FEEDBACK

Warminster Amateur Radio Club

Web Site k3dn.org **Warminster Amateur Radio Club** **Januaary 2016**

Next Meeting January 7th - Council Rock NASA

President's Message

Hello everyone, I hope you all enjoyed your Holiday Season. The New Year is upon us, which affords ample opportunity to explore new facets of our hobby, or make more time to get on the air. Welcome to 2016!

There's a lot on WARC's plate for year ahead, including: operating a Special Event in coordination with the ARRL National Parks On The Air initiative; we're planning a another trip to ARRL HQ this spring; organizing an introductory kit-building session; and, of course, we'll be putting together our Hamfest again this year, as well as our Field Day operation. Quite a slate thus far, and the year hasn't even started yet…

The new WARC-Talk group is gaining momentum, but a lot of us still need to get registered. Activity has been steady so far, and there's been quite a few informative discussions taking place. Remember, the old WARC-Talk reflector will be shuttered on February 15, and all intra-club communication will take place on the Yahoo! Group, so if you need help or guidance getting on the site, don't hesitate to contact any Board member for assistance.

As many of you are already aware, Dave Simpson WI3Y became SK in early December. Dave was a long-time member of WARC, and truly an asset to our club. His ham radio legacy will live on with the annual presentation of our newly created Outstanding Ham of the Year Award named in his honor, of which Dave was the inaugural recipient.

Our January meeting is on the 7th, and our topic will be led by the teachers at Council Rock South High School, who coordinated with several WARC members to contact the ISS last spring. It promises to be a fascinating presentation. See you there!

de Tony, W3FLH
73

Editor's Note: I thought this was an article that many of you would be interested in. We all have lived through the Apollo 13 mission, seen the movie or read the book. Maybe all 3 as in my case. This particular article deals with a communications issue that I was not aware of. Enjoy.

Things That Saved Apollo 13, part 3: Detuning the Saturn V's 3rd Stage Radio

by Nancy Atkinson on April 10, 2015

To celebrate the 45th anniversary of the Apollo 13 mission, Universe Today is featuring "13 MORE Things That Saved Apollo 13," discussing different turning points of the mission with NASA engineer Jerry Woodfill.

Very quickly after the explosion of Oxygen Tank 2 in Apollo 13's service module, it became apparent the Odyssey command module was dying. The fuel cells that created power for the Command Module were not working without the oxygen. But over in the Aquarius lunar lander, all the systems were working perfectly. It didn't take long for Mission Control and the crew to realize the Lunar Module could be used as a lifeboat.

The crew quickly powered up the LM and transferred computer information from Odyssey to Aquarius. But as soon as they brought the LM communications system on line another problem developed.

The Apollo 13 crew couldn't hear Mission Control.

The crew radioed they were getting lots of background static, and at times, they reported communications from the ground were "unreadable."
Additionally, the Manned Space Flight Network (MSFN) tracking stations around the world were having trouble "hearing" the

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Apollo 13 spacecraft's radio broadcasting the tracking data.

"Without reliable knowledge of where the vehicle was or was going might result in disaster," said NASA engineer Jerry Woodfill.

What was going on?

The dilemma was that two radio systems were using the same frequency. One was the transmitter from the LM's S-band antenna. The other was the broadcast from the spent third stage of the Saturn V, known as the S-IVB.

As part of a science experiment, NASA had planned for crashing Apollo 13's S-IVB into the Moon's surface. The Apollo 12 mission had left a seismometer on the Moon, and an impact could produce seismic waves that could be registered for hours on these seismometers. This would help scientist to better understand the structure of the Moon's deep interior.

In Apollo 13's nominal flight plan, the lander's communications system would only be turned on once the crew began preparing for the lunar landing. This would have occurred well after the S-IVB had crashed into the Moon. But after the explosion, the flight plan changed dramatically.

But with both the Saturn IVB and the LM's transmitters on the same frequency, it was like having two radio stations on the same spot on the dial. Communications systems on both ends were having trouble locking onto the correct signal, and instead were getting static or no signal at all.

