ATV equipment & article references.
http://www.hamtv.com	PC Electronics Inc. Lots of proven ATV equipment for sale.
http://downeastmicrowave.com	Down East Microwave Inc. Lots of uhf/microwave parts & modules.
http://www.yahoo.com/Entertainment/television/Amateur_television	Listing of some of the available ATV home pages.
http:/www.acs.ncsu.edu/HamRadio	General ham radio info- satellite track, call sign database etc.
http://www.arrl.org/hamfests.html	Current yearly hamfest directory.
http://amsat.org	AMSAT satellite directory/home page.
http://www.arrl.org	ARRL home page
http://www.ualr.edu/doc/hamualr/callsign.html	Search by call sign or name.

http://hamradio-online.com	Ham Radio Online “newsletter” Lot of Ham related information.
http:www.smart.net/~brats/atna.html	**ATNA** homepage

ATCO REPEATER TECHNICAL DATA SUMMARY

This space of each publication includes the technical information of our repeater. Each time a new feature is brought on line it's added here. Use this as a quick reference for up/down access codes as well as some of the more important parameters of our system.

Main repeater: Location: Downtown Columbus, Ohio

Coordinates: 82 degrees 59 minutes 53 seconds (longitude)
39 degrees 57 minutes 45 seconds (latitude)

Elevation: 630 feet above average street level
1460 feet above sea level

Transmitters: 427.25 MHz AM modulation, 1250 MHz FM modulation and 2433 MHz FM modulation.
interdigital filters in output line of 427.25 & 1250 transmitters
Transmitter Output Power - 40 watts average 80 watts sync tip (427.25)
50 watts continuous (1250)
8 watts continuous (2433)
Link transmitter - 1 watt NFM 5 kHz audio (446.350 MHz)

Identification The 427, 1250 and 2433 transmitters identify simultaneously every 10 minutes with video showing ATCO and WA8RUT with four different screens. Audio identification is 4 sequences of Morse Code.

Transmit antennas: 427.25 MHz - Dual slot horizontally polarized 7 dBd gain major lobe west
1250 MHz - Diamond vertically polarized 12 dBd gain omni
2433 MHz - Comet vertically polarized 12 dBd gain omni

Receivers: 147.45 MHz for F1 audio input control of touch tones
439.25 MHz for A5 video input with FM subcarrier audio (lower sideband)
915 MHz for F5 video link data from remote sites
1280 MHz for F5 video input
2411 MHz for F5 video input

Receive antennas: 147.45 MHz - Vert. polar. Hi Gain "Comet" 12 dBd (also for 446 MHz output)
439.25 MHz - Horiz. polar. dual slot 8 dBd gain major lobe west
915 MHz - Vert. polar. dB Products 10 dBd gain
1280 MHz - Horiz. polar. single slot 3 dBd gain major lobe west.
2411 MHz - Comet vertically polarized 12 dBd gain omni

		UP	DOWN
Input control:	Major Touch tones: beacon (5 min)	*439	#
	regional weather radar	697	#
	Local radar(5 min)	264	#
	User repeat 1 minute	*45	*22
	Touch tone pad tester	#0	#5
	Manual mode (ID)	*77 90	*22
	(910 input)	*77 91	*22
	(439 input)	*77 92	*22
	(1280 input)	*77 93	*22
	(cabinet cam)	*77 94	*22
	5 second ID	#9	*22
	Bulletin board	285 pause 92	286
	Roof Camera	285 pause 95	286
	Reset to scan mode	D37 or #437	

Remote sites: **Local radar (inactive at this time) (915 MHz link output 8 watts)
Aux link at WA8RUT QTH (915 MHz link output 1 watt)
Aux link at WB8CJW QTH (915 MHz link output 1 watt)

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 $10.00 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 the ATCO newsletter quarterly in January, April, July, and October. The newsletter is sent to each member without additional cost.

The membership period is from January 1ST to December 31ST. New Members 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. Your support of ATCO is welcomed and encouraged.

