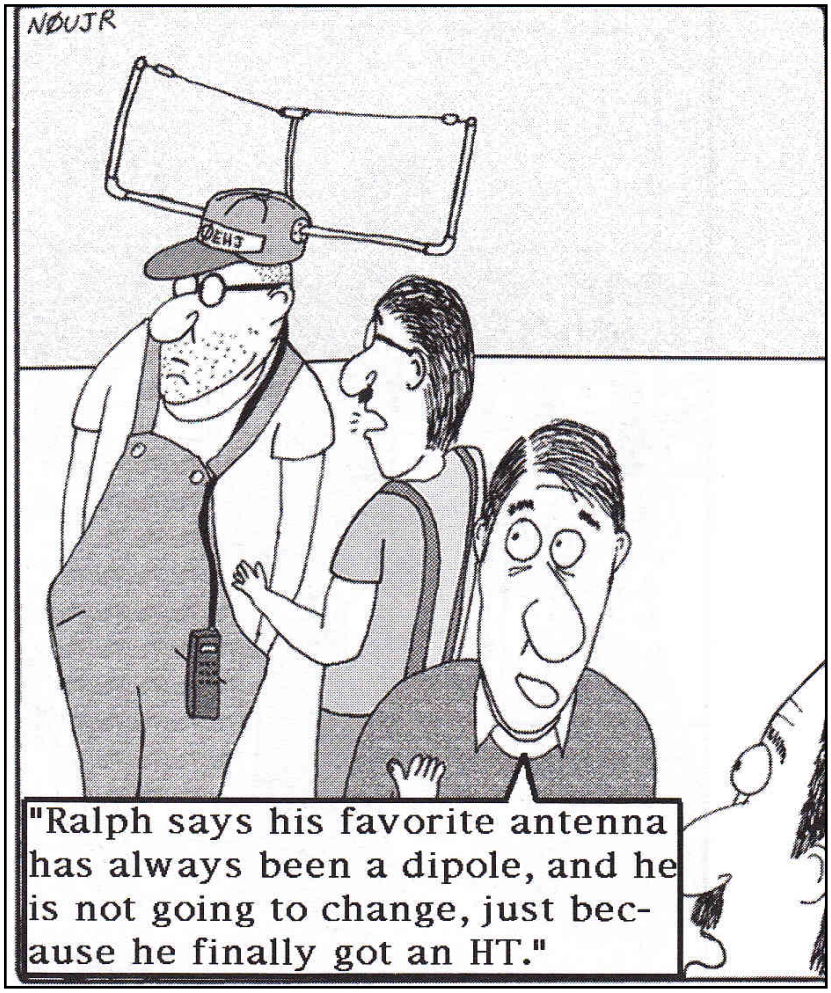
ATCO NEWSLETTER

VOLUME 29 NUMBER 3 **July 2012**

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 Greg Trook N0UJR for allowing us to share one of his cartoons. See also http://incolor.inetnebr.com/n0ujr/.



ACTIVITIES ... from my "*Crippled*" Workbench

It's Newsletter time again and with less than normal activity to report. Hmmm, why are we seeing less and less activity as time goes on? Well, it's the hot weather that's dampening the activity here for sure as I am stalling in an effort to put up a new tower. When I think about the hole to be dug and house brackets needed, I naturally gravitate toward activities within the confines of air conditioning. However, it isn't going to get done by itself and my wife will only lend moral support so I guess I need to "dig in" and get busy. The first order of business here is to secure the needed city permit. I've already contacted the city and they've outlined their requirements so I need to complete that portion before actual construction starts. They need a complete house plot plan with details on where the tower will be located and how it will be secured. Since they will allow a 50 foot tower, I'm planning on a 2 section 40 foot crank up one secured to the house peak at 23 feet. That eliminates the need for guy wires. I know it's sneaky but I also have a telescoping mast, like the ones used on broadcast ENG trucks that will fit inside the tower top section. It is 8 feet tall and telescopes out to 28 feet so a 40 foot tower will theoretically go up to 60 feet or so. When installed, I can crank it up when needed and keep it nested below 40 feet when not in use. That should help keep the neighbors satisfied too. That's neat, huh?

OK, so much for that. Now, it's on to other matters. The 1258 MHz analog repeater output quit a short time ago so a trip was needed to find out what was wrong. When I arrived, I saw the "25 VDC OK" light not on so I knew it was a power supply problem that couldn't be fixed on site. I removed it and brought it home for repair. The total supply consists of (4) 5 volt 8 amp switching supplies in series to fit inside the 1U rack chassis with each supply adjusted up to 6.25 volts. One of the middle ones decided to quit and blew its internal fuse. I have no explanation as to why as it has been in service for about 3 years now. Anyhow, a new supply fixed it. While I had it on the bench, I noticed the output power down a bit from 60 to about 40 watts. An attenuator adjustment brought it back up to about 55-60 watts so the signal should be a little better when I re-install it.

The 1280 MHz repeater receive antenna quit working so I switched the line to a spare 1200 MHz antenna and returned home with the "defective" one. Upon an inspection at home, I found the antenna OK as is. So I cleaned it up a bit and returned it to the repeater site. Tom Bloomer, KB8WRI, went with me because I don't want to climb on the girder work by myself. We checked the transmission line to find it was shorted. I replaced the short ½" Superflex jumper at the end of the 7/8" line at the antenna with a slightly longer piece of true ½" Heliax and re-connected it to the line. The short was still there! Then I tapped the 7/8" Heliax end at the antenna rather hard and the short went away! "Problem fixed!!!". OK, the real problem is in the connector but it was heavily coated with coax seal and located where it was not easy to get to without removing the entire line so we left it as is. I know it will probably come back but that task will be for another day when we have more time. Are there any volunteers????

The Red-White-Boom camera security activity was normal this year except that I was under manned. Because I could find no volunteers besides Bob, W8RWR, I needed to be as efficient as possible so the two of us could handle it. Tom, KA8ZNY, who usually helps, was unavailable so I had to make do with the cameras I had. Dale, WB8CJW, helped to build another remote camera controller to complement the one I already had. They were put to use as remotely controlled cameras on the Gas Co. and AEP roofs. I went to each location the day before and installed them so I wouldn't have to do that on July 3rd. They both worked great and were operated by John Chapman at the Police EOC. However, I found that the camera on the AEP roof was not the best selection as it didn't produce good video in bright sunlight and was not too helpful after dark. Next year I'll select a better camera unit. We operated each camera via touch tones on 449.975 and 449.985 MHz. Next year I plan to use 446.350 MHz with a different PL tone for each, install them a few days before and leave them there till the next weekend. That way the normal 446.350 repeater output can be used to control them from home if needed so any of us could pan the city landscape downtown. Next year, I would like to have more volunteers! I say that now so someone can plan for it in advance. How about it, any takers? The Police have begged us to continue as they have no better way to observe the crowd at this event. I like to do it because I feel it helps us to provide a little civic service to the community.

Oh, there are two more things: We need a new Secretary and also a Statutory Agent representative for our club because Frank Amore, WA8HFK, has moved to California. The Statutory Agent job is really not a "job" as such. It's only the official contact for the State of Ohio about our incorporation information. If the State needs to contact us, they contact the "Statutory Agent" on file with them. Will anyone volunteer for this? The Secretary job needs to be re-assigned also. I'd like to have someone volunteer for this to take notes of the proceedings at our Spring and Fall Events. Then the notes should be passed on to me for publication in this Newsletter. They don't need to be "publication ready" but only jotted reminders of the important topics discussed so I don't miss them later. Again, someone please help by volunteering for this.