The Manned Space Flight Network (MSFN) for the Apollo missions had three 85 foot (26 meter) antennas equally spaced around the world at Goldstone, California, Honeysuckle Creek, Australia and Fresnedillas (near Madrid), Spain.

According to historian Hamish Lindsay at Honeysuckle Cree, there was initial confusion. The technicians at the tracking sites immediately knew what the problem was and how they could fix it, but Mission Control wanted them to try something else.

"The Flight Controllers at Houston wanted us to move the signal from the Lunar Module across to the other side of the Saturn IVB signal to allow for expected doppler changes," Hamish quoted Bill Wood at the Goldstone Tracking Station. "Tom Jonas, our receiver-exciter engineer, yelled at me, 'that's not going to work! We will end up locking both spacecraft to one up-link and wipe out the telemetry and voice contact with the crew.'"

At that point, without the correct action, Houston lost telemetry with the Saturn IVB and voice contact with the spacecraft crew.

But luckily, the big 64 meter Mars antenna at Goldstone was already being switched over to help with the Apollo emergency and "their narrower beam width managed to discriminate between the two signals and the telemetry and voice links were restored," said Wood.

That stabilized the communications. But then it was soon time to switch to the tracking station at Honeysuckle Creek.

The Honeysuckle antenna by night.
Photo by Hamish Lindsay.

There, Honeysuckle Creek Deputy Director Mike Dinn and John Mitchell, Honeysuckle Shift Supervisor were ready. Both had foreseen a potential problem with the two overlapping frequency systems and before the mission had discussed it with technicians at

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Goddard Spaceflight Center about what they should do if there was a communication problem of this sort.

When Dinn had been looking for emergency procedures, Mitchell had proposed the theory of getting the LM to switch off and then back on again. Although nothing had been written down, when the emergency arose, Dinn knew what they had to do.

"I advised Houston that the only way out of this mess was to ask the astronauts in the LM to turn off its signal so we could lock on to the Saturn IVB, then turn the LM back on and pull it away from the Saturn signal," said Dinn.

It took an hour for Mission Control in Houston to agree to the procedure.

"They came back in an hour and told us to go ahead," said Mitchell, "and Houston transmitted the instructions up to the astronauts 'in the blind' hoping the astronauts could hear, as we couldn't hear them at that moment. The downlink from the spacecraft suddenly disappeared, so we knew they got the message. When we could see the Saturn IV downlink go way out to the prescribed frequency, we put the second uplink on, acquired the LM, put the sidebands on, locked up and tuned away from the Saturn IVB. Then everything worked fine."

Dinn said they were able to "pull" the frequencies apart by tuning the station transmitters appropriately.

Technicians at the Honeysuckle Creek tracking station near Canberra, Australia work to maintain communications with Apollo 13. Credit: Hamish Lindsay.

This action, said Jerry Woodfill, was just one more thing that saved Apollo 13.

"The booster stage's radio was de-turned sufficiently from the frequency of the LM S-Band so that the NASA Earth Stations recognized the signal required to monitor Apollo 13's orbit at lunar distances," explained Woodfill. "This was altogether essential for navigating and monitoring the crucial mid-course correction burn which restored the free-return trajectory as well as the set-up of the subsequent PC+2 burn to speed the trip home needed to conserve water, oxygen and water stores to sustain the crew."

You can hear some of the garbled communications and Mission Control issuing instructions how to potentially deal with the problem at this link from Honeysuckle Creek's website.

As for the S-IVB science experiment, the 3rd stage crashed successfully on the Moon, providing some of the first data for understanding the Moon's interior.

Later, on hearing that the stage had hit the Moon, Apollo 13 Commander Jim Lovell said, "Well, at least one thing worked on this mission!"

(Actually, in spite of the Apollo 13 accident, a total of four science experiment were successfully conducted on Apollo 13.)

In early 2010, NASA's Lunar Reconnaissance Orbiter spacecraft imaged the crater left by the Apollo 13 S-IVB impact.

