

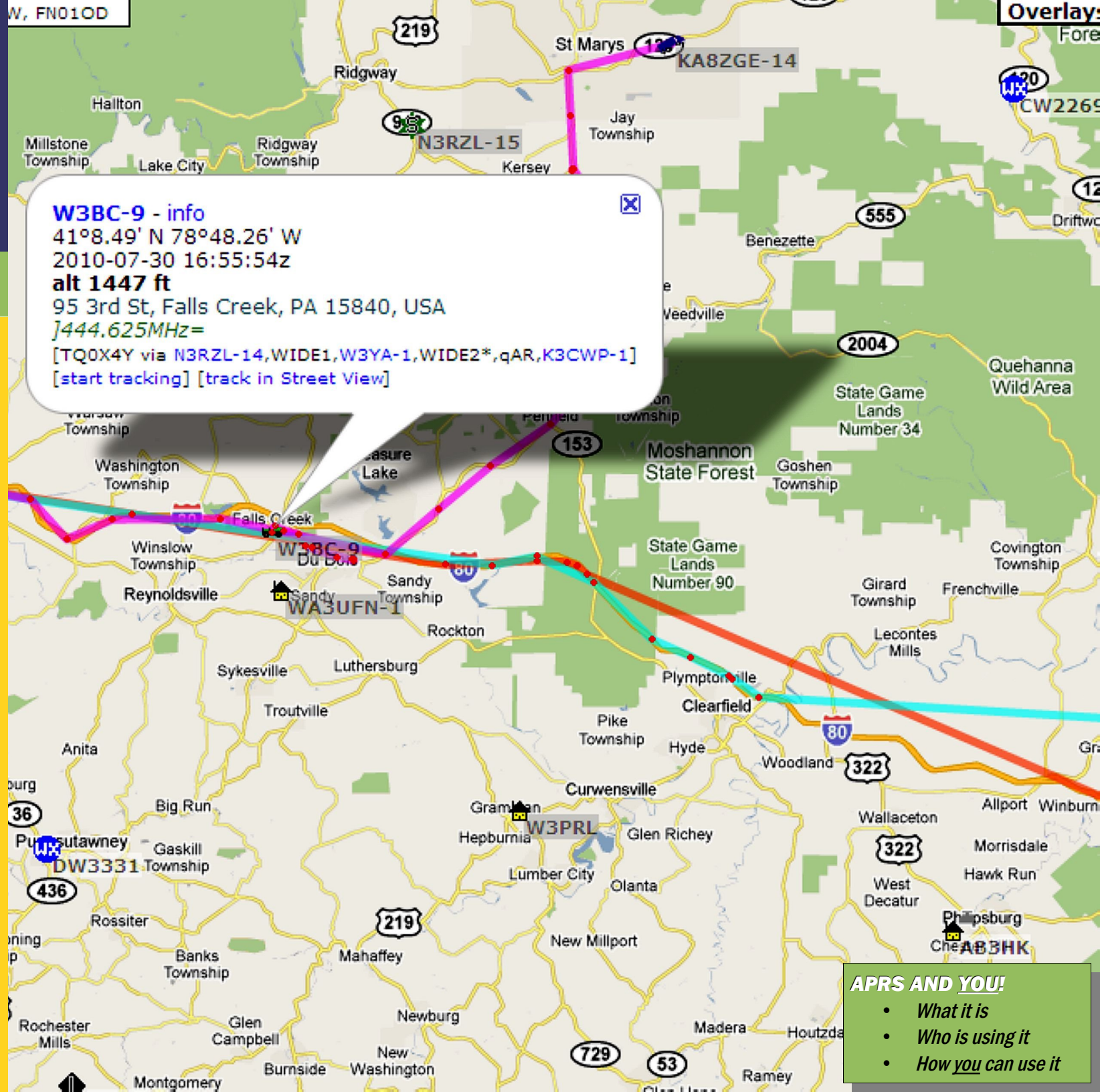
The Parasitic Emission

Volume 36 – Number 8
August 2010

Supporting Amateur Radio Club Activities

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WHY ARE YOU a ham? What is it that made it worth your while to get a license and buy equipment? Why did you join your local club? What keeps you coming back for more?

These are important questions and your answers may be very revealing. Speaking for myself, its Amateur Radio activities that keep me interested in Amateur Radio. There was a period of time where I became bored with Amateur Radio, and lost interest. During that period, I didn't even get on the air, let alone participate in other activities. They say hindsight is 20-20, and looking back, I wish I had been active, because I missed out on a lot of fun!

Loss of interest is not unusual, and almost always goes hand-in-hand with not participating in activities. But we must be careful in drawing any conclusions. It is a "chicken and egg" question: does losing interest result from lack of activities or is lack of activities the result of losing interest?

I believe it is a classic case of positive feedback where a little of one leads to more of the other, which leads to even more of the first... In other words, it's a self-perpetuating, downward spiral. Fortunately, all is not lost--there is a simple solution.

You may remember Newton's Law from your science classes: "A body at rest will remain at rest until acted upon by an outside force." This means we can change the direction upward, simply by applying positive actions. Soon we will be back in the situation where success builds upon success.

While this may sound simple, it is far from easy. It requires a majority of us to become willing to put some effort into making

Amateur Radio a worthwhile endeavor again. We have to make a commitment to do more than talk--we have to put our words into action. Here are some suggested actions you can take:

1. Attend your local club meetings
2. Plan activities with your club
3. Participate in those activities
4. Attract public interest in these activities
5. Recruit and train new hams

If only a handful of us see fit to do this, the results will be disappointing. Success requires the larger group to act together and see it through to the end.

And then, move on to the next activity. Every little bit helps, and great accomplishments are the result of many little contributions of effort, all in the same direction, with the same goal in mind.

If you're looking for a goal for yourself, why not start with our list above. Make it your Amateur Radio goal this month to attend your local club's meeting and participate. No excuses, just do it.

As John F. Kennedy might have put it, "Ask not what your Club can do for you; ask what you can do for your Club."