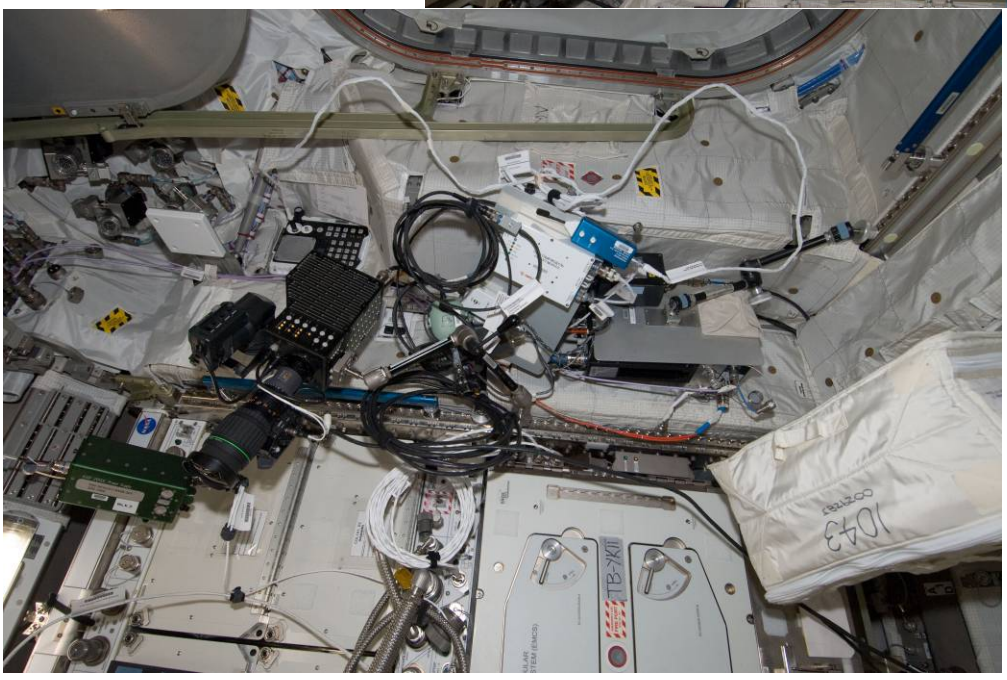
That's about it for this time guys.
…73, WA8RMC

DATV IN THE INTERNATIONAL SPACE STATION…an approved project

In the framework of an educational program, ESA has approved and funded the Amateur Television (HAMTV) project for the International Space Station (ISS), proposed by AMSAT Italia, a national radio amateur organization, and ARCOL, a multinational Working Group dealing with amateur radio issues onboard the Columbus Module of the ISS. The ARISS HAMTV project will make possible to view the astronauts and their ISS living habitat to ground stations operated by radio amateurs, by means of a new audio/video transmitter payload, named HAMVIDEO, providing a one way audio/video link from the ISS to the ground, which can be received on earth with simple low cost receivers. In the frame of ESA ESTEC / KAYSER ITALIA Contract n. 4000104115/11/NL/BJ “ARISS HAM VIDEO”, KAYSER ITALIA SRL (Livorno, Italy) is in charge as prime contractor for the design and development of the flight and ground segment. KAYSER ITALIA (KI) is an Italian SME with deep expertise in the development of scientific payloads for space applications, with a record of more than 80 payloads flown during 50 space missions matured in the course of 25 years. AMSAT ITALIA, as Italian satellite amateur radio society acting on behalf of the ARISS organization, will provide its specific support in the design phase, and will be involved during the entire project. HAMVIDEO, once installed into COLUMBUS, will be connected to the existing ARISS S Band antenna, to the Video camera, and to the KI already developed “KuPS” Power Supply. The HAMVIDEO, complemented by a number of ground stations, will be operated in the frame of ARISS "Amateur Radio on the International Space Station". The international ARISS organization offers students from all over the world the opportunity to talk with astronauts onboard the ISS. This program is supported by the space agencies for the promotion of STEM studies (Science, Technology, Engineering and Mathematics). Until now, these "Space Talks" are done in half duplex voice mode. HAMVIDEO will let the students see the astronauts in space talking to them and performing experiments. ARISS operations are conducted by volunteering radio amateurs, specialized in satellite communications. The HAMVIDEO payload successfully went through the PDR phase in March 2012 and will be ready for launch in spring 2013.

These pictures show the interior of the ISS Columbus module where the DATV equipment will be located. The connectors going to the two S band antennas already installed on the outside are located at the bottom left of the bottom photo just below the camera lens. It looks to me like total disarray so I volunteered to go there and tidy things up a bit.

(They haven’t gotten back to me on that one yet).



In addition to the DATV equipment it has been decided to also provide a low power 100 mw CW beacon to aid tracking efforts. The 10 watt DATV signal cannot be left on 24/7 because of power and temperature limitations but the CW beacon can. At this time it is planned to have it operate somewhere around 2400 MHz but that may change. I’ll keep us informed as the details become more concrete.
…WA8RMC

SOLDERING – Some Basic Information

by Bob Eckweiler, AF6C… courtesy Orange County Radio Club Inc. www.w6ze.com.

Here's an article dear to all of our hearts as I'm sure we've all had some soldering experience at one time or another. Many, I've been told, have given up home construction projects just because of the lack of soldering proficiency. That's too bad because with just a little practice, most of us can master this "art" acceptably. As most of you know by now, I encourage construction projects so this really fits in to the ATV environment. Happy soldering! WA8RMC

Introduction

Soldering is a process of using a low melting temperature metal alloy to join two pieces of metal together. The process is also often used for coating metals. Plumbing and stained glass assembly are just a few of the many places where soldering is employed. Soldering is used heavily in the electronic industry to connect circuits together. This white paper focuses on the process of soldering as it relates to the electronic hobbyist and Ham operator.

Soldering involves heating the components to be joined as well the solder. Assuming the items to be joined are clean, when the area of the connection reaches the correct temperature the solder melts and binds the metal parts to be joined together when it cools. The success of soldering depends on cleanliness, proper temperature and keeping the connection still while the solder cools.

Solder Types

Solder comes in many alloys, integral flux types, and sizes. A quick survey listed over 150 different types of solder alloys; on top of that solder often contains one of several types of flux. We'll discuss flux a bit later. Solder also comes in different shapes and sizes. Most common is the wire shape, although sheet, bar and even brick shapes are available for specific uses.

For hobby electronics you will mostly be using wire solder; however even wire solder comes in numerous diameters. Wire solder can be found from 0.125" (1/8") down to 0.015" and smaller. The largest solder you will probably use for electronic soldering is 0.062" (1/16"). This is good for chassis terminal work and "UHF" and "N" type coaxial connectors. Solder with a diameter of 0.040" or 0.031" (1/32") is normally used for through-hole circuit board hand assembly and can be used in place of the larger diameter solder if the larger size is not available. Just realize that you have to use a longer length of solder to get the same volume and sometimes the extra movement can add a bit of difficulty to feeding the solder. The small 0.022" (and smaller diameters) are used for fine work and hand soldering surface mount components.

For many years the most common solder type for electronics contained an alloy of tin and lead (sometimes with traces of silver and or copper added). With the recent environmental movement, lead in solder has become less popular and lead-free solder is becoming more of a standard. Lead is a known heavy metal poison and while exposure during soldering can be controlled; the scrapped electronics that is ending up in our landfills contains a lot of solder that can leach lead into the soil. Many newer electronic components are now marked as RoHS (Restriction of Hazardous Substances) in part indicating the use of lead-free solder.

Tin-lead solder however has a lot of advantages for general electronic work for the hobbyist. For electronics it is usually found in a ratio of 60:40 - often designated SN60, or 63:37 – often designated SN63. The two numbers between the ratio colon are the percent of tin to lead. SN63 is ideal as it is a **eutectic** mixture (we'll discuss eutectic in a separate paragraph). SN60 is close enough to the eutectic point to work well, is less expensive and more readily available. Until lead-free solder came on the scene SN60 was the solder used for mostly all common electronic soldering.