Thanks to space historian Colin Mackellar from the Honeysuckle Creek website, along with technician Hamish Lindsay and his excellent account of the Honeysuckle Creek Tracking station and their role in the Apollo 13 mission.

http://www.universetoday.com/119784/13-more-things-that-saved-apollo-13-part-3-detuning-the-saturn-vs-3rd-stage-radio/

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N3HBT TOWER

The tower is a free standing crank up (motorized), tilt over aluminum tower. It has 3 25 foot sections and I have it set to go up to 66 feet. It is 27 feet in the retracted position. It is installed and working thanks to the following people: Warren WB2ONA and his helper Peter, Tom KA3FQS, George KA3WXV, George KC3ESH, Jim WA4YWM, Michael KB1JEY, Dave Fox KB3LPB, and my wife Elaine N3TMP, who allowed this project to happen. My Seeing Eye dog, Duchess was a big help by greeting everybody with a loud bark.

The tower was purchased from the following:

ALUMA TOWER COMPANY, INC. 1639 Old Dixie Hwy
Vero Beach, FL 32960

There is a 3 element Steppir DB18 just above the thrust bearing, with a 4 element 222 beam for FM above that and a 8 element 2 meter/440 beam above that, and a 2 meter/ 220/ 440 meter vertical at the top of a 18 foot 2 inch 3/8 wall aluminum mast. This is all rotated with a Yaesu G2800 rotor. The tower is 75 feet high, with a limit switch that keeps to 66 feet tall with the motor. Thanks to all who helped install the monster.

400 LB TOWER BASE

TOWER ON THE TRUCK

GEORGE, GEORGE, TOM , WARREN

"CRANK IT UP, GEORGE!" SAYS GEORGE

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DAVE UP HIGH

WARREN UP REALLY HIGH

DAVE, JIM ON THE ROOF WITH THE STEPPIR

WARREN PUTS THE FINAL TOUCH ON THE STEPPIR

FULL EXTENSION

THE KING WITH HIS CASTLE TOWER

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TOWER FOR SALE

Height is 60 foot crank up tilt over free standing aluminum tower with thrust bearing and ac hoist motor and base template. $400.00. Must pick up in Warminster PA. Tower is 35 years old and will need some repair. For more information, contact George Brechmann N3HBT at 215-443-5656 or n3hbt@arrl.net.

K7RA SOLAR UPDATE

Over the past week, average daily sunspot numbers were up, but average daily solar flux values were down, compared to the previous 7 days.

Average daily sunspot numbers rose 8.1 points to 57.7, and average daily solar flux values were down 12.4 points to 109.9. The average planetary A index declined from 21.7 to 8.9, and the average mid-latitude A index went from 12.6 to 5.9.

Predicted solar flux is 95 on January 1; 100 on January 2-7; 105 on January 8; 110 on January 9-12; 105 on January 13-14; 110 on January 15; 115 on January 16-20; 110 on January 21-26, and 115 on January 27-29.

The predicted planetary A index is 30 on January 1; 18 on January 2-3; 12 and 8 on January 4-5; 20 on January 6-7; then 12, 10, 20, 18, and 10 on January 8-12; 5 on January 13-20; 10, 15, 10, and 12 on January 21-24; 10 on January 25-26; 8, 15, 25, 18, and 12 on January 27-31.

Courtesy ARRL Newsletter

HAM RADIO OUTLET FOUNDER ROBERT G. FERRERO, W6RJ, SK

Ham Radio Outlet (HRO <http://www.hamradio.com/>) Founder Robert G. "Bob" Ferrero, W6RJ (ex-K6AHV), of Danville, California, died on December 4 after a period of ill health. He was 78. An ARRL Life Member, Ferrero was a California state trooper and US Navy veteran when he acquired Ham Radio Outlet in Burlingame, California, in 1971. He characterized the original store as a "little radio emporium on a wooden train platform." HRO is now the world's largest Amateur Radio retail chain.