A long time ago, someone pointedly asked me, "What have you done for your club lately?" Embarrassingly, I didn't have an answer, but his comment eventually opened my eyes to how I was contributing to the decline of interest in the hobby. Instead of being part of the solution, I was being part of the problem!

I admit, it took me some years to figure out that I needed to take action, and several more to discover just what that action needed to be. Finally, I came to realize that Amateur Radio would only give back what I put into it.

The next time I went to that club I was ready to take action. That visit resulted in the rebirth of the publication that you're reading right now.

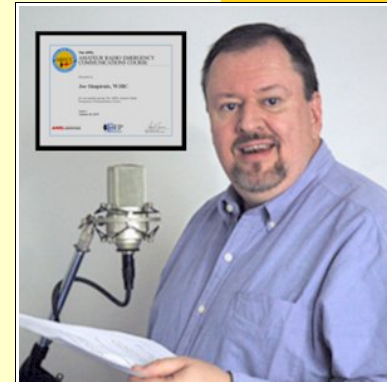
— . . . —

Many of us are interested in Emergency Communication or as it is often called, "EmComm." If you are one of those who is willing to serve the public as an emergency communicator, you have a great opportunity on the afternoon of Sunday, August 29th. Bryan Simanic, WA3UFN and I will be conducting a training class which will introduce you to the basics you need to know to effectively become an emergency communicator. Look for the announcement later in this edition.

Also in this edition, I present an introduction to APRS, a digital information system that uses existing amateur radio equipment you already have. More than just a "position reporting system," APRS has major implications for use by EmComm volunteers. In an emergency situation, the status of each APRS-equipped unit is constantly updated and available for all to see. It can make it easier for mobile units to navigate to a shelter, or any other place their services are required.

Wrapping things up, I've put together a short *Basic Concepts* installment about VHF propagation, both ionospheric and tropospheric. Many mysteries and secrets will be revealed, which can help you understand where those stray signals are coming from and why. You may be able to work some surprising DX on 6 and 2 meters, especially this time of year!

I'll see you... **on the air!**



Make it your goal this month to attend your local club's meeting...



The Quad-County Amateur Radio Club

Cameron, Clearfield, Elk, Jefferson Counties

Meeting Notice

July 18, 2010

The August Meeting of the QCARC will be at 7:30 pm, Friday, August 20, 2010. The meeting place is at the Clearfield County 911 Center on Leonard Street in Clearfield. The new Clearfield County EMA Director, Dave McClure will address the club after the meeting. This is your chance to meet him!

Minutes: July 16, 2010

by Jeff Rowles, KA3FHV

The meeting was called to order at 7:35 PM by Doug, W3DWR.

The minutes of the last meeting were approved as read. A motion to approve the treasurer's report was made by KA3FHV and seconded by W3KWT. Motion carried.

Old Business:

The Field Day report has been filled out and emailed to ARRL with the back up information to be mailed on Monday. The phone link for the repeater was discussed.

New Business:

Since there will be no Airport Awareness Day this summer, there will not be a swap meet. A picnic or "breakfast in the boonies" was discussed. It was decided that a picnic will be planned for August at Curwensville Lake to coincide with a camping weekend at the lake by Kay and Lars. Lars will work out the date. Those attending will be responsible for their food and place setting. More details to follow. Getting a G5RV on the tower at the 911 center was discussed. Doug will get in touch

with WB3EQW on the matter.

A motion to adjourn was made by KA3FHV and seconded by KB3LES.

Attendance:

KA3FHV, KB3LES, W3KWT, Kay Kvant, SM7FYW, W3BC, N3PUQ, K3JE and W3DWR.

Behind the Gavel

by Doug Rowles, W3DWR

BEFORE I GET into this month's topic, I would add a bit to the column from last month. I failed to mention Field Day events held at the FAA radar site atop Rockton Mountain. There are photos from 2001 and 2003 on the club web site.

Six meters has been my favorite ham band since my first ARRL VHF contest back in 1980. The WIT TEAM contest group had four forty foot tilt over towers at the Clear Run area that had been the original site of the 146.73

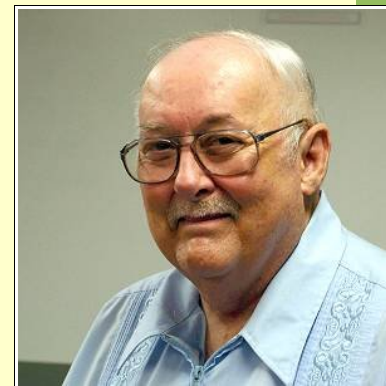
QCARC Information

President	Doug Rowles, W3DWR ka3dwr@hotmail.com
Vice President	Lars Kvant, SM7FYW/W3 sm7fyw@hotmail.com
Secretary	Jeff Rowles, KA3FHV jrowles@earthlink.net
Treasurer	Dorothy Morrison, N3PUQ edmo1@atlanticbb.net
Executive Board	Ed Hinkle, K3EDD Joe Bitner, N3IES Rich Brnik, KB3QKR Thomas Robinson, W3KWT Ed Morrison, K3JE
Repeaters	N3QC 147.315+ [173.8] K3EDD 444.625+ [173.8] N3IZE 444.900+ [173.8] local
Nets	Sunday @ 1900 147.315 (Club) Sunday @ 1945 147.315 (ARES)
Web	www.qcarc.com

repeater which later changed frequency to the current 147.39. They had operating positions on 2 meters, 220, 432, 1296 and 6 meters.

A couple years later I bought an ICOM 551D at the Rochester Hamfest. Wow! I had 100 watts on six meters. Then I replaced the Astrobeam with a 5 element Cushcraft for 6 meters and the race was on.

Over the years I managed to work and confirm the lower 48 states. After listening for Alaska for 15 years and hearing one station, all of a sudden on December 8, 2001, I worked three Alaska stations in five minutes.