Eutectic Point of Solder:

So, what is the eutectic point? Pure tin melts at 232°C; pure lead melts at 328°C. When you combine them the melting point of the alloy is lower than either element and varies with the ratio of the two. At one particular ratio the alloy melts at its lowest temperature. This is the eutectic point. For tin-lead solder that point is 63% tin and 37% lead and has a melting point of 183°C. At this point the alloy goes from solid directly into liquid. At all other mixtures of tin and lead the solder goes through a stage of being "pasty" where the paste is one element being liquid and the other being solid particles within the liquid. This is illustrated in the following graph with the eutectic point marked by the broken line:

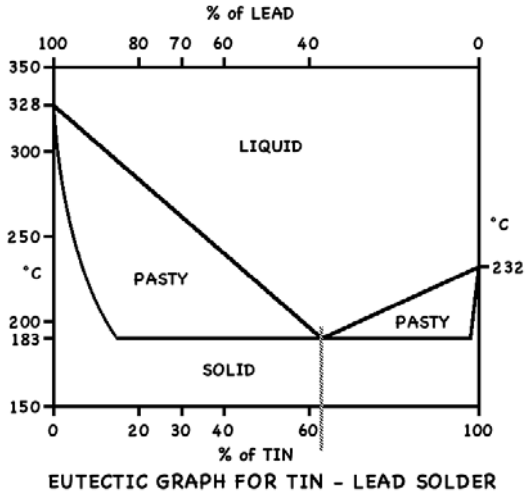


Figure 1: EUTECTIC GRAPH FOR TIN - LEAD SOLDER

If you look at the point for 60:40 tin-lead solder (just to the left of the eutectic point) you'll see there is a small temperature range where the solder is pasty. When you solder you want to be sure that the solder and the area it touches is above this pasty temperature zone. You also want to be sure that when the solder joint is cooling that the parts are held steady while the solder cools through this pasty zone. SN60 solder reaches its liquid state at 188°C so the pasty point is only 5°C wide and generally easily managed.

Solder can also contain other elements; trace amounts of silver and/or copper are sometimes added. These are elements that are

dissolved by solder. While the copper in wire being soldered is not a problem, soldering iron tips often contain copper and the solder will erode these tips over time. Also silver bearing solder is sometimes recommended for soldering silver plated components such as plate coils. Silver and copper also add some additional tensile strength to the soldered joint.

As mentioned earlier, lead-free solder is becoming more prevalent in the electronic industry. The solder that comes with soldering practice kits contains lead-free solder that is 99.3% tin and 0.7% copper. It has a rosin flux core. This variety of solder melts at 227°C, 39°C higher than common SN60 solder. It is an inexpensive solder (actually the word cheap was used in the reference I perused) and is recommended for lead-free wave soldering. I must admit I have never used this type of solder, so I brought SN60 solder for students to use in the class if they desired. I recommend that you do use the SN60 solder, at least while you are new at soldering. You can switch to other RoHS solder after you gain experience. The chart on the next page lists a few common solder types and their specifications. Many of these are available at Radio Shack as well as electronic distributors.

Flux

Flux is a reducing agent used to remove oxidation and help clean the parts to be joined. It comes as a liquid or paste and most electronic wire solder includes flux integral to the solder, usually inside one or more "cores" running lengthwise. "Solid wire" solder has no flux.

COMMON TYPES OF ELECTRONIC SOLDER

CLASS & Designation	Tin (Sn)	Lead (Pb)	Silver (Ag)	Copper (Cu)	Melting Temperature	Eutectic	Comments
LEADED:							
SN60	60.0%	40%	(none)	(none)	188°C 370°F	(close)	Most common electronic solder
SN63		37%	(none)	(none)	183°C 361°F	Yes	Less common eutectic version of SN60 electronic solder
62/36/2		36%	2%	(none)	179°C 354°F	Yes	Higher strength tin-lead solder
LEAD FREE:							
99.3/0.7	99.3%		(none)	0.7%	223°C 433°F	Yes	(alloy 244) Supplied with soldering kit
96/4	96.0%		4.0%	(none)	225°C 437°F	No	(ASTM96TS) Radio Shack 64-025
99.2/0.3/0.5	99.2%		0.3%	0.5%	211°C 430°F	No	Radio Shack 64-089 (0.022”) or 64-091 (0.05”). Poorly reviewed

Figure 2: Common Types of Electronic Solder

The two most common types of flux are acid and rosin. Acid core solder is primarily used for plumbing and metal work. It should not be used for electronic soldering. In the 40's and 50's acid core solder was very common and if used in electronic assembly will cause severe damage over a short period of time to the instrument. Most Heathkit manuals included a warning about acid core solder (See Illustration).

NOTE: ALL GUARANTEES ARE VOIDED AND WE WILL NOT REPAIR OR SERVICE INSTRUMENTS IN WHICH ACID CORE SOLDER OR PASTE FLUXES HAVE BEEN USED. WHEN IN DOUBT ABOUT SOLDER, IT IS RECOMMENDED THAT A NEW ROLL PLAINLY MARKED "ROSIN CORE RADIO SOLDER" BE PURCHASED.

Flux Warning Accompanying Many Heathkits

Most electronic solder uses a rosin core flux. New organic fluxes are also sometimes found in some electronic solder. We will be using only solder with integral rosin flux, commonly referred to Rosin Core Solder.

Flux can also be found as a paste that comes in a small container or a liquid in a glass or plastic bottle. Generally this is not used for general electronic assembly, but certain non-corrosive types can be useful for tinning wires and coaxial cable braid. It can also be used when soldering to a plated steel chassis or working with brass or other metallic solderable shields. Choose the flux paste you intend to use carefully. Some “NoKorode™” solder paste actually is corrosive. Liquid rosin flux can be purchased and is okay to use on electronic circuits, especially if your solder doesn’t contain a flux core.

Soldering Guns and Irons

The obvious tool you will need is a soldering iron. They come in many different styles and wattages. Before I recommend one, let's look at what is out there.

One common style is the soldering gun. Weller and Wen are two manufacturers. These irons are shaped like a gun, hence their name; they have an internal transformer that converts the AC line voltage into a very low voltage at high current. The current passes through the tip and the resistance in the tip creates a high heat quickly when the trigger is pulled. The tip also cools quickly, making it great for quick jobs. The guns useful to the hobbyists vary in wattage from typically 80 to 250 watts. Some of the Wen models had thermal regulation and tips covering 25 – 100 watts, 100 to 200 watts and 200 to 450 watts. Besides generally being higher wattage than needed for some circuit work, soldering guns can be heavy and hard to get into tight places. A nice feature of the Wen and Weller soldering guns is that they have small light(s) that illuminate your work. Soldering guns can be helpful when soldering large connectors. However unless you find a light low-wattage soldering gun, I'd recommend a pencil soldering iron.

Pencil soldering irons either come as a complete unit or as a modular unit. The complete units sometimes have a replaceable tip, but are fixed as to their wattage. With the modular iron you can choose your handle among various styles, add a heating element for the job you need and select a tip that fits your job. The heating element comes in various wattages and temperature ranges; it screws into the handle and can be changed easily (with tools it can be done while still cooling). Similarly, the tips screw into or on the heater element and can be changed; you have to be careful though to use an anti-seize compound or else the tip can freeze on the element. Tips and elements come as either "thread-on" or "thread-in" depending whether the tip's thread is male or female.

Soldering stations are soldering irons with a built-in temperature sensor and adjustable temperature control. Some have digital readout. They are handy, but not necessary for the casual amateur hobbyist. I'd start with a pencil iron which is always handy because it can be thrown into your toolbox unlike a soldering station.

The iron wattage depends on the job at hand. A 20 - 30 watt iron is good for most circuit board work and point to point wiring. A heavier iron is preferable when soldering chassis ground lugs and heavier wiring where the heat gets drawn away rapidly by the mass of metal. An iron of 60 to 100 watts works well here.