Ferrero took part in DXpeditions to Kingman Reef in 1974, the Austral and Marquesas Islands, and the now-deleted Bajo Nuevo and Serrana Bank. He also operated as 9J2RA, TJ1GB, and W6RJ/Z2, as well as from HZ1AB in the 1980s and early 1990s.

Ferrero was inducted into the CQ DX Hall of Fame in 1997 and into the CQ Amateur Radio Hall of Fame in 2005. He was a member of the A1 Operators Club. In 2009, the editors of CQ, in conjunction with the Visalia DX Convention, recognized Ferrero "for his many contributions to Amateur Radio."

He was among the initial patrons and a significant supporter of the Northern California DX Foundation (NCDXF <http://www.ncdxf.org/>).

Among his survivors is his son Robert, W6KR, a co-owner of HRO and a DXpedition partner. -- Thanks to Chip Margelli, K7JA, and The Daily DX <http://www.dailydx.com/>

Courtesy ARRL Newsletter

YASME FOUNDATION ANNOUNCES EXCELLENCE AWARD TO LOGGING SOFTWARE TEAM

The Yasme Foundation <http://www.yasme.org/> Board of Directors has named the N1MM Logger+ <http://n1mm.hamdocs.com/tiki-index.php> logging software development team to receive its Yasme Excellence Award. Team members include Tom Wagner, N1MM; Rick Ellison, N2AMG; Steve London, N2IC; John Bednar, K3CT; Nikolay Safronov, NA3M; Pete Smith, N4ZR; Andreas Hofman, KU7T; Larry Gauthier, K8UT, and Richard Ferch, VE3KI.

The Yasme Excellence Award recognizes an individual or individuals who, through their own service, creativity, effort, and dedication, have made a significant contribution to Amateur Radio. "The contribution may be in recognition of technical, operating, or organizational achievement, as all three are necessary for Amateur Radio to grow and prosper," the Yasme Foundation announcement said.

N1MM+ is a major revision to the original N1MM Logger program, involving a volunteer effort to rewrite and test more than more than 250,000 lines of code. The program continues to be available free, and is updated and supported on a regular basis.

Courtesy ARRL Newsletter

CLUB INFO

PUBLIC SERVICE

CLUB STATION
The WARC club station is open to anyone with an interest, on Tuesday evenings between the hours of 7:00 and 9:00 pm. For further information, call George Brechmann N3HBT at 215-443-5656.

WARC ALUMNI MEMBERSHIP
An Alumni membership category is available for WARC members who are unable to attend meetings and club activities on a regular basis because of health considerations, travel impediments, or other hardships. Dues for the Alumni membership are $10.00 annually. Please contact the Membership Committee for more information if interested."

ATTENTION MEMBERS
The Membership Committee can provide Club badges. Two types are available: an engraved plastic callsign and name badge for $5 or a free, laminated plastic, photo ID badge/card. The photo id badge is included with your membership when a facial photo is provided by you. Please see members' photos on club website for proper facial composition. If you do not have at least a Warminster Amateur Radio Club badge with your picture on it, please contact your Membership Chairs at the WARC monthly meetings. Otherwise, please contact Membership by email at: membership@k3dn.org.

If you want to have your picture taken to be placed on the 'Members' Photos' section of the www.k3dn.org website, please contact Membership with your interest. When we get enough people who are interested we will post a notice in Feedback and have a camera ready at the following club meeting.

