

# WASHRAG



VOLUME 25 ISSUE 01  
JANUARY 2023



RaspiNOAA V2 | V1.8 | Build: 9-MD  
<http://qsl.net/ve3elb/RaspiNOAA>  
Antenna: QHA

Ground Station: N3BSQ | Bethel Park Pennsylvania  
Satellite: NOAA 15 | 02-01-2023 08:30  
Max Elevation: 87° East | Sun Elevation: 3°  
Direction: Southbound | MCIR-precip | Gain: 42.0

N3SSH WASHRAG N225H/B



RaspiNOAA V2 | V1.8 | Build: 9-MD  
<http://qsl.net/ve3elb/RaspiNOAA>  
Antenna: QHA

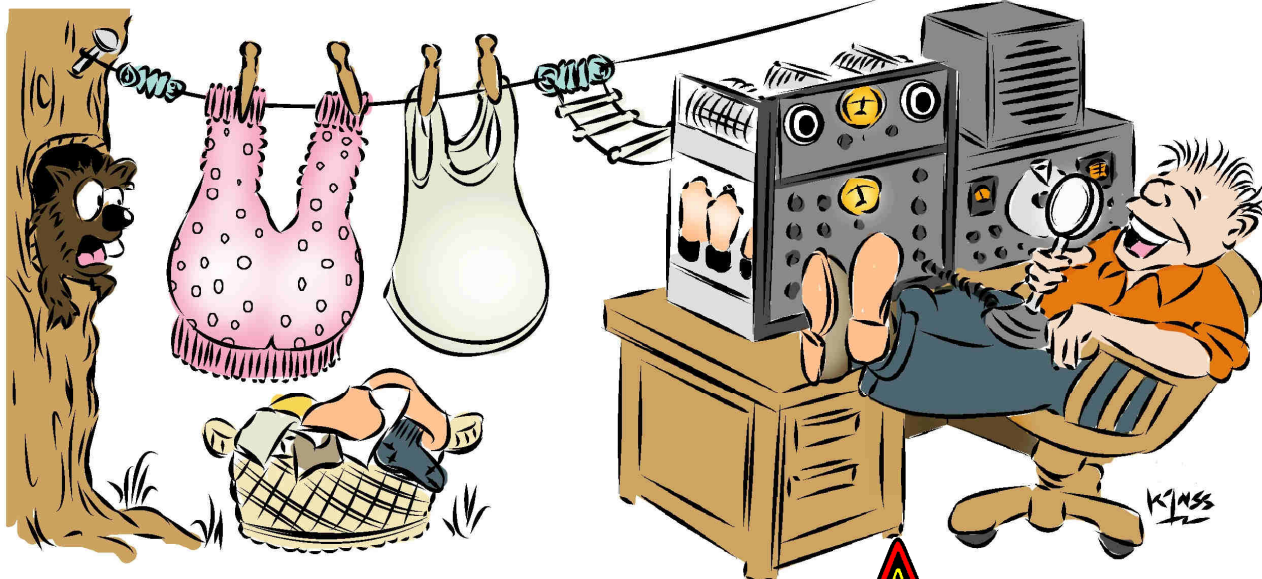
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[www.n3ssh.org](http://www.n3ssh.org)





# Wireless Association of South Hills



## WASHRAG™



VOLUME 25 Issue 01

JANUARY 2023

### Next Monthly Meeting: Thursday, January 5<sup>th</sup>, 2023

The next scheduled meeting of the WIRELESS ASSOCIATION OF SOUTH HILLS, INC. will be on **Thursday, January 5<sup>th</sup>, 2023**, starting at 7 PM, at **PANERA BREAD Galleria Mall**, 1500 Washington Road, Mt. Lebanon PA 15228. Room will be available to us starting at 6:30 PM for anyone who'd like to get dinner, or just nosh, before the meeting

Topics Include: **WASHFest 2023**, Field Day 2023, **WASH** 2023 planning, and more.

See you there!

Cover: An image from the Raspberry Pi Weather Tracking Software, RaspiNOAA V2 <https://qsl.net/ve3elb/RaspiNOAA>

Photo courtesy of and © Copyright 2023 Michael Serowik N3BSQ

## WASH 2023 OFFICERS

### EXECUTIVE COMMITTEE:

President	Curtis Turner KB3CMT
VP / Secretary	Nathan Suehr KC3GMM
VP / Treasurer	Mark Stabryla N3RDV

### AND WE COULDN'T DO IT WITHOUT:

N3SH Trustee	Larry Comden K3VX
WA3SH Trustee	Rich Danko N3SBF
NP2SH Trustee	Paul Jordan NP2JF
N3SH WA3SH NP2SH/B QSL Manager	Ron Notarius W3WN
NP2SH 2009 QSL Manager	Carl Schroeder K9CS
VE Team Liaison	Grant Olson KC3MLC
Webmaster	Curtis Turner KB3CMT
Quartermaster	Harold Rosenberger K3HCR
WASH FM Net Manager	Chuck Bihun KC3ELA
WASHFest 2022 Committee	Glenn Roberts KE7FD, Co-Chair
	Bill Hill W3WH, Co-Chair
	Paul Lusardi NØVLR, Co-Chair
Activities & Operating Events	Rick Bell KB3IAC
Ways & Means	Carol Danko KB3GMN
WASH 2M Contest Chair	Chuck Bihun KC3ELA
Field Day 2022 Coordinator	Glen Roberts KE7FD

### CLUB-AFFILIATED REPEATERS, BEACONS, & DIGIPEATERS:

Mt. Lebanon	N3SH / R	146.955 MHz (-)	PL 131.8
North Side	N3SH / R	442.550 MHz (+)	PL 131.8
Canonsburg	N3FB / R	443.650 MHz (+)	PL 131.8
St. Johns, VI	NP2SH / B	28.276 MHz	Propagation Beacon
Canonsburg	N3SH	144.390 MHz	APRS Digipeater

**N3SH / WA3SH WASHNet**, the weekly on-air net of WASH, meets every **Monday** Night, 8:00 PM ET, on the 146.955 & 443.650 repeaters. All radio amateurs, WASH members or not, are welcome to join in!

## THE LEGAL STUFF

"The WASHRag™" (formerly "The Mariner™") is the Official Newsletter of the **WIRELESS ASSOCIATION OF SOUTH HILLS, INC. (WASH)**, a 501.C.3 not for profit organization.

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Editor & Publisher: Ron Notarius W3WN

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e-mail: [newsletter@n3sh.org](mailto:newsletter@n3sh.org) or [w3wn@arrl.net](mailto:w3wn@arrl.net)

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The **WIRELESS ASSOCIATION OF SOUTH HILLS, INC.** was founded on August 23<sup>rd</sup>, 1993, as the original **SOUTH HILLS AMATEUR RADIO CLUB**, and operated under that name through 1998. WASH was also known briefly in late 1998 as the **N3SH AMATEUR RADIO CLUB**. It is not in any way affiliated with the "South Hills Amateur Radio Club, Inc." and is not responsible for that group, it's members, or it's actions in any way, shape, or form.

As always, special thanks to the owners & operators of both the N3SH/R Repeaters and the N3FB/R Repeater System for permitting the **WIRELESS ASSOCIATION OF SOUTH HILLS, INC.** and it's members to use their repeaters for club purposes.

## WASH Amateur Radio Club News Briefs

### Next WASH VE Test February 26<sup>th</sup>

The Next WASH VE exam session will be on **Saturday, February 26<sup>th</sup>, 2023, 10:00 AM, at Home Economics Building, South Park,** 3735 Buffalo Drive, South Park Township, during **WASHFest 2023**. Talk-in on the 146.955 MHz repeater. All examiners are ARRL VEC affiliated.

**Pre-registration is encouraged. Walk-ins taken on a space/time available basis.**

If you plan on attending the test session, please contact VE Team Liason Grant Olson KC3MLC: [kgo@grant-olson.net](mailto:kgo@grant-olson.net)

Please bring the following to your test session:

- + Picture ID or other suitable identification (2 forms of ID required)
- + Pen / Pencil / Calculator
- + Original FCC license plus a copy of license (if upgrading)
- + Original CSCE plus a copy of CSCE (if upgrading)
- + Check in the amount of \$15.00 (payable to: ARRL VEC)

Note that the FCC now only accepts FRNs as identification numbers. If you don't have an FRN, please create one in advance at <https://apps.fcc.gov/coresWeb/publicHome.do>

Future test dates: To Be Determined

### Curtis's Reflections



Wow, it seems like just a couple of days ago it was 2022!

I hope everyone had a good New Years Eve and has been enjoying the break we have had in the weather. I also hope the holidays have been nice for our club members and our fellow HAM community.

I am looking forward to our annual 2 Meter Simplex event on Saturday, January 14<sup>th</sup>, from 7-11pm EST (00:00 04:00z). I plan to be out in either Hillman or Raccoon to also use the 2m contacts for POTA.

And of course we have our annual **WASHFest** coming up on the 26<sup>th</sup> of February.

Our next club is meeting Thursday the 5<sup>th</sup> at Panera Bread in the Galleria Mall. Our February 2<sup>nd</sup> meeting will also be in the same location. We have the room from 6:30-9pm.

— 73, Curtis Turner KB3CMT  
President, WIRELESS ASSOCIATION OF SOUTH HILLS, Inc.  
N3SH / WA3SH / NP2SH

Mike N3BSQ "got into weather" a few years ago while running his APRS beacon node. He also has a dedicated radio just for NOAA Satellite reception.

But when he ran into issues with his old XP based software, he found the RaspinoAA V2 application — and put his idle Raspberry Pi in use. "After download the complete Operating System and configuring it, I had my first success"

And the results? On the cover of the newsletter.

Well done Mike!

***Reminder: The January & February WASH Meeting location will again be Panera Bread at the Galleria Mall, 1500 Washington Road (US 19) in Bethel Park. Meeting begins at 7 PM; the room is available to us starting at 6:30 PM. Remember, our hosts are letting us use the meeting room gratis, so please return the favor and grab a bite or a sandwich or dinner before the meeting begins!***

Congratulations to our **2023 Officers!** For those who didn't hear, Curtis KB3CMT was re-elected to another term as WASH President, and Nathan KC3GMM was re-elected to another 2 year term as Vice President/Secretary, at the December meeting, along with Mark N3RDV who is currently serving as Vice President/Treasurer.