Soldering Iron Tips:

There are four general types of soldering iron tips, as well as numerous special tips for specific tasks. The four general types are shown in the figure below; their actual names sometimes vary depending on the angle of the taper. Type I includes cone, pencil and tapered needle – tips that come to a point; Type II includes chisel and screwdriver - tips that come to an edge; Type III includes spade - a circular shaft (usually a small diameter) with a diagonal flat cut in the end; Type IV includes pyramid - a circular shaft (usually a large diameter) with three or four diagonal cuts at the end that come to a point.

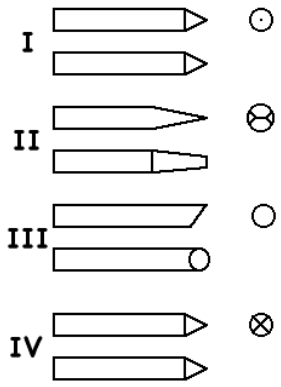


Figure 3:
Different Soldering Iron Tips

Tips screw into or onto the heating element (some less expensive irons and many heavy duty irons have tips that slide in and are held by a setscrew). If you want to be able to easily remove the tip it is imperative that you use an anti-seize compound on the threads and tighten the tip only hand tight. I usually leave my tips loose when not being used. Ungar sells a tube of anti-seize compound #8001.

Special tips include ones for unsoldering integrated circuits by heating all the pads at once, and ones with forked tips for bending wire on terminals, just to name a few.

Unsoldering Tools

Part of learning how to solder is learning how to remove soldered components and wires. There are numerous unsoldering tools the electronic hobbyist can use. It can make correcting a mistake or changing a failed component a less difficult task. There are two basic types of tools, one that uses suction or a vacuum to draw molten solder away from the connection, and the other uses a material that is heated at the connection and soaks up the molten solder.

Expensive vacuum unsoldering tools are available, usually as part of a soldering rework station. Various less expensive "solder suckers" have either a suction bulb or spring loaded vacuum plunger that allows you to use your iron to heat the connection and then, with the solder molten, suck the solder into the solder sucker. These devices have high temperature *Teflon* nozzles that limit the melting of the tip. They need to be cleaned often, as the tip tends to clog and the spring loaded devices need to be taken apart, cleaned and lubricated when they start to show signs of leaking.

A combination solder sucker heating iron is also manufactured. It has a hollow soldering tip that connects to a vacuum bulb. Heating the connection and then releasing the bulb can quickly clean solder from a connection. Radio Shack sells an inexpensive version, Model 64-2060 for $12. It is 45 watts which helps heat the area quickly. Extra tips are available for $2.00. The best known solder absorbing tool is *Solder Wick*® (which is available under numerous other names). It is a piece of braid that is saturated in rosin flux. You apply it to the connection and heat it just as if you were soldering the braid to the board. The fine braid, aided by the flux, soaks up excess solder into the braid, removing it from the connection. It is most useful on circuit boards. *Solder Wick*® comes in various braid widths depending upon the job at hand The soldering practice kit includes a wicking braid, and students will get to practice with it.

Other Tools:

There are numerous other soldering aids available. Heat sinks that clamp on to leads to keep the heat away from the component being soldered; I usually use a hemostat, but often a heat sink is not needed except for soldering critical components.

General Cement used to make a set of five soldering aid tools. These double ended pick-like tools are made of a chromium alloy that solder will not stick to. They have various ends for picking, reaming holes, bending wires, etc. They also have a stainless wire brush and scraper. I've never owned a set of these tools, but there were numerous times when I wished I had them handy. Harbor Freight sells some knockoffs of these tools for a few dollars each. Look in the soldering/welding section.

Anti-Seize was mentioned earlier. You just put a very small dab making sure you totally cover the threads of the tip and tighten the tip hand tight. Next, heat the tip and be sure to tin the tip if it hasn't already been tinned. The anti-seize puts off a lot of smoke when it first heats up so be careful not to breath the vapor.

A very important soldering accessory is a soldering iron holder. Radio Shack sells the model 64-2078 for $9. It comes with a sponge for cleaning the tip. Most irons come with little wire or metal holders that are only the minimum of basic in design. If you solder regularly a holder is a good investment in safety.

Another soldering accessory is a tip cleaner. Many holders have built-in sponges. Weller/ Ungar sells a high temperature plastic sponge holder with special refillable sponges. When I don't have a proper type sponge handy I just use a damp paper towel; it works as well! Ungar, which used to be a big name in soldering tools was bought by Weller and Weller is now a division of Cooper Tools.

Soldering Safety:
Never leave your soldering iron unattended. Always be sure it is unplugged after use. Keep the work area you are soldering on free of flammable items. A hot unattended soldering iron is a fire waiting to happen! Be extra cautious of the soldering iron cord. Keep the tip away from the cord so you don't melt the insulation.

A soldering iron can give you a nasty burn. Be attentive to where the hot end is at all times. Make sure the cord is free from becoming entangled and is long enough to reach your work easily. If you do get burned, immediately put it under cool running water and leave it there. You want to cool the burned area. If it is a severe burn you should seek medical help. You might want to brush up on burn first aid before you do too much soldering. I'm not a doctor so I'll leave any further discussions to the experts.

If you get too much molten solder on the tip it can drop off. If it lands in your lap or on your thigh it will go through loosely woven clothing and burn you. Also, don't wear nylon or easily melted synthetic clothing when soldering if there is a chance a blob of solder could drop onto any part of your clothing. It is best to keep the work over the table to prevent this. However, sometimes you just can't, so take precautions to keep the molten solder from landing on you should a blob drop from the tip.

Lead is a heavy metal and you want to keep from ingesting lead based solder (probably all other solders too.) After handling solder you should wash your hands. Standard care should be given handling solder. Keep it away from young children. Follow the warnings on the solder and flux packaging.

When you heat solder it gives off smoke and fumes. Rosin has a pleasant smell to may people, but to some it can cause an allergy. The best solution is to solder in a well ventilated area and to use a fan to keep the solder smoke from rising right into your face. I use an old surplus "muffin" fan for this. It doesn't need to blow too hard. When you first fire up a soldering iron it often emits a lot of smoke. This is especially true if you have used anti-seize on the tip. Be extra cautious of the smoke when you are first tinning the tip on a new iron. The smoking will stop after a few minutes.

My Soldering Iron Recommendation:
If you are looking for a practical first soldering iron let me recommend the Weller SP23L. It sells for around $17, and is available at ACE and probably many other hardware stores. It is 20 watts and adequate for most jobs around the shack. The L designation signifies that the iron has a neon light in the handle signifying that it is ON. I've used an older Weller SP-23 (black handle with no light) and it has given me many years of good service. Replacement screw in chisel and point tips are available for the SP-23(L). Happy Soldering!
…73, from AF6C

Figure 4:
Weller SP23L with extra tips

FCC EXPANDS PART 95 2360-2400 MHz operation rules

From ARRL Headquarters Newington CT May 31, 2012 To all radio amateurs

ARLB013 FCC Expands Part 95 MedRadio Rules to Allow Devices in 2360-2400 MHz Band

In a First Report and Order and a Further Notice of Proposed Rulemaking (ET 08-59) released on May 24, the FCC decided to expand the Part 95 Personal Radio Service rules to allow medical devices to operate on a secondary basis in the 2360-2400 MHz band. These devices -- called Medical Body Area Networks (MBAN) -- provide a way for health care facilities to monitor their patients via wireless networks. Because use of these frequencies will be on a secondary basis, MBAN stations will not be allowed to cause interference to -- and must accept interference from -- primary services, including radio amateurs who operate on a primary basis in the 2390-2395 MHz and 2395-2400 MHz bands.

ET 08-59 can be found on the web at, http://www.fcc.gov/document/medical-body-area-networks-first-report-and-order.