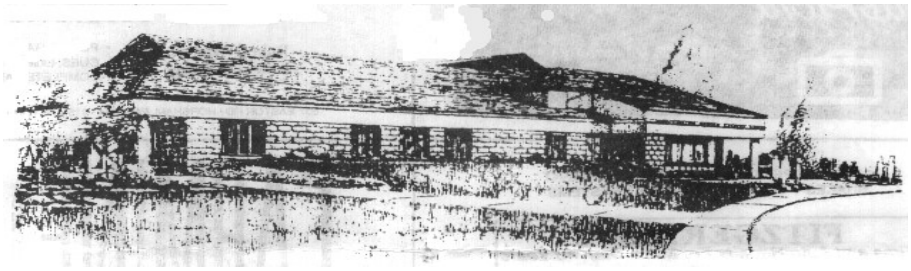
PROGRAMS 2016

January - Council Rock NASA

February - Club Auction

The Club Station - K3DN - is located at the Benjamin Wilson Senior Center, Delmont Avenue, Warminster, PA. The station is open for club members and the interested general public on non-holiday Tuesday evenings from 7 to 9 pm . The station is fully operational on HF (80 meters through 10 meters) both phone and CW. There is an assortment of amateur radio shareware which may be copied under the shareware licensing agreement.
For additional information on the Club Station please call the Station Manager N3HBT - George at 215-443-5656.

- **WARC Meetings are held the first Thursday of each month at 7:30 pm at the Benjamin Wilson Senior Center, Delmont Avenue, Warminster, PA. Talk in is available on the 147.09 & 443.950 repeaters.**



2016 Contest Calendar

JANUARY
ARRL January VHF Contest 1900Z, Jan 30 to 0359Z, Feb 1

FEBRUARY
School Club Roundup
Monday, Feb 8 through Friday, Feb 12 from 1300 UTC Monday through 2359 UTC Friday
International DX – CW
0000 UTC Saturday, Feb 20 through 2359 UTC Sunday, Feb 21

MARCH
International DX – Phone
0000 UTC Saturday, March 5 through 2359 UTC Sunday, March 6

QSO Parties
Montana 0000Z-2400Z, Jan 23
Vermont 0000Z, Feb 6 to 2400Z, Feb 7
Minnesota 1400Z-2400Z, Feb 6
New Hampshire 1600Z, Feb 13 to 2200Z, Feb 14

➢ ATLANTIC DIV. HAMFESTS ➢ 2016

January 23 - Harrisburg RAC Winter Hamfest
Harrisburg Area Community College Cooper Student Center
One HACC Drive
Harrisburg, PA 17101
http://w3uu.org

January 30 - Post Holiday Hamfest
Odenton Baptist Church
8410 Piney Orchard Parkway
Odenton, MD 21113
https://sites.google.com/site/marylandmobileers/hamfests-1/hamfest-2

February 14 - Gloucester City ARC Winter Hamfest
Brooklawn American Legion
11 Railroad Lane
Brooklawn, NJ
http://nj2gc.org

V.E. TEST LOCATIONS

Confirm all information, in advance, with the contact person. Licensed applicants must bring the original, and one photocopy of their license. All applicants, including children, must bring two forms of positive ID. Also bring the original, and a copy, of any Certificate of Successful Completion needed to prove current status. The ARRL VEC'S 2016 test fee is $**15.00**.
Warminster Amateur Radio Club, Monthly, Last Mon. 7:00 pm at the Wilson Senior Community Center 580 Delmont Avenue Warminster, PA 18974 George Brechmann (215) 443-5656.
Atco, NJ , The fourth (4th) Tuesday of each month, at 7 p.m. Winslow Township Senior Center, 33 Cooper Folly Road, 08004-2603.
Mark (K2AX) jtra@comcast.net
Levittown, PA, Monthly, 3rd Monday at 6:30. Falls Township Building - Ben Johns, K3JQH, 215-657-5994
Telford, PA, Monthly, RF Hill ARC. 3rd Monday at the Indian Valley Library. Charles Schmell, KB3CEZ, 215-257-6368 days 215-538-7458 evenings.
Philadelphia, PA, Testing is done on the 4th, non holiday Thursday of the month at the, Community Ambulance Association of Ambler, 1414 E Butler Pike, Ambler PA 19002 at 7:00 PM We also are testing on Saturdays at least once per quarter at 9:00 AM. For further information contact James McCloskey at jmccloskey@msn.com and by phone 215 -275-2979.
Lansdale, PA Testing on the first non-holiday Tuesday of the month starting at 7:00 PM. The Lansdale Library Community Room Vine St. and Susquehanna Ave. Lansdale, Pa.Registration is required 48 hrs. or more before the scheduled exam date. If there are no registrations the scheduled exam date will be canceled. NO WALK-INS. You can register by contacting:
Olaf N. Markert -------- Phone (610) 517 -5074, E-mail w3pa@arrl.net