I have noticed that there seem to be more new hams on 6 meters during the more recent openings. This was confirmed when I worked K0LL, Larry, from Smith Center, KS. He mentioned that since KDKA wasn't on the air any more the hams in that area wouldn't have to worry about interfering with TV signals. I told him they were still on the air, and he replied that they weren't on channel 2 any more. Then I realized that the lower frequencies that TV had been using had been abandoned in favor of the new digital frequencies. Another factor is that most of the newer low band rigs often include the six meter band.

Finally, don't forget. The next time six is wide open, tune up to 50.400 and work an AM station. I first did that back in October of 1987 and most recently on July 3 of this year - this time with 10 watts.



Punxsutawney Area Amateur Radio Club

Punxsutawney and Jefferson County Meeting Notice August 10, 2010

The August Meeting of the PAARC will be at 7:00 pm, Tuesday, August 10, 2010. The meeting will be held at the Punxsutawney Presbyterian Church on Findlay Street in Punxsutawney.

Shack Night is back! The next Shack Night will be Tuesday, August 3rd at the PAARC hamshack at the Punxsutawney Municipal Airport. Doors open from 7:00 to 9:00 pm.

The Punxsutawney Area Amateur Radio Club **weekly net** is every Monday (Mondays that fall on a Holiday will not have a net that evening) at 7:30 PM on the 147.390 repeater (PL 173.8). In case of repeater problems, the backup repeater is the 146.715 repeater in Punxsutawney, also with a PL of 173.8.

PAARC Information		
President	Mike Miller, N3HBH n3hbh@comcast.net	
Vice President	Jim Byrne, KA3WSX jimwsx@windstream.net	
Secretary	Steve Waltman, KB3FPN kb3fpn@windstream.net	
Treasurer	Sham Hollopeter, W3QOS	
Repeaters	N5NWC 146.715- [173.8] Punxs'y N5NWC 443.475+ Punxs'y KE3DR 147.390+ [173.8] Rockton N3HAO 53.07- (-1MHz) Rockton N3JGT 147.105+ [173.8] Sigel N3GPM 444.275+ Brookv1	
Nets	Monday @ 1930 147.390 (Club) Monday @ 2000 147.105 (ARES)	
Web	www.qsl.net/k3hwj/	



Philipsburg Amateur Radio Association

Philipsburg and Clearfield County Meeting Notice PICNIC: August 14, 2010 Meeting: September 11, 2010

Instead of an August meeting, the **Annual Picnic at Black Moshannon Park** will be held on Saturday, August 14th at 2:00 pm. We will meet at Pavilion #7 at Black Moshannon State Park on PA Route 504.

The **September meeting** of the Philipsburg Amateur Radio Association will be held on Saturday, September 11th at 3:00 pm at Bock's Dining & Tea Room, 429 North Centre Street, Philipsburg.

Activity Report by Dave Runk, AA3EJ

There was no July meeting. Instead, the Annual Philipsburg "Heritage days" special event was held July 7th through July 10th. We set up the "W3P" special event station in downtown Philipsburg and operated "W3P" from Wednesday through Friday, as we have in the past.

Lou, WB3AAI and I, AA3EJ operated under the PARA tent downtown for the CW station. The HF antennas were built by Lou, and I brought down my Ten-Tec Orion VII to operate. The SSB station was set up by John, N3SPW, and others dropped in to operate.

The weather was over 90 degrees F each day—the hottest I ever remember. We had lots of fun, but very little operating QSOs due to the heat.

The PARA picnic at Black Moshannon state

park will be held on Saturday, August 14 at Pavilion #7 at the park. The Picnic is open to all hams and their families. We hope to see you there!



PARA Information	
President	John Szwarc, N3SPW jsszwarc@yahoo.com
Vice President	Dave Runk, AA3EJ aa3ej@yahoo.com
Secretary	Dave Runk, AA3EJ aa3ej@yahoo.com
Treasurer	Jim Warg, N3ONE
Liaison	Filip Cerny AB3HK, ARRL Liaison Dick Thompson, K3BIE Interclub Liaison
Repeaters	W3PHB 146.430+ [173.8] Rt1snk Mt W3PHB 146.640- [173.8] Philipsbg W3PHB 444.750+ [173.8] Philipsbg
Nets	Saturday @ 2100 147.430+ [173.8]
Web	www.philipsburg-ara.org

Headwaters Amateur Radio Club

Coudersport and Potter County

Meeting Notice

August 5, 2010

The August meeting of the HARC is scheduled for 7:00 pm, Thursday, August 5, 2010, at the Potter County Emergency Operations Center.

Minutes: July 1, 2010

by Charles Scott Sharpe, KB3JVD

The meeting was called to order by Jason, K2BYL, at 7:00 PM.

Meeting minutes from the July meeting were read. Jim L motioned to accept the minutes Jim H seconded.

Treasures report accepted by Jim C motioned to accept the minutes Jim H seconded.

Old business:

Jim Hayes and Jason visited the Cool Spring engine museum on June 17th-19th

Charles needs to send the Parasitic Emission

Headwaters ARC Information

President	<u>Jason Layton, K2BYL</u>		
Vice President	<u>James Centanni, W2IMK</u>		
Secretary	<u>Charles Scott Sharpe, KB3JVD</u>		
Treasurer	<u>Wayne Stahler, II, WS3PC</u>		
Repeaters	N3PC	146.685-	[173.8] Coudersport
	K3CC	146.880-	[173.8] Coudersport
	KB3EAR	444.300+	Coudersport
Nets	Monday @ 1900	146.685-	[173.8]
	Monday @ 1930	28.360	[USB]
	Monday @ 1945	1.980	[USB]
Web	<u>www.n3pc.com</u>		

newsletter owner the email addresses of club members.

Field Day Report

The refrigerator quit. The BFCA was made aware of the issue.

