Merry Christmas

CrossTalk

December 2023   64 Years Of Service To Our Community   Issue 64 : 12

A — 2023 Club Officers

President :	Jonathan Pearce, WB2MNF
Vice President :	Ronald Block, NR2B
Treasurer :	John O'Connell, K2QA
Recording Secretary :	Karl Frank, W2KBF
Corresponding Secretary :	Frank Romeo, N3PUU

Trustees - 4 Year Term

Mark Gottlieb, KK2L	(2020-2023)
Carl Wittig, N2CRW	(2021-2024)
Charles Lanard, KD2EIB	(2022-2025)
Open Position	(2023-2026)

Directors - 3 Year Term

Alan Arrison, KB2AYU	(2023)	Jeffrey Garth, WB2ZBN	(2022-2024)
William Price, NJ2S	(2021-2023)	Chris Prioli, AD2CS	(2023-2025)
James Clark Sr, KA2OSV	(2022-2024)	James Wright, N2GXJ	(2023-2025)

General Membership Meeting
Wednesday, December 6, 2023 @ 1930 Hours
In-Person & ZOOM : 943 0211 9674, 843147

Tech Saturday Forum
Saturday, December 9, 2023 @ 0900 Hours
W2MMD Clubhouse

GCARC TechNet ZOOM Forum
Monday, December 11, 2023 @ 1930 Hours
ZOOM Meeting ID : 960 8543 6644, 964974

License Testing Session
Thursday, December 14, 2023 @ 1900 Hours
W2MMD Clubhouse

Board of Directors Meeting
Wednesday, December 20, 2023 @ 1900 Hours
W2MMD Clubhouse

Dinner @ The W2MMD Clubhouse
Wednesday, December 27, 2023 @ 1800 Hours

Tuesday AfterNoon 2M Net @ 1200 Hours

Tuesday & Thursday 10 Meter Net @ 1930 Hours

Thursday 2M Net @ 2000 Hours

December 2023

As my first year as GCARC President ends I feel very fortunate to have avoided some of my predecessors' challenges of global pandemics, tornadoes bringing down towers, and other similar calamities. On the contrary, the great members of this Club have turned out to create events and activities in record numbers. Meeting attendance is at an all-time high, as is Tech Saturday Forum participation. Sign-ins at the W2MMD Clubhouse have doubled those in previous years. Many areas of the Clubhouse are unrecognizable due to the outstanding work of a dedicated group of volunteers. At the December meeting I'll be reviewing some of the accomplishments of the Club that would have been impossible without the active participation of its membership.

RCA Museum Visit
On Saturday, November 11, 2023 about two dozen GCARC members and guests were treated to a visit at the RCA Heritage Program Museum at Rowan University for a tour of the museum and a fascinating presentation on an Apollo era radio that had been recreated by a former RCA employee. That session is described on Page 14.

Thanks again to GCARC member **Anthony Cerami N2OAC** for setting it up.

Volunteer Appreciation Awards
Many Club members have been prolific in their volunteer assistance to the Club, yet the Club has had no formal way of recognizing them. At the October Board Meeting the Board approved the creation of "**Volunteer Appreciation Awards**" to recognize those members who have made significant contributions of their time to benefit the Club. "Significant" generally means about 10 hours of activity in Clubhouse project work, organizing and running activities, preparing and presenting material at Club meetings, and similar types of contributions. Financial and equipment contributions are recognized separately and are not part of this award structure. Board members and officers are not eligible. At the November meeting the Board approved a number of members meeting these criteria over the last year or so, and those awards will be presented at the 2023 Holiday Dinner for those attending, and at the December meeting for others. Going forward the board will review potential awardees each quarter.

"Got My License, Now What?"
A recent QST article lamented the apparent phenomenon of Technician class licensees who pass their test but never pursue the hobby. Through our licensing classes we have been successful in assisting more than two dozen new hams to obtain their licenses, but have had no process for following up and helping them to become operational in the hobby. To address that situation we've created a *"Got My License, Now What?"* evening session that covers the primary areas with which Technicians need to be familiar to find their ham radio niche. That session will cover basic concepts of HF operation, using handheld radios with repeaters and nets, opportunities for Technicians in VHF and satellite operating, SDR radio use, and other topics as a quick overview to make sure the participants are familiar with them. The goal is not to go in depth in any of these sessions, but rather to create a basic level of familiarization from which additional sessions can be created. **Tony K3TS**, **Ron NR2B**, **Mike KG4JYA**, **John K2QA** and I will each present parts of that program. That session will take place on Monday night November 27th at 6:00 PM in the Clubhouse and any new hams who feel it would be useful are welcome to attend.

VHF Tower News and Funding Needs

The VHF tower project is moving slowly ahead. Anchor bolts for one of the towers had to be custom ordered from a supplier and have recently arrived. Some additional work is necessary on one of the tower bases and cold weather is approaching so it's most likely that excavation for the towers won't begin until the spring. This gives us more time for fundraising for this project. As was discussed at the October meeting, the VHF towers will require approximately $7,000 in donated funds to complete the installation. Donations can be made at any Club meeting, at the Clubhouse any Saturday morning and on the **"VHF Tower Donation"** page.

Meteor Scatter Success and Other Unique Operating Opportunities

The Leonid meteor shower passed on November 17 - 18 and once again we were able to work some meteor scatter contacts using the radios and antennas at the Clubhouse. Details of that operation are described in a different Crosstalk article, but our goal is to create Club activities when any interesting radio opportunities arise. The ARRL EME Contest was on the weekend of November 25th and the Clubhouse team attempted to bounce signals off of the moon using the 2 meter satellite antennas and the high-powered 2 meter amplifier that the Club received from the ARDC grant.

The Geminid meteor shower occurs on December 13 - 14, thankfully at a more convenient time than the Leonid did, so we'll again be operating during that period.

Finally, **Karl Frank W2KBF** has pointed out the solar eclipse operating event that will occur on April 8, 2024 so we'll be focusing on that in March to get prepared. The outstanding resources at the Clubhouse provide us with the opportunity to participate in almost any type of radio event, so our goal is to be able create member activities for each of them.

The Next Generation of Ham Radio

Many hams are content utilize current modes of Amateur Radio operation, working DX on 20 meters or rag chewing on repeaters, but another important facet of Amateur Radio is the ability to experiment with new technologies. Of the many newsletters in our hobby I've particularly enjoyed one named **Zero Retries (https://www.zerotries.org)** which reports back on new technologies, particularly those involving digital communications.

Like myself, the author is not a technical expert but is interested in developments in these areas and hopes to see them pursued more strongly in the future.

Let me know if you find anything of particular interest here - there's some technology that I'd like to pursue with the Club but can't do it alone.

My Absence Excuse

Having been absent from the November General Membership Meeting I feel that I need to show some justification for that transgression, so if anyone is interested, here is (**https://www.pearcefamily.org**) the link to the best of the underwater pictures that I took while diving in **Belize**.

73 de Jon Pearce WB2MNF
GCARC President

ARRL Special Service Club

Gloucester County Amateur Radio Club

This certificate indicates the club's commitment to improve the visibility of amateur radio as a positive force in the community by assisting in emergencies, and providing and encouraging training; as well as to further club activities for the betterment of the membership and the amateur radio service.

ARRL The National Association for Amateur Radio®

October 19, 2023
Date

Mike Walters, W8ZY
ARRL Field Services Manager

Our ARRL Special Service Club Certificate has been renewed. We are the only SSC in the ARRL SNJ Section

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GCARC TechNet ZOOM Forum

Monday, December 11, 2023 @ 2000 Hours

Go to : https://gloucestercountyarc.weebly.com/gcarc-technet.html
for TechNet Information Resources and ZOOM Instructions

Meeting ID : 960 8543 6644 ; Passcode : 964974

Need a ride to a Club meeting, event, or activity?

Just send a message to the Club's e-mail reflector asking if a member can pick you up

GCARC <at> MAILMAN <dot> QTH <dot> NET

All Club members have access to this FREE e-mail service

Gloucester County Amateur Radio Club
2023 Field Day Scores Breakdown

Callsign	QSOs	Class	Power	Participants	Total
W2MMD	2,542	7A	2	62	11,616
Court Smith, KD2SPJ	11	1E	5	1	260
Howard Marder, WA2IBZ	320	1D	2	1	1,330
Totals	2,873	7A, 1D, 1E	2, 5	64	13,206

Information Resource :

https://contests.arrl.org/ContestResults/2023/Field-Day-2023-FinalFullResults.pdf

Southern New Jersey Section Club Station 2023 ARRL Field Day Results

Club	Callsign	Aggregate Score	Entries	Class	QSOs	Power	Participants
South Jersey RA	K2AA + W2EA	17,966	6	5A, (4)1D, 1E	4,666	2	74
Gloucester County ARC	W2MMD + K2ZA	13,206	3	7A, 1D, 1E	2,873	2, 5	64
Old Barney ARC	N2OB + N2CW	8,481	4	3A, (2)1D, 1E	1,202	2, 5	30
Southern Counties ARA	K2BR	5,498	4	3F, 1D, (2)1E	1,107	2	34
David Sarnoff RC	N2RE	5,304	6	5A, (5)1D	907	2	35
Burlington RC	K2TD	2,986	2	3A, 1E	160	2, 5	18
Jersey Shore ARS	NJ2AR + K2HVE	2,762	2	4A, 1D	542	2	12
Delaware Valley RA	W2ZQ	1,982	1	3A	386	2	20
Audubon ARC	K2UD	556	1	2A	103	2	3

General Membership Meeting

Wednesday, December 6, 2023 @ 1930 Hours

Pfeiffer Community Center

Simulcast Live Via ZOOM

Meeting ID : 943 0211 9674; Passcode : 843147

Go to : www.w2mmd.org to download the ZOOM log-on instructions PDF

Radio Controlled Airplanes
GCARC December Meeting Program

This month, Sheldon Parker, K2MEN, will take a close look at how radio technology is used to control model aircraft. We will also learn a little about how aircraft operate and how the model airplane hobby has so many things in common with ham radio. Actual models will be displayed and operated (ground operations only) along with their internal radio controls.

Please join us for this fun and interesting event.
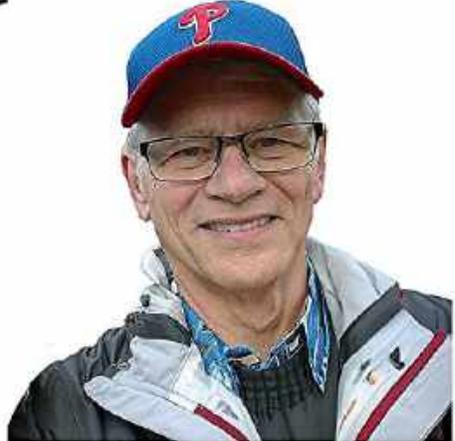
Tech Saturday Forum
December 9, 2023 @ 0900 Hours
W2MMD Clubhouse

Forum Presentation :
Jon Pearce, WB2MNF : Raspberry Pi - From Zero To HamClock

Q & A Session About All Things Ham Radio and Socializing
The HF Station Will Be Available For Local Operation

Tech Saturday sessions are held at the W2MMD Clubhouse on the first Saturday of the month following the Wednesday Night General Membership Meeting and are designed to be hands-on collaborative events focused on using the Clubhouse resources to demonstrate various aspects of Amateur Radio and related technical areas. Previous sessions have covered USB software-defined radios, Raspberry Pi and Arduino devices, satellite operations and other similar topics.

We would like to invite all of our new members as well as our veteran members to our Tech Saturday Forums to help answer any questions and discuss any and all issues the new members have come across as they progress through the **Amateur Radio Experience.**

The Discussion Theme is a QSO starting point - a way to initiate a conversation. All Tech Saturdays are an open QSO of all subjects of Amateur Radio interest. All questions are welcome as well as a venue for hams to show off their latest ham radio projects or gadgets. Have a problem programming that HT, we can help! Not sure what radio or antenna to buy, we can help!

All Club Members who would like Clubhouse access to use its radio equipment would have to have some brief "Elmering" on the Clubhouse rules, such as using the alarm system, the A/C and heaters, the antenna system, and the radio equipment. The Club's HF station is reserved for local use on Tech Saturday.

All are welcome - Hams and Non-Hams - Club Members and Non-Club Members.

Here is the slate of candidates for the 2024 Club Officer Elections. Voting will take place at the December 6th General Membership Meeting.

- **President : Jonathan Pearce, WB2MNF**
- **Vice President : Ron Block, NR2B**
- **Treasurer : John O'Connell, K2QA**
- **Recording Secretary : John Zaruba Jr, K2ZA**
- **Corresponding Secretary : Frank Romeo, N3PUU**

Vote for 2:
- **Director : Al Arrison, KB2AYU**
- **Director : Bill Price, NJ2S**

Vote for 3 :
- **Trustee : Carl Wittig, N2CRW (Appointed)**
- **Trustee : Sheldon Parker, K2MEN (Appointed)**
- **Trustee : Len Rust, W2LJR (New term replacing Mark KK2L)**

December 9, 2023 Tech Saturday Forum :
Preparing For The Raspberry Pi HamClock Session
By Jon Pearce, WB2MNF

HamClock (https://www.clearskyinstitute.com/ham/HamClock) is a program that displays various information such as time, date, location, weather, sun and moon data, propagation information, and more. We will guide you through the steps of installing the Raspberry Pi operating system, flashing the SD card, entering basic commands, and installing the HamClock program.

The December 9th Tech Saturday Forum is *"Raspberry Pi - From Zero to HamClock"* - a session to show how to start with a bare Raspberry Pi computer and empty SD card and end up running the "HamClock" application. If you're interested in finding out what you can do with one of these small but powerful computers but haven't yet delved into them this is the session for you. It will be a fun and easy way to get started with this versatile device.

Below is the list of materials that you'll need for that session.

The Raspberry Pi used can be any of the recent models from a Pi 3 through a Pi 5. Some of these are not available but one good option is the Pi 4 (4 GB) available from **Amazon** for $61 at : **https://bit.ly/47MBskw**

Or a Pi 4 (2 GB) from **Adafruit** for $45 at : **https://www.adafruit.com/product/4292**

Both the 2 GB or the 4 GB can run the HamClock application, but the 2 GB unit may not run other more intensive applications. These run on a USB-C power adapter and use mini-HDMI cables so be sure that you have them.

Here's the list of stuff that you'll need to have and load onto your PC :
- A USB micro-SD card reader to set up the card, like this one, in addition to the Pi : **https://bit.ly/4a2P0KH**
- A micro-SD card - max 32 GB like these : **https://bit.ly/49Q7Iov**

Download and install on your laptop :
- VNC for remote desktop to the Pi : **https://bit.ly/3sDjgeh**
- PuTTY for command line connection to the Pi : **https://www.putty.org**
- Raspberry Pi imager to put the operating system onto the SD card : **https://bit.ly/3MXpvAa**

Feel free to start experimenting with this stuff when you get it but we'll be starting from scratch at the Tech Saturday Forum, imaging the memory card and loading the HamClock application. We'll also review the process to connect to these devices from a PC using Putty for a command-line interface or VNC for a GIU interface.

These devices are amazingly use for a wide variety of applications so feel free to attend even if you don't want to build a HamClock. More info will be available closer to the event date.

Here's some additional information about the Raspberry Pi/HamClock session and the project :

- You'll need a USB power cable for your respective Pi - micro-USB for a Pi 3 or USB-C for a Pi 4. For the Tech Saturday session I'll have a few multi-output USB power blocks available to plug into, but when you get home you'll need one to power the Pi. For HamClock you don't need a lot of power but if you're going to use the Pi for high-CPU activities you may need a 3 amp supply or greater. In particular an SDR-based application would pull a lot of power, both to run the CPU and to power the SDR.
- You don't need a case and/or cooling fan for this project although it's a good idea to have one to protect and cool it. Again, the need for cooling depends on the CPU load of the application.
- You DO need heat sinks on the CPU and graphics chip. Some Pi's come with them, others may not. Pi cases come with heat sinks so install the heat sink even if you don't put on the case.
- If you're planning to make HamClock a permanent addition to your shack you'll obviously need a monitor devoted to it, which means that you'll need a HDMI cable from the Pi to the monitor. Note that the Pi 4 uses a mini-HDMI connector and can handle two different monitors (needing 2 different cables), whereas the Pi 3 uses a single full-sized connector. I haven't used the 2-monitor setup with a Pi 4 and don't know much about it.
- If you're planning to use the Pi for other applications and don't need a permanent monitor you can run it "headless" without a monitor, keyboard and mouse by connecting using the VNC or Putty applications. That's how we do most of the stuff at the Clubhouse. It's also how we'll be installing and setting up the software.

If you don't have a Pi but would like to play along I have a few extras that I can bring. If so, install the Pi imager, PuTTY and VNC software on your laptop.

Feel free to email with any questions.
Jon Pearce, WB2MNF

HamClock For The December 9th Tech Saturday Forum
By Vinnie Sallustio, N4NYY

In addition to what Jon said on page 9, I made a video about the HamClock, if anyone wants to build one on Tech Saturday. As Jon said, the HamClock is just one app for the Pi.

The HamClock I made is small (7"), and the combined cost of the required parts, were about $160 or so. However, if you have enough space and already have a PC display monitor, you can run it on that, as Jon set one up in the Clubhouse on a 22" display.

Here is the video link for the HamClock I built : https://youtu.be/PwwNhzhGjTA?si=zuJA_nDsAdxWgkTO

It is not an instructional video, but an explanation of what it is. There are a lot of instructional videos on building HamClock.