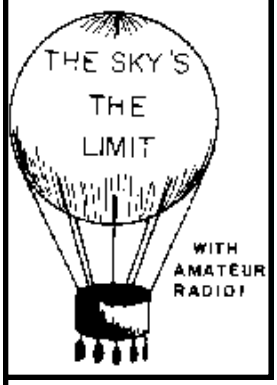
SKYWARN INFORMATION

MOUNT HOLLY NWSFO SKYWARN Weekly Information Net: EVERY THURSDAY AT 21:00 HOURS
SKYWARN Net Repeater Listing/ Streaming Audio of scheduled SKYWARN Net: http://www.skywarnnet.net
You do NOT have to be a certified SKYWARN Weather Spotter to check into the Net

Bucks County SKYWARN Weather Spotter PRIMARY FREQUENCY: 147.300MHZ (+ 131.8)
Fairless Hills, PA (many remote access locations throughout Bucks County)

Mount Holly NWSFO SKYWARN Homepage:
http://www.erh.noaa.gov/phi/skywarn/index.html

SKYWARN Basic Weather Spotter Educational Programs URL:
http://www.erh.noaa.gov/phi/skywarn/training.html#sched



The Warminster Amateur Radio Club
Announces Free Ham Radio Instructional Classes

If you're interested in Ham Radio, or think you might be, this is your opportunity. Perhaps you'd like to learn about digital communications, Morse code, VHF, UHF, satellite, or perhaps you'd rather sit down and chat with someone in South Africa, Russia, Great Britain or in the space station.

Technician classes will start on Monday March 14 and will run for 8 weeks and be from 7:00 until 9:00 pm at the Ben Wilson Center.

For further information contact George Brechmann, N3HBT at 215-443-5656.

Bucks County Amateur Radio Emergency Service (BCARES)
www.bucksares.org
Bucks County ARES will be on the air Wednesdays, at 9:00 PM . We will be using Warminster Amateur Radio Club's repeater on 147.090, pl 131.8. This net is linked as shown in the Net Schedule box for the Wednesday night net. It may also be linked to 147.300.
Winlink Gateway Stations:

Lower Bucks	NY3J-10	145.530 Bensalem
Montco	W3CF-10	145.950 Hatfield
Chester County	W3EOC-10	145.690

Net Schedules

Sunday	2100	10 Meter Net	28.445 MHz
Wednesday	2030	2 Meter Net	147.09 Rptr.
Wednesday	2030	Linked w/ 2 Meter Net	443.95
Rptr.Wednesday	2030	Linked w/ 2 Meter Net	53.230 Rptr.
Sunday	2030	Informal Net	223.5 Simplex
Thursday	1900	Mont. Cnty RACES Net	146.835 Rptr.

➢ CLUB EQUIPMENT

WARC has purchased four Vertex Standard 2-meter HT's that are available for use by members of the club. The HT's are available on a month-by-month basis and have been purchased primarily to help new hams get on the air. However, they may also be used by any club member who is in need of a temporary 2-meter radio. They are also available for use by participants in WARC's public service activities.
DE, Vinny Porcaro K3VJP
215-493-0783

Area Repeaters

VHF

145.310	R.F. Hill
145.350	Doylestown R.C.
146.790	Penn Wireless
145.330	Hilltown
146.670	DVRA
146.685	Holmesburg
146.925	Willingboro
147.000	Ham Buergers
147.030	Phil-Mont
147.090	Warminster
147.270	Frankford
147.300	BEARS
147.390	CBRA

220

224.580	PackRats
223.76	K3NAL

UHF

442.650	DVRA
443.250	TAG
443.050	Metro-Comm
443.950	Warminster
444.200	BEARS
447.475	WR3B
448.225	Penn Wireless

D-STAR

146.61000	K3PDR DV
445.18125	K3PDR DV
445.01875	AA3E Montco RACES

6 Mtr

53.030	WA3BXW
53.230	N3DQZ
53.320	K3MFI

Are you submitting an article for the Feedback ?