Call Used: N3PC
ARRL/RAC Section: WPA Class: 4A
Participants: 15
Power Source(s): Generator
Power Multiplier: 2X
Bonus Points:
100% Emergency power 400
Media Publicity 100
Youth participation 040

Youth operators=2

Youth participants=4

Submitted via the Web 050
Total Bonus Points 590

Score Summary:

	CW	Digital	Phone	Total
Total QSOs	0	0	206	
Total Points	0	0	206	206
Claimed Score = 412				

Need to check on LBOTW and EQSL. Charles to review

No operators did CW

Attempted to do digital but failed.

We should have kept to the bottom floor to stay cool.

Jim C. said he saw a FD operation in GA.

We need an antenna launcher - any volunteers to build one or 2 are appreciated.

Get a materials list and hold a Saturday build session for people to build their own.

We should have a n1mm introductions before the next contest.

Skip advised that for FD, people should standardize the equipment for FD.

He spoke about a kit form headset, with a foot switch.

Skip said he received a donation of 2 foot switches by AI KE2ZG

Ebay also has some ready to run versions

No one remembered his or her emergency handbooks.

No one has filled out the ARES/Races applications. Please see Wayne if interested.

Charles to send forms when Wayne gets them to him.

New Business

Skip asked about having the meetings at the BFCA. Skip volunteered to check with the BFCA about the possibility of holding meetings at the BFCA on the first Thursday of the month.

A short discussion was brought up about a drilling accident.

Don had a kc2gmh ask if our repeater had weather alert. We advised that it does not.

People suggested that we use the NOAA weather frequency to get updates.

Skip talked about Sky-warn and spoke about the classes.

Suggested a spotters weather net.

Jason spoke about adding it to the repeater. Jason will investigate to see if we can add to the repeater.

NOAA and the county might be able to provide a radio.

Both Don and Jason have both been called by the Sky-warn in State College for a report.

Don asked if water had been getting into the repeater? He had noticed muffled communications.

People reported that 2 meters is open and Wayne has heard Washington DC.

Adrian reported that he is still waiting on hardware for his repeater.

Jason spoke of a 2 meter antenna that covers 140-160 MHz dipoles. Talk to Jason if you are interested in buying a Commercial quality 2 meter antenna.

Don has a 30ft 17 element 2 meter yagi. He is selling it for \$200

Breakfast is July 24th at 9am

Testing session is 17th 10am at the hospital. They are still looking for Volunteers to be VEs.

Skip asked how many had 2 meter mobile and base rigs.

It is a good idea that more of us activate the repeater. If you hear someone on the repeater say hi!

He is trying to work a deal to get Kenwood V7 2m/440 mobile radios that could be used as a cross band repeater.

Skip mentioned we should start discussing the PAQSO party.

It is Oct 9th and 10th

Skip Motioned to have the party at the BFCA, Don second

Wayne will check availability.

The New York QSO party is the next week end. Oct 16th-17th

Skip mentioned a session on learning the radio operations and settings. He will let the club know when he can do a training session.

We had a short discussion about filters, roofing filters, and DSP.

The meeting was adjourned at 8:22.

Jim motioned for adjournment, Don 2nd.



Elk County Amateur Radio Association

Elk and Cameron Counties

Meeting Notice

August 22, 2010

The August meeting of the Elk County Amateur Radio Association will be held at 1:00, Sunday, August 22nd at the Elk County Emergency Operations Center.

— . . . —

In place of the July meeting, a picnic was held at Mary's Cabin near Hallton.

Elk County ARA Information			
President	<u>Scott Logue, N3LVG</u>		
Vice President	<u>Rick Wehler, N3RJH</u>		
Secretary	<u>Jerry Robinson, N3RYG</u>		
Treasurer	<u>Mary Lewis, N3UDN</u>		
ARES EC	<u>Bob Devilling, N3SGY</u>		
Repeaters	N3NIA 147.000+	[173.8]	Bootjack
	N3NWL 147.285+		Ridgway
	N3RZL 442.200+		Ridgway
	N3RZL 442.350+		Boone Mtn
	N3RZL 144.390=	[APRS]	Ridgway
	WA8RZR 443.675+		St Marys
	N3NIA 28.205	BEACON	Ridgway
	N3FYD 146.805-		Emporium
	WA3WPS 147.180+		Emporium
Nets	Sunday @ 2000 147.000+ [173.8]		
Web	<u>www.n3nia.com</u>		

Two Meter Net Schedules

by Joe Shupienis, W3BC

QCARC	1900	Sunday	147.315	T	173.8
ECARA	2000	Sunday	147.000	T	173.8
PAARC	1930	Monday	147.390	T	173.8
Jefferson Co.	2000	Monday	147.105	T	173.8
C1fd Co ARES	2100	Wednesday	147.315	T	173.8
PARA	2100	Saturday	146.460	T	173.8
Headwaters ARC	1900	Monday	146.685	T	173.8

Shorts

Attention Club Officers! *Club Connections* is the place to make your club shine! Hams all over our area are interested in reading about **your club's** activities!

Please help make this section even better by encouraging your members to submit items about your club's activities and photos of your members having fun with our favorite hobby!

We need your club's content every month, by the **fourth Monday** of the month. Please help us make this the best publication it can be! Thank you!

— . . . —

Attention all readers! Have you done something interesting lately? Do you have any interesting photos? I'm sure you do. So don't hide this information away—**spread the joy!**

Please help us all out by sending these items in for publication. There are over 150 readers throughout central Pennsylvania who would really enjoy reading about what you're doing!

The address is:

submit@parasiticemission.com

Thank you!

— . . . —

The July DuBois VE session was a great success—all the applicants passed!

Congratulations to Tom Sprague, KB3TOY, Reynoldsville and Joe Rouse, KB3OVF, Strattanville, who both earned their Generals; and new Technician Eric Hudson, who drove all the way from Williamsport, where he was staying on a business trip.

Thanks to VEs Bryan Simanic, WA3UFN, Charlie Lindahl, KA3DEO, and Joe Shupienis, W3BC; and Herb Murray, KB3TAP who is awaiting his VE certification. The next exam session is being scheduled for October.

Attention: All Radio Amateurs willing to serve in an emergency communications capacity!