If you are interested in the portable one that I have, let me know and I will send a parts list with links.

If you want to build one on a regular computer display, you will likely only need the Raspberry Pi, case, and power supply. Much cheaper than the $160 portable.

I am not sure yet I will be attending the December 9th Tech Saturday, as I am a serious fisherman and it is Blackfish season. But I can leave my HamClock with Jon for assistance.

Welcome New Club Members :

Todd Foster, KE2CAH, an Amateur Extra Class who lives in Glassboro, NJ.
Robert Jensen Jr, KC3WWL, a Technician Class who lives in Marshallton, DE
Robert Kay, KE2CEG, a Technician Class who lives in Mullica Hill, NJ

We are glad to have you as members of the Club and hope to see you regularly at Club meetings, events, and activities. Hope to see you at the December 6th General Membership Meeting, either in-person or on ZOOM, the December 9th Tech Saturday Forum, the December 11th GCARC TechNet ZOOM Forum, and the Dinner @ The Clubhouse on December 27th.

We also hope to *"SEE"* you on the *"AIR"* on the following nets :
- Sunday Night Skywarn Net @ 1930 Hours and the Sunday Night ARES Net @ 2000 Hours.
- Tuesday AfterNoon Net @ 1200 Hours.
- Tuesday & Thursday Night 10M Rag Chew Nets @ 1930 Hours on 28.465 or 28.475 MHz.
- Thursday Night Rag Chew Net @ 2000 Hours.

All 2 Meter nets are on our 147.180 MHz (PL 131.8) repeater or on EchoLink W2MMD-R.

Gloucester County Amateur Radio Club Elmers

We are still looking for some more Club Elmers. If you would to add your name to the Elmer's List, send your specialty to w2mmdgcarc@gmail.com. Here is what we have so far :

- **Tony Starr, K3TS : Antenna Construction; Contesting; CW Help and Training**
- **Ken Bozarth, KN2U : Antennas**
- **Jeff Welsh, KD2AZI : Boat Anchor Repair & Operation; Raspberry Pi; Arduino; Python; POTA; Mobile Installation & Operating**
- **Karl Frank, W2KBF : Digital Messaging (FLDIGI, WinLink)**
- **Lenny Rust, W2LJR : DMR Radios & Programming**
- **Ron Block, NR2B : Lightning protection & grounding**
- **Chris Prioli, AD2CS : Kit Building; Antenna Building; Radio Programming; PC and Electronic Troubleshooting; ham radio licensing & studying**
- **John Zaruba Jr, K2ZA : Yaesu System Fusion Radio Programming, POTA, SOTA**
- **Jerry Barnish, K2EAB : Radio Astronomy**
- **Mike Thompson, KG4JYA : Radio Astronomy; VARA (HF and FM); WinLink**
- **Steve Farney, W2SEF : WSJT-X; FT-8; LoTW; TQSL; Grid Square**
- **Carl Wittig, N2CRW : Audacity® Audio Editor**
- **Gary Mirkin, WA3SVW : FLDIGI; MMSSTV**
- **Jon Pearce, WB2MNF : Satellite Communications**
- **Frank Romeo, N3PUU : Toilet Installer; Jack-Of-All Trades - Master Of None**
- **John Hill, W2HUV : Local & Remote W2MMD HF Station Operation, Training & Support**

Santa Net 2023 On The Air!

Every year on **3.916 MHz**, we give good little boys and girls a chance to talk to Santa Claus at the North Pole! It is indeed a magical experience to experience kids talking with Santa through the magic of Amateur Radio! The Santa Net is on the air every night, **November 24, 2023 through December 24, 2023 at 2000 Hours Eastern**. To participate in the **Santa Net**, just have your kids prepared to tell Santa their top 2-3 gift wishes.

The **Santa Net** is a team effort by the **3916 Nets (http://www.tailgatersnet.com)** members. The **Santa Net** is also streamed live on **YouTube (https://www.youtube.com/channel/UCnNhXbexBDlvlnlz9jQkIvA/live)**.

For more information, go to : **http://www.cqsanta.com** and **http://www.facebook.com/3916santanet**

Tape-Measure Yagi & Offset Attenuator Building Class
Tentatively Scheduled For Mid-January 2024 - W2MMD Clubhouse
For More Information & To Register, Go To :
https://gloucestercountyarc.weebly.com/yagi-building-class.html

New Clubhouse Roof!

W2MMD

GCARC Monthly VE Exam Testing Summary - November 2023

Gary Reed, N2QEE, Reports : It was a busy month for the VE Team with three VE sessions. On Thursday, November 9, 2023 the normal monthly session had one candidate who upgraded to Amateur Extra. The candidate was **Todd Foster KE2CAH of Glassboro**. His upgrade was posted on November 14th because of the holiday weekend.

The attending VE's were :

- **Mike N2WOQ**
- **Mike KG4JYA**
- **Jerry K2EAB**
- **Chris AD2CS**
- **Mike N2MHO**
- **Rich W2RHS**
- **Court KD2SPJ**
- **Gary N2QEE**

On Tuesday, November 14, 2023, the VE session for the Technician and General Classes was held. There were four candidates with two new Technicians and an upgrade to General. The candidates were :

- **Mary Ciraula KE2CEF, Technician of Pittsgrove**
- **Robert Kay KE2CEG, Technician of Mullica Hill**
- **Glen Guenther KE2BUO, General of Sewell**

The General upgrade was posted on November 15th and the Technicians on November 16th.

The attending VE's were :

- **Chris AD2CS**
- **Mike N2WOQ**
- **Jeff WB2ZBN**
- **Earl KC2NCH**
- **Rich W2RHS**
- **Mike KG4JYA**
- **Mike N2MHO**
- **Court KD2SPJ**
- **Gary N2QEE**

The third session was on Friday, November 17, 2023 for candidates in the Amateur Extra Class. There were five candidates with three upgrades. The new Amateur Extras were :

- **James Ricketts KC3TYH of Media, PA**
- **Joseph Gadoury KE2AKT of Tabernacle**
- **Jean Wilson-Kinney KE2AHV of Medford**

The attending VE's were :

- **Chris AD2CS**
- **Jeff WB2ZBN**
- **Earl KC2NCH**
- **Mike N2WOQ**
- **Rich W2RHS**
- **Mike N2MHO**
- **Gary N2QEE**

A big thank you to the VE's who helped with the sessions.

Next year they'll be additional Ham classes for upgrades to General and Amateur Extra. Also Technician classes for people who may be interested in getting into the hobby, Go for it.

The next monthly session will held Thursday, December 14, 2023 @ 1900 Hours at W2MMD Clubhouse.

Radio History at the RCA Museum at Rowan University
By Jon Pearce, WB2MNF

The **RCA Heritage Program Museum at Rowan Unive**rsity houses a fascinating collection of radio artifacts from the Radio Corporation of America, Victor Records, and others of the predecessor organizations that were a huge force in all areas of radio and electronics for almost 50 years. On Saturday, November 11, 2023 and for the second time GCARC members were invited over to view this museum, and for a special presentation on the recreation of the radios that were used by the Apollo astronauts on the moon. GCARC member **Anthony Cerami N2OAC** set up this session along with other members of the Rowan Museum team, and about two dozen GCARC members and guests were treated to a fascinating tour of radio history - and even pre-radio history with the Victor gramophone that relied on nothing more than needle-in-record vibration to create sound. Interestingly, many GCARC members are also former RCA employees - I found **John O'Connell K2QA** in the library searching for pictures of himself during his RCA days and finding a picture of Anthony in the RCA employee archives. **Tony Starr K3TS** also pointed out the radio test set that he had personally worked on during his early days at RCA.

After the museum tour we moved downstairs to a meeting room in which former RCA employee **Steve DiMedio** presented a fascinating session on the radios that he had recreated from the Apollo era. While walking on the moon in their space suits the astronauts used radios that transferred both voice and telemetry data back to the lunar rover and also to the command module orbiting above the moon. Steve showed how he had rebuilt one of these radios after first carefully inspecting an original copy and creating the schematic diagrams. In most cases he was able to use original components although some were unavailable and had to be replaced by modern parts. This radio actually worked for both voice and telemetry, and he was able to transmit his voice over the radio and receive it on a SDR receiver.

He was also able to put a heart rate transducer on his chest and show how the EKG would be transferred from the radio and ultimately back to earth.

As someone who's always searching for interesting educational and project opportunities for Club members I took particular note of several areas of this project that he described as great learning opportunities. The first was his need to be able to create printed circuit boards, for which he had to learn the KiCAD PC board software. The second was far more complex - he needed to learn how to use the GNU radio modeling software to design certain parts of the receiving station, including decoding the telemetry. After the session several GCARC members expressed interest in both areas, although GNU radio is quite complex, but we may have a chance to create educational opportunities around some of his presentation.

Thanks once again to the RCA museum staff for creating this terrific opportunity for GCARC and its members.

Editor's Note : More pictures on the "RCA Museum" webpage.

Gloucester County Amateur Radio Club
YouTube Channel
https://www.youtube.com/@W2MMD

"Dinner @ The Clubhouse"
Wednesday, December 27, 2023 @ 1800 Hours
W2MMD Clubhouse

Tony Starr, K3TS with the test unit he worked on
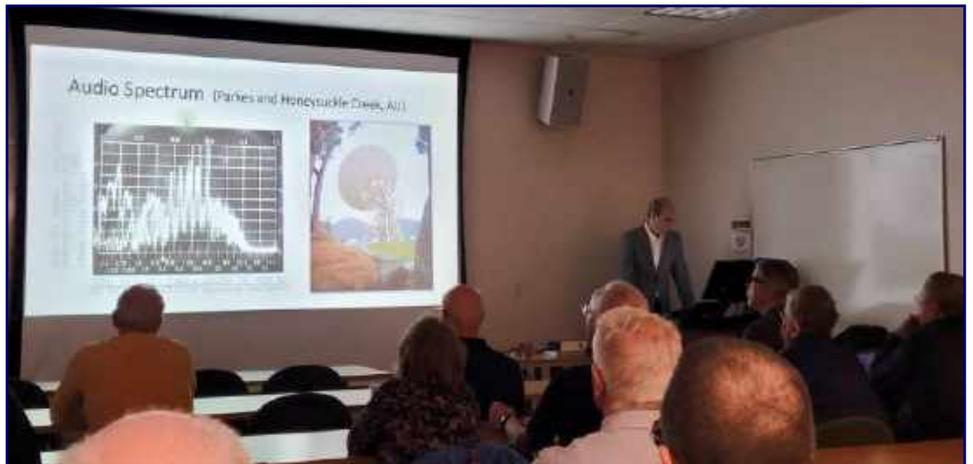
Jim with the STE Secure Data Phone he worked on back-in-the-day

Radio Presentation

DAs and DITs

>> **Congratulations** to the following Club members with their license upgrades :
- **Marylu Ciraula, KE2CEF : New Technician Class**
- **Joseph Gadoury, KE2AKT : Upgrade to Amateur Extra Class**
- **Glen Guenther, KE2BUO : Upgrade to General Class**
- **James Ricketts, KC3TYH : Upgrade to Amateur Extra Class**
- **Jean Wilson-Kinney, KE2AHV : Upgrade to Amateur Extra Class**

>> **Condolences** to **Jim Wright, N2GXJ** and family on the loss of his father.

>> **Congratulations** to **Marty Pittinger, KB3MXM**, of Owings Mill, MD, on winning re-election to the **Atlantic Division Vice Director** seat. **ARRL Atlantic Division Director Bob Famiglio, K3RF**, won unopposed. Their terms of office begin on January 1, 2024.

>> **NASA** has an app called *"Spot The Station"* which will list upcoming visible passes of the ISS, send notifications of when it's in view and also has an augmented reality view using the phone camera to help locate the ISS in the sky. Check it out in the iPhone App or Google Play App stores.

>> Congratulations to **Evan McCormick, KD2NEB**, on the birth of his son. Another ham in the making!

ARRL Learning Center
https://learn.arrl.org

Discover how to make Amateur Radio your own.

Online courses from the ARRL Learning Center provide ARRL members with additional instruction and training for getting on the air, emergency communications, and electronics and technology.

Current Website Updates : Go to this page to find out the latest changes & updates on our W2MMD Website
https://gloucestercountyarc.weebly.com/current-website-updates.html

W2MMD

Facebook

www.facebook.com/W2MMD

twitter.com/w2mmd_gcarc

ZOOM Protocols For GCARC Meetings

To provide for a more pleasant and efficient ZOOM experience for our Club members, several protocols have been established for use at these meetings.

- **All participants will be MUTED by the administrator.**
- **If you wish to comment, please use the ZOOM "Raise Hand" feature. (See Below)**
  - **In the meeting controls, click "Reactions", then click "Raise Hand".**
  - **Users can also raise or lower their hand with the Alt+Y (Windows) or Option+Y (macOS) keyboard shortcuts.**
- **The administrator will then un-mute you so you can join the conversation. You will not be able to un-mute yourself.**
- **If you are going to use your camera, please be attired as you would be if physically coming to the meeting. Otherwise, please turn off your video.**

Thanks for following these points to help our meetings run smoothly.
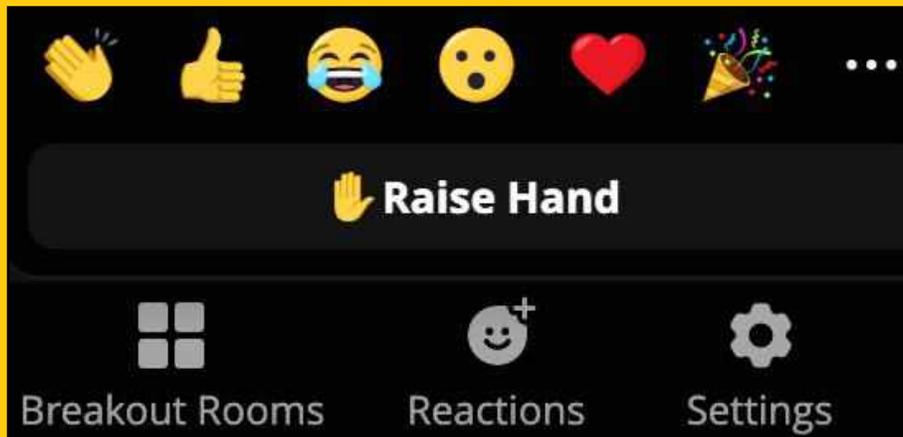
Tuesday & Thursday Nights 10M Rag Chew Net @ 1930 Hours
Net Control Host : Jim Clark, KA2OSV
28.465 MHz or 28.475 MHz

"a Festivus for the rest of us"
Saturday, December 23, 2023

Customary Practices :

- **Festivus Pole : A 6 Foot Aluminum Pole.**
- **Festivus Dinner : Meatloaf, Spaghetti With Red Sauce.**
- **The Airing Of Grievances : It Consist Of Each Person Lashing Out At Others And The World.**
- **Feats Of Strength : The Head Of The Household Challenges Each Guest To A Wrestling Match.**
- **Festivus Miracles : It's A Miracle Somebody Hasn't Called The Cops By Now!!**

The Education Connection
By Chris Prioli, AD2CS - chris@ad2cs.com
www.ad2cs.com

December 2023

Session VI of the GCARC Ham Exam Preparation Classes is now complete and in the books. Although the test results were not exactly what I would have liked them to be, I realize that each of the test candidates none the less gave it a *"best effort"*, and I am confident that those who did not test or did not test successfully will take the exam at one of our monthly VE sessions. The monthly VE sessions are scheduled for a 1900 Hour start time on the second Thursday of each month, at the W2MMD Clubhouse. Remember that these exams are *not* time-limited, so there is no pressure to complete the test in a fixed amount of time. Another point to note is that I strongly recommend that any students who have not successfully tested for their license upgrades pursue those upgrades as soon as possible. The more time that goes by since taking the class, the more difficult that most people will find the exam to be.

I would like to take this opportunity to extend my congratulations **and my thanks** to all of the students who did successfully complete their planned license testing. I fully understand the time and effort that goes into preparing for one of these exams, and I am sure that I speak for my assisting instructors as well as for myself when I say that your time and efforts are greatly appreciated.

Looking ahead, I would like to try something new for the January sessions. I am not at all sure that there will be sufficient enrollment to support running the classes at all three levels. It is my guess that there will be adequate enrollment for the Element 3 (General) class, but not so much for the Element 2 and Element 4 classes. As an alternative, I would like to offer a specialized short-term (four-week) class on a specific topic from which each student will walk away with a working piece of amateur radio-related equipment that will have been built by the student. In so doing, the student will develop several physical skills and some specific knowledge that will serve the student well throughout his/her future radio experiences.

Specifically, I am talking about building and testing a directional two-meter antenna and attenuator unit that is perfectly suitable for fox hunting and other 2-meter RDF exercises. I know that we have offered both of these topics before, individually. However, we have not offered the two units together as a combined class topic. I believe that we would get enough enrollment in this program to make it worthwhile to run the class. Here is how it would work :

The class would run for a series of four Monday evenings starting in mid-January.
- A fixed price will be developed that will include *all* materials necessary to complete the build.
- The specific units built would be :
  - A tape-measure three-element Yagi-type directional antenna built on a PVC pipe boom with a rubber hand grip, a capped tube, and 3D-printed plastic fitments for element attachment and element end capping
  - A KC9ON 4 MHz Offset Attenuator with BNC connectors and a thirty-inch connecting cable for attachment to a hand-held radio.