The annual **WASH 2 Meter Simplex Contest** is coming up this January 14<sup>th</sup>, the Saturday evening (EST) of the weekend prior to the ARRL January VHF Contest. Full rules for 2023 are on Page 6 — and please note the addendum! A PDF of the rules, log sheets, and so forth will be available on the WASH website within the next few days, if it's not already there!

**WASHFest** isn't far behind. Carol KB3GMN is hard at work putting the 2023 event together. First Prize has been picked — and updated! (Now a Yaesu FT-710 AESS) Second prize should be "official" any day now. She's now looking for other prize suggestions, and is just in the beginning of organizing things. So help and suggestions are very much appreciated. We didn't expect to be THIS long a gap between local hamfests this year, but it happens. And because of that, we have an opportunity to have a REALLY big bash this year! We're all really looking forward to it, so: Now is the time! Let Carol know where you can help, what you can do; spread the word, whatever it takes (within reason) so we can make another great hamfest next February!

We had hope to have more information about the **2023 Breezeshooter Groundwave Contests** by now. We've been told in the past that our "best guesses" based on past years hasn't always been accurate... OK, fair enough. We want to get it right, so we'll wait until we hear something official!

So what's up for the new year? In no particular order: Breezeshooter's, **WASHFest**, other area/regional hamfests, Hamvention, Field Day, contests, antenna projects, new rigs, rebuilt rigs, new hams to greet and old acquaintances to meet again, and who knows what else! Looking forward to it? We sure are!



**Frank N3FB and Jim WB4GCS at the December WASH Meeting... more meeting photos on Page 6!**

***Join WASH or Renew your Membership Today! Membership Application on Page 11***



## Minutes, December 1<sup>st</sup> Meeting

Nathan Suehr KC3GMM, Vice President / Secretary, WASH

Call to Order: 19:10. Presiding Officer: Curtis KB3CMT

24 members, 1 guest present.

Pledge of Allegiance, Moment of Silence for Silent Keys and others deserving.

Roll Call.

### Committee Reports:

**Treasurer:** Mark Stabryla, (N3RDV): Report read. Motion to accept by Richie (N3RDV), seconded by Larry (K3VX). Carried.

**Secretary:** Nathan Suehr (KC3GMM): Correction to November minutes. Correction to November minutes - Jeff (N3JSF) was submitted as 'N3JDF' by mistake. Motion to accept by Bill (W3WH) with second by Ron (W3WN). Voted and carried.

**Repeaters:** 443.65 repeating. New messages loaded for announcements. Need access to 955 machine. Would like access to the 442.550 repeater to replace battery as well. Club call needs updated. Curtis - Has updated address for call to PO Box.

**WASHNet:** Charles (Chuck) Bihun, III (KC3ELA): Net going well. Replacement net control schedule completed.

**Thursday Night Tech Net:** Glen Roberts (KE7FD) Tech talk to resume starting in January every third Thursday night. Has several topics already and is open to suggestions.

**Public Service:** Mike (WA3PYU): No report

**Newsletter:** Ron (W3WN): Out!

**Volunteer Examiners:** Next session at WASHFest. Carol (KB3GMN) - Can test session be at 10AM? Grant (KC3MLC) - Yes.

**Ways & Means** (including Member Contributions): Carol (KB3GMN): Should have brought 50/50 tickets. May bring them to next meeting.

### 2023 WASH Officers Elections:

+ Floor opened for nominations:

Vice President/Secretary: Nathan (KC3GMM)

President: Curtis (KB3CMT)

+ No other nominations.

+ Motion to close nominations and have the Vice President/Treasurer cast a single vote for each candidate by Ron (W3WN), second by Tony (KB3BYA). Passed unanimously.

+ Single vote for each candidate cast by Mark (N3RDV).

**Contests:** Larry (K3VX): (no report)

**WASHFest 2023:** Carol (KB3GMN):

+ Coming along well. Two tables sold already.

+ First Prize Radio is not FTD10 but the FT710 and the flyer needs changed.

+ Who has ticket machines? Possibly Harold.

+ We have enough tickets for 50/50, prizes, and entrance.

+ First prize radio has arrived. MFJ has supplied some small hourly prizes.

+ Del (W3DTP) has sold one ad so far for the book. Tony (KB3BYA) to plan menu.

+ Curtis (KB3CMT) has PA system. Taking suggestions and donations for prizes. Will provide bagels and donuts for vendors.

+ Frank (N3FB) - Recommendation to ask HRO for suggestions for a second prize.

+ Del (W3DTP) - Has sheets to sell ads for hamfest program.

+ Tony (KB3CMT) - Menu by next meeting and possible prices and amounts of food.

**President's Report** - Curtis (KB3CMT): (No report)

### New Business:

+ Ron (W3WN) - Received an email from NL7XM asking about life membership for the WASH club.

+ Mark (N3RDV) - We have a discount for members over 65 years or age and many folks pay multiple years in advance.

+ Further discussion about the pros and cons of offering a life membership.

+ Larry (K3VX) - Need new field day chairperson in training to replace Chuck (KC3ELA). Bill (W3WH) - Will bring it up again at next meeting.

+ Larry (K3VX) to send Nathan (KC3GMM) copy of letter to submit to Allegheny County for permission to stay at park overnight for field day.

+ Chuck (KC3ELA) - Is Harold still quartermaster? Bill (W3WH) - Yes.

+ Larry (K3VX) has 5BTV antenna belonging to the club and would like to purchase it.

+ Curtis (KB3CMT) - Any opposition to Larry keeping the antenna (no objections).

+ Curtis (KB3CMT) - January meeting in person or Zoom?

+ Larry (K3VX) - Can we use the screen at Panera for presentations? Old Business:

### Old Business:

+ Larry (K3VX) - Status of the beam antenna for tower trailer/Field Day?

+ Frank (N3FB) - What requirements do we need for the antenna? More details coming from Frank.

+ Jim (WB4GCS) - The Mosley suggested antenna was his first tri-band antenna and it worked well.

+ Eric (K3SGT) - Was his first antenna as well.

+ Carol (KB3GMN) - What is the purpose of the antenna?

+ Mark (N3RDV) - Does the antenna store on the trailer? Frank (N3FB) - Can fit on the trailer for transport but would recommend indoor storage.

+ Eric (K3SGT) - Recommendation of a balun to use with the antenna.

+ Curtis (KB3CMT) - Price of balun and antenna around \$725.

+ Del (W3DTP) - Build vs. buy?

+ Jim (WB4GCS) - Recommend DXE branded balun for common mode current elimination.

+ Bill (W3WH) - Motion to purchase antenna with second by Jim (WB4GCS). All present voted to move forward with purchase.

+ Larry (K3VX) - Willing to donate discone for top of tower trailer for VHF/UHF.

+ Frank (N3FB) - While building patch panel and filter box he discovered some filters that are not performing up to spec. Should we repair and sell them at the hamfest?

Continued on Page 18

## WASH Spotlight: IC-7700



A new year... A new rig.

Latest addition to the W3WH Shack: ICOM IC-7700.

(Guess Santa was good to Bill this year!)

Photo courtesy of and © Copyright 2022, 2023 Bill Hill W3WH

Every month we're going to feature a **WASH** club member, something about them, something they're involved in or a club-related activity that we're involved in, in the **WASH Spotlight**.

Submissions for the Spotlight should be sent to Ron W3WN at [newsletter at n3sh dot org](mailto:newsletter@n3sh.org)

## Monthly WASH Breakfast



Please join us for the next **WASH** Breakfast! We usually get together on the LAST Saturday of every month for a chance to informally sit down, shoot the breeze, compare notes, drink lots of coffee, and just have a good time!

Join us this month at **Eat'n Park**, 3380 Washington Road (US 19), McMurray. Start time is about 8 AM until ????. Monitor 146.955 & 443.659 for talk-in or any last minute changes.

All are welcome, **WASH** members or not, amateurs or not!

## Wireless Association of South Hills Membership

2023  
AA3MR  
AC4KU  
K3HCR  
K3VX  
K3WPL  
K6DWR  
KA3VXM  
KB3CMT  
KB3GMN  
KC3OCT  
KC3TEU  
KC3UUK  
KC4WTT  
KE7FD  
N3DFK  
N3JSF  
N3RDV  
N3SFB  
N3UE  
NB3C  
NL7XM  
W3DTP  
W3LE  
W3WH

W3WN  
W8LEV  
WA3PYU  
WA3VSS  
WB4GCS  
Melissa  
Greenwald  
Charlotte  
Peterson  
Charmel  
Spirk  
2022  
AA3XY  
AE3DL  
K3GW  
K3SGT  
KB3BYA  
KB3GMU  
KB3GUZ  
KB3IAC

KB3IVX  
KB3JHR  
KB3YCX  
KC3ELA  
KC3GMM  
KC3MLC  
KC3NFV  
KC3QZY  
KC3RAA  
KC3RGV  
KC3TDX  
KC8ACK  
N0VLR  
N3FB  
N3IDH  
N3KFD  
N3TDV  
N8NEU

WASH FL  
KA3UPY/M  
WASH NE  
N0PEU  
WASH OH  
N8DPW  
WASH OR  
KB3NVL  
KB3NVM  
WASH SC  
N8NEU

WASH TN  
K3OL  
KE3XB  
N3YPB  
WASH TX  
NB3C  
K3LGM  
KB3IJX  
Jane Wagner  
WASH VI  
NP2JF

### Silent Keys

AB3KA  
AB3ED  
AC4KU  
AD3Q  
K3EED  
K3LIE  
KA3NMG  
KB3ENX  
KB3FNM  
KB3FOT  
KB3JHQ  
N3BPB  
N3CZZ  
N3FZ  
N3HKQ  
N3KEH  
N3OBD  
N3RNX  
N3SKR  
N3SRC  
N3ZEL  
N3XFE  
W3ZLK  
W4ZE  
WA3JPP