ATCO CLUB OFFICERS

President:	Art Towslee WA8RMC	Repeater trustees:	Art Towslee WA8RMC
V.President:	Ken Morris WA8RUT		Ken Morris WA8RUT
Treasurer:	Bob Tournoux KF8QU		Dale Elshoff WB8CJW
Secretary:	Rick White WA3DTO	Statutory agent:	Rick White WA3DTO
Corporate trustees:	Same as officers	Newsletter editor:	Art Towslee WA8RMC

ATCO MEMBERSHIP APPLICATION

RENEWAL O NEW MEMBER O DATE _____ CALL _____

OK TO PUBLISH PHONE # IN NEWSLETTER YES O NO O 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 O MONEY ORDER O

Make check payable to ATCO or Bob Tournoux & mail to: Bob Tournoux KF8QU 3569 Oarlock CT Hilliard, Ohio 43026

TUESDAY NITE NET ON 147.45 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 would like to 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. Then a second round follows with periodic checks for late check-ins. We rarely chat for more than one hour so please join us if you can.

ATCO TREASURER'S REPORT - de KF8QU

OPENING BALANCE (7/12/98).....	$ 662.13
RECEIPTS (dues).....	$ 100.00
OTHER INCOME (bank interest).....	$ 4.64
EXPENDITURES	
(Postage for July Newsletter).....	$ 38.50
(film and development).....	$ 12.51
CLOSING BALANCE (10/10/98).....	$ 585.76