The student would develop certain skills, as was already mentioned, during this class. Those skills would include :

- **Electronic Kit Assembly -** Parts identification, following directions, and PCB soldering
- **Electronics Testing -** Use of oscilloscope to check operation of oscillator in attenuator
- **Coaxial Cable Handling -** Stripping and prepping coax, installing terminals to coaxial cable
- **Antenna Physical Layout -** Measuring element length, measuring driven element position, and parasitic element spacing
- **Antenna Physical Construction -** Assembling the component parts into a whole unit
- **Antenna Testing -** Use of NanoVNA or other antenna analyzer to test the assembled antenna for frequency response

This is a new idea that has not been widely discussed at this point. I am not even sure that this is in fact going to be a workable program, though I cannot see why it should not be. So… what I am looking for is some responses.

Who Would Be Interested In Attending A Class Of This Type?

If this is something to which you would be willing to commit a series of four Monday evenings, drop me an e-mail and let me know.

If you do not have a fox hunt antenna and/or attenuator for that antenna, or if you want another set-up, this is a great way not only to obtain one, but to build it yourself, have some fun doing it, and learn some new skills along the way.

See you next month!

Gloucester County Amateur Radio Club
2023 Field Day Scores Summary

	2023	Rank		Total #
Score	13,206			13,206
Class	7A	#2	out of	18
QSOs	2,873			
Power Mult	2			
Section	SNJ	#2	out of	9
Division	AT			
Participants	64			

"Got My License – Now What?" Class
By Jon Pearce, WB2MNF

Because of the success of the Club's licensing classes there are many new Technician licensees looking at the world of Amateur Radio and wondering what to do next. On Monday November 27, 2023 the GCARC held its first "Got my license - Now What?" class for about a dozen new Technicians who are interested in finding out more about this great hobby. The session covered multiple topics with **Tony Starr K3TS** describing HF operation, antennas, and Field Day; **Ron Block NR2B** covering handheld radio operation; **John O'Connell K2QA** describing software defined radios; **Mike Thompson KG4JYA** covering VHF operation; and me covering satellite operations. **John Zaruba Jr K2ZA** also filled in on POTA, SOTA, and several other topics.

The reactions were quite favorable with many participants noting that they weren't familiar with several of the areas discussed and had recommendations for topics that should be presented in greater depth. We were also able to connect several attendees with members who could assist them in a particular area of interest, which was a primary goal of the event.

This session was also a testbed for the curriculum that we had developed and several changes were clear; for example the participants were more familiar with HT operation than we had envisioned so future sessions will probably go more in-depth into HT programming and troubleshooting. We'll hold these sessions occasionally whenever new groups of Techs get licensed.

2023 Holiday Dinner - A Fun Time Was Had By All!
By Ron Block, NR2B

This year's Holiday Dinner was organized by Club members as a fund-raiser for the Club's VHF towers. The event was held at the Pfeiffer Community Center on November 29, 2023, with a total of 56 members and guests.

The food was prepared by Club members' wives, led by **Kathy Romeo (Frank, N3PUU)** and supported by **Mary Jane Block (Ron, NR2B)**, and **Phyllis Martin, W2PDB, (Ray, W2RM (SK))**.

The sausage served at the dinner was donated by **C. W. Brown Foods**, the makers of **Botto's Genuine Italian Sausage (https://bottosausage.com)** , whose products are available in your local grocery store.

Volunteer Appreciation Awards were presented to :

- **Anthony Cerami, N2OAC** : For arranging multiple visits to the RCA Museum at Rowan University, repairing the Club generator, and repairing the HF tower lift mechanism.
- **Gary Mirkin, WA3SVW** : For establishing the Monday evening DigiNet, for serving as longtime host and/or net control station for DigiNet and TechNet, and for serving as rotating net control station for the Thursday Night 2 Meter Rag Chew Net.
- **Carl Wittig, N2CRW** : For providing accurate scaled electronic architectural drawings of the W2MMD Clubhouse : electrical, plumbing, building structure, and ramp proposal.
- **John Zaruba Jr, K2ZA** : For supporting the Yaesu equipment at repeater sites, for being a frequent presenter at meetings and events, and as an assisting instructor in licensing classes.
- **Kathy Romeo, (SPECIAL NON-MEMBER)** : For assuming the primary responsibility for the preparation of the Holiday Dinner and for provisioning and preparing the Field Day meals for the last several years.

Door prizes were won by :

- **PCM-25ADL ICT Noise Filter - Mary Ciraula, KE2CEF**
- **JBL Bluetooth Headset - Linda Harrison (AD2CS XYL)**
- **MFJ-336T Tri-Mag Mount - Karl Frank, W2KBF**
- **Baofeng 70cm Handheld - Len Rust, W2LJR**
- **Yaesu FT-1900 2m mobile radio - Gary Mirkin, WA3SVW**
- **ICT 10A Power Supply - Carl Wittig N2CRW**

The 50-50 generated $236 and was won by **MaryLu Ciraula, KE2CEF**, who donated her share back to the Tower Fund. Thank you MaryLu!

Musical entertainment was graciously provided by Karl Frank, W2KBF and his Amazing Accordion. He sang a few Clubhouse ditties from his vast mellifluous repertoire.

The event was a success, and it will contribute a significant amount to the tower fund, thanks to the efforts of both members and non-members. I'm glad to hear that everyone had a great time and enjoyed the good food, fellowship, and conversation.

Tuesday AfterNoon Net @ 1200 Hours

Net Control Stations : Steve Farney W2SEF,
Chris Prioli AD2CS, & Mike Thompson KG4JYA

Alternate Net Control Stations : Greg W5DO, Gary WA3SVW, & Jeff WB2ZBN

147.180 MHz (+) (131.8) Repeater & EchoLink W2MMD-R

Here is the schedule for the upcoming weeks

Steve Farney, W2SEF : December 5, 2023
Steve Farney, W2SEF : December 12, 2023
Mike Thompson, KG4JYA : December 19, 2023
Jeff Garth, WB2ZBN : December 26, 2023

If you would like to be a control operator for this net, please contact Steve, W2SEF
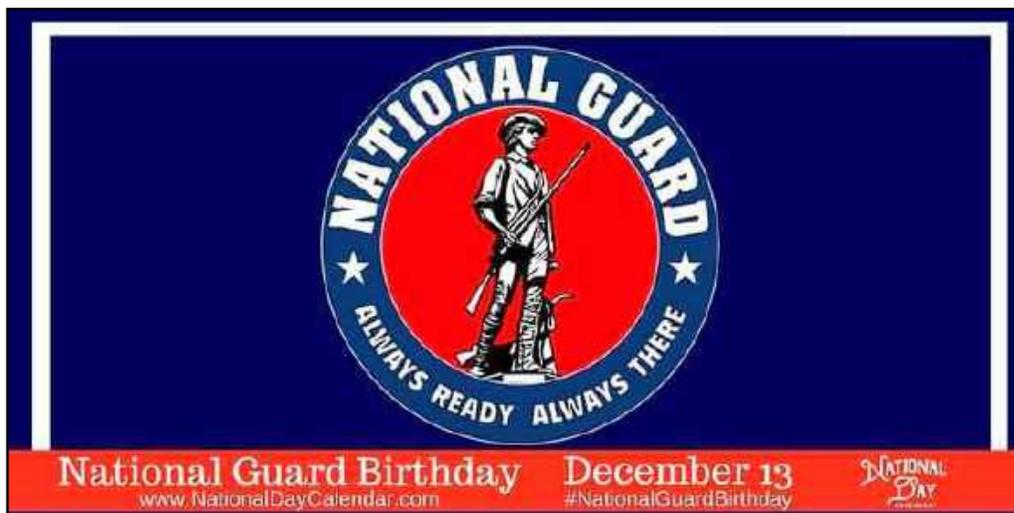
Thursday Night Rag Chew Net @ 2000 Hours

Net Control Stations : Steve W2SEF, Chris AD2CS,
Mary W2TDS, & Gary WA3SVW

Alternate Net Control Stations : Greg W5DO & Jeff WB2ZBN

147.180 MHz (+) (131.8) Repeater & EchoLink W2MMD-R

Here is the schedule for the upcoming weeks

Charlie Wahl, KC2STO : December 7, 2023
Mary Delemarre, W2TDS : December 14, 2023
Gary Mirkin, WA3SVW : December 21, 2023
Steve Farney, W2SEF : December 28, 2023

If anyone would like to be a net control operator, please contact Jeff, WB2ZBN

Tech Saturday Forum - November 4, 2023
By Ron Block, NR2B

Amateur Radio is not just for two-way communication. You can learn a great deal about our local universe by monitoring naturally occurring radio sources. Pictured below is **Mike Thompson, KG4JYA**, with 15 Club members, at the W2MMD Clubhouse on the November 4, 2023 Tech Saturday Forum leading a discussion on his decades long experience with Radio Astronomy. Mike began by summarizing his presentation for those who could not attend the November 1, 2023 General Membership Meeting and then continued by sharing some of his own personal experiences in capturing samples of celestial audio and low frequency RF energy.

Mike explained that the signals coming from space are always very weak, except for the Sun whose radio emissions are very strong due to proximity; in fact, so weak that it is difficult to differentiate them from the background noise. This requires the use of special receivers developed for radio astronomy and mandates that antennas be large as possible in order to increase the received signal strength. Man-made noise is a ubiquitous issue and has driven both the technology and geographical aspects of this part of our hobby.

This sparsely populated corner of ham radio is rewarding and has consistently contributed to the knowledge of our universe.

Happy Channukah!

Thursday,
December 7, 2023

Gloucester County Skywarn Net

The Gloucester County Skywarn Net is held every Sunday @ 1930 Hours on the 147.180 MHz (+) (131.8) Repeater & EchoLink W2MMD-R

All Are Welcome To Participate

Net Control Stations : Steve Bromhead KB2RTZ, Greg Ciraula W5DO, Bob Keogh KD2NEC, Charlie Wahl KC2STO & Jeff Garth WB2ZBN

December 3, 2023
NCS : Bob Keogh KD2NEC
Weather Report Recorder & Weather Forecast : Steve Bromhead KB2RTZ

December 10, 2023
NCS : Greg Ciraula W5DO
Weather Report Recorder & Weather Forecast : Greg Ciraula W5DO

December 17, 2023
NCS : Steve Bromhead KB2RTZ
Weather Report Recorder & Weather Forecast : Bob Keogh KD2NEC

December 24, 2023 : Christmas Eve - No Skywarn Net
December 31, 2023 : New Year's Eve - No Skywarn Net

January 7, 2024
NCS : Steve Bromhead KB2RTZ
Weather Report Recorder & Weather Forecast : Bob Keogh KD2NEC

Gloucester County ARES Net

The Gloucester County ARES Net is held every Sunday @ 2000 Hours on the 147.180 MHz (+) (131.8) Repeater & EchoLink W2MMD-R

All are welcome to participate

Net Control Stations : Steve Farney W2SEF, Greg Ciraula W5DO, Bob Keogh KD2NEC, Karl Frank W2KBF, Al Arrison KB2AYU, Gary Mirkin WA3SVW, Todd Woodward KD2ESH, & Jim Wright N2GXJ

Net Control Station Schedule

December 3, 2023 : Steve Farney, W2SEF
December 10, 2023 : Greg Ciraula, W5DO
December 17, 2023 : Karl Frank, W2KBF
December 24, 2023 : Christmas Eve
December 31, 2023 : New Year's Eve

At The Repair Bench…
A monthly column describing a recent repair bench event.
By Chris Prioli, AD2CS - chris@ad2cs.com - www.ad2cs.com

Antenna Rotator Controller - December 2023

Back around the end of May, **Al KB2AYU** came to me and told me that the **antenna rotator controller (Figure 1)** that I had built and given to the Club for use in the VHF room was "hosed". A quick look at it showed that he was correct - the display, which should have been showing azimuthal readings between zero degrees and three hundred and sixty degrees, was displaying values way up into the four- and five-digit area **(Figure 2)**, as well as blanking out some of the letters in the word "Azimuth", which should have been displayed as well.

Figure 1 : Antenna Rotator Controller

Figure 2 : Erroneous Display On Controller

This controller consists of some very basic parts… (1) an H-bridge motor driver to handle the output current to the rotator motor, including directional (polarity) control, (2) a simple five-volt voltage regulator that drops the incoming 24VDC down to the 5VDC required by the brains of the unit, and (3) an Arduino Mega2560 microprocessor board. A plain Mega2560 shield was built up to bring out the necessary pin connections as well as serve as the PCB for a low-pass filter that is a crucial part of the circuit.

When I say "to bring out the necessary pin connections", it must be understood that there are many more +5VDC connections and ground connections made back to the Arduino than there are native pins on the Arduino to handle. As a result, a row of eight or nine pins of each type - +5VDC and ground - are set up on the shield. In addition to the LPF already mentioned, the shield also carries the contrast control for the front panel display, which is a blue and white backlit LCD panel with 16 x 2 character capability.

The shield also carries the interface pins for the other controls on the front panel, which include directional motion switches (CW and CCW), preset, park, and speed controls, as well as the bulk of the front panel display connections. This shield board, of course, simply plugs piggy-back style onto the Arduino Mega2560.

I initially thought that maybe a quick reload of the program on the Arduino might solve the problem, in that it may have somehow gotten corrupted. Deciding to try that on the spot, I brought my laptop and a USB-A to USB-B cable into the VHF room, hooked it up to the controller, fired up the Arduino IDE software, and uploaded the program into the Arduino. No joy - the problem remained. I decided then that I would bring the unit home for repair, and I would swap it out with a second controller that I had already built for my own use, but was sitting idle.

Originally, I was going to bring the replacement controller to the Clubhouse on Tuesday evening when I went there to teach the General class (Monday was a holiday, and the Technician class was cancelled for that evening).

The way things worked out, I was able to bring the fully repaired controller back to the Clubhouse on Tuesday evening instead. Here is what I found…

I began by verifying the operation of the +5VDC voltage regulator, because if that voltage was screwy, the Arduino operation would also be wonky if it worked at all. The five-volt regulator was fine, with a steady output under load of 4.996 volts. No problem there.

Now, as I have already explained in describing the controller, this thing is actually quite simple with a limited number of places for a problem to crop up. Those problems, discounting a wire connection issue, are limited to the voltage regulator, the H-bridge, the display, and the Arduino. The voltage regulator has already been cleared, and the display was evidently operational, as it displayed information - just not the correct information. Simply in an effort to be thorough, I disconnected the plug the carries control signals from the Arduino to the H-bridge, and re-booted the controller, only to find that the same condition existed. Three out of four of the possibilities have now been eliminated, leaving only the Arduino as the culpable component.

Knowing that the programming had already been uploaded to the Arduino once since this problem began, and also knowing that the upload did not resolve the issue, I was left with the base Arduino as the fault source. Now… the Arduino obviously operated, as it was sending data to the H-bridge and the display, even if that data was incorrect. My reasoning told me to try to recover the Arduino and restore its proper operation.

There is a piece of software embedded on the Arduino called the *boot loader* which basically sets up the operating condition of the Arduino in use. That is the only thing, apart from a possible hardware failure, that determines how the Arduino behaves. Because of the fact that this is a piece of embedded software, the possibility exists that this software could have become corrupted. I decided to erase the Arduino and to burn a new boot loader into place on the board.

Burning the boot loader can be done in a couple of ways. One way is to use a second Arduino as a programming interface. Another way is to use a dedicated programming device that is compatible with the type of Arduino at hand. In this case, with the Arduino being a Mega2560, I would be able to burn the boot loader using a device known as a USBasp (USB Atmel Serial Programmer). The **USBasp (Figure 3)** simply plugs into a USB port on the host PC, and then connects to the *ICSP (in circuit serial programming)* header on the Arduino board. Easily enough done, this procedure does require removal of the shield board in order to access the ICSP header, which in turn requires disconnection of all of the myriad pin connections made on the shield board. Note that the intermediate board in the data cable of the USBasp in the **Figure 3** photo is an adapter interface, changing the ten-pin output of the USBasp to six pins so that it can be connected to a six-pin ICSP header such as that used in the Mega2560.
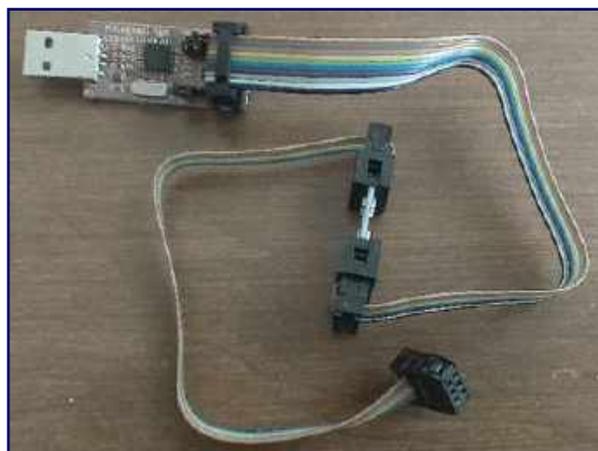
Figure 3 : USBasp Programming Device

The USBasp works seamlessly, provided that two preliminary steps are taken. First is to set the on-board *Slow SCK* jumper on the USBasp to its closed (active) position. This introduces some wait states in the data stream so as to enable successful communications with the Mega2560. Second is to install the correct driver for the USBasp under your operating system. I am using Windows 10, and this step was a simple as running the *ZADIG* software and installing the driver from within *ZADIG*.

Once the driver is installed, launch the Arduino IDE (if it is not already running), go to the ***Tools > Programmer*** menu item and select ***USBasp*** as the programmer in use. Then, with the USBasp connected to both the PC and the Arduino, go to ***Tools > Burn Boot Loader*** and let the software do its job.