Clearfield County ARES is sponsoring a one-day training seminar for all those interested in amateur radio emergency communications. This four-hour course is open to residents of any county, and will be held Sunday, August 29, from 1:00 pm to 5:00 pm in the conference room of the Clearfield County Emergency Operations Center, 911 Leonard Street, Clearfield, PA 16830.

Participants will receive an overview of Emergency Communication, the relationship of Amateur Radio and Served Agencies, an introduction to the National Incident Management System (NIMS) including the Incident Command System (ICS), and a preview of the ARRL EC001 Course ("Level I").

The training will consist of the NIMS IS-700.a course and an overview of the first four units of the ARRL EC001 course. These will be presented in a classroom setting, using the official course content and structure. Upon completion of the NIMS IS-700.a training, participants will be prepared take the final examination and submit it for certification.

The training session will be conducted by Joe Shupienis, W3BC and Bryan Simanic, WA3UFN. Course materials are provided by the FEMA Emergency Management Institute, and the American Radio Relay League. Upon successful completion of the IS-700.a course, participants will receive a Certificate of Achievement from the FEMA Emergency Management Institute, 0.3 Continuing Education Units (CEUs), and 1/3 college credit.

Registration is required and limited to 20.
Email to ARES@parasiticemission.com.

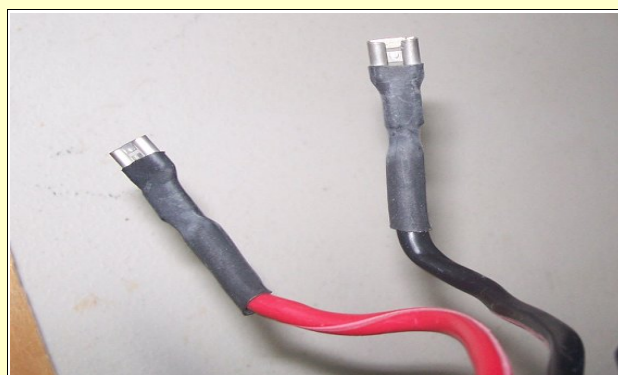


Easy Power Distribution System

by Charles Scott Sharpe, KB3JVD

OCCASIONALLY I FIND the need to power multiple 12 volt devices from one power supply. I investigated the many options for hams and they all seemed expensive. Since my wallet was not full of cash, I decided to make a power distribution system. Off to the local stores, NAPA, Radio Shack and AutoZone, for a solution to my power distribution needs.

What I found was an automotive fuse block that took blade style fuses, it had holders rated at 30 amps and had six positions.



For simplicity, I bought two and use one block for the positive side and one block for the negative side. I also bought some ring

connectors and a box of female spade connectors.

I mounted the fuse blocks on a piece of scrap wood, added fuses, connected leads to the terminals with ring connectors; these would connect to my power supply.

Then I put spade connectors on the leads from my radios and attached the appropriate lead to each block.

Quick and easy. At the time, I think the parts cost me about \$20 dollars.

More recently, I added male and female spade connectors to the input leads so that I could migrate from power source to power source.

Possible upgrades or options

Make connecting to other hams' equipment easier; make a few pigtailed that combine the spade connectors with common power pole connectors.

Create a box for your distribution panel and add an AMP and VOLT meter. Ebay has some cool digital meters with shunts reasonably priced.



APRS: Just Where **IS** Waldo?

By Joe Shupienis, W3BC

FOR MORE THAN a year now, I've been playing around with APRS. I have to admit that there is a "learning curve". I also have to say that the more I learn, the more I appreciate just how useful this technology can be.

APRS is an acronym for "Automatic Packet Reporting System" and is based on and uses digital amateur packet technology. Using a special implementation of the AX.25 packet specification, APRS stations send brief (1/4 - 1/2 second) digital bursts, or packets, of encapsulated information from the sending station. This information can include callsign, status, frequencies in use, weather, and location. The location tracking feature is so popular that many hams mistakenly think the "P" in "APRS" is for "Position"—but that is incorrect!

Primarily using only the single frequency 144.390 FM, APRS stations periodically transmit packets, which are usually digipeated to other APRS stations. If the stations transmit GPS coordinates, each station can display information on the bearing and distance to each of the others, along with their status and other messages. Each station can send a short text message (similar to an SMS text message on a cell phone) to any other APRS station in the network. When properly configured, the "local" range using digipeaters can expand to a radius of well over 100 miles.

Emergency Services

The implications for EmComm operations are obvious... and substantial! During a widespread disaster, each shelter can set up

an APRS station to automatically process weather, status and other messages. Mobile units trying to find a particular shelter can get directions to its exact coordinates, and both the Incident Command Post and the shelter can monitor the progress, location, voice frequency and status of the mobile stations, while freeing their voice frequencies for other critical traffic.



Since APRS digipeaters use simplex, "time-domain repeating", they are very inexpensive and easy to fabricate and deploy. In fact most commercially-built APRS radios have the capability of serving as APRS digipeaters if desired. In an emergency, any vehicles so equipped can be dispatched to appropriate locations to establish wide-range and intermediate fill-in digipeaters as needed, at low cost, and on a moment's notice.

Travelers' Aide

For those who travel a lot, APRS offers many benefits. The key concept here is "objects." An object can be created by a local club to periodically "beacon" the frequency and access tone needed for their local repeater. Travelers passing through the repeater's coverage area will receive this message, and with a single push of a button, they can tune in the repeater, set the correct input frequency, and configure the correct CTCSS ("PL™") tone!

Better yet, the club can create an object for their meeting... or VE session, hamfest, picnic, breakfast or whatever. The coordinates received will create a waypoint on the visitor's GPS, which can be used for navigation to the

event! Again, if the talk-in frequency is properly configured, the visitor can push a button and then check in!

Nets can be set up in a similar manner. Through the week, the net is "announced" periodically, just often enough to let people know of its existence. When the net is in session, the announcements are more frequent, and the one-button configuration allows anyone with an APRS radio to immediately tune in and check in.