If your call  
should be listed  
here & isn't,  
please contact  
Mark N3RDV

Through January 2<sup>nd</sup>, 2023

List compiled by

Mark Stabryla N3RDV, Vice President/Treasurer

# 2023 WASH Upcoming Events Calendar

## Club Meetings & Other Significant Events — Subject to Change

January 5 <sup>th</sup>	WASH Meeting	Panera Bread / Galleria Mall, 1500 Washington Road, Mt. Lebanon PA
January 14 <sup>th</sup>	WASH 2 Meter Simplex Contest	Rules on Page 7 — Note the Addendum!
January 14 <sup>th</sup>	Harrisburg RAC Winterfest 2023	8000 Derry Street, Harrisburg PA 17111
January 21 <sup>st</sup> - 23 <sup>rd</sup>	ARRL January VHF Contest	<a href="https://www.arrl.org">https://www.arrl.org</a>
February 2 <sup>nd</sup>	WASH Meeting	Panera Bread / Galleria Mall, 1500 Washington Road, Mt. Lebanon PA
February 18 <sup>th</sup> - 19 <sup>th</sup>	ARRL DX Contest CW	<a href="https://www.arrl.org">https://www.arrl.org</a>
February 26 <sup>th</sup>	WASHFest 2023	Home Economics Building, South Park 3735 Buffalo Drive, South Park Township, PA 15129
	WASHFest 2023 VEC Exams	
March 2 <sup>nd</sup>	WASH Meeting	TBD
March 4 <sup>th</sup> - 5 <sup>th</sup>	ARRL DX Contest SSB	<a href="https://www.arrl.org">https://www.arrl.org</a>
March 25 <sup>th</sup> - 26 <sup>th</sup>	CQ WW WPX Contest SSB	<a href="https://www.cqwp.com">https://www.cqwp.com</a>
April 6 <sup>th</sup>	WASH Meeting	TBD
April 16 <sup>th</sup>	Two Rivers ARC Hamfest 2023	Elizabeth Borough VFD Bingo Hall, 101 South 1 <sup>st</sup> Avenue, Elizabeth PA 15037
April 23 <sup>rd</sup>	PARS Tri-State Radio Fest	1495 Old Brodhead Road, Monaca, PA 15061
May 4 <sup>th</sup>	WASH Meeting	TBD
May 19 <sup>th</sup> - 21 <sup>st</sup>	Dayton ARA Hamvention 2023	<a href="http://Hamvention.org">Hamvention.org</a>
May 27 <sup>th</sup> - 28 <sup>th</sup>	CQ WW WPX Contest CW	<a href="https://www.cqwp.com">https://www.cqwp.com</a>
June 1 <sup>st</sup>	WASH Meeting	TBD
June 24 <sup>th</sup> - 25 <sup>th</sup>	ARRL Field Day	<a href="https://www.arrl.org">https://www.arrl.org</a>



# ***"Seen" at the December Meeting***

Photos courtesy of and © Copyright  
2022 Ron Notarius W3WN



# 23<sup>rd</sup> Annual WASH Two Meter Contest Rules

Here we go again, folks! This January will mark the Twenty-Third Annual **WASH** 2 Meter Contest. We're looking forward to a chance to stretch our legs, our wheels, and our antennas once again!

Join us for a fun operating event, where you can hear some old friends, and maybe make some new ones, as well as net yourself a free Door Prize Ticket for **WASHFest 2023** just for submitting a log! See you on the air!

- 73, Chuck Bihun III KC3ELA

**Date & Times:** Saturday, January 14<sup>th</sup>, 2022 from 7 to 11 PM EST. (That's January 9<sup>th</sup> 0000-0400 UTC to the purists!)

## Objectives:

- ♦ To make as many contacts as possible
- ♦ To have fun!

**Band, Mode & Frequencies:** The contest will take place solely on 2 meter band.

- ♦ **FM** : FM simplex only, no repeater contacts. The FM frequencies are all standard 2 Meter simplex frequencies, as per the ARRL 2 Meter Band Plan, every **15 kHz**, from **146.505 to 146.595 MHz**, and **147.450 to 147.580 MHz**.

Use of simplex frequencies in the "FM Experimental Simplex" band of 145.510 to 145.670 are not recommended. See list of recommended simplex channels at the end of the rules.

- ♦ **CW**: 144.05 to 144.1 MHz Only. (See ARRL 2 Meter band plan)
- ♦ **SSB & AM**: 144.2 to 144.275 MHz Only. (See ARRL 2 Meter band plan).
- ♦ **Digital (including RTTY)**: 144.51 to 144.55 MHz. (See ARRL 2 Meter band plan) Multiple digital modes may be used, and participants are free to use any generally accepted Digital mode, but only ONE Digital QSO with a given station regardless of mode

→ *Note: Listen for CW QSO's around 144.1 MHz 15 minutes after the hour*

→ *Listen for SSB & AM QSO's around 144.2 MHz 30 minutes after the hour*

→ *Listen for Digital QSO's around 144.51 MHz 45 minutes after the hour*

In the event of accidental QRM with nets and non-contest QSO's in progress, please respect their right to the frequency and QSY.

**Power Limit:** Maximum 100 watts output.

**Exchange** : Callsign, contact number, ZIP Code.

For the purposes of the contest, the 5 Digit ZIP Code for your location is sufficient — do not use the "Zip +4" code. Mobiles and portables should use the ZIP code of their location as determined to the best of their ability. Canadian stations will use their 6 digit postal code

**Example 1:** "N3ZCG from W8XK, please copy Number 3, 15347."

**Example 2:** "K3VX from K3CM, please copy Number 21, 16801"

**Example 3:** "W3WH from W3OC, please copy Number 7, 15137"

**Contacts** : Work as many different calls and locations as possible, giving Exchange as noted above. Work each station once per mode, and **once** per ZIP Code — Mobiles can be reworked whenever they change locations. Remember hilltops work best!

**Disqualification:** Remember, this is a friendly "for fun" contest. Stations may be disqualified for infractions of the rules and for unacceptable operating practices. While not an inclusive list, stations may be disqualified for: • FM signals transmitted on simplex channels below 146.505 MHz. • Intentional interference to non-contesters, nets, & QSO's • Intentional interference to other contest operators • The committee reserves the right to verify QSO's. QSO's that can not be verified may be removed from the log without penalty.

**Scoring:** Each Contact:

<b>Phone</b> (FM, SSB, AM):	1 point
<b>CW</b> :	2 points
<b>Digital</b> (any mode):	2 points

**Multipliers:**

Locations (Number of different ZIP Codes)	
Power:	
Stations running 10 watts output or less:	3
Stations running over 10 up to 30 watts output:	2
Stations running over 30 watts output:	1

**Final Score:** Total Points x Locations x Power

**After the Contest:** Fill out all the log information. In the upper left corner check whether "base" or "mobile." In the upper right corner be sure to enter your callsign and club affiliation (or "none" if not a member of any club). Please number all log sheets consecutively. Log sheets can be downloaded from the **WASH** web site, [www.n3sh.org](http://www.n3sh.org), no later than January 1<sup>st</sup>.

**Submit Log Sheets:** Check your log sheets carefully for dupes. Verify that all information is entered.

Send the logs to: **\*\* Correct Address for 2023 \*\***

WASH 2 Meter Simplex Contest  
c/o Charles Bihun KC3ELA  
4144 Lebanon Church Road  
West Mifflin, PA 15122

Enclose a #10 SASE for return of results.

**Entry Deadline:** February 1<sup>st</sup>, 2023

**Each log submitted on or before the deadline will receive one (1) main prize ticket to **WASHFest 2023****

Logs submitted with an SASE will have their ticket mailed to them, otherwise, the tickets will be available at the **WASH** Club table

## Recommended FM Simplex Frequencies:

146.505 MHz	146.580 MHz	147.510 MHz	146.520 MHz (*)
147.450 MHz	147.525 MHz	146.535 MHz	147.465 MHz
147.540 MHz	146.550 MHz	147.480 MHz	147.555 MHz
146.565 MHz	147.495 MHz	147.570 MHz	

Simplex channels below 146.505 MHz are not to be used, as many of these are in use in WPA as repeater input frequencies.

(\*) The National Simplex Frequency, 146.520 MHz, may be used.

However, many stations use 52 for casual conversation or as a calling frequency. If the frequency is in use or becomes used by non-participants, please permit them to use the frequency unimpeded.

To avoid interference to other contestants and other users of the bands, please do not operate on 5 or 10 kHz "offsets" from these recognized FM channels.

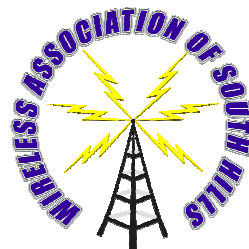
More information about the frequency selection can be found in the FAQ section on Page 5 of the Contest Rules, Log Sheets, and other information found on the **WASH** web site, <http://www.n3sh.org>.

## **\*\* Addendum \*\***

It has been brought to my attention that the current rule set seems to neglect the extra efforts of the **MOBILE** stations which are brave enough to go forth into the cold weather in order to offer ALL stations fast paced thrills of operation, giving the fixed stations all the more opportunities to hunt down those contacts!

In order to reward those intrepid souls, **MOBILE** stations will not be limited in transmitter power, and will be awarded an automatic X3 power multiplier in scoring (as if running QRP). If actually running **MOBILE** QRP, an X4 multiplier will be awarded! I hope these changes will incentivize more people to go **MOBILE**, and make the event more fun for all!

73, Chuck Bihun KC3ELA







# DX Century Club

Bill Hill W3WH

Photos courtesy of and (c)Copyright 2022 Bill Hill W3WH

Canonsburg, PA, December 17<sup>th</sup>, 2022 – Ham Radio has almost limitless paths to enjoyment, personal enrichment and service. I have traveled several of these. One is the pursuit of contacts with other “countries” around the world. The accepted standard for measuring how well you have done in the pursuit of distant entities is the ARRL’s DXCC award. It was established in its present form in 1945 well before most, if not all of us, were not yet hams.

The basic award is granted after presenting proof of two way contacts with at least 100 “countries”. “Countries” is in quotes because many Countries include several DXCC entities. For example The United Kingdom includes England, Scotland, Wales and several others as separate entities for DXCC credit. Even the USA includes Hawaii, Alaska, the Virgin Islands and other possessions as separate DXCC entities. Over the years many “countries” have been added and deleted from the list. Right now I believe there are 339 eligible “countries”.