I did all of this, and then I re-uploaded the operational program to the Arduino again. Next, I completely re-assembled the controller (without its cover), including installing the shield board and re-connecting all of the pin connections. Finally, I connected up the 24VDC power supply to the controller and turned it on. ***Voilá!*** It worked normally, as it should have done. Note that the "damaged" digit in the **Figure 4** image is a digit that was in the process of changing when the photo was snapped.

Figure 4 : Fully Operational Rotator Controller

Finally, I installed the top cover, and the job was complete. I connected it up to a Yaesu rotator motor I have on hand here, and it worked flawlessly. Thus, it was able to go back to the Clubhouse that evening.

The moral of the story here is that when everything else has been eliminated, what remains must be the problem, regardless how unlikely it may seem. I would have expected the operational program to become corrupted before I would expect that to happen to the boot loader. However, the proof is in the repair, and the boot loader was certainly at fault here.

See you next month!

The Jersey String Band has one parade on Saturday, December 2, 2023 in West Cape May : Glenn Dougherty, N2YIO

The Band is working hard on the 2024 New Year's Day Parade. They practice every Wednesday evening from 7:30 to 9:30 pm at the Woodbury Heights Fire Hall on their New Year's Music and every Sunday from 2:00 to a little after 4 pm weather permitting in the parking lot of the fire hall on their drill.

This year we are looking for extra help for our New Year's Day Show to help with props. We aren't asking for anyone to join the band unless you really want to, but we can use 20 to 40 people to help with the props, this is besides the regular full time marshals that are members of the band.

You wouldn't be needed until the last two or three rehearsals in December and most likely only on Sundays.

If you know anyone male, female, or older teenager that would like to help us out no experience necessary, please stop out for five minutes on a Wednesday night practice and talk to our captain or contact me Glenn Dougherty @ 856-371-7970 as soon as you can.

As of today, November 18th, there are only 45 days until New Year's Day 2024 and we need this many people to put on our best show. If we don't get them then we would have to scale down to what we have available. This being our first year in the String Band Association, it would be a shame.

Club Member DMR IDs

Club Member	DMR ID
W2MMD Clubhouse	3198604
Anthony Cerami, N2OAC	3202759
Mike Covaleski, N2MMC	3134855
Thomas Distelcamp Sr, KC2GYC	3110869
Harry Elwell, AD5TT (K2ATX)	3128498
Karl Frank, W2KBF	3146716
Glen Guenther, KE2BUO	3202079
Melissa Guenther, KE2BWZ	3202496
Gary Mirkin, WA3SVW	3165494
Phil Nunzio, WA3RGY	3134336
John O'Connell, K2QA	3110610
Jon Pearce, WB2MNF	3163415
Mike Pecorini, K2MRP	3132996
John Price III, KD2QYC	3123583
Chris Prioli, AD2CS	3195449
Len Rust III, W2LJR	3186225
Len Rust IV, K2LJR	3196243
Dave Sheppard, W2PAX	3112666
Cory Sickles, WA3UVV	1142052
Court Smith, KD2SPJ	3186243
Brett Waller, K2BKW (KC2UXQ)	3134261
Bill Wood, KD2OSJ	3197459
John Zaruba Jr, K2ZA	3134331

DMR Configuration Sequence

1. **Obtain and Configure DMR ID :**
   - https://www.radioid.net

2. **Download Contact List :**
   - http://www.dmrcontacts.com

3. **Identify Repeater or Hotspot :**
   - https://www.repeaterbook.com

4. **Define Talk Groups**
   - **Numerical ID**
   - **Text Name**

   https://brandmeister.network/?page=talkgroups

5. **Create Channel**
   - **Select Number**
   - **Assign Name**
   - **Select DMR ID**
   - **Assign Frequency**
     - **Transmit**
     - **Receive**
     - **Bandwidth**
     - **Power**
     - **DMR Mode (Simplex/Repeater)**
     - **TX Permit (Channel Free)**
   - **Assign Talk Group**
   - **Assign Color Code**
     - **Agreed Upon with Other Users**
   - **Assign Time Slot**
     - **Agreed Upon with Other Users**

6. **Create Zone**

7. **Add Channels to Zones**

8. **Configure Features**

9. **Upload Code Plug**

10. **Upload Contact List**

For more information, DMR links, and W2LJR's DMR presentations, go to :
https://gloucestercountyarc.weebly.com/dmr.html

Updating the Amateur's Code - October 2023
By Dan Romanchik, KB6NU

There have been several versions of the Amateur's Code since it was written by Paul M. Segal, W9EEA, in 1928. Here's the version that currently appears in *Ethics and Operating Procedures for the Radio Amateur, Edition 3, June 2009* (**https://www.iaru-r1.org/on-the-air/code-of-conduct**) :

The Radio Amateur Is
CONSIDERATE… He never knowingly operates in such a way as to lessen the pleasure of others.
LOYAL… He offers loyalty, encouragement and support to other amateurs, local clubs, the IARU Radio Society in his/[her] country, through which Amateur Radio in his country is represented nationally and internationally.
PROGRESSIVE… He keeps his station up to date. It is well-built and efficient. His operating practice is above reproach.
FRIENDLY… He operates slowly and patiently when requested; offers friendly advice and counsel to beginners; kind assistance, cooperation and consideration for the interests of others. These are the marks of the amateur spirit.
BALANCED… Radio is a hobby, never interfering with duties owed to family, job, school or community.
PATRIOTIC… His/[Her] station and skills are always ready for service to country and community.

Well, now the IARU is updating Ethics and Operating Procedures for the Radio Amateur, and I'm part of the group that's working on the update. One of our tasks is to make the text more gender-neutral. The ARRL has a somewhat gender-neutral version of the Code, but really all they did was to replace "he" with "he/she."

That being the case, I've taken it upon myself to create not only a **gender-neutral version of the Code (https://www.arrl.org/amateur-code)**, but to also clarify some of the language. Here's what I've come up with so far :

The Radio Amateur is
CONSIDERATE… The radio amateur never knowingly operates in such a way as to lessen the pleasure of others.
LOYAL… The radio amateur is loyal to and supportive of other amateurs, local clubs, and the IARU Radio Society in their country.
PROGRESSIVE… The radio amateur's station up to date, well-built, and efficient. Their operating practice is above reproach.
FRIENDLY… The radio amateur operates slowly and patiently when requested and offers friendly advice and counsel to beginners. They are also cooperative and considerate of the interests of others.
BALANCED… Radio amateurs realize that radio is a hobby and never allow it to interfere with their duties owed to family, job, school, or community.
PATRIOTIC… The radio amateur's station and skills are always ready for service to country and community.

Not only do I think that my version is clearer, I think that it is more parallel than the previous version.

I **posted this to my blog (https://www.kb6nu.com/updating-the-amateurs-code)** and got some great feedback from my followers on LinkedIn and Mastodon. For example, Jesse, WB2IFS, pointed me to his version of the Code, which he **published on his blog in September 2022 (https://www.eyepoet.net/post/2022/09/04/the-new-amateurs-code.html)**. I particular like his rendition of "progressive :"

> **PROGRESSIVE…**An Amateur is curious. An Amateur is enthusiastically and continuously learning new techniques, technologies, countries, and cultures with the understanding that everyone is an Amateur.

I got quite a few **comments on Mastodon (https://mastodon.radio/@kb6nu/111247772923040827)**. Several folks wanted me to reconsider the use of the term "patriotic." Christopher, M0YNG, said, "I'm not a massive fan of "patriotic" and wonder if it could be more "humanity focused" rather than country[-focused]? Not sure on the words though." Jevid, KE8DET, opined, "Patriotic is often conflated with, and co-opted by nationalism, which contains an inherent aspect of 'my country first.' This sits in opposition to amateur radio being a means to foster international good will."

Andreas, DJ3EI, had a number of comments, but this one I found to be the most appealing. He says, "The old Code requires 'operating practice ... [to be] above reproach.' I highly recommend [a change] to 'always be eager to try something new.' You'll enjoy! I certainly do! Learning+studying is one of the official goals of our hobby! Thus, we may become beginners on a regular basis, bound to make beginner's mistakes. An 'above reproach' angst only hinders."

Sam, N9MII, says, "Perhaps focus on safe and well-considered operation? As in something that doesn't spike all over the band and whatnot." I think that safety is something the Code is surely missing.

Onno, VK6FLAB, also weighed in. In his version of the Code, he changes the word "patriotic" to "supportive." He writes, "The Radio Amateur is SUPPORTIVE...knowledge, station and skills always ready for service to country and community." I'm not sure that's quite the right word, either, but the idea is that the radio amateur is ready to pitch in when needed.

As you can see, there's still some work to be done here. If you have any comments on this, please feel free to email me directly or to add a comment on my blog.

Dan Romanchik, KB6NU, is the author of the **KB6NU Amateur Radio Blog (KB6NU.Com)**, the "No Nonsense" amateur radio license study guides (**https://KB6NU.Com/study-guides**), and often appears on the ICQPodcast (**https://icqpodcast.com**). When he's not writing about amateur radio, he tinkers with electronics projects and operates POTA and works CW on the HF bands.

Bill of Rights Day
www.NationalDayCalendar.com
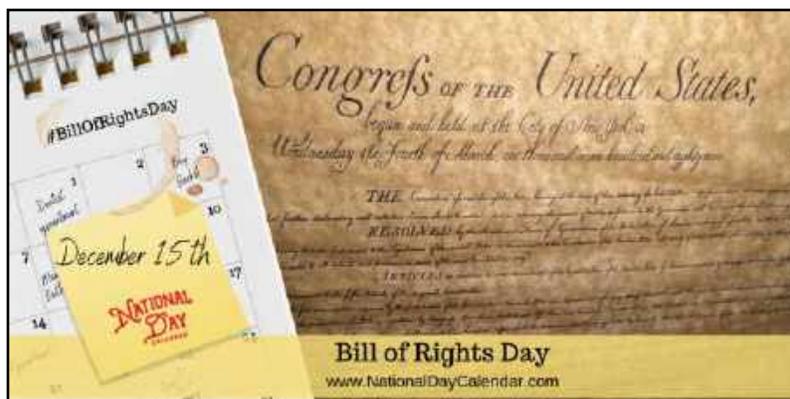
Where's The DX?

By Jim Wright, N2GXJ

Oh, it's there. Quite the geography lesson too! Know where to find Timor-Leste? What about Marquesas Islands? Or Solomon Islands? What about Yemen? How about Trindade & Martim Vaz (what's that)?

Answer to where to find all of the above : on the airwaves (haha). You can find them on the waterfall display, using FT8, too - if you know where to look. And then to have a best chance of being able to make a contact with them, you'll need to know what mode of FT8 they are using. For those that are versed in FT8, you'll already know this. If need a refresher on how to recognize the different FT8 modes, like fox-hound and multi-stream, and how to configure to contact them for each of these modes, see the May 2023 CrossTalk as a refresher. But figuring out the mode assumes you've found them. And that is not always easy to do, unless you know some tricks. So how do you find them? How do you find them on the HF radio dial?

Turns out, these "DX Expeditions" are generally not using the standard WSJT-defined FT8 frequencies. So if you just stick to the frequencies plugged into WSJT by default, you are not going to find them. To find them, you can have several options, including checking a spotter network, or running an HF SDR to "see" a larger portion of the band than just where your radio is presently tuned to. Examples of each follow.

For a spotter network example, here is a sample from **http://dxsummit.fi/#/** . Here we see a non-standard FT8 frequency (18.107 MHz) listed, vs the usual 18.100, and a comment saying they are using MSHV.

🐦 Spotter	⛰ Freq.	🦎 DX	🕐 Time	❗ Info	🌍 Country
KW4OA-@	18107.0	TX7L	20:49 18 Nov	MSHV	Marquesas Islands

Spotter example for a DX station using MSHV on non-standard FT8 frequency

If you do have an SDR that can show a wider waterfall than just the 3 kHz or so that you are audio listening to, and if on this display there are any suspicious signals on the band that look like FT8, either above or below the standard FT8 frequency for the band you are on, that is a big clue to tune there to go look.

For an SDR example, here is a view of what I was seeing on a Saturday morning on 12 meters. If I had only tuned to the "standard" 12M FT8 frequency of 24.915 MHz, look at what would have been missing!
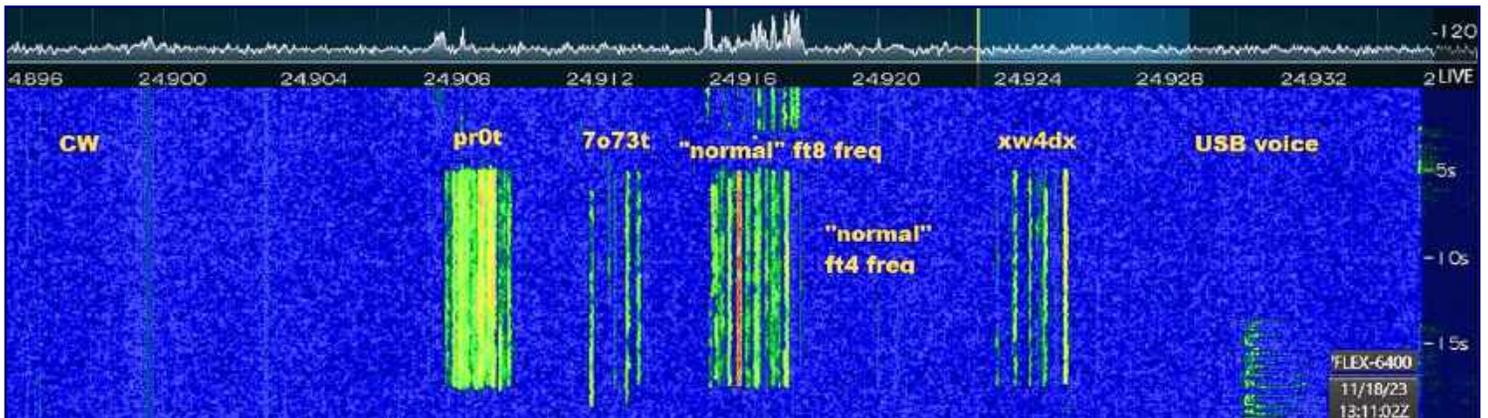
Wider waterfall example, marked to show FT8 DX could have missed on 12M

Hope this helps. Good DX everyone!

Amateur Radio Emergency Services - December 2023 Resources - News - Updates

By Bob Keogh, KD2NEC - kd2nec@qsl.net
Gloucester County Emergency Coordinator

In a previous issue of CrossTalk, we briefly discussed the formal role of Amateur Radio Emergency Communications, while working with Federal, State and Local Government Agencies. As we expand our presence to include our Local Government Agencies, we need to understand the Incident Command System (ICS) and the National Incident Management System (NIMS). These two FEMA Guidelines are an extremely important part of the ARES Training Plan; IS-100.c, IS-200.c, IS-700.c and IS-800.c. If you have any questions regarding these courses, please reach out to me.

Information and Communications Technology Functional Guidance provides a framework to incorporate Information and Communications Technology (ICT) services within the Incident Command System (ICS) to meet the increasing demands and expectations for ICT capabilities.

This Guidance also introduces new ICT positions intended to support successful outcomes by providing communications resources and access to Information Technology (IT) capabilities for incident commanders/unified command and emergency managers. While this Guidance incorporates the ICT Branch within ICS, the ICT Branch can be incorporated into any command and coordination system, such as the Incident Support Model.

This Guidance establishes how the ICT function manages the infrastructure and systems that support and enable communications, information management processes, and applications required by the responders managing an incident. Additionally, this Guidance describes how the ICT function safeguards incident operations from Cybersecurity threats and explains how to manage the interrelationship of communications and IT infrastructure. This Guidance does not describe the operational response to Cybersecurity incidents. This Guidance describes the incident commander/unified command or emergency manager's authority to organize the ICT Branch based on incident complexity.

Additionally, this Guidance explains the organization of and roles and responsibilities of the ICT function within an ICT Branch.

Skywarn™ Recognition Day

If you have the time on Saturday, December 2, 2023 and you're looking for a unique way to make contacts with some of the National Oceanic and Atmospheric Administration Centers, this is a fun way to accept the recognition that NOAA provides us every year.

The instructions are all in this link :
https://www.weather.gov/crh/skywarnrecognition

If you are interested in learning more about our local weather, check into our GCARC Skywarn Net, every Sunday night at 1930 Hours on the 147.180 MHz Repeater and EchoLink W2MMD-R.

SKYWARN Recognition Day Is Ready to Go

The 2023 SKYWARN™ Recognition Day (SRD) is December 2 from 0000z to 2400z.

The event honors all SKYWARN storm spotters and amateur radio operators for their contributions to the National Weather Service (NWS) during severe weather. Amateur radio operators also provide vital communication to the NWS and emergency management when normal communications fail.

The **National Oceanic and Atmospheric Administration (NOAA - https://www.weather.gov/crh/ skywarnrecognition)** website is now updated with the SKYWARN registration form, mapping form, and rules and information you'll need to check in for this year's event.

It's important to review the following event resources on the NOAA website :
- Operating procedures
- Participant registration lists
- SRD 2023 contact log sheet
- SRD 2023 NWS office contact log sheet
- SRD 2023 NWS operational details
- Social media planning document

SRD was developed in 1999 by the NWS and ARRL. Amateur stations exchange contact information with as many NWS stations as possible on 80, 40, 20, 15, 10, and 6 meters, plus the 2-meter and 70-centimeter bands. Contacts are also permitted using repeaters. Non-amateur radio spotters can exchange information with NWS offices using social media.