Reaching Further

Clubs and EmComm users will want to take advantage of "groups." During a large-scale disaster, each county's EmComm group may wish to be able to address messages to members of their group. Emergency Coordinators and Incident Commanders may need to see at a glance which resources are theirs and where they are positioned. APRS groups and filters offer these capabilities and more.

An amateur on the road may wish to use APRS messaging services to contact other hams many hundreds of miles away. Others may wish to use APRS services to look up a callsign. All this and much more is made possible by APRS-IS. The "-IS" is for Internet Service. Certain APRS stations have been configured by their owners as "Gateways" to the Internet. Through these gateway stations, all packets received are forwarded to internet servers around the world—and even in space!

This data can be shared globally by other gateways, for example, enabling packets to be sent from a mobile in State College to another mobile in Los Angeles. But the most popular use of the data is mapping all APRS activity. Several websites offer "mash-ups" of maps, overlaid with tracks and icons of APRS station activity. Two of the most popular are aprs.fi and www.openaprs.net. Both of these

The implications for EmComm operations are obvious... and substantial!

allow you to see activity in your local area.

You can even send a text message to any APRS station, anywhere it may be. APRS-IS is the mechanism which “knows” the QTH of a given station, and figures out where the nearest gateway is that can be digipeated to your desired station. If the destination radio is turned on, and within the digipeated range of the gateway, your message will be received and displayed on the target radio's console.

Hardware, Software and Firmware

As you can well imagine, there is a lot going on under the hood which is well beyond the scope of this article. But you don't have to be able to change your spark plugs to drive your car, and the same holds true for APRS. You can get a lot of mileage by following a few simple instructions and setting your radio to the correct configuration. Leave the advanced bells and whistles for later!

There are several manufacturers of “plug and play” APRS radios, or you can roll your own. My first APRS rig was a 25-year old Icom IC-Ø2AT hand-held, a 10-year old Sony laptop, and a 10-year old Magellan GPS. I made up a cable to go from the computer's sound card and printer port to the HT's speaker and microphone connectors. (For the curious, the printer connection uses one pin to control the HT's push-to-talk feature.)

The GPS has a serial data cable which merely plugs into the computer's serial port. I needed to download a couple of free programs, and set them up. AGWPE¹ enables the computer to make packet TNC noises and receive them. UI-View² “connects” to AGWPE and the GPS to make sense of the data. It then displays a moving map in full-screen and glorious color, showing all the other stations and objects in range. Total cost was \$0.00 for the software,

1 <http://www.sv2agw.com/downloads/default.htm>

2 <http://www.ui-view.org/>

\$0.00 for the hardware, and about \$20.00 for the parts to make the cables and wiring it all together.

Recently, I got a great deal on a Kenwood TM-D710A, dual-band transceiver with built-in APRS and Packet TNC. It's a great rig, and has every bell and whistle you could ever want. It performs very well, with 50 watts on 2 meters and 440 MHz, and a hot receiver on both bands.

If you go this route, be sure you visit Kenwood's download site³ and get the latest upgrades for the radio. Install them before you program it. When you're ready to program it, use the latest version of the MCP-2A programming software. It makes programming a snap, and keeps a “good” copy on your hard drive for those times you “program” the radio into oblivion and wish you had a “go-back” button!

Other models of APRS radios are numerous. Here are a few of the more popular ones:

Yaesu makes the [VX-8R](#) and [FTM-350](#). Add a GPS and you're ready to go.

In addition to the TM-D710A, Kenwood also offers the [TH-D7A](#), the [TH-D72](#), and the venerable, out-of-production (but reasonably priced used) [TM-D700A](#).

Kenwood also sells the control head separately as the [RC-D710](#), which can be connected to several Kenwood radios, and by carefully following Kenwood's instructions, just about any VHF-FM transceiver!

Alinco offers the [435-I](#) with TNC option.

If you already have a transceiver and a GPS, a [Byonics Tiny-Trak TNC](#) may be your lowest-cost entry point.

Icom bets their future on D-Star™, not APRS.

3 http://www.kenwood.com/i/products/info/amateur/software_download.html

Is Anybody Out There?

Here in central Pennsylvania, we have a surprising amount of APRS activity. Several wide-coverage digipeaters provide good coverage, and a number of local amateurs have seen fit to set up fill-in digipeaters and gateways in their homes. There are a few gaps in the map, notably a 40-mile stretch between Rockton and Milesburg; the West Branch, Ligonier, and Cowanshannock Valleys; as well as the the extreme northern and southern counties. Most major highways are well covered, but a few fill-in digipeaters in strategic locations would be welcome!



Setting up a digipeater in a needed area is a laudable exercise for any club or individual hams. It is not as expensive or complicated as a voice repeater. In fact all that is needed is a good location that covers an area in need of service, a 2-meter antenna, a two-meter transceiver, a TNC, computer or “Tracker,” and a reliable source of power.

Coordination is not necessary, but if you are thinking that you might want to help out, I would be happy to check the coverage of your proposed location with the software that generated the APRS coverage map above. With that, you can see how effectively you can serve your fellow amateurs!

Another important consideration—especially for digipeaters—is proper configuration of the TNC. Incorrect settings could conceivably bring the APRS network to its knees, which would not win you many friends! APRS operators are a helpful lot, and will be glad to answer your “newbie” questions and get you pointed in the right direction. If you don't know, ask. It's in everyone's best interest!

I've encountered a few APRS stations with settings that could potentially cause some problems, or at least prove embarrassing to the operator. It is a really good idea for you to give these systems a “tune-up,” since a poorly configured system does little more than generate massive amounts of QRM for everyone within its range. I would be more than happy to help you determine if your system is operating properly. Key problem areas for many hams revolve around the “PHG” string. I can help you compute your Height Above Average Terrain (which is quite different from your elevation), and the correct syntax for the rest of the “PHG” string. Just shoot me an email, and we can give your system a quick check-up to make sure it's operating at its very best.