ATCO MEMBERS AS OF 10 OCTOBER 1998

K8AEH	Wilbur Wollerman	1672 Rosehill Road	Reynoldsburg	Oh	43068	866-1399	
KC8ASD	Bud Nichols	3200 Walker Rd	Hilliard	Oh	43026		
WB4BBF	Randall Hash	212 Long Street	Bluefield	Va	24605		
W4/F5BJV	Marcel Pitzini	443 Eastland Drive	Decatur	Ga	30030	404-378-2772	
KC8BNI	Fred Stutske	8737 Ashford Lane	Pickerington	Oh	43147		kc8bni@amsat.org
KC8CNV	Jack Compson	5065 Sharon Hill Dr	Columbus	Oh	43235	451-4054	kc8cnv@ee.net
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	Oh	43065	766-5823	dale.elshoff@usiny.mail.abb.com
WA8DNI	John Busic	2700 Bixby Road	Groveport	Oh	43125	491-8198	wa8dni@juno.com
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	Oh	42616	419- 691-1625	
WA4DFS	Ed Walker	PO Box 150	Mountain City	Tn	37683	423- 727-9611	ebwalker@preferred.com
WA3DTO	Rick White	5314 Grosbeak Glen	Orient	Oh	43146	877-0652	wa3dto@aol.com
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	Oh	43026	876-6033	wb8dzw@aol.com
KB8EAA,KB8VBF	Rick, Judy Hesket	6261 Maple Canyon Dr	Columbus	Oh	43229	891-3887	rjheskett1@worldnet.att.net
W8EHW	Foster Warren	P.O. Box #32	No. Hampton	Oh	45349		
KB8FF	Dave Tkach	2063 Torchwood Loop S	Columbus	Oh	43229	882-0771	tkack@copper.net
KS4GL	John Barnes	216 Hillsboro Ave	Lexington	Ky	40511	606-253-1178	ks4gl@juno.com
WD4GSM	E.R. Hall	4955 Pole Bridge Rd	Wise	Va	24293	540- 328-9235	
K8GCS	Harry Covault	4820 Archmore Dr	Kettering	Oh	45440	937- 434-5412	k8gcs@megsinet.net
K6GUC	Reuben Meeks	428 Lewiston Road	Kettering	Oh	45429	937- 294-0575	rmeeksjr@megsinet.net
KA8HAK	Jim Reese	1106 Tonawanda Ave	Akron	Oh	44305		
WA8HFK,KC8HIP	Frank, Pat Amore	3630 Dayspring Dr	Hilliard	Oh	43026	777-4621	
W8JND	Richard Knowles	573 Plaza Drive	Circleville	Oh	43113	477-8132	
N8KQN	Ted Post	1267 Richter Rd	Columbus	Oh	43223	276-1820	
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	Oh	45331	513- 548-2492	
K8MBY,N8SIR,KB8UVK	Phil,Jim,Phil jr Buckholdt	153 East Bergey St	Wadsworth	Oh	44281		
N8LRG	Phillip Humphries	3226 Deerpath Drive	Grove City	Oh	43123	871-0751	phumphries@iwaynet.net
KA8MID	Bill Dean	2630 Green Ridge Rd	Peebles	Oh	45660		deanfam@bright.net
KB8MDE	Shaun Miller	5061 County Rd 123	Mt Gilead	Oh	43338	419- 768-2588	kb8mde@bright.net
K8MZH	Leland Hubbell	7706 Green Mill Road	Johnstown	Oh	43031	967-8412	
WD8OBT,KB8ESR,KA8ZPE	Tom Camm & sons	1634 Dundee Court	Columbus	Oh	43227	860-9807	
N8OCQ	Robert Hodge	3689 Hollowcrest	Columbus	Oh	43223	875-7067	
N8OOA	Jeff Clark	9894 Fincastle-Winchester	Sardinia	Oh	45171	937- 695-1229	
N8OPB	Chris Huhn	146 South Hague Ave	Columbus	Oh	43204	279-7577	
W6ORG	Tom O'Hara & family	2522 Paxson Lane	Arcadia	Ca	91007	626- 447-4565	tom@hamtv.com
WB8OTH	Perry Yantis	1850 Lisle Ave	Obetz	Oh	43207	491-1498	pyantis@compuserve.com
WA2PCH	Craig Stoll	PO box 1117	Orchard Park	Ny	14127		
KE8PN	James Easley	1507 Michigan Ave	Columbus	Oh	43201	421-1492	jeasly@ee.net
W8PGP,WD8BGG	Richard, Roger Burggraf	5701 Winchester So. Rd	Stoutsville	Oh	43154	614- 474-3884	
KF8QU	Bob Tournoux	3569 Oarlock Ct	Hilliard	Oh	43026	876-2127	rtournou@columbus.rr.com
W8RIK	Joe Hussey	1678 Sandhurst Rd	Columbus	Oh	43229	895-7601	
WA8RMC	Art Towslee	180 Fairdale Ave	Westerville	Oh	43081	891-9273	towslee@ee.net
WA8RUT,N8KCB	Ken & Chris Morris	3181 Gerbert Rd	Columbus	Oh	43224	261-8583	wa8rut@aol.com
W8RVH	Richard Goode	9391 Ballentine Rd	New Carlisle	Oh	45334	513- 964-1185	w8rvh@glasscity.net
WD8RXX	John Perone	3477 Africa Road	Galena	Oh	43021		
WA8SAR	Gary Obee	3691 Chamberlain	Lambertville	Mi	48144		
N8SFC	Larry Campbell	316 Eastcreek Dr	Galloway	Oh	43119	851-0223	larry@psycho.psy.ohio-state.edu
WA8SJV	John Beal	2899 Castlebrook Ave	Columbus	Oh	43026	876-9412	
W8STB	John Hey & family	894 Cherry Blossom Dr	West Carrolton	Oh	45449	937- 859-5295	w8stb@megsinet.com
N8TBU	Ed Latham	8399 Fairbrook Ave	Galloway	Oh	43119		
KB8TRP,KB8TCF	Tom, Ed Flanagan	1751 N. Eastfield Dr	Columbus	Oh	43223	272-5784	eflanagan@ohlck.ang.af.mil
WA8TTE	Phil Morrison	154 Llewellyn Ave	Westerville	Oh	43081		
KB8UGH	Steve Caruso	39 South Garfield Ave	Columbus	Oh	43205	461- 5397	scaruso@freenet.columbus.oh.us
WB8URI	William Heiden	5898 Township Rd #103	Mount Gilead	Oh	43338	419- 947-1121	
KB8UU	Bill Rose	9250 Roberts Road	West Jefferson	Oh	43162	879-7482	
WB8VJD	Rick Morris	203 Merton Street	Holland	Oh	43528		
KA8VUQ	Jack Wolff	2682 Hiawatha Ave	Columbus	Oh	43212	263-3092	
W8WAU	Jake Fuller	PO Box 117	No. Hampton	Oh	45349		
N8WLT	James Neymeyer	2879 East Moreland Drive	Columbus	Oh	43209	237-2331	
KB8WBK	David Hunter	45 Sheppard Dr	Pataskala	Oh	43062	740- 927-3883	dhunter147@aol.com
N8XYJ	Dan Baughman	4269 Hanging Rock Ct	Gahanna	Oh	43230	471-1089	
KB8YIO	Ric Wise	1465 25th Ave	Columbus	Oh	43211	291-6508	rwise@columbus.rr.com
KB8YMN	Mark Griggs	2160 Autumn Place	Columbus	Oh	43223	272-8266	mmgrigs@aol.com
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	Oh	43064		
KB8ZLB	Dave Kibler	243 Dwyer Rd	Greenfield	Oh	45123	937- 981-4007	k154@bright.net
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	Oh	43125	836-3519	ka8zny@copper.net

ATCO Newsletter
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