To learn how to become a trained NOAA storm spotter visit **Spotter Training (https://www.weather.gov/pdt/ spotterTraining)**.

In 2022, more than 5,000 spotters participated in SKYWARN Recognition Day.

Article Credit : The ARRL Letter for November 16, 2023 - www.arrl.org
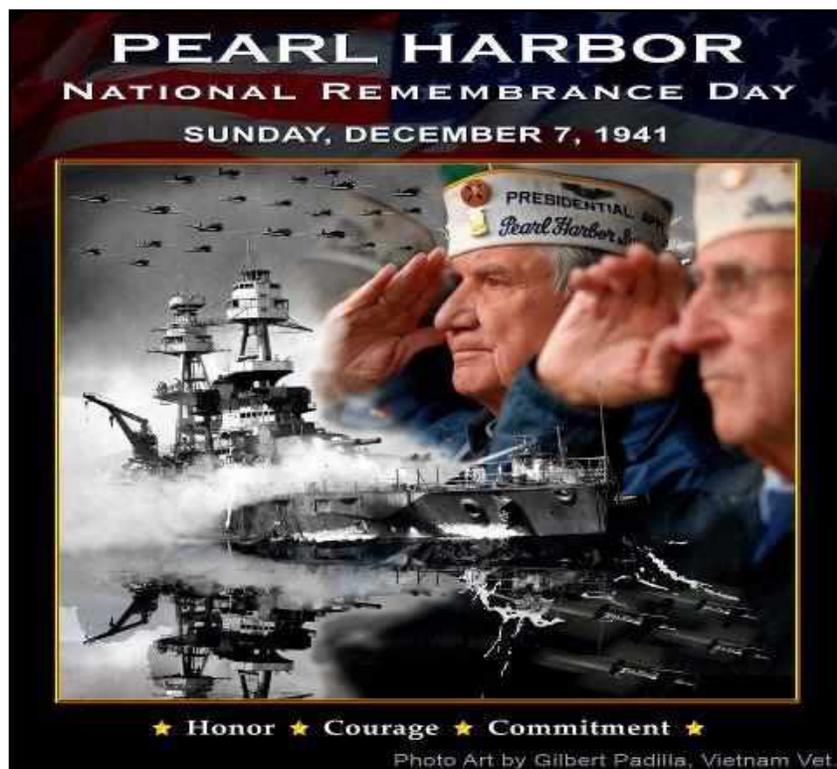
Announced DX Operations
www.ng3k.com/Misc/adxo.html
From The Shack of Bill Feidt, NG3K
www.ng3k.com

2023 Nov29	2023 Dec03	Madagascar	5R8VE	F4EZG	TDDX 20231117	By F4EZG fm Nosy Faly I (IOTA AF-057); 20-10m; SSB FT8
2023 Nov29	2023 Dec07	Cocos (Keeling) I	VK9CY	LoTW	DXW.Net 20231106	By YL2GM EA5EL fm IOTA OC-003; 160-10m; CW SSB FT8; see Web page for QSL details
2023 Nov30	2023 Dec09	Vietnam	3W9C	LoTW	OPDX 20231109	By SP5APW fm Con Son I (IOTA AS-130); 20 17 15 10 6m; SSB FT8, some CW; FT8 on 6m; tx 53.313 or 53.323, rx 50.313 or 50.323; 100w
December						
2023 Dec01	2023 Dec21	East Kiribati	T32TT	LoTW	DXW.Net 20231114	By Rebel DX Group; 160-6m; focus on FT8 FT4 some CW SSB; begin and end dates are approximate
2023 Dec04	2023 Dec12	British Virgin Is	VP2VMM	LoTW	TDDX 20231014	By Team Vertical; mainly 20-10m; CW SSB + digital; QRV for ARRL 10m Contest
2023 Dec04	2023 Dec16	Micronesia	V6EU	LoTW	DL2AWG 20230707	By DL2AWG DK2AMM DL2AMD DF4GV fm Chuuk I (IOTA OC-011); 160-10m, perhaps 6m; SSB CW RTTY FT8; QSL via Club Log OQRS or DL2AWG
2023 Dec06	2023 Dec19	Burkina Faso	XT2AW	M0OXO OQRS	TDDX 20231102	By DF2WO fm Ouagadougou; HF; CW SSB FT4 FT8; 100w
2023 Dec07	2023 Dec14	Surinam	PZ5NH	JA0JHQ	DXW.Net 20231106	By JA0JHQ; HF; CW SSB FT8
2023 Dec09	2023 Dec18	St Kitts & Nevis	V47JA NEW	LoTW	W5JON 20231124	By W5JON fm Calypso Bay; 160-6m; SSB FT8; yagi, verticals; QSL also OK via W5JON direct
2023 Dec11	2023 Dec22	Cape Verde Is	D44MCS	LoTW	DXW.Net 20231118	By OE3MCS fm Sal I (IOTA AF-068); 40-10m, perhaps 6m; SSB CW, perhaps FT8 and RTTY; QSL via OE3MCS
2023 Dec26	2024 Jan05	St Vincent & Grenadines	J87TT	LoTW	DXW.Net 20230905	By PA2LO fm Ratho Mill, St. Vincent (IOTA NA-109, FK93jd); 40-6m; SSB CW + digital; QSL via PA2LO Buro
2023 Dec27	2024 Jan06	Rodrigues I	3B9AT	LoTW	DXW.Net 20230807	By IK3ZAQ IV3JVJ fm IOTA AF-017; 40-10m; CW SSB FT8; QSL via IV3JVJ
2023 Dec29	2024 Jan16	French Guiana	TO2FY	eQSL	DXW.Net 20231112	By F4GPK fm Korou; @FY5KE; HF; SSB; holiday style operation

Also for your convenience, there is a direct link to NG3K of our website.
Click on the NG3K DX Page.

Printed Circuit Board Fabrication For The Hobbyist - Part 1

By Chris Prioli, AD2CS : chris@ad2cs.com : www.ad2cs.com

When one gets involved in all of the various aspects of the electronics hobby, as I do, the time will eventually come when it becomes necessary - or at least most convenient - to use a printed circuit board (PCB) instead of "dead bug" point-to-point wiring of a project. There are several options open to the hobbyist when it comes to making custom PCB's for any given project. These range from hand cutting the necessary voids in a copper-clad board, to printing and etching a board using the toner transfer method, to one of the ways I made boards years ago, where resistive pads and traces are applied to a copper clad board which is then etched, to having custom boards professionally manufactured by a PCB house. Let's take a look at some of these methods one at a time - you might find one that suits your needs.

I am going to start at the place that I always start - with a good, clear, and concise schematic. Now… there is nothing that says that the schematic cannot be hand-drawn, although my chicken scratching hardly passes for "clear" or "concise". As a result, I use a piece of freeware schematic creation software, of which there are several available. A quick Google search will turn up several results for considera- tion, including **KiCad**, **Eagle**, and **ExpressPCB**.

The software that I use is a package known as **ExpressPCB (Figure 1)**, which includes the schematic creation component **ExpressSchematic**. This software includes numerous compo-

Figure 1 : The Express Schematic Interface

nent definitions, but also provides for the creation of definitions of custom or un-included components. Once all of the necessary component definitions are at hand, it is a simple matter to draw out the schematic to match the de- sign that is in mind.
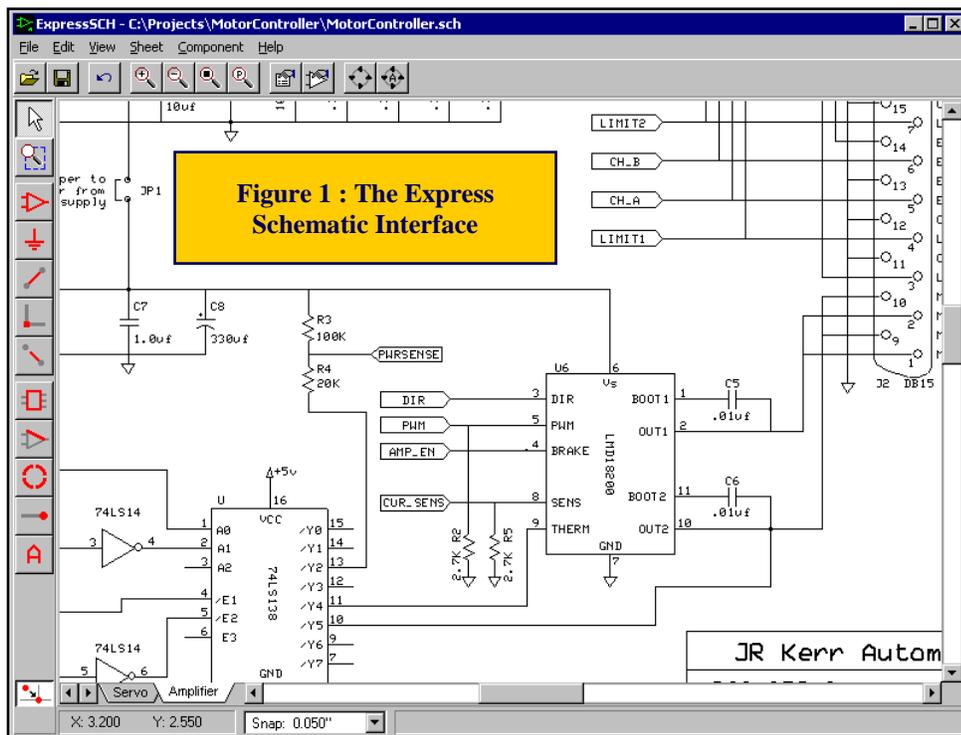
Translating the schematic to a PCB design is quite another story. In a schematic drawing, it is quite acceptable to have lines cross each other. However, in the layout of a PCB, the traces cannot cross each other *on the same layer*. Therefore, either some more complex routing of the traces is necessary, or else the board can be made as a two- layer PCB, with traces on each surface of the PCB. In this case, when a trace has to be shifted off from one side of the PCB to the other side in order to cross another trace, the connection from one surface to the other is made us- ing small plated through holes called *vias*.

Of course, if a trace needs to be on the second side of the PCB, generally the upper surface, it can be routed there from its origination at a component lead connect point. In such a situation, it must be remembered that the through hole for that component lead will have pads on both sides of the PCB.

Under general through-hole component circumstances, most of the traces are placed on the underside, or lower surface, of the PCB, known as the *foil side*. The components are installed to the upper surface, known as the *com- ponent side* of the PCB.

Sometimes, the positive voltage rail is routed on the component side of the board and the part of the foil side not occupied by current-carrying traces is filled by a copper plane to which all of the common, or chassis (ground) connections are made. Care must be taken to avoid placement of such a ground point in an "island" of the filled plane that does not have adequate connectivity to the rest of the plane.

I use the **ExpressPCB (Figure 2)** software component to lay out my PCB's, regardless how they are eventually produced. A few words are in order here regarding **ExpressPCB**. The software is a free offering of *ExpressPCB, LLC*, a company that is in the business of manufacturing printed circuit boards for their clients. They make the software available at no cost in the hope that the user will also use their board-production service. Unfortunately, I find their pricing to be prohibitive, especially as compared to some of the other board houses that I have used in the past. I will talk some more about that later.
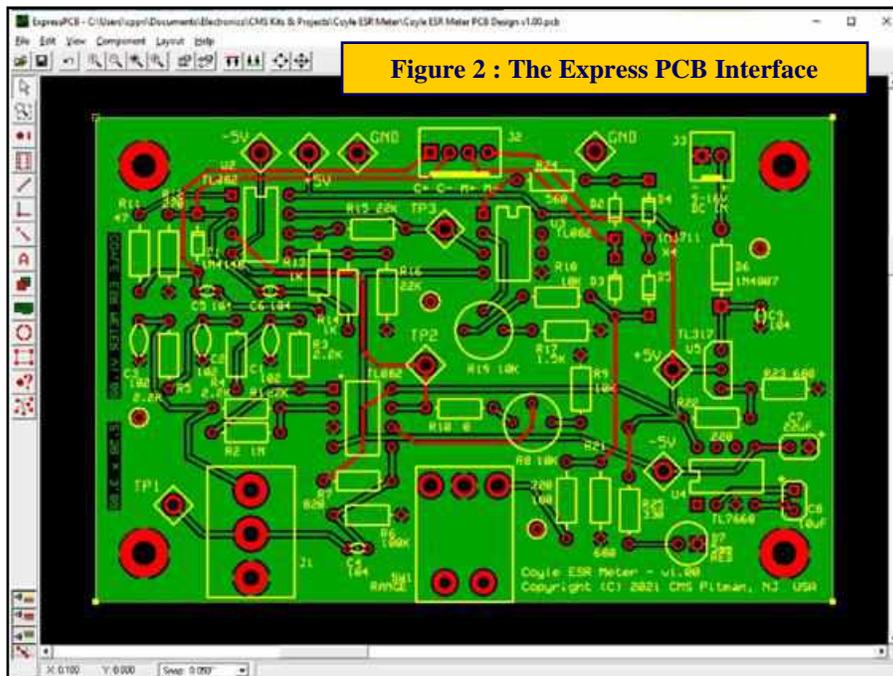
Figure 2 : The Express PCB Interface

For home-shop manufacture of PCB's, we start with a sheet of copper-clad **FR-4 (Figure 3)** or phenolic board. If we are making a single-sided board, we use single-clad board stock as the base. If the board needs to be double-sided, we use double-clad board stock. The thickness of the copper layer on the board is described in ounces, meaning how much one square foot of the copper material weighs in ounces. Most standard PCB's use one-ounce copper. A one-ounce copper layer will have a thickness of ≈35µm or 1.4 mils (0.0014"). Two-ounce copper will be appropriately thicker at ≈70µm or 2.8mils (0.0028").

When the board is produced, we begin by covering the wanted part of the copper layer - the traces and pads - and then immersing the entire board into a caustic solution that will remove the uncovered copper, leaving only the covered and therefore protected areas behind.

Figure 3 : Copper Clad FR-4 Boards

Now would be a great time to talk a little bit about safety. The processes involved in the production of printed circuit boards involve the use of chemicals, many of them caustic and most of them quite pungent and even harmful to inhale. Be sure to wear protective clothing and PPE including but not limited to chemical splash **goggles (Figure 4)**, a rubber apron, and rubber gloves. Also be sure to work in an environment with proper and adequate ventilation. Finally, be sure to have neutralizing agents on hand, e.g., vinegar when working with alkalis and baking soda when working with acids, so as to neutralize any spills or splashes, especially on your person. I will not repeat these safety instructions at each and every step of the way through this article, but they apply none the less. Be aware of the hazard and proceed at your own risk.

Figure 4 : Chemical Splash Goggles

Also, be sure to always properly dispose of the used chemicals following the applicable hazardous waste requirements. To actually produce the PCB's, we have to go through a series of steps, depending upon which method of production has been chosen. I will start out by describing the old peel-and-stick method first.

Once upon a time, before the common use of laser printers and dry toner type copy machines, it was a commonplace practice to create PCB designs using a series of stick-on labels that would cover and thus protect the copper on a copper-clad board. These labels were available as traces and pads in various sizes and shapes **(Radio Shack catalog number 276-1577, Figure 5)**, which would be placed onto a prepared copper-clad board and then pressed into place to seal them to the board surface. The design was built up slowly, selecting each trace line, angle, dogleg, and pad from the master sheet in turn and moving them into place on the board, overlapping them as necessary to create a continuous path of protected copper for each trace, to and into its connected pads. Some brands of these labels would have the center holes of the pads already punched, so that when the pad label was put in place and the board was etched, a drill center would be apparent on the center of each pad. This was important as a means of keeping the drill from "walking" on the board when drilling the component lead holes later.

Figure 5 : Radio Shack 276-1577

Once the design was complete, I would use a standard baker's rolling pin with a sheet of glass under the copper-clad board to tightly seal the labels to the copper-clad board. A tight seal to the board is necessary to keep the caustic solution from bleeding under the label and deteriorating the pads and, more importantly, the traces. With enough bleed, a narrow trace could potentially be bisected by the caustic creeping under the label.

Once the labels were all sealed to the board, the board would be immersed in a tray of caustic solution. Back in the bad old days, we would use **Ferric Chloride (FeCl$_3$)** in a shallow plastic pan or tray, using enough of the FeCl$_3$ to completely cover the board in the tray. With the board submerged copper side up (I only made single-sided boards back then), I would rock the pan forward and back gently to wash the FeCl$_3$ over the surface of the board. In about ten minutes, the board would be done, with all of the exposed copped removed. The copper was generally etched from the outer edges of the board inward towards the center by this method. Once the board was fully etched, it would need to be rinsed under cold running water to halt the etching process. After that, the protective pattern labels would have to be peeled off, usually with the help of a hobby knife. Then, the requisite holes would have to be drilled in the center of each pad, to accept the component leads. This is best done in a drill press, as it is quite difficult to drill these holes accurately with a very small twist drill in a portable drill motor, cordless or corded.

Making PCB's using this method had one huge drawback. Disposal of the used FeCl$_3$ was a problem, and as a second negative, the solution would weaken as the copper was dissolved into it, making the process take progressively longer and making disposal of the solution even harder to manage. There had to be a better way, and I found it.