Look Who's Talking

The following digipeaters are on the air and providing valuable APRS service to the amateur community throughout Central Pennsylvania:

Callsign	Location
N3RZL-15	Bootjack Mtn, Elk Co.
N3RZL-14	Boone Mtn, Elk Co.
K3ARL-11	Corsica, Clarion Co.
WA3UFN-1	Du Bois, Clearfield Co.
W3PRL	Grampian, Clearfield Co.
W3EOD	Curwensville, Clearfield Co.
AB3HK	Philipsburg, Clearfield Co.
K3CWP-1	State College, Centre Co.
W3YA-1	State College, Centre Co.
N3DXC-1	Glen Campbell, Indiana Co.
N3LZX-9	Johnstown, Cambria Co.
K3ARL-5	Altoona, Blair Co.
K3DNA	McVeytown, Centre Co.
K3ARL-6	Windber, Cambria Co.
N3NRI-2	McConnellsburg, Franklin Co.

Many thanks to all the hams who have set up these digipeaters, and made them available to all of us!

The Information and Other Highways

The Internet is a big part of Amateur Radio these days, and it doesn't look like it will be going away anytime soon. Tracking the locations of other stations can be interesting. It's fun to see how fast the trucks are going on the Interstates.

But wait—there's more! The National Weather Service severe weather announcements are reported to APRS-IS as objects. That's right... you can track the movement of a tornado or severe thunderstorm, both on the map on your computer, and on the display of your mobile APRS radio!

If you have a home weather station that can connect to a computer, odds are that you can connect it to your APRS radio and automatically make periodic weather reports from your station. This data is of great use to the National Weather Service, and of interest in EmComm work as well. Mobile APRS operators can check your station for an



instantaneous report of current weather conditions at your QTH, which is very useful in stormy weather.

In Conclusion

Bob Bruninga, WB4APR created APRS as an offshoot of his ship tracking and positioning research projects at the US Naval Academy. It uses conventional analog modulation and standard voice-band modem technology to communicate with other APRS systems.

APRS is completely compatible with virtually all existing amateur transceivers and packet systems. It is highly flexible and configurable, and can be adapted for almost any digital messaging needs. Point-to-point, digitized, encrypted voice transmission is not and never was an APRS design goal.

APRS is a mature digital technology, with widespread deployment and near-total “market share.” It has much to offer all active hams. Since initial development in the late 1980s, APRS has continuously grown in functionality, refinement and popularity.

APRS operators are a helpful lot, and will be glad to get you pointed in the right direction.

RADIO PIONEERS called it “The Æther.” Current scientists call it the Troposphere and Ionosphere. CBers call it “Skip.” Whatever you call it, it causes radio signals to travel greater distances than they would without it.

As you know, scientists have divided the Earth's atmosphere into various “layers” such as the Thermosphere, the Troposphere and the Ionosphere. Radio Propagation science subdivides the Ionosphere into alphabetical layers, based on the reflective characteristics of each concentric region of our sky.

Amateur radio operators are most interested in the D, E, and F layers. High Frequency DX, especially on frequencies below 25 MHz is very dependent on the F layers being “active,” and to a lesser extent a low level of D-layer ionization. Frequencies above 20 MHz are more dependent on E-Layer ionization to work its magic and usher in the distant stations.

VHF is a whole other game. Above 50 MHz, F-layer propagation is extremely rare, and E-layer performance is usually “sporadic” and not very predictable. At 144 MHz, E-skip is very rare, and at even higher frequencies, ionospheric propagation is extremely uncommon.

Well below the Ionosphere, the troposphere is more commonly the area that reflects or refracts the very short wavelengths over distances beyond “line-of-sight.” Tropospheric propagation requires “discontinuities” in air masses. These reflective and refractive discontinuities involve air masses of different temperatures and densities coming into contact with each other. The sharp changes in the characteristics of the air masses causes radio waves to bend in directions which favor long-distance communications.

You have probably seen this phenomenon on hot days. Air above a hot parking lot or highway seems to ripple the light that passes through it. In many cases, the heated air gains a mirror-like shimmer, reflecting the sky or the ground on the other side of a ridge, allowing you to “see through” the crest of a hill. In other words, a *mirage*.



This lens-like behavior works on light, which if you remember from your high-school physics classes is really very, very high-frequency radio waves. When the air pockets are larger, the same lens-like behavior affects VHF radio waves in exactly the same manner: the radio waves are “bent” or “refracted.”

Thus, instead of hurtling off uselessly into outer space, our radio waves are gently bent back down toward the Earth, where a distant station's antenna picks them up. This requires a lot of heat, and so this “Tropospheric reflection” is commonly experienced during the hot, summer months, on hot, summer days.

But there is more to it. After sunset, if conditions are right, some pockets of air cool off more quickly than others, resulting in air pockets with widely different temperatures and densities. So we again have all the ingredients necessary to form the “radio lens.” This is why we sometimes experience VHF band openings on calm, cool evenings after hot, still days.

Some other natural phenomena which lead to

radio wave refraction and reflection are weather fronts with a cold air mass on one side and a warm air mass on the other. The sharper the frontal boundary, the more likely the reflection will happen.

Normally, the higher you go, the cooler the air gets. Sometimes, a warm layer of air traps a cooler layer beneath it. This is called a “temperature inversion” and will be highly refractive or reflective if the temperatures are sufficiently different. Inversions are common in areas which consist of deep valleys surrounded by flat-topped mountains, like most of Western Pennsylvania!

Finally, several or all of these conditions together can result in areas that act like radio pipes, or waveguides in the sky. This is called tropospheric ducting, and results in crystal-clear communication through the duct to distant stations hundreds of miles away. Really strong ducting can support VHF and UHF communications over paths in excess of 1,000 miles!

All of the “tropospheric enhancement” modes of propagation require heat and stable air masses. Calm, clear summer days offer the best chances, but smaller enhancements are common all year long, especially in the early evening.