Contributions of articles to be published are always accepted for consideration. Please follow these guidelines:

- **E-Mail to:**
  wa4ywm@comcast.net
  Or via snail mail to:
  FEEDBACK EDITOR
  Warminster Amateur Radio Club
  Box 113
  Warminster, Pa 18974
- **Use both upper and lower case letters.**
- **Use your program's spell check.**
- **If you don't have a computer, then typewritten sheets are o.k, but please use both upper and lower case.**
- **Put your name and call at the beginning or end of the article, and show credits if you are using material from another source.**
- **Deadline for articles is the Saturday before the regular meeting.**

For general club correspondence:
k3dn@k3dn.org

Visit our Home Page at:
http://www.k3dn.org

The annual dues rate structure is as follows:

Full Member:	**$ 20.00**
2nd Family Member:	**$ 10.00**
Student:	**$ 10.00**
Alumni:	**$ 10.00**

- **Are your dues current ?**
- **Check the date on your Feedback mailing label.**

2016 Officers

Executive Officers

President	Tony Cuttone	W3FLH	267-679-9297
Vice-President	Vinny Porcaro	K3VJP	215-493-0783
Secretary	Andy Vavra	KD3RF	610 287-3295
Treasurer	Bill Ballantine	K3FMQ	215-766-0764
Director (A)	Michael Shanblatt	W3MAS	267-491-5773
Director (E)	Larry Abbott	WA3ELQ	215-704-3282
Director (A)	Jim Elmore	WA4YWM	215-538-1889
Director (E)	George Brechmann	N3HBT	215-443-5656
Past President	Irwin Darack	KD3TB	215-343-8170

Committee Chairpersons

Archives			
ARES/RACES Liason	Karl Harris	K3KH	215-264-1855
Arrl Liason	Richard Luce	AG3L	215-441-8264
Awards Manager	Vince Pironti	KD3TC	215-674-0446
Classes	George Altemus	KA3WXV	215-855-3856
Digital and APRS	Ron Wenig	NY3J	215-638-9257
DXpedition	Doc Whitticar	W3GAD	215-968-6397
Feedback Editor	Jim Elmore	WA4YWM	215-538-1889
Field Day 16			
Fundraising	Adam Huffnagle	KB3JCP	215-442-9526
Hamfest 16	Mike Karabin	WJ3O	215-317-4029
Hamwear	Herb Hickmott	KB3VMN	267-718-3601
Holiday Dinner	George Brechmann	N3HBT	215-443-5656
Membership	George Acker	KC3ESH	215-815-7783
Net Manager	George Brechmann	N3HBT	215-443-5656
PA QSO Party	Mark Kempisty	AA3K	215-953-1493
Publicity	Bernice Kraut	KB3PCX	215-884-8195
Refreshments	Brandon Penglase	KC3DYT	
RF Interference	Andy Vavra	KD3RF	610-287-3295
RF Interference	Bill Ballantine	K3FMQ	215-766-0764
Repeater Coordinator	Brian Taylor	N3EXA	215-257-6303
Safety Officer	Vinny Porcaro	K3VJP	215-493-0783
Skywarn Liason			
Station Trustee	George Brechmann	N3HBT	215-443-5656
Sunshine Club	Vince Pironti	KD3TC	215-674-0446
Township Liason	Richard Luce	AG3L	215-441-8264
VE License Testing	Larry Abbott	WA3ELQ	215-704-3282
VHF/UHF/MW	George Altemus	KA3WXV	215-855-3856
Website Coordinator	Al Konschak	WI3Z	215-491-9941
Youth Programs	Steve Larson	WW3Y	215-822-1511