I developed a plan whereby I would, wearing gloves, of course, put about a tablespoonful of $FeCl_3$ into a small sponge, and then would wipe the solution onto the copper-clad board, working from the center towards the edges, and I would actually see the copper wiping off the board in a matter of a minute or so. When etching was complete, I would rinse the board and the sponge under cold running water, and then I would store the sponge, after it dried, with the bottle of $FeCl_3$ for the next use. On occasion, I even rinsed off the gloves and re-used them. Waste not, want not!

This method worked well and served me for quite a few years. I used to buy the $FeCl_3$ right at my local **Radio Shack® (catalog number 276-1535 - Figure 6)**, where I would also buy my one -ounce copper-clad board stock. However, as time went by, I was always looking for the next better idea, and I found and fooled around with a few of them over the years. The next method was the photo-resist method.

This method also involved etching the board, but the board preparation was done differently. In the peel-and-stick method above, I prepped the board by scrubbing it with steel wool and some dish soap, blotting it dry with a paper towel *and then not touching the copper surface at all with my bare fingers*. This was because the skin oil would prevent the labels from adhering properly to the copper-clad board surface.

Figure 6 : Ferric Chloride

With the photo-resist method, the board was prepped initially following the same procedure. However, and this is quite important, it there are any burrs or raised edges on the board from saw-cutting the material, be sure to file and/or sand them off. The edges must be at least flush with the surface of the board for this method to be successful. This is because any lip on the edge of the board would affect the entry of light to the board during exposure. There are two alternatives in this method as regards the board stock. One is to purchase pre-coated boards that already have the **photo-resist material applied (Figure 7)**, and the other is to apply the photo-resist paint to the board your-self. If you choose to coat bare stock yourself, it should be done with a spatula rather than with a brush, so as to get a smooth and even coating across the board without brush tracks in the paint. You may need to thin the paint before you can get it to flow properly. Use acetone for this purpose. If you thin the paint too much, stir it for a few minutes; it will thicken as the acetone flashes

Figure 7 : Photo Resist Board

off. Allow the photo-resist paint to fully cure on the board before continuing with the process. It helps to heat the board slightly to aid in the curing of the coating. I have done this using a re-purposed **Mr. Coffee™** heater plate with the water tank and upper portion of the coffeemaker cut off, and a solid aluminum disc 1/4" thick cut in a round to fit onto the heating plate and bring its surface up above the edge lip of the heater plate. The coated copper -clad board was placed on top of this aluminum disc and left in a darkened room overnight. It is important to keep the photo-resist paint from being exposed to light as much as possible, and especially to bright or UV light.

The next step is to prepare your photo mask. This is done by printing, on a clear acetate sheet, a *negative* image of the PCB trace and pad layout at its full and exact size. Be sure to print this with zero scaling applied, and *mirrored* at that full size. I prefer to take the image out of my design software as a .PDF file, which I then print mirrored at full size on a 3M transparency sheet. I also set my printer to out feed the printed sheet directly out the back instead of the printer rolling it over and out-feeding into the top tray, as this prevents fine split lines from appearing in the still-soft toner on the acetate sheet as the sheet is tightly curled in the rolling process.

This print, generally cut out of the full sheet, is then placed into a glass sandwich stack made up as follows :
1. The photo-resist coated copper-clad board on the bottom, coated side up
2. A sheet of 1/8" window glass goes on top of the copper-clad board
3. The mask print goes on top of the glass *with the toner side facing downward*
4. A second sheet of 1/8" window glass goes on top of the print

This entire stack is then exposed to UV light, preferably in a dark environment. I have at various times used a home-made exposure box using a cardboard carton and a black light bulb in a lamp base or socket, a similar box with a "black light" fluorescent tube, and again a similar box with a regular fluorescent lamp. I have even tried it without the box, just placing the stack directly under a fluorescent lamp, within about ten inches of the lamp. In any event, the exposure will take at least fifteen minutes and the stack should be rotated a couple of times to even out the exposure. I used clear tape to hold the whole stack together so that the components would not shift during rotation, and I used a repurposed game board turntable to make it simple to rotate the stack - just turn the turntable 120° or so every five minutes.

After the exposure, the next step is developing. In this step, the board is immersed into a developer solution, typically a mild **Sodium Carbonate (Na_2CO_3) (Figure 8)** solution in water. A solution of about 1/8 ounce by weight to one gallon of water is appropriate. This equates to about 1 gram per liter of water for our metric-centric folks out there. A stronger solution runs the risk of removing the exposed photo-resist coating while washing away the unexposed portions. We want the unexposed areas to be washed clean while the exposed areas remain in place for the etching process. If necessary, replace the developer solution midway through the development process, keeping the mix ratio the same. Do not increase the strength of the solution, no matter how much you may feel as if you need to do so. This process takes time; let it develop!

Next up after developing and rinsing is the etching process. This can be done with the ferric chloride ($FeCl_3$) as described, or it can be done with a solution of one part **30% Muriatic Acid (HCl(aq)) (Figure 9)** in two parts **3% Hydrogen Peroxide (H_2O_2) (Figure 10)**. Be sure to add the acid to the peroxide instead of the other way around. Stir the solution gently with a plastic utensil to thoroughly mix the constituents, and then immerse the developed copper-clad board in the solution. Gently agitate the solution periodically until all of the visible copper has been etched away. The solution will likely turn a brilliant green color during this process, and that is perfectly normal. If the process slows down to a crawl before etching is complete, add a little bit of 3% H_2O_2 to the solution and continue the agitation. Once the etching is complete, remove the board using plastic tongs (which should also be used to handle the board while in the solution) and then rinse it under cold running water to stop the etching process. Blot the board dry with a paper towel.
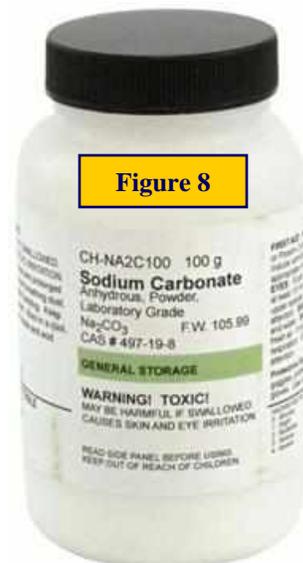

Figure 8

Figure 9
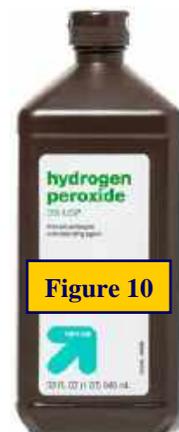
Figure 10

Editor's Note : Part 2 will be in the January 2024 CrossTalk.
Go to for a downloadable PDF.

2020-2024 Element 4 Amateur Extra Class License Question Quiz

This month we continue with Subelement E4 Amateur Practices (5 exam questions out of 5 groups) (Answers on 'Last Page Calendar')

E4C01
What is an effect of excessive phase noise in a receiver's local oscillator?
A. It limits the receiver's ability to receive strong signals
B. It can affect the receiver's frequency calibration
C. It decreases receiver third-order intercept point
D. It can combine with strong signals on nearby frequencies to generate interference

E4C02
Which of the following receiver circuits can be effective in eliminating interference from strong out-of-band signals?
A. A front-end filter or pre-selector
B. A narrow IF filter
C. A notch filter
D. A properly adjusted product detector

E4C03
What is the term for the suppression in an FM receiver of one signal by another stronger signal on the same frequency?
A. Desensitization
B. Cross-modulation interference
C. Capture effect
D. Frequency discrimination

E4C04
What is the noise figure of a receiver?
A. The ratio of atmospheric noise to phase noise
B. The ratio of the noise bandwidth in hertz to the theoretical bandwidth of a resistive network
C. The ratio of thermal noise to atmospheric noise
D. The ratio in dB of the noise generated by the receiver to the theoretical minimum noise

E4C05
What does a receiver noise floor of -174 dBm represent?
A. The minimum detectable signal as a function of receive frequency
B. The theoretical noise in a 1 Hz bandwidth at the input of a perfect receiver at room temperature
C. The noise figure of a 1 Hz bandwidth receiver
D. The galactic noise contribution to minimum detectable signal

E4C06
A CW receiver with the AGC off has an equivalent input noise power density of -174 dBm/Hz. What would be the level of an unmodulated carrier input to this receiver that would yield an audio output SNR of 0 dB in a 400 Hz noise bandwidth?
A. -174 dBm
B. -164 dBm
C. -155 dBm
D. -148 dBm

E4C07
What does the MDS of a receiver represent?
A. The meter display sensitivity
B. The minimum discernible signal
C. The multiplex distortion stability
D. The maximum detectable spectrum

E4C08
An SDR receiver is overloaded when input signals exceed what level?
A. One-half the maximum sample rate
B. One-half the maximum sampling buffer size
C. The maximum count value of the analog-to-digital converter
D. The reference voltage of the analog-to-digital converter

E4C09
Which of the following choices is a good reason for selecting a high frequency for the design of the IF in a superheterodyne HF or VHF communications receiver?
A. Fewer components in the receiver
B. Reduced drift
C. Easier for front-end circuitry to eliminate image responses
D. Improved receiver noise figure

E4C10
What is an advantage of having a variety of receiver IF bandwidths from which to select?
A. The noise figure of the RF amplifier can be adjusted to match the modulation type, thus increasing receiver sensitivity
B. Receiver power consumption can be reduced when wider bandwidth is not required
C. Receive bandwidth can be set to match the modulation bandwidth, maximizing signal-to-noise ratio and minimizing interference
D. Multiple frequencies can be received simultaneously if desired

E4C11
Why can an attenuator be used to reduce receiver overload on the lower frequency HF bands with little or no impact on signal-to-noise ratio?
A. The attenuator has a low-pass filter to increase the strength of lower frequency signals
B. The attenuator has a noise filter to suppress interference
C. Signals are attenuated separately from the noise
D. Atmospheric noise is generally greater than internally generated noise even after attenuation

E4C12
Which of the following has the largest effect on an SDR receiver's dynamic range?
A. CPU register width in bits
B. Anti-aliasing input filter bandwidth
C. RAM speed used for data storage
D. Analog-to-digital converter sample width in bits

E4C13
How does a narrow-band roofing filter affect receiver performance?
A. It improves sensitivity by reducing front end noise
B. It improves intelligibility by using low Q circuitry to reduce ringing
C. It improves dynamic range by attenuating strong signals near the receive frequency
D. All these choices are correct

E4C14
What transmit frequency might generate an image response signal in a receiver tuned to 14.300 MHz and that uses a 455 kHz IF frequency?
A. 13.845 MHz
B. 14.755 MHz
C. 14.445 MHz
D. 15.210 MHz

E4C15
What is reciprocal mixing?
A. Two out-of-band signals mixing to generate an in-band spurious signal
B. In-phase signals cancelling in a mixer resulting in loss of receiver sensitivity
C. Two digital signals combining from alternate time slots
D. Local oscillator phase noise mixing with adjacent strong signals to create interference to desired signals

CrossTalk Submissions

This is your Club Magazine. Make use of it.

If you have stories or photos of your hobby that you would like to share with the Club, please do so!

We will keep covering all of the GCARC events, but it is also nice to get those personal perspectives to include in every issue. Connecting through experiences is what makes the Gloucester County Amateur Radio Club a *REAL* Club.

All submissions, queries, comments, and editorials should be addressed to :
Jeff Garth, WB2ZBN at djgrath1 *<at>* gmail *<dot>* com

Submission deadline for the January 2024 issue : Wednesday, December 20, 2023

Club Website www.w2mmd.org
Club E-Mail Reflector: GCARC *<at>* Mailman *<dot>* QTH *<dot>* net

Gloucester County Amateur Radio Club
General Membership Meeting Minutes
Wednesday, November 1, 2023

Vice President Ron Block NR2B opened the General Membership Meeting at 1930 Hours with the Pledge of Allegiance to the Flag.

ATTENDANCE :
- **31 In-Person**
- **12 ZOOM**

VISITORS : (none)

NEW MEMBERS IN ATTENDANCE :
- **David Danichkin KD2UXC from Vineland, NJ**
- **Lance Appel KE2UC from Vineland, NJ**
- **Melissa Guenther KE2BWZ from Sewell, NJ**
- **James Foster K3JNF from Springfield, PA (via Zoom)**

ANNOUNCEMENTS :
- Tech Saturday Forums begin at 9 AM at the W2MMD Clubhouse on the Saturdays following the monthly General Membership Meetings. The October 7th Tech Saturday featured **Jim Wright N2GXJ** continuing his presentation on Antenna Modeling and Simulation.
- November 4th : Tech Saturday Forum : **Mike Thompson KG4JYA** on Radio Astronomy.
- November 11th : **Anthony Cerami N2OAC** has arranged a demonstration of Apollo Lunar Lander Radios at the RCA Museum at Rowan University. 20 people expressed interest by a show of hands. Anthony asked them to assemble in the parking lot by 9:45 AM.
- November 13th : GCARC TechNet ZOOM Forum, 7:30 PM, on operating during meteor showers.
- November 15th : GCARC Board of Directors Meeting at the Clubhouse, 7 PM.
- November 27th : A "Got my License - Now What?" session at the Clubhouse, beginning at 6 PM. This will be a multi-hour overview of the many aspects of Amateur Radio.
- November 29th : The Club is holding a Holiday Dinner at the Pfeiffer Community Center from 7:00 to 9:30 PM in order to raise funds for the VHF towers. This is to be a family event and tickets are $32 per person. A handout advertising the event has been circulated. The deadline to pay is Wednesday, November 15th.

Ron Block NR2B asked Club members about their current activities :
- **John Zaruba Jr K2ZA** has ordered a new Elecraft KH1 QRP transceiver.
- **Lance Appel KE2UC** provided the tip that if radials for a ground mounted vertical antenna are laid down this time of year and held down with lawn staples, the grass will grow in the Spring, hiding the radials without the need to dig trenches.

CLUB NETS :
- **Jim Clark KA2OSV** said things have been slow on the 10 meter Net, with an average of 3 to 4 check ins.
- **Bob Keogh KD2NEC** reports an average of 8 on the Skywarn Net and 15 on the ARES Net.

BUSINESS MEETING

The minutes of the October General Membership Meeting, as published in Crosstalk, were approved.

TREASURER : John O'Connell K2QA reported YTD Budgeted items :
- Income : $14,607
- Expenses : $10,105
- Net Gain : $4,502
- Use of $5,013 is restricted leaving $16,645 unrestricted.

The Treasurer's Report was approved.

CLUBHOUSE REPORT : Alan Arrison KB2AYU reported that grounding rods and straps have been installed for the VHF room. Rotors for the satellite antennas have failed and **Chris Prioli AD2CS** found and repaired the bad transformers and voltage regulators in the rotor control boxes. The rotators still would not move and it was found that the motors were burned-out. New rotators were purchased and remain to be installed. Chris plans to re-wind the old motors. Alan noted that we still need to raise about $7,000 to complete the installation of two VHF towers and that it is unlikely that pouring of the concrete foundations can occur before Spring.

FUTURE PROGRAMS : Ron Block NR2B provided a slide summarizing topics for the upcoming General Membership Meetings :
- Tonight : **Mike Thompson KG4JYA** on Radio Astronomy
- December : **Sheldon Parker K2MEN** on Radio Controlled Model Aircraft
- January 3 : **Robert Welsh N3RW** on Radio Astronomy and the Radio Amateur

DX and CONTESTS : Tony Starr K3TS noted the following contests :
- November 4 - 5 : ARRL Sweepstakes, CW
- November 11 - 12 : OK/OM DX Contest
- November 18 - 19 : ARRL Sweepstakes, Phone
- November 25 - 26 : CQ WW DX, CW

PUBLIC SERVICE : Bob Keogh KD2NEC and **Karl Frank W2KBF** reviewed the Simulated Emergency Test (SET) on October 14th that was a joint exercise between ARES and the New Jersey American Red Cross (NJ-ARC) with an emphasis on use of Winlink to transmit data on Red Cross Forms. Bob and Karl submitted an article with photos to The Crosstalk.

EDUCATION COMMITTEE : Chris Prioli AD2CS announced the next round of licensing classes to begin January 8th (Mondays) for Technicians, January 9th (Tuesdays) for Generals and January 12th (Fridays) for Extras. Exams will take place the week of March 12th. Chris reminded everyone that ARRL dues will go up next year. You can renew now at the current rate and the Club receives a commission from the ARRL if ARRL membership is new or renewed thru the Club.

OLD BUSINESS :

Ron Block NR2B reviewed the slate of candidates for 2024 office that the Nominating Committee has identified :

- **President : Jonathan Pearce WB2MNF**
- **Vice President : Ron Block NR2B**
- **Treasurer : John O'Connell K2QA**
- **Recording Secretary : John Zaruba Jr K2ZA**
- **Corresponding Secretary : Frank Romeo N3PUU**

- **Director : Alan Arrison KB2AYU**
- **Director : Bill Price NJ2S**

- **Trustee : Carl Wittig N2CRW**
- **Trustee : Sheldon Parker K2MEN**
- **Trustee : Leonard Rust W2LJR**

The floor was opened for nominations but none were received. The nominations are now closed and elections will take place at the December 6th General Membership Meeting.

CODA :

CONSTITUTION COMMITTEE : Ron Block NR2B reviewed the proposed new draft of the GCARC Constitution, which had been circulated previously to the membership, and addressed questions that were received. This draft will be reviewed again at the December 6th General Membership Meeting, at which time we will seek a vote from the membership for approval (75% positive rate required).

The Business Meeting concluded @ 2053 Hours and was followed by a presentation from **Mike Thompson KG4JYA** on Radio Astronomy.

Karl Frank W2KBF,
GCARC Recording Secretary

Sentinel Of The Delectable Treats!