In July 2006, the FCC released a Notice of Proposed Rulemaking and Notice of Inquiry and Order (NOI), regarding the use of the radio spectrum for advanced medical technologies. In December 2007, GE Healthcare filed ex parte comments in response, proposing that the band 2360-2400 MHz be allocated on a secondary basis for "Body Sensor Networks" (BSNs). In April 2008, the FCC put the proposal on Public Notice; the ARRL submitted comments, pointing out the potential incompatibility with amateur operations. Nevertheless, in June 2009, the FCC released a Notice of Proposed Rulemaking that also requested comments on possible alternatives, including 2300-2305 MHz. The ARRL followed up in October 2009 with additional comments.

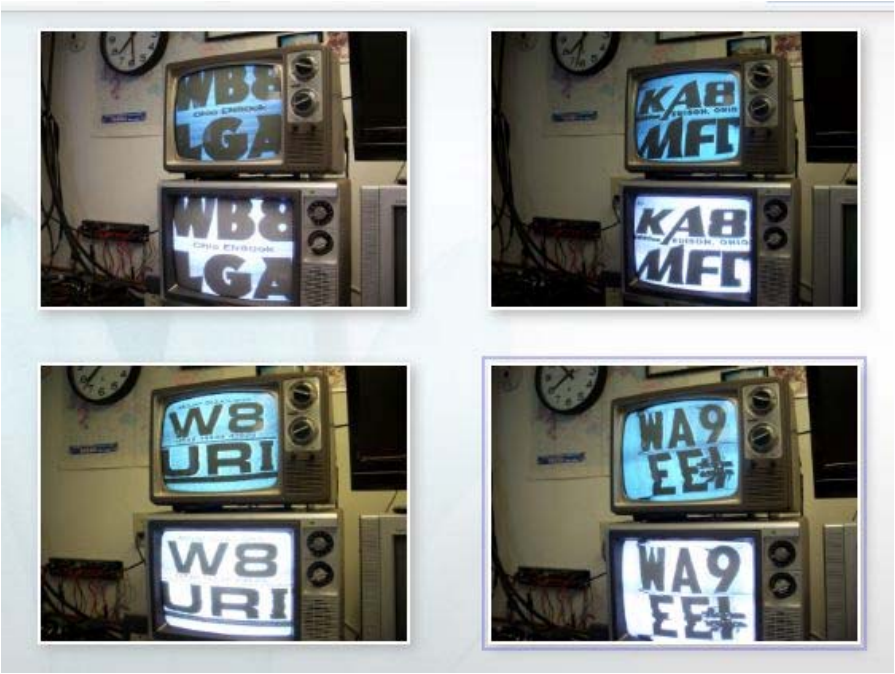
"Even though the Amateur Radio Service retains its primary status at 2390-2400 MHz, it remains to be seen how the addition of a new secondary service in the band will work out in practice," noted ARRL Chief Executive Officer David Sumner, K1ZZ. "In the past, the FCC has declined the ARRL's request to raise the status of the Amateur Service at 2300-2305 MHz to primary, even though there is no other service to which this segment of the band is allocated. This is now the only portion of the 2300-2450 MHz band -- which at one time was available in its entirety to amateurs -- that is not encumbered by other spectrum occupants. We hope that in the future, the FCC will be receptive to making the Amateur Service primary in this narrow segment, in recognition of the reduced utility of the remainder of the band."

In making the decision to allow these devices in the 2360-2400 MHz band, the FCC noted that the costs of permitting MBAN operation "are limited to the risk of increased interference, which we minimize by adopting rules to protect other licensed operations in these bands. We find that the risk of increased interference is minimal and is greatly outweighed by the benefits of the MBAN rules we adopt today."

Sumner observed that with this decision, "the Commission has effectively taken 2360-2400 MHz off the table for consideration for commercial wireless broadband."

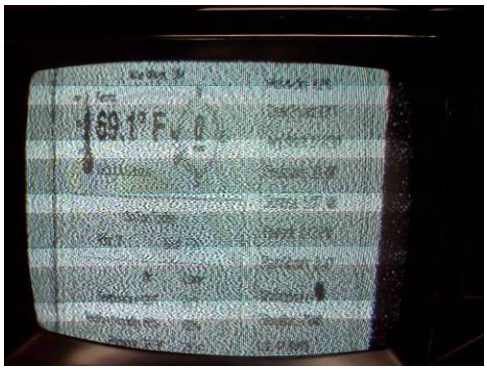
ATV DX FROM WB8LGA

Here are Some P5+ stations I worked into Cincinnati on May 30, 2012 Early AM. These are 2 way P5 contacts with Ross, KA8MFD, Bill, W8URI locally and WA9EEI in Cincinnati.
…WB8LGA



ATV DX FROM W8URI

Here is a picture from W4HTB as received at my house in late June 2012.

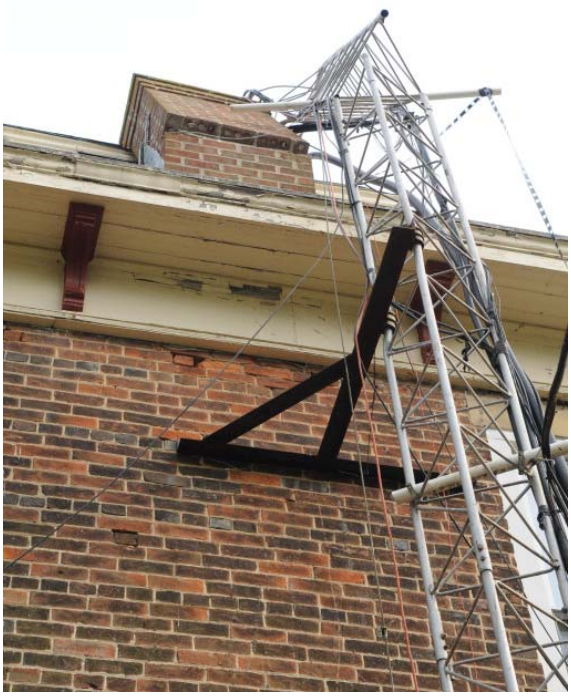


Here is a pix of the W8FY repeater/beacon in Van Wert, Ohio. The tx freq is 434.00 MHz vertical polarized in late June 2012.

W8FY repeater/beacon. If you look closely you can see the Fort Wayne I D in the pix. Again, pix taken late June 2012.

Here are pictures taken by Hank Cantrell, W4HTB, on that day. What an opening! Not bad for 315 miles.
… Bill W8URI

NR8TV TOWER STORM DAMAGE



The thunder storm on Friday, June 22 roared through central Ohio with some significant property damage and power outages. Below is what happened to me here in Greenfield in the central-southern part of Ohio near Chillicothe. These are the roof photos I sent to the insurance man. For icing on the cake, the chimney swallows and maybe her young died in the chimney and now is stinking up that part of the house with hundreds of baby flies in that room. I sealed the chimney, sprayed insect killer in the chimney and the windows of that room.

It's just one thing after another. The bracket attached to the triple brick wall held rock steady. My 84' tower was well overloaded but made it for 13 years with no problems.

The good news (if there IS any good news) is that it appears that as the tower fell, it kind of wrapped around the house roof, broke the fall and prevented any serious antenna damage as shown in the bottom right photo.

One guy snapped at the 66' height. Look at the close up of the guy. There is no rust. It may have been a lightning strike.
…Dave

ATCO SPRING EVENT

Here we are again at the annual ATCO Spring Event. Good weather, good friends and a good place to gather. What else could we ask for? This year the attendance was up a little which is an encouraging sign. We had 30 people this time, up by 5 from last year and as a result, most of the food was gone by the end of the day. That's a GOOD thing!

As usual, we discussed the weather, the latest Ham activities and what we're going to be looking for at the upcoming Dayton Hamvention. The door prizes were plentiful this time so if you missed it, you missed a lot of "goodies" as I believe everyone went home with something. The pictures below help to illustrate my point.
…WA8RMC

DAYTON HAMVENTION FRIDAY NIGHT DINNER

The Dayton Hamvention ATV Friday night dinner was a huge success again this year. Our purpose is to get together informally Friday evening after the Hamvention closes so we can relax, decompress a little from a full day in the flea market and discuss our purchases and the items we either didn't find or the bargain that got away! In any case, it's a great way to end the day. We had about 50 join us this year, more than last year.