In an effort to predict tropo enhancement, meteorologist William Hepburn offers his tropo prediction maps at his website, <http://www.dxinfocentre.com/tropo.html>.

Tropospheric enhancement, or “Tropo” has several natural enemies. Wind is the biggest spoiler. Windy conditions intermix the cold pockets and the hot pockets™ resulting in no pockets... and no DX. High humidity can disrupt the process by absorbing and attenuating the signals before they can get far enough to do any good.

Thunderstorms represent the worst case scenario for tropo enhancement, with strong winds, high humidity, RF interference from lightning, and swirling, unstable air. Sometimes, though, thunderstorms resulting from a cold front can actually form a reflective squall line which acts like a big reflector in the sky. For a few minutes.

In Summary...

Here is a quick summary, or the College Notes version of all of this to help you know what to expect and when to expect it.

Sporadic E: July and August. Smaller peak in late December and early January. Bands: 15, 12, 10, 6, and sometimes 2 meters. HF bands best in late afternoon, early evening, 15 often open late at night in January. 6 and 2, best shortly after noon, occasionally in mid-morning with sunspot activity. After a lull, it picks up again in late afternoon into early evening. DX: 500-2,000 miles, sometimes double hops, especially over water paths, like to Europe and Africa. In winter, 15 meter polar paths to Asia around midnight may occur on rare occasions.

Tropo Scatter: Spring and Fall, especially on calm, clear days that warm up quickly and then cool off quickly at night. 2, 220 and 432 are most frequent. Microwaves over water paths, especially with warm water and intensive radiational cooling. Best times are after the winds calm down after sunset, until well into the night.

Ducting/Inversions: Hot summer days, with appropriate air masses and fronts. 6 meters and up to microwaves. Starts in morning after sunrise, and can last well into the night. Over open water, especially very hot water, trans-oceanic ducts are possible on 6 and sometimes 2. Across vast stretches of water or flatlands, microwave DX records can be broken with ease.

Shorts

AMATEUR RADIO GPS MYSTERY TOUR.

EVERY MONTH, we present a set of GPS coordinates that are somehow related to amateur radio.

Some will be immediately obvious, while others will require some head-scratching.

Last month's coordinates were 62° 23' 33" N, 145° 09' 02" W, which is the Alaskan location of the High Frequency Active Auroral Research Program (HAARP) which conducts ionospheric research by heating (and otherwise "stimulating") a patch of the ionosphere to "see what happens." I have it on good authority that when they are conducting their experiments, you actually **can** see Russia from your front porch. Now where did I put my my tinfoil hat???

This month, we will visit a surprisingly similar location. Does anyone know the history? Bonus points for the callsign!

July ARGMT Coordinates:

40° 46' 25" N, 77° 57' 55" W

Hint: It's closer than you think! *Anchors Aweigh!* Was this on *Nova*?

— . . . —

From John Szwarc, N3SPW, PARA President:

Just a quick note to let everyone know that EchoLink has been re-connected on the 146.430 repeater. The audio levels are not perfect and it is broadcasting a 60 cycle hum when EchoLink is in use. This is a ground loop issue. But it is functional. Feel free to give it a try. Here is a link to the instruction on how to use it:

<http://www.philipsburg-ara.org/echolink.htm>

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www.parasiticemission.com

which also makes available selected back issues, current issues and more.

— . . . —

The current, online, interactive version of the calendar, which contains regional club activities and events in upcoming months may be accessed at calendar.parasiticemission.com.

You may use that calendar to enter amateur radio events of interest to local amateurs which are intended for publication, subject to review and approval.

Thunderstorms represent the worst case scenario for tropo enhancement

August 2010 Amateur Radio Club Activities

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
01 7:00pm» QCARC 2-meter FM Net 8:00pm» Elk Co ARA Net	02 7:00pm» HARC Nets 7:30pm» Punxsutawney ARC 2 Meter Net 8:00pm» Jefferson County A.R.E.S. Net	03 7:00pm» Punxsutawney Area ARC "Radio Night"	04 9:00pm» Clearfield County A.R.E.S. Net	05 7:00pm» Headwaters ARC Meeting	06	07 9:00pm» Philipsburg ARA Net
08 7:00pm» QCARC 2-meter FM Net 8:00pm» Elk Co ARA Net	09 7:00pm» HARC Nets 7:30pm» Punxsutawney ARC 2 Meter Net 8:00pm» Jefferson County A.R.E.S. Net	10 7:00pm» Punxsutawney Area ARC Meeting	11 9:00pm» Clearfield County A.R.E.S. Net	12	13	14 9:30am» QCARC Breakfast 2:00pm» PARA Meeting 9:00pm» Philipsburg ARA Net
15 8:00am» Warren, OH Hamfest 1:30pm» Elk County ARA Meeting 7:00pm» QCARC 2-meter FM Net 8:00pm» Elk Co ARA Net	16 7:00pm» HARC Nets 7:30pm» Punxsutawney ARC 2 Meter Net 8:00pm» Jefferson County A.R.E.S. Net	17	18 9:00pm» Clearfield County A.R.E.S. Net	19	20 7:30pm» QCARC Meeting	21 9:00pm» Philipsburg ARA Net
22 7:00pm» QCARC 2-meter FM Net 8:00pm» Elk Co ARA Net	23 Parasitic Emission Submission Deadline 7:00pm» HARC Nets 7:30pm» Punxsutawney ARC 2 Meter Net 8:00pm» Jefferson County A.R.E.S. Net	24	25 9:00pm» Clearfield County A.R.E.S. Net	26	27	28 9:00pm» Philipsburg ARA Net
29 1:00pm» EmComm Training 7:00pm» QCARC 2-meter FM Net 8:00pm» Elk Co ARA Net	30 7:00pm» HARC Nets 7:30pm» Punxsutawney ARC 2 Meter Net 8:00pm» Jefferson County A.R.E.S. Net	31	01 9:00pm» Clearfield County A.R.E.S. Net	02 7:00pm» Headwaters ARC Meeting	03	04 9:00pm» Philipsburg ARA Net