Ham Humor, Part 1

Across

1. Four after A
5. High frequency prefix
10. Two is one
14. Dubai designator
15. Best condition for contesting, or tower climbing, say
16. ZS neighbor's prefix
17. AI language
18. Diminish
19. FET type
20. With 41 and 52 across, society highlighted in 36 across and founded by 31 down
23. VE2 way
24. They make some displays play
28. Skedaddles
31. Buzzer (non-RF)
33. 5N dough
34. Mint alt., on eBay, e.g.
35. "Excuse me", low in the band
36. QST department
37. React. plus res.
38. Hams love them
40. Bird word
41. See 20 across
43. Owns
44. Coffee maker
45. "Sesame Street" regular
46. Cut 100
47. Salad green
49. Kane's word
51. "QRZ?"
52. See 20 across
58. N.Y.C. part
61. 4W, was CR8 during the time of 31 down writing 36 across
62. Tuvalu
63. Houston university
64. 31 down's prefix
65. She sheep

66. Rotating rings for towers
67. "Yes, Sen. Kennedy", familiarly
68. Zero

Down

1. Unadorned
2. Nassau prefix
3. EME antenna
4. IC-7800, say, in JA
5. Grammar topic
6. Radiation pattern feature
7. Ski lift
8. Respond again, on RTTY, say
9. "He's ___ nowhere man"
10. Tool for reducing spectrum width?
11. 20's dispenser
12. JA transceiver maker middle
13. Don'ts partner

21. Famous DXpedioner, when 31 down wrote 36 across, familiarly
22. Trillions of zeptos
25. Goof
26. Passions
27. 5th century G-land settlers
28. Last second on-line bidder
29. D6 place
30. Poplars, in W0, say
31. Callsign suffix of one time 36 across writer and creator of 20 across.
32. Zero zulu in two-land June
35. Articulate
36. Very popular examples of 38 across
38. Early radio maker
39. Fast no more
42. Decorates 60's-style
46. "...like taking ____

from a fire hose." (information overload)
47. Half a Latin dance
48. T.O.M.'s series of articles
50. Where the DX might be listening
51. Kit alternative
53. Radiate
54. UHF antenna type, with dis-
55. Prefix in Lombardia
56. First astronaut ham, familiarly
57. Well known DXer KH6IJ when 31 down ran 36 across
58. Disp. device before LCD, LED
59. Early first century year
60. Inter-area NTS org

Crossword Puzzle courtesy of https://www.w2pa.com/Home/articles/crossword-puzzles

Answers on Page 57

Gloucester County Amateur Radio Club
Board of Directors Meeting Minutes
Wednesday, November 15, 2023

Meeting opened @ 1900 Hours by President Jonathan Pearce WB2MNF.

ATTENDANCE :
- **President Jonathan Pearce WB2MNF**
- **Vice President Ron Block NR2B**
- **Treasurer John O'Connell K2QA**
- **Recording Secretary Karl Frank W2KBF**
- **Corresponding Secretary Frank Romeo N3PUU**
- **Director Al Arrison KB2AYU**
- **Director Jeff Garth WB2ZBN**
- **Director Jim Clark KA2OSV**
- **Director Chris Prioli AD2CS**
- **Director Jim Wright N2GXJ**

NEW MEMBER APPLICATIONS : The following three applications were approved :
- **Todd Foster KE2CAH, Amateur Extra Class from Glassboro, NJ**
- **Robert Jensen KC3WWL, Technician Class from Marshallton, DE**
- **Robert Kay KE2CEG, Technician Class from Mullica Hill, NJ**

TREASURER : John O'Connell K2QA reported YTD totals :
- Income : $12,642
- Expenses : $10,207
- Net gain : $2,435

Total unrestricted funds at year end is projected to be $14,645. The Treasurer's report was accepted.

HOLIDAY PARTY : The November 29 Holiday Party will go forward as planned, with 56 tickets sold. **Jeff Garth WB2ZBN** will check with **Sheldon Parker K2MEN** to see if any Hamfest gift certificates are available as prizes. **Chris Prioli AD2CS** offered to donate a radio (TBD). **Frank Romeo N3PUU** will need some assistance around 4 PM to set up tables, etc. **Jonathan Pearce WB2MNF** will arrange a picture show and **Ron Block NR2B** will carve the ham.

CLUBHOUSE : Alan Arrison KB2AYU reports that the satellite antennas are back in place with new rotators and that ground rods have been installed for the VHF station. The SATNOGS antennas and rotators have been removed for repair.

THE TOWER PROJECT : Frank Romeo N3PUU reports that anchor bolts were shipped yesterday. Holes will be dug for the concrete foundations as soon as possible. The Club still needs to raise approximately $5,000 for the towers. The 50/50 from the Holiday Party will go toward the Tower Project.

TECHNICAL COMMITTEE : Jonathan Pearce WB2MNF will open the Clubhouse early Saturday morning to facilitate contacts during the Leonid Meteor Shower

PROGRAMS : Ron Block NR2B has speakers lined up for the next few meetings.

EDUCATION COMMITTEE : Chris Prioli AD2CS reported two new Technician Licensees and one Technician upgrading to General. The exams for Amateur Extra Class will take place on Friday. Chris would like to have the **SNJ Affiliated Club Coordinator Ron Fish, NX1W**, publicize the GCARC classes to other clubs.

GOT MY LICENSE, NOW WHAT? : A special session for new hams will be held at the Clubhouse on Monday, November 27, starting at 6 PM. **Tony Starr K3TS, Ron Block NR2B, John O'Connell K2QA**, and **Jonathan Pearce WB2MNF** have committed to provide an overview of the many aspects of Amateur Radio. Jon will send an invitation to new hams. **Mike Thompson KG4JYA** will be speaking on VHF/UHF operation.

CONSTITUTION COMMITTEE : Ron Block NR2B reviewed the current draft at the last General Membership Meeting. It will be reviewed again at the December General Membership Meeting, followed by a vote to accept.

OLD BUSINESS : The BoD discussed candidates for Volunteer Appreciation Awards. It was decided to present these awards at the Holiday Party and at the December General Membership Meeting.

NEW BUSINESS : Alan Arrison KB2AYU received a request from the 4H for us to provide a date for the 2024 Hamfest. Also, Alan suggested that a 15 - 20 minute Annual Review be done at the January General Membership Meeting regarding what has been accomplished during the last year and how the funds have been used. **Frank Romeo N3PUU** has experienced difficulties running the ZOOM sessions during the General Membership Meetings. It was decided that **Jonathan Pearce WB2MNF** will prepare a slide regarding ZOOM etiquette that will be shown at the beginning of each meeting.

The BoD meeting was closed @ 2023 Hours.

Karl Frank W2KBF, GCARC Recording Secretary

ARES Resources

Download the ARES Manual [PDF] : https://bit.ly/3iUhJLQ
ARES Field Resources Manual [PDF] : https://bit.ly/3QT4PtY
ARES Standardized Training Plan Task Book [Fillable PDF] : https://bit.ly/3wg5kVt
ARES Standardized Training Plan Task Book [Word] : https://bit.ly/3ZTNDbR
ARES Plan : https://bit.ly/3XLokXH
ARES Group Registration : http://bit.ly/3XodGpX
Emergency Communications Training : http://bit.ly/3J2gMMf
2022 National Preparedness Report : https://bit.ly/3EnvcTW
Southern New Jersey Section EOP 2022.PDF : https://bit.ly/3SbrXol

The Amateur Radio Emergency Service® (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment, with their local ARES leadership, for communications duty in the public service when disaster strikes. Every licensed amateur, regardless of membership in ARRL or any other local or national organization is eligible to apply for membership in ARES. Training may be required or desired to participate fully in ARES. Please inquire at the local level for specific information. Because ARES is an amateur radio program, only licensed radio amateurs are eligible for membership. The possession of emergency-powered equipment is desirable but is not a requirement for membership.

If you are interested in learning more about the Gloucester County ARES Program or becoming an ARES member, please contact Bob Keogh (KD2NEC@QSL.NET)

Electronic Tool Tip #2 - Vacuum Tube Puller
By Chris Prioli, AD2CS - chris@ad2cs.com - www.ad2cs.com

It is funny how you sometimes find a great idea when you are looking for something else. I was on ebay.com one day looking to purchase some NOS (New Old Stock or "Nasty Old Stuff") vacuum tubes of the 12AU7 type, when my search for that tube number brought me to this little wonder.

I have often struggled to remove vacuum tubes from down inside a host of other tubes, transformers, and capacitors, with little or no room for getting a decent grip on the vacuum tube, which is slick and slippery glass to begin with. On occasion, I have even broken a tube or two trying to get them out under really tight space conditions. As a result, I was very quick to jump on this nifty tool when I found it. The illustration above shows two of these tools together with two vacuum tubes; the price discussed near the end of this article will get you a single puller.

The concept is quite simple. The tool is a molded pliable thermoplastic tube with a "flattened" mushroom profile and a closed dome at the upper end. To remove a vacuum tube, the tool is placed down over the top of the tube, and then the tube can be wiggled and pulled straight up and out. The tool is then easily removed from the vacuum tube by just pulling it off at a slight angle to break the suction.

It is an easy task to use the tool as an aid in the installation of the vacuum tubes back into the equipment chassis. Insert the tube into the puller, align the pins with the tube socket properly, and push the tube into place. To remove the tool from the installed tube, once again pull the tool off at a slight angle to the tube to break the suction.

This puller fits many of the miniature seven-pin, nine-pin, and ten-pin tubes, and is quite useful when space around the tube location is limited. I heartily recommend this tool to anyone who does more than just occasional vacuum tube removal and installation.

The tool costs $10.95 (USD) from *spin4cards* via their eBay storefront, where this vendor has a 100% positive rating over 15,500 transactions. Shipping was quite reasonable at $4.95 from Cicero, NY.

Go to https://www.ebay.com/itm/394061782564 to investigate this tool for yourself.
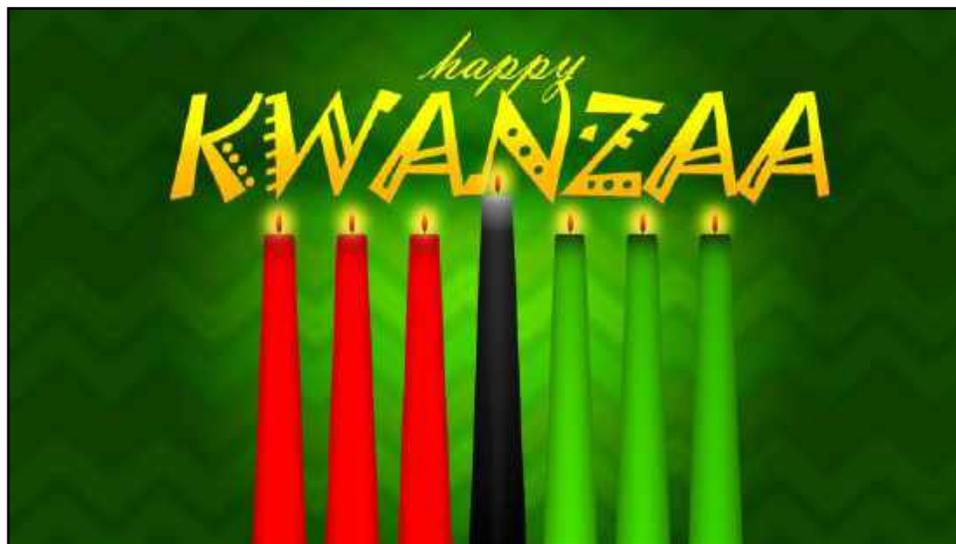
Tuesday, December 26, 2023

Name/Callsign	DXCC
Bill Grim, W0MHK	352
Edward De Fonzo, W2DE	339
Darrell Neron, AB2E	332
John Hill, W2HUV	266
Vinnie Sallustio, N4NYY	253
Ken Denson, WB2P	248
Jim Wright, N2GXJ	232
Tony Starr, K3TS	226
Sheldon Parker, K2MEN	212
Dennis Sandole, K2SE	204
Matt Wilson, K2MFW	201
Howard Marder, WA2IBZ	148
Eric Morris, N2BRJ	137
Phil Nunzio, WA3RGY	134
Rich Subers, W2RHS	124
Marc Federici, WM2Y (New Entry)	116
Steve Farney, W2SEF	111
Bart Kleczynski, AC2PT	106
Chuck Capasso, WB2PGE	103
Harry Strahlendorf Jr, W3DNQ	87
Jim Clark, KA2OSV	71
Lee Marino, N2LAM	62
Updated As Of 11/18/2023	

New Year's Eve 2023

December Birthdays
Congratulations To Our Members Who Are
Celebrating A Birthday This Month

Richard Bobb, W2NSA
Lou Bonaventura III, N2JXG
Bob Brown, KD2YUG
Anthony Cerami, N2OAC
Keith Dreyer, KD2ZRB
Karl Frank, W2KBF
Tom Gorman, KE2ES (President 2012, 2013)
Bill Grim Jr, W0MHK
Jim Kinkade, KC2JAX
Bart Kleczynski, AC2PT
Fred Lederer III, KD2WPD
Jim McDonald, WB2AOL
Gary Mirkin, WA3SVW
Eric Morris, N2BRJ
Richard Nicholas IV, KC3WIR
Sheldon Parker, K2MEN
John Price III, KD2QYC
Bill Robinson, KD2ANM
Bob Saunders Jr, KC2UYS
Dave Sheppard, W2PAX
Bill Sheppard Sr, WA2KMS

In Memoriam : December Birthdays

August Bendler, W2GUS
Joseph Bowen Jr, KD2AE
Howard Carter, WA2OVQ
Frank Ciancaglini, K2JLY
Daniel Coursey, WA2ZTY
Frank DiPalma, N2ESF
Vincent Gadzinski, WB2VNS
Arthur Goldman, K3WIN (Charter Member)
William Helmetag, WA2VQG
Ronald Hermann, KC3FRE
John Hirst, WA2FMP (Charter Member)
Barry Hovey, N2FSG
Urban LeJeune, W1UL
Frank Malinowski Sr, KE2NY
John Marshall, KB2RGR
William O'Donnell Sr, NT2N

James Peck, W2LVW
   (President 1961, Charter Member)

Donald Seibert, N2MOO
John White, WA2MEM (President 1974)
Norman Williams, W2SPN
Raymond Wrzeszczynski, N2SXO
Noboru Yamasaki, WA2WPZ

winter solstice (December 21)

N → polar night (6 months of night)

Arctic Circle (66.5° N)
24 hours of darkness

Tropic of Cancer (23.5° N)
13.5 hours of darkness

Equator (0°)
12 hours of darkness

Tropic of Capricorn (23.5° S)
10.5 hours of darkness

Antarctic Circle (66.5° S)
0 hours of darkness

S → polar day (6 months of day)
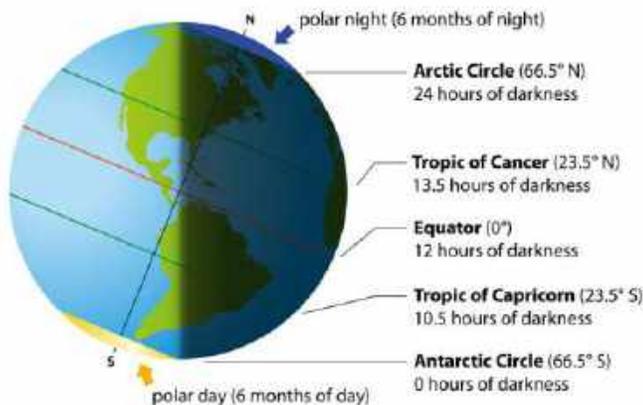
Thursday, December 21, 2023 @ 2227 Hours

Full Cold Moon : December 26, 2023 @ 1933 Hours

A name used by the Mohawk people, this Moon occurs when winter cold fastens its grip. Other names that allude to the cold and snow include Drift Clearing Moon (Cree), Frost Exploding Trees Moon (Cree), Moon of the Popping Trees (Oglala), Hoar Frost Moon (Cree), Snow Moon (Haida, Cherokee), and Winter Maker Moon (Western Abenaki). Long Night Moon is a Mohican term; Mid-Winter Moon, Lakota and Northern Ojibwe. Other names include Moon When the Deer Shed Their [Antlers] (Dakota) and Little Spirit Moon (Anishinaabe).