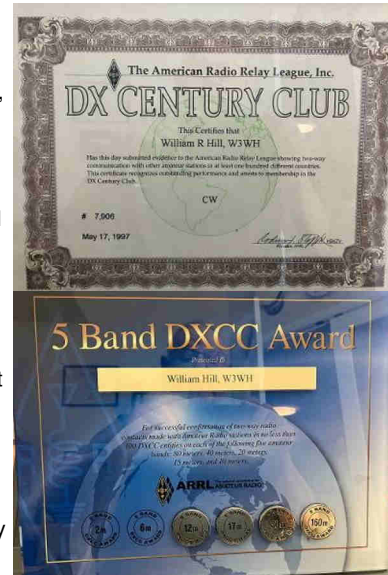
Some “countries” are usually uninhabited and the only way to work them is when a DXpedition activates them. An example of this situation is Bouvet Island (3Y) which is expected to be activated early in 2023.

In order to become a member of the “Club”, you must be a member of the ARRL. There are several ways to apply for membership, including a traditional paper application, an online application and via Logbook of the World. I’m told that the fastest way to complete the process is via LOTW. There are fees involved and details of these and all other pertinent details are available on the ARRL website. There are also several categories of awards such as mixed, CW, Phone etc. Working DX and collecting confirmations via QSL cards and or LOTW has been one of the most interesting parts of the hobby for me. I’m still four or five confirmations short of qualifying for DXCC Honor Roll and perhaps one day I’ll get there but for me the Nine Band DXCC award was the one I wanted most and I reached that a couple of years ago.

You may think that a high power station with a tower and big beam is needed to work DXCC is needed but that isn’t the case. I have 123 “countries” worked using 5 watts and wire antennas and I just finished working 100 “countries” from my apartment with an indoor dipole and gutter/downspout antenna.

Contests are a wonderful way to pick up “new ones” and of course DXpeditions will get you the rarer “countries”. If you’ve never tried to work much dx just get on the air and try. You’ll be surprised how quickly the first 100 “countries” mount up.

Join the fun. It will be worth your time!



# An Australian Antenna Story

Rob Powell VK4HAT

Courtesy of QRZ.COM

Photos courtesy of and (c)Copyright 2022 Rob Powell VK4HAT

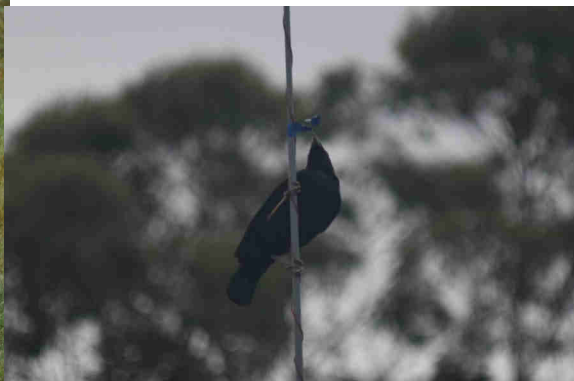


Blackbutt, Queensland, Australia, December 28<sup>th</sup>, 2022 – On 40m I use a 40m quarter wave. It’s a helically wound wire on a SOTA beams light weight fiberglass poll. At each joint in the pole I have used electrical tape to stop the pole from collapsing in wind and rain. This is only temporary ‘till I get aggravated to drive into Brisbane and buy some aluminum tube. Or so I said 18 months ago LOL

Anyway, if you look closely the blue tape is evenly spaced out up the pole but is missing in places. When I taped the seams I taped all of them. I only noticed yesterday that some were missing, when I saw the thief in action.

A Satin Bower bird, who has his bower in my neighbors yard, flew in, landed sideways on the poll and started to undo the tape. He started by pulling with his beak to get a hold, then swung around the pole like it was a swing until the tape fully unraveled and he dropped to the ground. Then picked up his bounty and flew back to his bower hoping to impress his girlfriends.

My mistake? Using **blue** electrical tape. Satin Bower birds collect **blue** things. When it comes to **blue** things they are kleptomaniacs and this one has decided to steal my antenna. HAHAAHA. (He is bugged now, a couple of sections have collapsed and I am about to make it **green** tape instead LOL)



I moved from a sunny house with no trees and a reflective pond to the west, to reduce the intense sunlight in my west facing windows.

I bought a smaller house with weeping willows to the south.

When I tried to install solar panels, they told me I have to remove all the trees. Doah.

– Dr. Loren Chassels KLØT

If you wait until the last minute...

It only takes a minute

– David J. Wilson NS4WT

Ours is a special hobby.

Different set ups, different machines, different locations, different antennas.

Yet, talking to each other easily.

— Dinesh Patel VU2DCI



# Who Has'ma Plasma?

Eric P. Nichols KL7AJ

Courtesy of [QRZ.COM](https://www.qrz.com)

Photos courtesy of and (c)Copyright 2022 Eric Nichols KL7AJ

North Pole, AK, December 19<sup>th</sup>, 2022 – Plasma physics isn't as esoteric as it sounds, and you work with plasmas all the time whenever you work HF.

For the most part, when you're working with a plasma, you're dealing with the COLLECTIVE effects of charged particles, which can be very different from the individual effects of the particles themselves.

Here's some interesting stuff about the ionospheric plasma that might explain a lot of the strange (and not so strange) behavior or HF radio signals. First, some basic chemistry.

The primary ingredient of F2 propagation is Nitrogen ions, most commonly N2+. As you may recall from high school chemistry, Nitrogen has an atomic number of 7, but in its native state generally occurs as a two atom molecule (N2). So the effective atomic number of most nitrogen is 14. Now, a proton is about 2,000 times the mass of an electron. This means that an N2 molecule is about 28,000 times as massive as an electron. When an electron is slapped off an N2 molecule, you now have an N2+ ion and an electron. However, the CHARGE magnitude of an electron is the same as the charge magnitude of an N2+ ion.

Now, what this means is, that for a given electric field (such as the E field of a radio wave, the electron is going to respond 28,000 times as fast as an N2+ ion. This is why FREE ELECTRONS primarily define the "goodness" of radio propagation.

Now, if you have a bunch of free electrons (which is good for radio propagation), what stops them from just blorping off into space (which is bad for radio propagation)? As it turns out, the massive N2+ ions which pretty much stay put (or at least as "put" as neutral air), tend to keep the free electrons in the general vicinity. This is what causes electrons to form in layers, when their natural inclination is to mutually repel each other and disperse into nothingness. So even though the direct interaction between radio waves and ions is almost nothing (unless you're working at HAARP-like power levels, which creates all kinds of new interesting effects), the role of ions is to keep the electrons in a grouping that can do you some good as far as radio propagation.

Now, none of this is to imply that we have ANY region of space which is nothing but free electrons. The free electrons are always part of a vast particle soup. However, at certain heights the ratio of free electrons to general particle soup is greater. The electron density profile (displayed on any ionogram) shows the level of concentration, which usually maxes out at around 250 km in altitude. (Which can change quickly and radically).

In MOST cases, the ionospheric plasma is what we call a weak plasma....meaning that actual ionized particles are a very small percentage of the total number of particles. (Conversely, in the case of an electric ARC, we have a very strong of "full" plasma, where every atom is actually ionized. This can also occur in narrow regions when there's an active aurora. But in general, it's quite surprising how few ions (and electrons) relatively speaking, control all that we do in radio. In fact, the overall density of the Earth's atmosphere at altitudes that are interesting to radio propagation, is about one QUADRILLIONTH the density of air at sea level. Or to look at it from a different perspective, the ENTIRE ionosphere weighs about a metric ton, which means you could, in theory, compress the whole thing in a tank and roll it into your garage on a pallet truck. It should be no surprise then, that the ionosphere acts pretty flaky at times. In reality, there's almost nothing there...even under the best radio conditions!

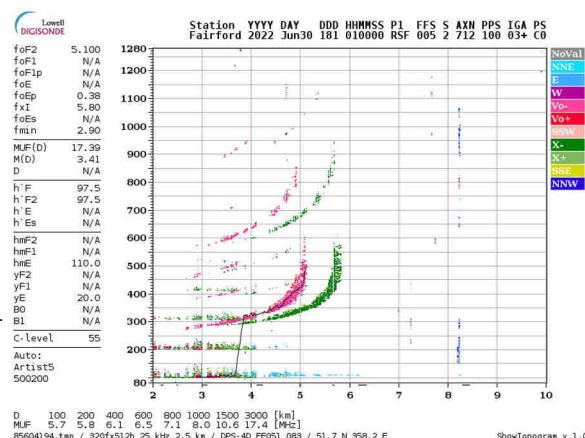
Because of the varying density of free electrons in the ionosphere, we have a continually varying dielectric constant with respect to height, which translates into a continually varying velocity factor.

At this time, we need to stop and explain the difference between refraction and dispersion. By the way, ALL these principles are exactly analogous to optics principles...just being of a different scale.

A high quality lens, for example, works by means of refraction. It focuses light by virtue of the fact that glass has a different dielectric constant, and hence, a slower velocity factor than a vacuum. However, a GOOD lens focuses all frequencies of light the same amount. On the other hand a PRISM bends different frequencies of light a different amount...this is because glass (at least SOME glasses) have a variable dielectric constant. This creates frequency dispersion. The bottom line here is that all dispersive materials are refractive, but not all refractive materials are dispersive. This becomes an important distinction when we translate things into radio propagation in the ionosphere.

Here (Figure 1 — Right) we have a lovely specimen of Sporadic E. This is from the Fairford, England Digisonde....we don't have anything like this condition up here. As you can see there are multiple reflections of the sporadic E, which means the absorption is very low.

But, ignoring all but the first reflection at 90 Km, we see that the height vs frequency curve is perfectly horizontal...VERY different from the F layer returns. This is because sporadic E electron clouds aren't mixed with ions (which is why the F layer is dispersive), but are rather embedded in NEUTRAL air. This makes the response more like a specular reflection than a refraction (a subtle distinction we will explore in due time).



## Marines To Gain Radio Op Experience via Amateur Radio

Morongo Basin Amateur Radio Club via the American Radio Relay League

Newington, CT, December 22<sup>nd</sup>, 2022 -- On Wednesday, December 7<sup>th</sup>, 2022, 22 Communication Officers at the Marine Corps Communication-Electronics School (MCCES) in Twentynine Palms, California, became amateur radio operators. W6BA, the [Morongo Basin Amateur Radio Club \(MARC\)](#) administered the exams and 21 candidates passed their Technician exam, and one passed their General exam. 14-year-old Kalynn Cossette KN6WVD was the youngest candidate who passed her Technician exam.