We had a very good dinner ordered separately then had a discussion and some door prizes hosted by Ron Cohen K3ZKO. Also, the event was streamed on the internet to the guys in the ATN group in California. Please plan to join us next year. It is an ideal stopping point for the Columbus group because it's located just off I-70 on the way back home.

Below left, Don Hill from the ATN California group demonstrates the streaming capability of his web connected I Phone. Below right is Ron Cohen K3ZKO who is introducing the next guest speaker. Note that Bill Brown WB8ELK is off to the left busy taking pictures of his own.

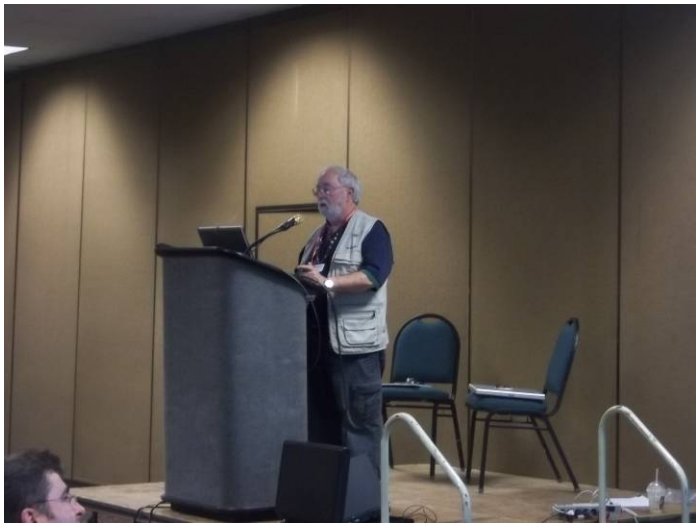
…WA8RMC

DAYTON HAMVENTION ATV FORUM

The Dayton Hamvention ATV forum held on Saturday 3-5 PM was very informative. Although it didn't go as smoothly as I had expected, I'm told that it was great, had a good selection of topics and everyone enjoyed it. We had a couple of computer malfunctions that cost us about 15 minutes of time so we had to cut the presentation of the DigiLite DATV board short. I hope to be able to have it in its entirety again next year. (It seams that no matter how many times one checks the presentation files, it's still possible to have one that won't run properly).

We had about 75 people this year so it seems the attendance is increasing each year. That's great!!!

Above is Gordon West, WB6NOA, introducing his associate who will describe how important proper lighting is for the ATV camera. Gordo has great humor and is dressed in a tuxedo jacket, dress shirt and shorts this time. (No, they're not Boxers).



Here, Lou McFadden, W5DID, describes our International Space Station efforts.

Ahhh, it wouldn't be a proper Hamvention without Bill Brown, WB8ELK, talking about his latest balloon launch effort. Here Bill describes the one he launched that day from the flea market area in back of Hara Arena.

And finally, Charles Beener, WB8LGA, talks about the construction aspects of the DigiLite DATV transmitter board he just completed.

…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 him or her with information. New members are our group’s lifeblood. It's important that we actively recruit new faces aggressively.

Don Kemp NN8B , Hanoverton, Ohio
Ferrell Winder W8ZCF, Cincinnati, Ohio

…WA8RMC

CONSTRUCTION ARTICLE INDEX

The following list is an index of all construction related material that has appeared in the ATCO Newsletter since its inception in the early '80's. This is a handy reference for that particular construction article that you knew existed but didn't want to wade through each issue to find it. All Newsletters below are also listed in order in the ATCO homepage under "Newsletters". Once you locate the Newsletter section, the displayed list can then be re-sorted as needed by clicking on the "date" in the header.
…Bob N8OCQ

Issue	Page(s)	Article
Vol 1 II	5	439 Beam
Vol 2 I	4	439 Beam
Vol 2 II	8,9	439 Parabolic Ant
Vol 2 II	9	Video Modulator
Vol 2 III	7	1296 Ant 45 Ele loop yagi
Vol 2 III	10	RF Power Indicator (in-line) for 1296 MHZ
Vol 2 SE	2,3	Diode Multiplier for 23 CM
Vol 2 SE	4,5	1296 MHZ 10 Watt Solid State Linear Amp
Vol 4 I	3	RF/Video Line Sampler
Vol 4 II	3	P-Unit Meter
Vol 4 II	7,10,11	UHF Gated Noise Source
Vol 4 II	12	420 – 450 Broom Handle Rhombic Ant
Vol 4 III	4,8	25 Element 1.26 Loop Yagi
Vol 4 IIII	6	Video Modulator (Tube Type)
Vol 5 I	3	Video Modulator One Transistor
Vol 5 II	4,7	900 MHZ Yagi Ant
Vol 5 II	6	Video Modulator for 2C39 Final
Vol 5 III	3	440 MHZ Hidden Transmitter Finder
Vol 6 I	3	Video Line Amp
Vol 6 I	8	25 Ele 910 MHz Loop Yagi
Vol 6 II	4,6,7	Microwave Oven ATV Xmiter
Vol 6 II	5	Matching a Quad Driven Ele
Vol 6 II	8	Power Divider for 33CM
Vol 9 IIII	5,7	16 Ele Loop Yagi for 439.25 MHz
Vol 10		No Articles
Vol 11 II	4,5,6	439 48 Ele Collinear Ant
Vol 11 IIII	7	1280 MHZ Cavity Filter
Vol 12 I	6,7,8	439 & 1200 Horz Polarized Mobile Ant
Vol 12 II	5,6,7	ATV Line Sampler
Vol 12 II	10	439 & 1280 Interdigital Filter(s)
Vol 12 III	6,7,8	439 Cheap Attic Ant
Vol 13 I	9, 10	High Level Modulator for ATV
Vol 13 II	5	VGA to NTSC Converter for Computer
Vol 13 III	9, 10	AM Video Modulator
Vol 13 IIII	4	1200 MHZ Transistor Linear Amp
Vol 13 IIII	6	900 & 1200 MHz Loop Yagis
Vol 14 IIII	8	439 31 EleYagi
Vol 14 IIII	12, 13	1250 MHZ FM ATV 3 Watt Xmiter
Vol 15 I	16	427.25 Horz J-Pole Ant
Vol 15 II	14	2400 MHZ Loop Yagi
Vol 15 III	8	Wavecom Modification
Vol 15 III	12,13,14	2.4 Gig Antenna's
Vol 16 II	20	2.4 Gig Helix Ant
Vol 16 IIII	4	1280 MHZ Loop Yagi
Vol 17 I	14, 15	Video Amp (Multi Output)
Vol 18		No Articles
Vol 19 IIII	4	Pwr Supply for 28 Volt Ant Relay
Vol 20 III	9, 10	Video Sampler
Vol 21 II	4	RF Pwr Amp for 900/1200 MHZ
Vol 21 II	14	10-14 Volt Doubler for 28 Volt Ant Relays
Vol 21 III	5	S-Video To Composite Adaptor
Vol 21 IIII	3,4	Video Noise Rejection Amp
Vol 21 IIII	14,15,16 ,17	"S" Meter For Comtech Boards
Vol 22 I		No Articles
Vol 22 II	10	1260 MHZ Cavity Filter
Vol 22 III		No Articles
Vol 22 IIII		No Articles
Vol 23 I		No Articles
Vol 23 II	5,6	Linear 60 Watt For 70CM
Vol 23 II	8,9	Video Modulator Update
Vol 23 III		No Articles
Vol 23 IIII		No Articles
Vol 24 I	13	RF Sniffer For 2.4 GIG
Vol 24 II		No Articles
Vol 24 III	3	Quantum 1500 Rec Tuner Mod
Vol 24 IIII	9	Battery Recharge Ckt
Vol 25 I		No Articles
Vol 25 II	6,7	Comtech TX Module Improvement
Vol 25 III	11	Comtech TX Module Improvement Correction
Vol 26 I	6	Isolator (Circulator) Mod. 850 To 1260 MHz
Vol 26 II	5,6	Comtech 1200 MHz rec. module improvements
Vol 26 III		No Articles
Vol 26 IIII	9	Remote Touch Tone Decoder For Your Shack
Vol 27 I	10	ATV Low Pass Filter (427 Mhz)
Vol 27 II	15	PictureTel Camera Data Cable Wiring
Vol 27 II	10	ATV Low Pass Filter (427 Mhz)
Vol 27 II	15	PictureTel Camera Data Cable Wiring
Vol 27 III		No articles
Vol 27 IIII		No articles
Vol 28 I	11	Super 1280 MHz amplifier
Vol 28 II		No articles
Vol 28 III		No articles
Vol 28 IIII		No articles