Old Farmer's Almanac - www.almanac.com

Contest	Time
NCCC FT4 Sprint	0100Z-0130Z, Dec 1
NCCC RTTY Sprint	0145Z-0215Z, Dec 1
QRP Fox Hunt	0200Z-0330Z, Dec 1
NCCC Sprint	0230Z-0300Z, Dec 1
K1USN Slow Speed Test	2000Z-2100Z, Dec 1
SEC QSO Party	2100Z, Dec 1 to 2100Z, Dec 2
ARRL 160-Meter Contest	2200Z, Dec 1 to 1600Z, Dec 3
Kalbar Contest	0000Z, Dec 2 to 2359Z, Dec 3
UFT Meeting	0500Z-0800Z, Dec 2 and 1500Z-1800Z, Dec 2 and 0700Z-1000Z, Dec 3
Wake-Up! QRP Sprint	0600Z-0629Z, Dec 2 and 0630Z-0659Z, Dec 2 and 0700Z-0729Z, Dec 2 and 0730Z-0800Z, Dec 2
PRO CW Contest	1200Z, Dec 2 to 1159Z, Dec 3
INORC Contest	1400Z, Dec 2 to 1359Z, Dec 3
FT Roundup	1800Z, Dec 2 to 2359Z, Dec 3
K1USN Slow Speed Test	0000Z-0100Z, Dec 4
ICWC Medium Speed Test	1300Z-1400Z, Dec 4
OK1WC Memorial	1630Z-1729Z, Dec 4
ICWC Medium Speed Test	1900Z-2000Z, Dec 4
Worldwide Sideband Activity Contest	0100Z-0159Z, Dec 5
ARS Spartan Sprint	0200Z-0400Z, Dec 5
ICWC Medium Speed Test	0300Z-0400Z, Dec 5
QRP Fox Hunt	0200Z-0330Z, Dec 6
Phone Weekly Test	0230Z-0300Z, Dec 6
A1Club AWT	1200Z-1300Z, Dec 6
CWops Test	1300Z-1400Z, Dec 6
VHF-UHF FT8 Activity Contest	1700Z-2100Z, Dec 6
Mini-Test 40	1700Z-1759Z, Dec 6
Mini-Test 80	1800Z-1859Z, Dec 6
CWops Test	1900Z-2000Z, Dec 6
QRP ARCI Topband Sprint	0000Z-0300Z, Dec 7
Walk for the Bacon QRP Contest	0000Z-0100Z, Dec 7 and 0200Z-0300Z, Dec 8
CWops Test	0300Z-0400Z, Dec 7
CWops Test	0700Z-0800Z, Dec 7
NRAU 10m Activity Contest	1800Z-1900Z, Dec 7 (CW) and 1900Z-2000Z, Dec 7 (SSB) and 2000Z-2100Z, Dec 7 (FM) and 2100Z-2200Z, Dec 7 (Dig)
SKCC Sprint Europe	2000Z-2200Z, Dec 7
NCCC FT4 Sprint	0100Z-0130Z, Dec 8
NCCC RTTY Sprint	0145Z-0215Z, Dec 8
QRP Fox Hunt	0200Z-0330Z, Dec 8
NCCC Sprint	0230Z-0300Z, Dec 8
K1USN Slow Speed Test	2000Z-2100Z, Dec 8
PODXS 070 Club Triple Play Low Band Sprint	0000Z, Dec 9 to 2359Z, Dec 11
ARRL 10-Meter Contest	0000Z, Dec 9 to 2400Z, Dec 10
TRC Digi Contest	0600Z, Dec 9 to 1800Z, Dec 10
SKCC Weekend Sprintathon	1200Z, Dec 9 to 2400Z, Dec 10
ARI 40/80 Contest	1300Z, Dec 9 to 1300Z, Dec 10
QRP ARCI Holiday Spirits Sprint	2000Z-2300Z, Dec 10
K1USN Slow Speed Test	0000Z-0100Z, Dec 11
4 States QRP Group Second Sunday Sprint	0100Z-0300Z, Dec 11
ICWC Medium Speed Test	1300Z-1400Z, Dec 11
OK1WC Memorial	1630Z-1729Z, Dec 11
ICWC Medium Speed Test	1900Z-2000Z, Dec 11
Worldwide Sideband Activity Contest	0100Z-0159Z, Dec 12
ICWC Medium Speed Test	0300Z-0400Z, Dec 12
NAQCC CW Sprint	0130Z-0330Z, Dec 13
QRP Fox Hunt	0200Z-0330Z, Dec 13
Phone Weekly Test	0230Z-0300Z, Dec 13
A1Club AWT	1200Z-1300Z, Dec 13
CWops Test	1300Z-1400Z, Dec 13
Mini-Test 40	1700Z-1759Z, Dec 13
VHF-UHF FT8 Activity Contest	1700Z-2100Z, Dec 13
Mini-Test 80	1800Z-1859Z, Dec 13
CWops Test	1900Z-2000Z, Dec 13
CWops Test	0300Z-0400Z, Dec 14

December 2023 Contest Calendar - Continued from page 55

CWops Test	0700Z-0800Z, Dec 14
EACW Meeting	1900Z-2000Z, Dec 14
NCCC FT4 Sprint	0100Z-0130Z, Dec 15
NCCC RTTY Sprint	0145Z-0215Z, Dec 15
QRP Fox Hunt	0200Z-0330Z, Dec 15
NCCC Sprint	0230Z-0300Z, Dec 15
AGB-Party Contest	1600Z-1700Z, Dec 15
Russian 160-Meter Contest	1800Z-2200Z, Dec 15
K1USN Slow Speed Test	2000Z-2100Z, Dec 15
OK DX RTTY Contest	0000Z-2400Z, Dec 16
Feld Hell Sprint	0000Z-2359Z, Dec 16
Croatian DX Contest	1400Z, Dec 16 to 1400Z, Dec 17
ARRL Rookie Roundup, CW	1800Z-2359Z, Dec 17
Run for the Bacon QRP Contest	2300Z, Dec 17 to 0100Z, Dec 18
K1USN Slow Speed Test	0000Z-0100Z, Dec 18
ICWC Medium Speed Test	1300Z-1400Z, Dec 18
OK1WC Memorial	1630Z-1729Z, Dec 18
ICWC Medium Speed Test	1900Z-2000Z, Dec 18
Worldwide Sideband Activity Contest	0100Z-0159Z, Dec 19
ICWC Medium Speed Test	0300Z-0400Z, Dec 19
NAQCC CW Sprint	0130Z-0330Z, Dec 20
QRP Fox Hunt	0200Z-0330Z, Dec 20
Phone Weekly Test	0230Z-0300Z, Dec 20
A1Club AWT	1200Z-1300Z, Dec 20
CWops Test	1300Z-1400Z, Dec 20
Mini-Test 40	1700Z-1759Z, Dec 20
VHF-UHF FT8 Activity Contest	1700Z-2100Z, Dec 20
Mini-Test 80	1800Z-1859Z, Dec 20
CWops Test	1900Z-2000Z, Dec 20
Walk for the Bacon QRP Contest	0000Z-0100Z, Dec 21 and 0200Z-0300Z, Dec 22
CWops Test	0300Z-0400Z, Dec 21
CWops Test	0700Z-0800Z, Dec 21
NTC QSO Party	1900Z-2000Z, Dec 21
NCCC FT4 Sprint	0100Z-0130Z, Dec 22
NCCC RTTY Sprint	0145Z-0215Z, Dec 22
QRP Fox Hunt	0200Z-0330Z, Dec 22
NCCC Sprint	0230Z-0300Z, Dec 22
K1USN Slow Speed Test	2000Z-2100Z, Dec 22
RAEM Contest	0000Z-1159Z, Dec 23
CW QRS Xmas Activity	0000Z, Dec 24 to 2359Z, Dec 31
K1USN Slow Speed Test	0000Z-0100Z, Dec 25
ICWC Medium Speed Test	1300Z-1400Z, Dec 25
QCX Challenge	1300Z-1400Z, Dec 25
OK1WC Memorial	1630Z-1729Z, Dec 25
QCX Challenge	1900Z-2000Z, Dec 25
ICWC Medium Speed Test	1900Z-2000Z, Dec 25
Worldwide Sideband Activity Contest	0100Z-0159Z, Dec 26
ICWC Medium Speed Test	0300Z-0400Z, Dec 26
QCX Challenge	0300Z-0400Z, Dec 26
DARC Christmas Contest	0830Z-1059Z, Dec 26
SKCC Sprint	0000Z-0200Z, Dec 27
Phone Weekly Test	0230Z-0300Z, Dec 27
A1Club AWT	1200Z-1300Z, Dec 27
CWops Test	1300Z-1400Z, Dec 27
Mini-Test 40	1700Z-1759Z, Dec 27
Mini-Test 80	1800Z-1859Z, Dec 27
CWops Test	1900Z-2000Z, Dec 27
CWops Test	0300Z-0400Z, Dec 28
CWops Test	0700Z-0800Z, Dec 28
NCCC FT4 Sprint	0100Z-0130Z, Dec 29
NCCC RTTY Sprint	0145Z-0215Z, Dec 29
NCCC Sprint	0230Z-0300Z, Dec 29
K1USN Slow Speed Test	2000Z-2100Z, Dec 29
RAC Winter Contest	0000Z-2359Z, Dec 30
YOTA Contest	1200Z-2359Z, Dec 30
Original QRP Contest	1500Z, Dec 30 to 1500Z, Dec 31
Stew Perry Topband Challenge	1500Z, Dec 30 to 1500Z, Dec 31
Bogor Old and New Contest	0900Z-2359Z, Dec 31

The Volunteer Monitor (VM) Program is a joint initiative between ARRL and the FCC to enhance compliance in the Amateur Radio Service. This is the August 2023 activity report of the VM Program.

- Advisory notices were issued to Technician-class operators in New Jersey, Rhode island, and Florida for FT8 operation on 20 meters. Technicians have no privileges on 20 meters.
- Advisory notices were issued to Technician-class operators in Texas and California for FT8 operation on 40 meters. Technicians have no data privileges on that band.
- An advisory notice was issued to an operator in Illinois for ongoing interference and harassment of operators on 40meters. The licensee was informed that any additional complaints would result in a recommendation to the FCC that voice privileges be removed from his amateur license.
- A similar advisory was issued to an operator in New York after exceptionally rude and harassing behavior toward a net control operator, and for claiming that the frequency was "his frequency because his net had used that frequency for decades." All frequencies are shared, and net longevity does not result in special privileges on any frequency.
- A former licensee in Paden City, West Virginia, was advised that continued operation of a repeater on an expired license would result in an FCC referral for enforcement action.
- A licensee in Indiana was issued an advisory notice informing him that the repeater owner's request for him to stay off the repeater was enforceable by the FCC and by state law.
- Two operators in Loogootee, Indiana, received commendations for exceptional work with C4FM technology on the 444.8 repeater in their area. The operators made extra effort to explain the technology to new users.

The VM Program Administrator participated in one meeting with the FCC. The totals for VM monitoring during July 2023 were 2,159 Hours on HF frequencies, and 2,651 Hours on VHF frequencies and above, for a total of 4,810 Hours.

Thanks to Volunteer Monitor Program Administrator Riley Hollingsworth, K4ZDH

Crossword Puzzle Answers (From Page 48):

B	C	D	E	■	U	L	T	R	A	■	B	A	N	D
A	S	I	X	■	S	O	B	E	R	■	A	T	W	O
L	I	S	P	■	A	B	A	T	E	■	N	M	O	S
D	X	H	O	G	G	E	R	Y	A	N	D	■	■	■
■	■	R	U	E	■	■	P	L	A	S	M	A	S	
S	C	A	T	S	■	B	E	E	■	N	A	I	R	A
N	O	S	■	S	R	I	■	H	O	W	S	D	X	
I	M	P	■	G	A	D	G	E	T	S	■	C	O	O
P	O	E	T	R	Y	■	H	A	S	■	U	R	N	
E	R	N	I	E	■	A	T	T	■	C	R	E	S	S
R	O	S	E	B	U	D	■	W	H	O	■			
■	■	D	E	P	R	E	C	I	A	T	I	O	N	
C	I	T	Y	■	T	I	M	O	R	■	T	T	W	O
R	I	C	E	■	W	N	I	N	E	■	E	W	E	S
T	I	C	S	■	O	K	T	E	D	■	N	O	N	E

2023 Club Committees

Standing Committees	Committee Chairs
Budget	John O'Connell, K2QA
Constitution & By-Laws	Ron Block, NR2B
Education	Chris Prioli, AD2CS
Field Day	Tony Starr, K3TS
Hamfest	Sheldon Parker, K2MEN and Bill Price, NJ2S
Health, Welfare, & Silent Keys	Bill Price, NJ2S
Hospitality	Jeff Garth, WB2ZBN
Membership	Chris Prioli, AD2CS
Membership Badges	Chris Prioli, AD2CS
Nominations	Jon Pearce, WB2MNF
Publicity	Tony Starr, K3TS
Repeaters	*Open Chair*
W2MMD Clubhouse Site	Al Arrison, KB2AYU

Activity Committees	Committee Chairs
Awards & Certificates	GCARC Board of Directors
Club Photographer	*Phil Nunzio, WA3RGY*
Club Publications & Historian	Jeff Garth, WB2ZBN
Contests	Tony Starr, K3TS
DX	*Open Chair*
GCARC Family Picnic	*Open Chair*
GCARC Foxhunts	Jim Wright, N2GXJ
GC-ARES Emergency Coordinator	Bob Keogh, KD2NEC
Holiday Dinner Party	Frank Romeo, N3PUU
License Testing/VEC Liaison	Gary Reed, N2QEE
Membership Roster Database	Jeff Garth, WB2ZBN
Programs : General Membership Meetings	Ron Block, NR2B
Radio Nets	Jim Clark, KA2OSV
Technical & Tech Saturday Programs	Jon Pearce, WB2MNF
W2MMD License Trustee	Darrell Neron, AB2E
W2MMD Special Event Station	Mark Gottlieb, KK2L

GCARC *<at>* Mailman *<dot>* QTH *<dot>* Net e-mail reflector guidelines

1. **No attachments** (e.g. pictures, files) are allowed on the reflector.
2. If you have Club-related pictures that you would like to share, you can send them to the webmaster, he will put them on the website and will send out a general e-mail to all the members.
3. Otherwise, the pictures will have to be sent to the members' addresses.
4. URLs/Hyperlinks are acceptable on the reflector.
5. Do not send any messages with e-mail addresses in the **BCC** (**Blind Carbon Copy**) field. The message will be rejected. Use only the **To:** or **CC:** fields.
6. Members are subscribed to the reflector using the member's e-mail address from the roster database. You must use that address when sending an e-mail via the reflector.
7. If you use another address on the reflector, the message will get rejected or "*bounced*", because the reflector does not recognize that address. Whenever a message sent to reflector is rejected or *"bounced"* for various reasons, the administrator has to log-in to the Mailman.QTH website and approve the message.

The W2MMD Repeaters

2 Meter Repeater
Output : 147.180 MHz
Input : 147.780 MHz
Offset : +600 kHz - PL : 131.8 Hz
(Conventional FM plus C4FM Capability)
EchoLink : W2MMD-R

70 cm Repeater
Output : 442.100 MHz
Input : 447.100 MHz
Offset : +5 MHz - PL : 131.8 Hz
(Conventional FM plus C4FM Capability)

The above repeaters are both
located in Pitman, NJ
GPS : 39.728481°, -75.131088°

1.25 Meter Repeater
Output : 224.660 MHz
Input : 223.060 MHz
Offset : -1.6 MHz - PL : 131.8 Hz
Location : Sewell, NJ
GPS : 39.746738°, -75.077094°

SKYWARN™ Net
Sunday @ 1930 : 147.180 MHz Repeater

Gloucester County ARES Net
Sunday @ 2000 : 147.180 MHz Repeater

GCARC TechNet ZOOM Forum
2nd Monday of Every Month @ 1930 Hours

Tuesday AfterNoon Net
Every Tuesday @ 1200 Hours

Tuesday & Thursday Night 10M Net
Every Tuesday & Thursday @ 1930 Hours
Tune in on 28.465 MHz or 28.475 MHz

Thursday Night Rag Chew Net
Every Thursday @ 2000 Hours

Meeting Calendar

General Membership Meeting
**Wednesday, December 6, 2023
1930 Hours
Live & In-Person
Pfeiffer Community Center
Simulcast Live on ZOOM**

Board of Directors Meeting
**Wednesday, December 20, 2023
1900 Hours
W2MMD Clubhouse**

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*"There's More To Ham Radio Than
You Can Possibly Do!"*
- K3TS

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*"The big thing about being in a club and
being a "Ham" is to help each other
when there is a need "*
- W2SEF

*** Badges ***

**Need a new or replacement badge
Contact "*The Badge Man*"**

**Chris Prioli, AD2CS
chris@ad2cs.com**

Question Pool Answers : E4C01:D; E4C02:A; E4C03:C; E4C04:D; E4C05:B; E4C06:D; E4C07:B; E4C08:D; E4C09:C; E4C10:C; E4C11:D; E4C12:D; E4C13:C; E4C14:D; E4C15:D

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73   Gloucester County Amateur Radio Club - P. O. Box 370 - Pitman, NJ 08071   Ω

December 2023 CrossTalk : Learning Stuff! Building Stuff! Doing Stuff! TOGETHER!   **59**

December 1964 Crosstalk

Yes Fellows, There is a Santa Claus By One Who Really Knows

Twas the night before Christmas as I look back,
And there I sat with a light in the shack.

The stockings were hung by the chimney with care,
Across the band I looked for some DX to snare.

The children were nestled all snug in their beds
While visions of rare ones danced through my head.

Up and down the band I tuned once more,
I was so tired it was becoming a chore.

When I heard it I could hardly believe my ears,
A CQ being tapped out by eight tiny reindeers!

I turned on the rig and grabbed for the key,
And in two seconds he was answering me!

"Hello young fellow, the handle's Saint Nick"
When I heard this I thought I'd been hit by a brick!

" I'm on a journey to near and far,
The rig is mounted in this thing I use for a car."

"It's powered by cheer and good wishes for all.
And by the way, thanks for giving us a call."

"Back to you" he said with a click,
But I still couldn't believe it was really Saint Nick.

The years have gone by and I've grown old,
Time after time this story I've told.

To believe it I know is really hard,
Until I show you his QSL card!

Each non-believer examines it well,
And leaves the shack really feeling swell!

For there on the wall for all to see,
Is proof of Santa's que-so with me!

And on the back of his card he wrote with red and green pens,
MERRY CHRISTMAS TO ALL OF MY FELLOW HAM FRIENDS.