Retired Marine Corps Warrant Officer 4 (and MARC President) Robert Cloutier WO4ROB says it was a great event and he is excited to see so many new amateur radio operators. So, what drove the officers to want amateur radio licenses? Cloutier pointed out that all of the candidates already have a background in radio administration but not operating experience.

"Chief Warrant Officer (CWO3) Kalem Cossette KK4KC one of the training officers at MCCES, introduced amateur radio to the Communication Officers," said Cloutier. "Most of the students were curious on how to get their license, so CWO3 Cossette contacted the MARC to schedule an exam session."

Cloutier said that all new license holders were offered a free club membership but many of them will be deployed to other locations around the world and will be able to join other amateur radio clubs. He said they hope to conduct exams every three months.



# ***Volunteers On The Air***

## ***A Year Long Operating Event Recognizing Volunteers***

American Radio Relay League

Newington, CT, December 15<sup>th</sup>, 2022 – As announced in the January 2023 issue of QST (see <https://www.arrrl.org/files/file/VOTA%20-%20Volunteers%20On%20The%20Air/QST%20VOTA.pdf>), ARRL is celebrating a year-long operating event honoring all ARRL volunteers: Volunteers On the Air.

In similar fashion to the 2014 ARRL Centennial Celebration, and the 2018 International Grid Chase, this event will be exclusively driven only by QSOs uploaded to Logbook of The World (LoTW).

Highlights of the event include:

- ♦ **Earning Points for contacting W1AW Portable Stations:** There will be week-long activations of portable W1AW/# stations in all 50 states, and in several US Possessions/Territories, that will generate on-air activity to earn points. Each state will be activated twice. The schedule of when which states will be activated as posted in the dashboard above will be updated as changes/additions occur. See the POINTS TABLE for the full list of points.
- ♦ **Contacting ARRL Volunteers or Members on the air:** ARRL Officers, Directors, Section Managers (and their appointees), Staff, and even Members domestically (and DX) can be contacted for points. See the POINTS TABLE for the full list of points.
- ♦ Using Logbook of the World (LoTW – see <http://www.arrrl.org/logbook-of-the-world>) as the QSOs data source, the 2023 Volunteers On The Air event features W1AW activations from all 50 states (twice) and several territories during 2023. Weeks will begin on a Wednesday and end on a Tuesday. Some weeks will be shown as off weeks to avoid other major operating events.
- ♦ Participants will work W1AW portable stations and ARRL volunteers (see <https://contests.arrrl.org/docs/2023-VOTA-State-Activations-Schedule.pdf>) to earn QSO points. (\*)
- ♦ Participants do not need to upload to, or participate in LoTW. Uploads to LoTW by W1AW portable stations and by the volunteers will feed the points scoring system. [Participants are not required to be ARRL Members. Even so, we encourage all Amateur Radio operators who are not members to consider joining the comradery with our 160,000+ current members. When joining, you'll discover support, inspiration, and advice to elevate your Amateur Radio experience.]

A Leaderboard will be activated after the event ramps up, and Certificates will be available during and after the event concludes. Once the year is completed, a final summary will be released.

(\*) Pennsylvania is currently scheduled for the weeks of April 5<sup>th</sup>–11<sup>th</sup>, and September 20<sup>th</sup>–26<sup>th</sup>. For more information about participating as part of W1AW/3, please contact George Miller W3GWM [w3gwm@arrrl.org](mailto:w3gwm@arrrl.org)



# ***Rep. Bill Johnson Introduces Bill To Eliminate Private Land Use Restrictions on Amateur Radio***

American Radio Relay League

Newington, CT, December 23<sup>rd</sup>, 2022 – Congressman Bill Johnson (OH-6) introduced a bill in the U.S. House of Representatives (H.R.9670) on Thursday, December 22<sup>nd</sup>, 2022, to eliminate private land use restrictions that prohibit, restrict, or impair the ability of an Amateur Radio Operator from operating and installing amateur station antennas on property subject to the control of the Amateur Radio Operator.

The exponential growth of communities subject to private land use restrictions that prohibit both the operation of Amateur Radio and the installation of amateur station antennas has significantly restricted the growth of the Amateur Radio Service. These restrictions are pervasive in private common interest residential communities such as single-family subdivisions, condominiums, cooperatives, gated communities, master-planned communities, planned unit developments, and communities governed by community associations. The restrictions have particularly impacted the ability of Amateur Radio to fulfill its statutorily mandated duty of serving as a voluntary noncommercial emergency communications service.

Congress in 1996 directed the Federal Communications Commission (FCC) to promulgate regulations (Public Law 104–104, title II, section 207, 110 Stat. 114; 47 U.S.C. 303 note) that have preempted all private land use restrictions applicable to exterior communications facilities that impair the ability of citizens to receive television broadcast signals, direct broadcast satellite services, or multichannel multipoint distribution services, or to transmit and receive wireless internet services. ARRL attempts to obtain similar relief for Amateur Radio were rejected by the FCC with a statement such relief would have to come from Congress. ARRL Legislative Advocacy Committee Chairman John Robert Stratton N5AUS noted that Congress, in 1994 by Joint Resolution, S.J.Res.90/H.J.Res.199, declared that regulations at all levels of government should facilitate and encourage the effective operation of Amateur Radio from residences as a public benefit. He continued by stating that “H.R.9670, the *Amateur Radio Emergency Preparedness Act*, is intended to fulfill that mandate and preserve the ability of Amateur Radio Operators to continue to serve as a key component of American critical communications infrastructure.”

ARRL President Rick Roderick K5UR, and Mr. Stratton both extended on behalf of the ARRL, its Members, and the Amateur Radio community their thanks and appreciation for the leadership of Rep. Johnson in his tireless efforts to support and protect the rights of all Amateur Radio Operators.

For the full text of the bill, [click here \(PDF\)](#).





# ***Allegheny County ARES***

## ***In-Person Meetings Resume in 2023***

Bob Mente NU3Q

Allegheny County Emergency Coordinator

Carnegie, PA, December 26<sup>th</sup>, 2022 – I hope everyone had a good Christmas!

Due to COVID, I did not have any in-person meetings for 2020, 2021 and 2022 for our Allegheny County ARES unit as I felt it best to err on the side of caution. Since it appears that COVID is now in the "rear view mirror", I will resume our once monthly in-person meetings on a Saturday morning.

- For the winter months (Jan, Feb, Mar), I am currently scouting out venues/locations in Allegheny County where we can hold those meetings.
- For the other months (Apr-Dec), I will alternate between Steel City ARC in Collier Township and Skyview Radio Society in Upper Burrell Twp.

Please note that Nov and December meetings will be WX dependent. If the WX for those meetings appear to be "iffy", I will have the meetings for those months in an alternate location.

Please stay tuned for further information/details.



### **Harrisburg RAC Winterfest 2023**

**Saturday, January 14<sup>th</sup>, 2023, 7:00 AM—11:00 AM**

**Vietnam Veterans of America**

**8000 Derry Street,, Harrisburg, PA 17111**

**DXCC, WAS, VUCC Card Checking Available**

**Admission \$5**

More Information at <http://www.w3uu.org/winterfest/>



### **Two Rivers ARC 51<sup>st</sup> Annual Hamfest**

**Sunday, April 16<sup>th</sup>, 2023, 8:00 AM—2:00 PM**

**Elizabeth Borough VFD Bingo Hall**

**101 South First Avenue, Elizabeth, PA 15037**

**Talk-in on 146.730 — Mobile Check In 146.52**

**Admission \$5**

More Information at <http://www.trarc.net>



### **17<sup>th</sup> Annual Tri-State Radio Fest**

**Sunday, April 23<sup>rd</sup>, 2023, 8:30 AM— 4:00 PM**

**Sponsored by the Pittsburgh Antique Radio Society**

**Center Stage Banquet Hall**

**1495 Old Brodhead Road, Monaca, PA 15061**

**Talk-in on 146.64 PL 131.8      General Admission \$5**

More Information at <https://pittsburghantiqueradiosociety.org/>



# Noise and Power Supplies

Jim Sanford WB4GCS

Eighty Four, PA, January 2<sup>nd</sup>, 2023 – A few days ago, a club member was wrestling with power-line or other noise and asked about ferrite beads. I responded to the reflector with a long (sorry!) email about a bunch of things. Included in that diatribe was the below:

*Better to get rid of the walwarts and replace with linear power supplies. They are poor quality of manufacture (A few weeks ago, I had one for an LED light fail after a week; replaced with a higher quality USB device) and they have been known to cause fires, due to poor quality of soldering and manufacture in China. Note that these things can overheat and start a fire, LONG BEFORE THEY DRAW ENOUGH CURRENT TO TRIP A CIRCUIT BREAKER. So, when Patti or I charge a smartphone, we unplug the device as soon as done, and before leaving the house. If you MUST use these, recommend replace with an electrical outlet which has USB ports built in. Being UL certified, I have a LITTLE more confidence in these.*

I received a private communication reminding me that the outlets with USB ports are "Vampires", like your flat screen TV that consumes power, even when OFF, so that you can turn it on with a remote, rather than a switch on the TV. Some of these can consume WATTS of power, 24 hours per day, 7 days per week. This communication spurred me to do some thinking and measuring, since today was a rain-out.

SO, I built a test rig of one of those outlets with USB in them, a power cord, and one of those plug-in voltage/current/power monitors you can buy at the big box stores and made some measurements. Here's the results of some PRELIMINARY measurements:

1. Current draw and power draw by the outlet/USB was ZERO with no load.
2. Plugged in to the USB ports and LED desk lamp – NO power draw.
3. Turned on the LED desk lamp and saw 11 watts and 0.12A.
4. Repeated the above test with a clamp-on ammeter, same results.

OK, so all this got me to thinking about the broadband noise I've been wrestling with. SO, I got out the IC-R10 and started listening on 80 meters. Baseline noise level with nothing plugged in to anything. Plugged in the USB/Outlet – I could sort of hear a difference, but not really. The change was MUCH less than the noise picked up by bringing my had close to the IC-R10, which attests to the low noise around here in general. To measure noise from the outlet device, I put the antenna of the IC-R10 on top of it and kept my hand away. Imperceptible change between that outlet having power or not. SO, it is neither a "Vampire" or a noise source. SO FAR.