This is the complete list for construction articles shown in past ATCO newsletters. The page numbers listed may not match the actual page in the Newsletter. They are the numbers shown in the PDF file. Some early issues are missing. Art did not have a copy of every year. This list is complete through Volume 28 IIII.
…Bob N8OCQ

LOCAL HAMFEST SCHEDULE

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

07/22/2012 | **Van Wert Amateur Radio Club Hamfest**
Location: Van Wert, OH
Type: ARRL Hamfest
Sponsor: Van Wert Amateur Radio Club
Website: http://www.w8fy.org

07/29/2012 | **Portage Hamfair '12**
Location: Randolph, OH
Type: ARRL Hamfest
Sponsor: Portage Amateur Radio Club
Website: http://www.hamfair.com

08/04/2012 | **Columbus Ohio Hamfest**
Location: Columbus, OH
Type: ARRL Hamfest
Sponsor: Voice of Aladdin ARC (W8FEZ)
Website: http://www.aladdinshrine.com/hamfest.htm

08/04/2012 | **Ohio State Convention**
Location: Columbus, OH
Type: ARRL Convention
Sponsor: ARRL Ohio Section
Website: http://www.arrl-ohio.org

09/16/2012 | **GCARA Hamfest**
Location: Cincinnati, OH
Type: ARRL Hamfest
Sponsor: Greater Cincinnati Amateur Radio Association
Website: http://www.gcara.org

09/23/2012 | **Cleveland Hamfest and Computer Show**
Location: Berea, OH
Type: ARRL Hamfest
Sponsor: Hamfest Association of Cleveland
Website: http://www.hac.org

10/28/2012 | **Massillon Hamfest**
Location: Massillon, OH
Type: ARRL Hamfest
Sponsor: Massillon Amateur Radio Club
Website: http://www.w8np.org

INTERNET ATV HOME PAGES (list verified 01/21/12)

Domestic homepages

http://www.atco.tv	Ohio, Columbus, homepage (ATCO)
http://www.w8bi.org/atv/atvresources.html	Ohio, Dayton ATV group (DARA)
http://www.citynight.com/atv	California, San Francisco ATV
http://atn-tv.org/ATN.htm	California, Amateur Television Network in Central / Southern
http://members.tripod.com/silatvg	Illinois, Southern, Amateur Television group
http://www.ussc.com/~uarc/utah_atv/id_atv1.html	Idaho ATV
www.bratsatv.org.	Maryland, Baltimore Radio Amateur Television Soc. (BRATS)
www.qsl.net/k7atv/	Salem, Oregon Amateur Television Associations-Salem
http://www.qsl.net/kd2bd/atv.html	New Jersey, Brookdale ARC N2SMT/R repeater
http://www.ipass.net/~teara/menu3.html	North Carolina, Triangle Radio Club (TEARA)
http://www.oregonatv.org	Oregon, Portland OATVA ATV Association W7AMQ/R repeater
http://members.bellatlantic.net/~theojkat/	Pennsylvania, Phila. Area ATV W3PHL repeater
http://www.hotarc.org/atv.html	Texas, WACO Amateur TV Society (WATS)
www.qsl.net/ww7ats	Washington, Western Washington Television Soc. (WWATS)
http://www.shopstop.net/bats/	Wisconsin, Badgerland Amateur Television Society (BATS)
http://www.kcatvg.org	Kansas, Kansas City ATV Group WR0ATV repeater (KCATVG)

Foreign homepages

http://atv.hamradio.si	Slovenia ATV
http://www.batc.tv.	British ATV club (BATC)
http://www.**batc.org.uk/cq-tv**	British ATV Club and CQ-TV Magazine

Misc other ATV related sites

http://www.atv-tv.org	The Amateur Television Directory
http://www.atn-tv.org	Amateur Television Network
http://www.atvquarterly.com	Amateur Television Quarterly Magazine
http://gb3lo.camstreams.com	"GB3LO" Repeater Camstream westoft, UK
http://www.ham-radio.com/sbms	"SBMS" San Bernardino Microwave Society
http://www.qsl.net/kc6ccc/	"METS" Microwave Experimenters Television System
http://www.icircuits.com/store/index.html	Intuitive Circuits ATV products
http://www.atvresearch.com/	ATV Research Co, cameras & related security products
http://www.downeastmicrowave.com/	Down East Microwave, UHF/Microwave parts
http://www.directivesystems.com/	Directive Systems, UHF/VHF/Microwave antennas
http://www.m2inc.com/	M2 Antenna Systems
http://www.hamtv.com/	PC Electronics, ATV equipment

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 checkin requests or comments. We rarely chat for more than an hour so please join us if you can.

ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (4/21/12)....$ 1976.98
RECEIPTS(dues)....$ 150.00
Spring Event auction proceeds....$ 100.00
Spring Event food....$ (181.74)
Paypal fee....$ (1.76)
CLOSING BALANCE (7/20/12)....$ 2043.48

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 average street level (1460 feet above sea level)

TV Transmitters: 427.25 MHz VSB AM mod, 1258 MHz FM mod, 1268 MHz QPSK digital, 2433 MHz FM mod, and 10.350 GHz FM mod.
(multipole filters in output lines of all transmitters)

Output Power - 427.25 MHz: 50 watts average 100 watts sync tip
1258 MHz: 40 watts continuous (Analog ATV)
1268 MHz 20 watts continuous DVB-S (QPSK) DATV SR=3125, FEC=3/4 , 2 video channels.
2433 MHz: 15 watts continuous
10.350 GHz: 1 watt continuous
Link transmitter - 446.350 MHz: 5 watts NBFM 5 kHz audio

Identification: 427, 1258, 1268, 2433, 10.350 GHz transmitters video identify every 30 min. with ATCO & WR8ATV on 6 different screens.
1268 MHz digital & 10.350 GHz analog - Continuous transmission of ATCO & WR8ATV with no input signal present.

Transmit antennas: 427.25 MHz - Dual slot horizontally polarized "omni" 7 dBd gain major lobe east/west, 5dBd gain north/south
1258 MHz - Diamond vertically polarized 12 dBd gain omni (Analog ATV)
1268 MHz - Diamond vertically polarized 12 dBd gain omni (Digital DVB-S ATV)
2433 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni
10.350 GHz - Commercial 40 slot waveguide horizontally polarized 16 dBd gain omni

Receivers: 147.480 MHz - F1 audio input with touch tone control. (Input here = output on 446.350)
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. Requires 131.8 Hz PL tone. (Input here = output on 446.350).
1280.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
- DVB-S (QPSK) digital SR=4167, FEC= 7/8. This input feeds all transmitters and also goes directly to 1268 MHz digital output channel 2. Therefore a 1280 DATV input and 439 or 2398 can be ON at the same time.
2398.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
10.45 GHz - F5 video analog NTSC (not installed)

Receive antennas: 147.480 MHz - Vert. polar. Diamond 6dBd dual band (also used for 446.350 MHz link output)
439.250 MHz - Horizontally polarized dual slot 7 dBd gain major lobe west
1280.00 MHz - Diamond vertically polarized 12 dBd gain omni
2398.00 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni
10.45 GHz - Commercial 40 slot waveguide horizontally polarized 16 dBd gain omni (not installed)

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 up for 5 minutes) Select # to shut down before timeout.
697	Select Time Warner radar. (Stays up till turned off). Select # to shut down.