I put the IC-R10 against the USB dongle which came with my desk lamps and no noise. Then I plugged the dongle in and got a whole bunch of noise –MUCH more than when I plugged the desk lamp into the USB outlet and turned the lamp on. When I turned the lamp on plugged into the dongle, the noise increased by a huge factor.

I was ready to toss the USB outlets because of the certification questions and noise concerns. So here's where I am no; noise concerns are mostly alleviated. Can't (YET) measure any "Vampire" power draw. So will give them a try.

My loathe for the unsafe, unreliable, and noisy USB plug-in cubes has been reinforced.

Next step: Build a jig with which to measure the parasitic ("Vampire") load of these USB outlets down to milli-watt level and document results.

To be continued . . .



## New General Class Question Pool Effective July 1<sup>st</sup> Released

American Radio Relay League

Newington, CT, December 9<sup>th</sup>, 2022 – The National Conference of Volunteer Examiner Coordinators' (NCVEC) Question Pool Committee (QPC) has released the 2023 - 2027 General Class FCC Element 3 Syllabus and Question Pool to the public. The new General Question Pool is effective July 1<sup>st</sup>, 2023, through June 30<sup>th</sup>, 2027.

The new pool incorporates some significant changes compared to the 2019 - 2023 version. Its 432 questions were modified slightly to improve wording and to replace distractors; 51 new questions were generated, and 73 questions were eliminated. This resulted in a reduction of 22 questions, bringing the total number of questions in the pool down from 454. The level of difficulty of questions is more balanced, and the techniques and practices addressed have been updated.

The pool is available as a Microsoft Word document and PDF. The single graphic required for the new General Question Pool is available within the documents, or separately as PDF and JPG file formats.

"The newly revised pool must be used for General-class license exams starting July 1<sup>st</sup>, 2023," said ARRL VEC Manager Maria Somma AB1FM, who is a member of the NCVEC Question Pool Committee. "New test designs will be available to ARRL Volunteer Examiners on that date. The ARRL VEC will supply its officially appointed, field-stocked VE teams with new General exam booklet designs around mid-June."

General class examination candidates preparing for their exams using the 9<sup>th</sup> edition of [The General Class License Manual](#), and/or the 6<sup>th</sup> edition of [ARRL's General Q & A](#) are encouraged to test by, or before, June 30<sup>th</sup>, 2023. New editions of ARRL licensing publications will be available in May, for exams taken on, or after, July 1<sup>st</sup>, 2023.



**ARRLVEC**  
Volunteer Examiner Coordinator®

St. Charles, MO, December 23<sup>rd</sup>, 2022 – The Board of Directors of The YASME Foundation is pleased to announce that it has made a grant to support the purchase of radio equipment, accessories, and supplies for the 2023 YOTA (Youth On The Air) Region 2 Summer Camp scheduled for July 16<sup>th</sup> -21<sup>st</sup>, 2023, at Carleton University in Ottawa, Ontario, Canada. ([youthontheair.org](http://youthontheair.org)).

Earlier this year Yasme provided support to this group's Geofoxing (fox hunting combined with geocaching) and radio communication activities for high-school students ([www.ardfottawa.ca/index.php/Main/Events](http://www.ardfottawa.ca/index.php/Main/Events)).

— Ward Silver NØAX, President



The **YASME**  
FOUNDATION  
PO Box 20578 • Castro Valley, California 94546  
A not-for-profit corporation organized to conduct scientific and educational projects related to Amateur Radio [www.yasme.org](http://www.yasme.org)



# Deadline for 2023 ARRL Foundation Scholarships January 4<sup>th</sup>

American Radio Relay League

Newington, CT, December 16<sup>th</sup>, 2022 – The application deadline for the 2023 ARRL Foundation Scholarship Program is January 4<sup>th</sup>, 2023, at 12 PM Eastern Time. More than 100 scholarships ranging from \$500 to \$25,000 will be awarded in 2023 to radio amateurs who are pursuing higher education. While the terms of each scholarship vary, many of the awards may be applied to tuition, books, fees, and other educational expenses.

Applicants must be active, FCC-licensed amateur radio operators. Active foreign amateur radio operators are eligible for scholarships established by Amateur Radio Digital Communications (ARDC) and administered by the ARRL Foundation. Every applicant must submit a completed online application by the deadline.

ARRL intern Jherica Goodgame KI5HTA was among the 2022 ARRL Foundation Scholarship winners. She attends the University of Mississippi.



The ARRL Foundation will be utilizing the same scholarship management platform for 2023 scholarships that was used for 2022 scholarships. Transcripts and additional required documents must be submitted with the online application and not emailed separately. Some scholarships require additional documents, such as a letter of recommendation from a sitting officer of an ARRL Affiliated Club. **Applications without accompanying transcripts and additional required documents (if applicable) will not be considered.**

Additional information and a link to the application can be found at [www.arrl.org/scholarship-program](http://www.arrl.org/scholarship-program).

The ARRL Foundation Scholarship Committee will review all applicants for eligibility and award decisions. Recipients will be notified in May 2023 via USPS and email. Awards are mailed directly to recipients' schools.

In 2022, there were 139 Foundation Scholarships awarded, totaling \$921,250.

The ARRL Foundation administers programs to support the amateur radio community, and was established in 1973 by ARRL The National Association for Amateur Radio®.

## GreenCube now Italy-OSCAR 117

AMSAT News Service

Washington, DC, December 4<sup>th</sup>, 2022 – On July 13<sup>th</sup>, 2022, the GreenCube satellite was launched on a Vega-C launch vehicle from the Centre Spatial Guyanais in Kourou, French Guiana. The satellite project is managed by the S5Lab research team at Sapienza University of Rome, and involves ENEA (the Italian National Agency for New Technologies, Energy and Sustainable Economic Development) and University of Naples. The satellite carries environmental and thruster payloads and as well as a 70cm digipeater for amateur radio use.

At the request of the GreenCube teams, AMSAT hereby designates the satellite as Italy-OSCAR 117 (IO-117). We congratulate all the involved teams, thank them for their contribution to the amateur satellite community, and wish them continued success on this and future projects.

### GreenCube User Club

Because of the increasing interest and the quick appearance of instructional material on making digipeated contacts through IO-117, the "GreenCube User Club" has rapidly grown to more than 300 as reported by Doug Papay K8DP. Several individuals have blogs describing their operational set up that enables them to take advantage of the great DXCC and VUCC opportunity:

Burt DeMarq FG8OJ offers some nicely detailed instructions and good advice on his blog at: <https://bit.ly/3FjqM1f>.

Fabio Roccatagliata F5VKV writes on the AMSAT-BB mailing group that the UZ7HO Soundmodem is very useful for IO-117 but one must download <http://uz7.ho.ua/greentnc.zip> for success as the tone spacing is shifted from those normal for APRS. He continues: "Use the SSB modem, 1600 main frequency in the spectrum. (Put the) Radio in USB, AGC off if possible (or fast), no noise blanker/reduction. You should receive the packet when the signal is within the bandwidth bar you see in the sound modem spectrum. Adapt the DCD threshold accordingly, usually by the half. In the green cube GUI window you should see the decoded packets, in the sound modem the data."

Joe Pereira VK5EI suggested on the AMSAT-BB mailing group that the summary by Tom Van den Bon ZR6TG is particularly helpful for newcomers. It may be found in a blog post on Tom's website: <https://bit.ly/3Uqpm9B>.

Doug Papay sent a Friday update (which is growing rapidly) on the number and DXCC distribution of contacts made on the bird:

As of 1400Z 02 Dec 2022 there have been 303 stations active on IO-117 since 31 Oct 2022. Congratulations to ZL3TKZ for contact #300!

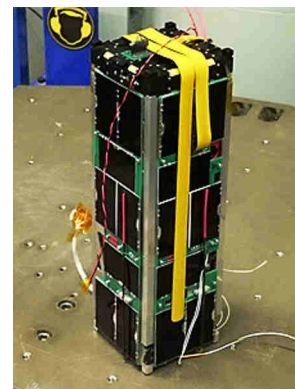
GreenCube is "An ESA mission is exploring the potential of space farming that could help food supply for future manned space missions. The prototype has been developed by ENEA, a biotechnology Italian laboratory, as part of its mission of transferring the results of scientific research to industry and public administrations with a sustainable economic development approach.

The micro-garden measures 30 x 10 x 10 cm and it is based on a closed-cycle hydroponic system guaranteeing a complete 20-day testing growth cycle of micro-vegetables, adequately selected from those best suited to withstand extreme extra-terrestrial conditions. Placed in a pressurized and confined environment, the micro-vegetable garden GREENCUBE, equipped with an integrated hi-tech sensor system for controlling environmental parameters, growth and health of plants, is designed to transmit to Earth, in complete autonomy, all the information acquired. It is mainly inspected about the responses of plants to extreme conditions.

The satellite carrying the garden is constituted by two main parts: one unit dedicated for an effective garden, plants, nutrients and sensors; while the other one will be occupied by the spacecraft management and control platforms necessary to the mission operative in-orbit. This satellite enables new data acquisition about the possibility of literally farming in space.

This study could represent the basis for future possible development of much bigger cultivation at zero gravity supporting human explorations with a green touch. For example it could represent a turning point for deep space human future missions, like Mars exploration programs, in this case an own food production could mean a significant saving in mission stocks.

An indirect possible goal of such a mission is the study of the possible advantages of a space farming and vegetable species answer to such a new environment."



# 3rd Annual Youth Essay Contest Winners

Paul S. Ewing N6PSE, President, The Intrepid DX Group

San Jose, CA, December 15<sup>th</sup>, 2022 – It is with great pleasure that we announce the winners of the 3rd Annual Youth “Dream Rig” Essay Contest. We received essays from young amateurs from all over the world. Each essay was unique in thought and very well-written. Extra consideration was given for correct grammar, punctuation, and spelling. The essays gave interesting perspectives on how to reach out and connect with the youth of today, and we will be sharing those ideas in subsequent postings.



- First Place winner, and recipient of the ICOM IC-7300 is Maria Polyanska VE3OMV
- Second Place winner, and recipient of the Yaesu FT-65R radio, is Ryan Kocourek N7RSK
- Third Place winner, and recipient of a Yaesu FT-65R radio, is Toby Latino AG5ZM



Having read your many essays this week, we can tell you that our youth are full of great ideas, and they are brimming with enthusiasm to keep our hobby alive well into the future.

Thank you to our sponsor, Robert Chortek AA6VB for providing the funds for this year's prizes.

Thank you to all of the youth participants for helping us make our third annual Youth Essay Contest a success. Let's do this again next year!

## Young Ham Lends A Hand Contest

Carole Perry WB2MGP, Director, Youth Activities, Radio Club of America

Staten Island, NY, NY, December 24<sup>th</sup>, 2022 – We want to reward a young ham who has volunteered to help an elderly person, a military person, his or her community somehow, or a young ham actively involved with recruiting other young people into ham radio.

There's no red tape; it's just me and my RCA Youth Activities evaluating the application forms. You will smile to know that we have had high caliber and terrific young hams who get nominated every year.

I am still accepting nominees for this contest to encourage volunteerism in our young hams. Forms may be submitted up until April 1<sup>st</sup>. The winner is usually announced at the Hamvention Youth Forum.

This May, I will be announcing the winner through our normal ham radio networks. A \$100 stipend is awarded to the winner.

Please fill in the following request for information about your nominee for this year's contest:

- Information about your nominee: Name and call sign, age, address, home number and cell number
- YOUR name, relationship to the candidate, and contact information.
- Please describe reasons why this nominee is deserving of the award that looks for a young ham who gives back to the community by participating and helping in local events, assisting the elderly, assisting military personnel, or is instrumental in recruitment and/or training of more young hams.

This is sponsored by RCA and QCWA. Please contact me with any questions. All forms should be submitted to [wb2mgp@gmail.com](mailto:wb2mgp@gmail.com)



## DX News Briefs

On 19 December, the 3YØJ Team, via Ken LA7GIA, posted this on their Facebook page:

**Today we reached 100% funding of our \$715,000 budget! The 3YØJ fundraising has been extremely successful and one month before we go to Bouvet we have secured 100% financing. This is quite amazing, and we want to thank all our upfront supporters!**

**We are quite humbled receiving all this upfront support – and we're really thankful seeing the trust in our team! It is only with upfront donations that such DXpeditions can take place. We have prepared the best we can and we are determined to do our best to fulfill all your expectation and make a great show at Bouvet!**

**Each team member have paid up to \$25,000 dollar in operator fee and other expenses. Some of these expenses are not shown in any DXpedition budget but are paid by the operators to make this DXpedition happen. Not to mention the huge amount of time we have put into this. Despite we have reached 100% funding, please feel free to continue supporting us if you want to help us reducing the operator fee.**

PA3EWP announced on 11 December that the upcoming **W8S** DXpedition to Swains Island OC-200 has been **postponed** again due to transportation difficulties. They are simply unable to charter a ship for March 2023. Status changes will be posted on their website, <https://swains2020.1ldt.eu/>, Twitter, and Facebook as they happen.

**D44TWO** is QRV through 21 January. QSL via DF2WO

**VP2MDX** is QRV through 31 March. QSL via W2APF

**PJ4/NE9U** will be QRV 11 – 26 February. QSL via NE9U

**FG4KH** will be QRV 15 February – 7 March. QSL via F1GUZ

**VK9CVG** will be QRV from Cocos Keeling 17 – 24 February. QSL via MØOXO

**KH7Q** will be QRV 18 – 19 February for the ARRL DX CW contest. QSL via AH6NF

**PJ4A** will be QRV 18 – 19 February for the ARRL DX CW contest. QSL via K4BAI

**VE3DZ** and **FM5BH** will be QRV as **J79BH** 20 – 26 February. QSL via FM5BH

**CYØS** will be QRV from Sable Island 20 – 29 March. They plan on having 4 stations QRV 24/7 on HF during their stay.

**PJ2/DK5ON** will be QRV 4 – 22 March. QSL via DK5ON

**PJ5/W5JON** will be QRV 28 March—4 April. QSL via W5JON/V47JA

**W9DR** will be QRV as **VP2V/W9DR** on 6 meters only, 23 – 29 June. QSL via W9DR

## QSL Routes

4U1A via UA3DX	EH3HNY via EB3JT	PR2R via PY2ERA
5B4YOTA via 5B4CY	EH5FPM via EA5JDN	PT4Z via PY4JW
5H3FM via HB9DS	EH5HNY via EA5ZD	R2Ø23NY via RØ7L
5Z4VJ via MØURX	FG4KH via F1GUZ	S21DX via EB7DX
7S1GRK via SK1BL	FT8WW via F6EXV	SD6F via SM6JWR
8P6ET via KU9C	H25A via LZ3SM	SN2M via SP2XF
CW3A via EA5GL	HGØIDPD via HA5MA	SP9ØENG via SP3PDO
CX5A via CX2ABC	HSØZJF via ON4AFU	TM34SCRIP via F5JBU
D44PM via IZ4DPV	J79BH via FM5BH	TM35FIST via F6JOE
D44TWO via DF2WO	K5A via K5DB	TM5ØVAR via F4GPB
DFØCOC via DL4PY	KT3Q via DF8DX	TO9W via W9ILY
DKØDI via DH7ZP	KH7Q via AH6NF	UG5F via RW3DSR
DLØAGU via DL1RNT	LP1A via EA7FTR	VK9CVG via MØOXO
DLØF via DL3EL	LZ/OP4L via ON4LKD	VP2MDX via W2APF
DLØNOT via DL1ZAV	LZ1GLASS via	VP9IN via EC6DX
DLØROS via DL8MEW	LZ1KAK	XE3E via EA5ZD
DL2ØSOTA/P via	MJ5E via GU4YOX	XF1S via IT9EJW
DL6GCA	OG7F via OH5AD	XP3A via PA3249
DN2MR via DD7MR	OQ5M via ON5ZO	YJØCA via VK2YUS
DN3TD via DL3TD	ORØA via ON6ZK	YR14ØØVT via YØ6KGS
DP5N via DJØACA	OR1ØØRCBE via	ZF2RX via KC1KUG
EA7/WH6GV via EA7KN	ON4GDV	ZZ4A via PX4DX
EA9KB via EA7FTR	P3AA via RW3RN	ZW2A via PY2SGL
EG5DSI via EA5RKS	PI4DX via PD1DX	
EH23HNY via EA5URV	PJ4A via K4BAI	

Thanks to DL1SBF, KB8NW, NG3K, the DX-QSL Reflector, 425 DX News, DX Coffee, DX World.Net, ICPO Bulletin & ARRL DX Bulletin for our DX News information. Thanks also to the ARRL DXCC Desk, & Bernie McClenny W3UR / The Daily DX for confirmations & additional information.





## WASH Classifieds

Information shown here is as supplied to the **WASHRag**. Condition as stated, and all sales should be considered "as-is" unless otherwise noted. All subject to prior sale or withdrawal from sale at the owner's discretion. All responsibility for this information lies with the source and not the **WASHRag** or the **WIRELESS ASSOCIATION OF SOUTH HILLS, INC.**

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Antennas Rotors & Towers      Computer Media & Software  
Mechanical Breakdown & Electrical Damage Coverage



Antenna Zoning or PRB-1 Issues?

Contact: **Michael S. Lazaroff K3AIR, Esquire**

Lazaroff & Suhr, Attorneys at Law

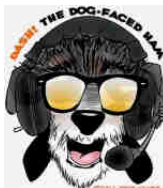
277 West Main Street, Saxonburg, PA 16056

Phone: 724-352-4905

The **WASHRag** Masthead is courtesy of Jeff Murray K1NSS, creator of DASHToons & Dash the Dog Faced Ham!!

Find the online cartoons and stories of Dash the Dogfaced Ham & more at <https://www.jeffk1nss.com> !

Shop for Dash items at his online store on Café Press, [www.cafepress.com/shopdash](http://www.cafepress.com/shopdash)



### US Amateurs by Class as of December 31<sup>st</sup>, 2022

Novice	7,327
Technician	430,100
General	198,493
Advanced	37,044
Extra	162,067
Club	12,462
<b>Total</b>	<b>847,493</b>
All-Time High	12/23/2022 847,606

Last 90 Days:	New Amateurs	5,687
	Callsign Changes	1,549
	Class Changes	2,719
	No Longer Licensed	4,661
	All Updates (*)	22,296

(\*) Includes renewals, address changes, etc.

Information gathered from FCC Daily Updates, courtesy of [Hamdata.com](http://Hamdata.com)

### Latest Region 3 Sequential Calls, Issued as of December 31<sup>st</sup>, 2022:

Group A	AC3JP
Group B	KF3EU
Group C	(none available / all issued)
Group D	KC3VJH

Information gathered from FCC Daily Updates, courtesy of [Hamdata.com](http://Hamdata.com)

If you've downloaded the **WASHRag** from the N3SH web site, or picked up a copy from a friend... you can sign up to have the PDF copy sent directly to your email. You **do NOT** have to be a member of **WASH**!

Just send an email to [w3wn73@gmail.com](mailto:w3wn73@gmail.com) and we will take care of the rest!

**Has Roadway found the tower yet?**



## FCC News

Courtesy of the American Radio Relay League

Newington, CT, December 23<sup>rd</sup>, 2022 – Congresswoman Debbie Lesko (AZ-08) introduced a bill in the U.S. House of Representatives ([H.R. 9664](#)) on December 21<sup>st</sup>, 2022, to require that the Federal Communications Commission (FCC) replace the current HF digital symbol rate limit with a 2.8 kHz bandwidth limit.

After being petitioned by ARRL The National Association for Amateur Radio® in 2013 (RM-11708) for the same relief, in 2016 the Commission issued a Notice of Proposed Rulemaking (WT Docket No. 16-239) in which it agreed that the HF symbol rate limit was outmoded, served no purpose, and hampered experimentation. But the Commission questioned whether any bandwidth limit was needed in its place. Most amateurs, including the ARRL, objected to there being no signal bandwidth limit in the crowded HF bands given the possibility that unreasonably wide bandwidth digital protocols could be developed, and since 2016 there has been no further FCC action.

In conjunction with introducing the legislation, Congresswoman Lesko stated that "With advances in our modern technology, increased amounts of data can be put on the spectrum, so there is less of a need for a regulatory limit on symbol rates. I am pleased to introduce this important piece of legislation to update the FCC's rules to support the critical role amateur radio operators play and better reflect the capabilities of our modern radio technology."