Manual mode functions:

00* then 1 for Ch. 1	Select 439.25 receiver
00* then 2 for Ch. 2	Unused
00* then 3 for Ch. 3	Select 1280 receiver
00* then 4 for Ch. 4	Select 2398 receiver
00* then 5 for Ch. 5	Select video ID (4 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 (not in use at this time)
03* or 03#	Channel 3 1280 MHz scan enable
04* or 04#	Channel 4 2398 MHz scan enable
A1* or A1#	Manual mode select of 439.25 receiver audio
A2* or A2#	Unused channel at this time
A3* or A3#	Manual mode select of 1280 receiver audio
A4* or A4#	Manual mode select of 2398 receiver audio
C0* or C0#	Beacon mode – transmit ID for twenty seconds every ten minutes
C1* or C1#	C1* to disable 427 MHz transmitter, C1# to enable it
C2* or C2#	C2* to disable 1268 MHz digital transmitter, C2# to enable it

ATCO MEMBERS AS OF July 2012

Call	Name	Address	City	St	Zip	Phone
KD8ACU	Robert Vieth	3180 North Star Rd	Upper Arlington	OH	43221	614-457-9511
KC3AM	Dave Stepnowski	735 W Birchtree Ln	Claymont	DE	19703	
AH2AR	Dave Pelaez	1348 Leaf Tree Lane	Vandalia	OH	45377	
W8ARE	Larry Meredith III	6070 Langton Circle	Westerville	OH	43082-8964	
KC8ASF	Tom Pallone	3437 Dresden St.	Columbus	OH	43224	614-268-4873
WB4ATV	Don Coy	489 Crystal Lake Drive	Melbourn	FL	32940	
NN8B	Don Kemp	6384 Camp Blvd.	Hanoverton	OH	44423	
KC8BTX	Dudley Field	357 N. Ridge Heights Dr	Howard	OH	43028	
W6CDR	Wynn Rollert	1141 Pursell Ave	Dayton	OH	45420	937-256-1772
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	OH	43065	614-210-0551
N8COO	C Mark Cring	3941 Three Rivers Lane	Groveport	OH	43125	614-836-2521
N8CXI	Garry Cotter	2367 Northglen Drive	Columbus	OH	43224	
N9CX	Bill Erwin	231 Gateside Ct.	Gahanna	OH	43230	
WB8CXO	Mike Young	289 Gayloard Dr	Munroe Falls	OH	44262	
N8CZO	Mike Flaharty	1025 Josiah Morris Road	London	OH	43140	
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	OH	42616	419-691-1625
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	OH	43026	614-876-6033
KC8EVR	Lester Broadie	108 N Burgess	Columbus	OH	43204	
WA8FLY	Rod Shaner	16012 London Rd.	Orient	OH	43146	740-279-3614
N8FRT	Tom Flanagan	1751 N Eastfield Dr.	Columbus	OH	43223	
W8FTX	George Biundo	3675 Inverary Drive	Columbus	OH	43228	614-274-7261
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	OH	43147	
KB8GHW	Mike Amirault	5560 Refugee Rd.	Baltimore	OH	43105	614-859-7005
WA8HFK,KC8HIP	Frank & Pat Amore	3630 Dayspring Dr	Hilliard	OH	43026	614-777-4621
W4HTB	Henry Cantrell	905 Wrenwood Dr.	Bowling Green	KY	42103	270-781-9624
WG8I	Chris Vojsak Sr,	3536 W Henderson Rd	Columbus	OH	43220-2232	614-203-6000
WB2IIR	Michael Anthony	370 Georgia Drive	Brick	NJ	08723	
N8IJ	Dick Knowles	1799 Homeward Ave	Lima	OH	45805	
W8KHP	Allan Vinegar	2043 Treetop Lane	Hebron	Ky	41048	
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	OH	45331	937-548-2492
N8LRG	Phillip Humphries	3226 Deerpath Drive	Grove City	OH	43123	614-871-0751
WB8LGA	Charles Beener	2540 State Route 61	Marengo	OH	43334	
KA8LWR	Mel Alberty	1645 Olentangy Road	Bucyrus	OH	44820	419-468-2971
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	
W0MNE	Mike Doty	4300 Winchester Southern Rd	Circleville	OH	43113	740-420-9060
N8NT	Bob Tournoux	3569 Oarlock Ct	Hilliard	OH	43026	614-876-2127
WU8O	Tom Walter	15704 St Rt 161 West	Plain City	OH	43064	614-733-0722
N8OCQ	Bob Hodge Sr.	3750 Dort Place	Columbus	OH	43227-2022	
KB8OFF	Jess Nicely	742 Carlisle Ave	Dayton	OH	45410	
W6ORG,WB6YSS	Tom, Maryann O'Hara	2522 Paxson Lane	Arcadia	CA	91007-8537	626-447-4565
KE8PN	James Easley	1507 Michigan Ave	Columbus	OH	43201	614-421-1492
W8PU	Gary Poland	3347 S.R. 28	Midland	OH	45148	
W3RCJ	Thomas Farrell	1912 Burnwood Road	Baltimore	MD	21239	
WA6RCW	Ed Mersich	34401 Columbine Trl W	Elizabeth	CO	80107-7866	
WA8RMC	Art Towslee	438 Maplebrooke Dr W	Westerville	OH	43082	614-891-9273
W8RRF	Paul Zangmeister	10365 Salem Church Rd	Canal Winchester	OH	43110	
W8RRJ	John Hull	580 E. Walnut St.	Westerville	OH	43081	614-882-6527
W8RUT,N8KCB	Ken & Chris Morris	2895 Sunbury Rd	Galina	OH	43021	
W8RVH	Richard Goode	9391 Ballentine Rd	New Carlisle	OH	45334	937-964-1185
W8RQI	Ray Zeh	2263 Heysler Rd	Toledo	OH	43617	
KB8RVI	David Jenkins	1941 Red Forest Lane	Galloway	OH	43119	614-878-0575
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
W8SJQ	Rocky Eramo	795 Riverbend Ave	Powell	OH	43065	614-207-2740
W8SJV, KA8LTG	John & Linda Beal	5001 State Rt. 37 East	Delaware	OH	43015	740-369-5856
KB8SSH	Mike Cotts	3424 Homecroft Dr	Columbus	OH	43224	614-371-7380
W3SST	John Shaffer	6706 Gilette Dr	Reynoldsburg	OH	43068	614-751-0029
W8TIP	Gene Hawkins	1720 Liberty Street	Toledo	OH	43605	
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 R. Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
KB8WBK	David Hunter	45 Sheppard Dr	Pataskala	OH	43062	740-927-3883
KC8WRI	Tom Bloomer	PO Box 595	Grove City	OH	43123	
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	OH	43224-3011	
N8XYJ	Dan Baughman	4269 Hanging Rock Ct.	Gahanna	OH	43230	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	
KC8YPD	Joe Ebright	3497 Ontario St	Columbus	OH	43224	
N8YZ	DaveTkach	2063 Torchwood Loop S	Columbus	OH	43229	614-882-0771

Call	Name	Address	City	St	Zip	Phone
W8ZCF	Ferrel Winder	6686 Hitching Post Ln.	Cincinnati	OH	45230	
K3ZKO	Ron Cohen	915 Rowland Ave	Cheltenham	PA	19012	215-828-1263
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	OH	43125	614-202-9042

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

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

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

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

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:	(open)	Statutory agent:	(open)
Corporate trustees:	Same as officers	Newsletter editor:	Art Towslee WA8RMC

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 Newsletter
c/o Art Towslee-WA8RMC
180 Fairdale Ave
Westerville, Ohio 43081

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.