ARRL President Rick Roderick K5UR hailed introduction of the bill. Roderick stated that "the FCC's delay in removing this outdated restriction has been incomprehensible, given that the biggest effect of the delay is to require totally inefficient spectrum use on the already-crowded amateur HF bands. I hope that the Commission will act to remove this harmful limitation without waiting for the bill to be passed."

ARRL Legislative Committee Chairman John Robert Stratton N5AUS added that "the symbol rate limit hampers experimentation and development of more efficient HF data protocols by U.S. amateurs. For all practical purposes the field has been ceded to amateurs outside the U.S., where there is no comparable limit. Removing the restriction not only will allow U.S. amateurs to use the most efficient data protocol suitable for their purpose, but it also will promote and incentivize U.S. amateurs to experiment with and develop even more efficient protocols."

For the full text of the bill, [click here](#) (PDF).

## New Year's Greetings



Belated holiday greetings from one of the Elves... Alex UT5UY/OH5UY  
Photo courtesy of and © Copyright 2022, 2023 Martti Laine OH2BH

## N3UE Woodworking

Ed Wolf N3UE has recently taken up a new endeavor... laser engraving. (See sample)

He's currently available for plaques and signs of varying shapes and designs.



Prices vary, but are very reasonable!

Interested? Contact Ed directly at [n3ue11@gmail.com](mailto:n3ue11@gmail.com)



# WASHfest 2023

The South Hills Hamfest — Now in our **TWENTY SEVENTH** big year!  
Sponsored by the WIRELESS ASSOCIATION OF SOUTH HILLS AMATEUR RADIO CLUB, INC.

Sunday, February 26<sup>th</sup>, 2023

8:00 AM until 3:00 PM Rain or Shine (or Snow!)

**Home Economics Building, South Park**

3735 Buffalo Drive, South Park Township, PA 15129

Behind the Allegheny County Police Station on Brownsville Road

Talk-In on 146.955(-) and 443.650(+) 131.8 PL

Donation \$5



**(800) 545-8881**

Breakfast & Lunch will be available!



*FREE Coffee* for the entire Hamfest  
courtesy of HAM RADIO INSURANCE ASSOCIATES  
of Canonsburg, PA

**MAIN PRIZES *\*\* updated \*\** — You've Got to Play to WIN!**



First Prize: Yaesu FT-710 AESS Compact HF+6M 100W SDR Transceiver

Second Prize: To Be Announced

Third Prize: To Be Announced

**Additional Hourly Door Prizes! 2 Special Black Box Prizes (Separate Drawing)!**

**Main Prize tickets are \$2.00 each, 3 for \$5.00, 7 for \$10, 15 for \$20, 40 for \$50, 90 for \$100**

**All Prizes Subject to last-minute changes**

For Table Reservations, or More Information, Please Contact:

Carol Danko KB3GMN at (412) 884-1466 [n3sbf@comcast.net](mailto:n3sbf@comcast.net)

E-mail us directly at [washarc@yahoo.com](mailto:washarc@yahoo.com) Check out our website too! [www.n3sh.org](http://www.n3sh.org)

**Please Note:** Early Table Reservations must be paid in full on or before January 31<sup>st</sup>, 2023.

Reservations received after February 1<sup>st</sup>, 2023 must include payment in full.

Reserve now... we have sold out in advance twelve years running!

Hamfest Table Reservation Form—Please PRINT LEGIBLY ALL INFORMATION

Name: \_\_\_\_\_ Email: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: ( ) \_\_\_\_\_ - \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Call Sign: \_\_\_\_\_

Tables WITH Electricity: \_\_\_\_\_ X \$15.00 = \_\_\_\_\_

Tables WITHOUT Electricity: \_\_\_\_\_ X \$12.00 = \_\_\_\_\_

**5 Or More** Tables w/o: \_\_\_\_\_ X \$10.00 = \_\_\_\_\_

Please make all checks payable to:  
WIRELESS ASSOCIATION OF SOUTH HILLS  
PLEASE MAIL RESERVATION TO:  
**WASHFEST 2023**  
c/o CAROL DANKO KB3GMN  
4246 Seton Drive  
Pittsburgh, PA 15227-1244

We reserve the right to resell any tables not occupied by 8 AM, unless prior arrangements have been made!





# WIRELESS ASSOCIATION OF SOUTH HILLS, INC.

## Membership Application, New or Renewal



I would like to join WASH! I am interested in the following type of membership: ☐ **New Membership** ☐ **Membership Renewal**

(check quarter \_\_\_\_\_)  
(check one )

	<input type="checkbox"/> 1st Qtr Jan-Mar	<input type="checkbox"/> 2nd Qtr Apr-Jun	<input type="checkbox"/> 3rd Qtr Jul-Sept	<input type="checkbox"/> 4th Qtr Oct-Dec
<input type="checkbox"/> (F1) Full Membership:	\$20.00	\$15.00	\$10.00	\$5.00
<input type="checkbox"/> (F2) Full Membership < 18 or > 65 yrs of age:	\$10.00	\$7.50	\$5.00	\$2.50
<input type="checkbox"/> (A1) Associate Membership:	\$10.00	\$7.50	\$5.00	\$2.50

☐ (FM1) Family Membership (\$3.00 x No. of household family members): \$ \_\_\_\_\_

Name(s): \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Email Address: \_\_\_\_\_

New Members Only:

☐ I do NOT want to be added to the Club E-Mail Reflector

☐ I do NOT want to be added to the Electronic Newsletter Mailing List

[If you have an Email address, you Will be added to both lists UNLESS you choose to Opt-Out]

Signature: \_\_\_\_\_

Call Sign: \_\_\_\_\_

License Class: \_\_\_\_\_

Expires On: \_\_\_\_\_

Work Phone: \_\_\_\_\_

Birthday: \_\_\_\_\_

ARRL Member? ☐ Yes ☐ No Family ARRL Member? ☐ Yes ☐ No

Date: \_\_\_\_\_

Amount Enclosed: \$ \_\_\_\_\_

*N3RDV has requested that all membership requests and renewals include an application so that his information is up to date*

Please make your check or money order payable to the club treasurer, Mark Stabryla.  
The Wireless Association of South Hills, Inc. reserves the right to accept or reject new memberships or renewals.  
Please return completed membership form along with check/money order to the club treasurer or mail to:

WIRELESS ASSOCIATION OF SOUTH HILLS, INC.  
c/o Mark Stabryla N3RDV, VP/Treasurer  
1120 McKnight Drive  
Bethel Park, PA 15102-2456



## DXers have a choice!

Get a free two week trial of The Daily DX and The Weekly DX and decide for yourself which one best fits your needs for informing you of all the DX news!



Send an email to [bernie@dailydx.com](mailto:bernie@dailydx.com) or go to [www.dailydx.com](http://www.dailydx.com)

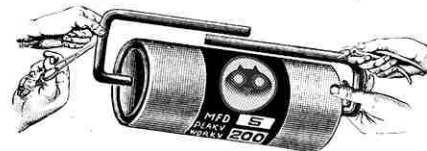
The Daily DX, 3025 Hobbs Road,  
Glenwood, MD 21738 Phone: 301-854-5650



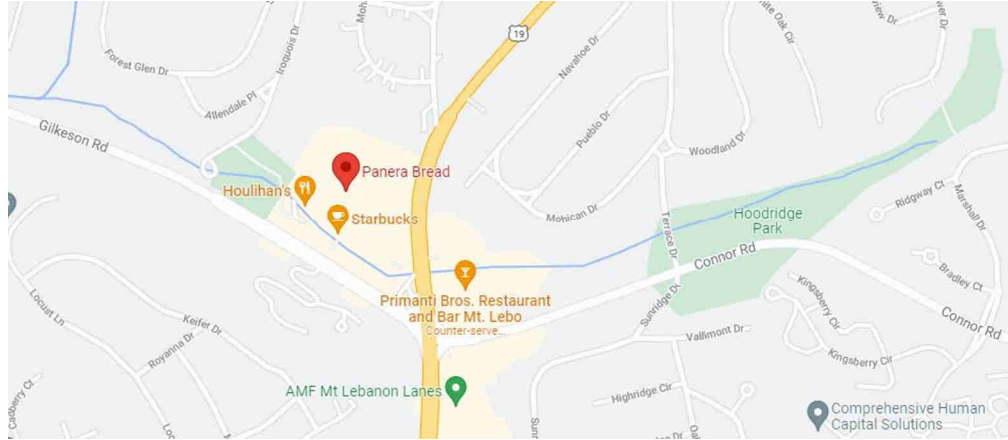
**Arghh!**  
What Mightst We Draw For Ye, Matey?



**HANDMADE BY GNOMES.**



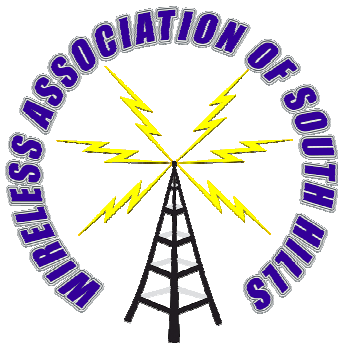
# Directions to the January Meeting Site



The January and February meetings will be held at Panera Breads, Galleria Mall, 1500 Washington Road, Mt. Lebanon PA 15228, upper level, at the mall entrance to the upper parking lot.

The Galleria can be accessed from Washington Road south, or Gilkeson Road West.

Meeting starts at 7 PM. If you're grabbing a bite first, we have the room starting at 6:30 PM



## Meeting Minutes continued from Page 4

- + Short discussion about repairing and selling filters with a motion by Frank (N3FB) and second by W3WH. All present voted to repair and sell the filters.
- + Mark (N3RDV) - Need info about hamfest, test session, and ad program published on Facebook.
- + Chamel - Reaching out to other Facebook groups and creating event. Can the newsletter content be published on Facebook? Ron (W3WN) - Yes.

### Good of the order:

- + Eric (K3SGT) - Need new bells for WASHNet net control?
- + Frank - Question about how many ad books we intend to print and distribute.

**Motion to adjourn** by Bill (W3WH), second by Ron (W3WN). Carried  
Adjourned at 20:32 PM 12/01/2022



## The WASHRag

Wireless Association of South Hills, Inc.  
Ron Notarius W3WN, Editor  
3395 Rosewood Drive  
Castle Shannon, PA 15234-2546



N3SH / WA3SH  
NP2SH/B

[www.n3sh.org](http://www.n3sh.org)  
[www.washarc.org](http://www.washarc.org)

