The GARzette

The Official Newsletter of the Gwinnett Amateur Radio Society

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www.GARS.org

TechFest 25th
Gwinnett Amateur Radio Society
GARS January Exhibition of the Technical aspects of Amateur Radio
Held at the Gwinnett County Fairgrounds

CELEBRATING 50 YEARS
1973 2023

Don't forget to support our advertisers at the back of the *GARzette*.

GARS Meeting: Pi-Star DMR Hot Spot – Mark Prichard KN2TOD
Tuesday April 11, 2023 at 7:00 PM

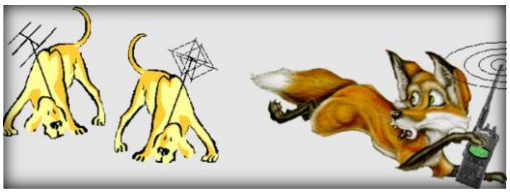
President's Message

From the President…

Many thanks to the HamCram Team who have prepared, tested, and sent off into the airways yet another fine class of hams. A big Thanks goes out again to Ralph Pickwick, KJ4CNC and John Davis, WB4QDX for their exceptional leadership in this training effort. The Pass rate for this particular HamCram session was 100%! What a testament to these instructors. Also, thanks to the VE team, led by Dave Bruse, W4DTR, for the giving of time to administer exams to the newly instructed Amateur Radio Operators.

Another Dog Show is on the books. We all should applaud the volunteers whom braved the elements and daily tasks at hand necessary to conduct this fund-raising effort. The money earned by our volunteering for the Dog Show helps in keeping our funds at a healthy level needed to maintain operations of both the Gwinnett Amateur Radio Society and Gwinnett Amateur Radio Emergency Service. And do not forget about the perks. Mmmm, donuts. Thanks again everyone who volunteered.

Fox Hunt in May - Our program for **May** is on Radio Direction Finding or aka Fox Hunting. This will prepare you for the actual Fox Hunt that will be held on the following **Saturday May 13th**, **starting at 8 am in GWINNETT County.** Everyone is invited. Our hope is that this activity gains traction and will also be held in various counties in the area. Stay tuned for additional information including where and when the hunt will begin, as well as the Frequencies of the FOXES. ***We will also have folks on site giving hunting instructions, tips, tricks and Hints, to anyone seeking help in this art of finding the hidden transmitter.***



Oh, and the final location of the Fox Den will be at……well, you will have to find it yourself. HiHi 😉

Memorial Day Parade May 29th – This is always a fun and rewarding event and an important one as well. As we gather, sort, stage, and execute this parade, we ensure the parade participants and spectators will have a fun, safe and exciting parade experience. Please volunteer by signing up at: https://docs.google.com/spreadsheets/d/1XVUGryXiQLy2-ddky_NAUvTU-7E7f8Q590rz_gfDp8o/edit#gid=1512576878

Keep on RF'ing.

73,

Joe Biddle, AD4PZ

Club President

GARS Repeaters and Other Communications

2 Meter Repeaters	6 Meter Repeater	
147.075(+) MHz Tone 82.5 147.255(+) MHz Tone 107.2	53.110 (-1 MHz) No Tone (Offline for Maintenance)	6M Currently down 147.075 Operational in Snellville 147.255 Operational in Snellville 224.580 Operational in Grayson 442.100 Operational at Goshen Springs 442.325 Operational in Buford 444.525 Operational in Snellville
1.25 Meter Repeater	**Other Resources:**	
224.580(-) MHz Tone 100.0, 1.6 MHz Offset	APRS	Link remote receivers being added
70 Cm Repeaters	144.390 -- 1200 Baud W4GR	
444.525(+) MHz Tone 82.5 442.100(+) MHz Tone 100 442.325(+) MHz Tone 100	D-STAR (WD4STR)	
	145.060 + (1.4 MHz) 440.550 + (5 MHz)	

Notable Web Links

Ham Radio Glossary: https://noji.com/hamradio/glossary.php a very comprehensive listing provided by Noji Ratzlaff KNØJI. On his site there is also a lot of information about getting started in ham radio.

Need Help – Let GARS Elmers answer your questions

Send an email to elmers@gars.org with the subject listing the area (like Antennas, Repeaters, Digital, DMR etc.) of your query to get to GARS Elmer volunteers.

The *GARzette* is the official monthly newsletter of the Gwinnett Amateur Radio Society, serving its members and other persons interested in the advancement of the Amateur Radio art.

Original articles, art, and photos are invited and encouraged. Previously copyrighted submissions cannot be accepted for reprinting unless permission from the appropriate publisher is provided in writing along with the information being submitted. If reprints are from publications allowing their unrestricted use, please include a copy of the printed permission contained in the publication.

If possible, bring your articles to the monthly meeting in Microsoft Word or rich text (.rtf) or text or HTML format or by e-mail to editor@gars.org. Artwork can be accepted in most any graphics format and can be submitted via e-mail to the same address. Alternate means of submittal can be arranged when necessary.

In keeping with the Amateur Radio spirit, permission is hereby granted for the reproduction of The *GARzette* articles by other Amateur Radio club newsletters provided that proper credit is given to the individual author and *The GARzette*.

The GARzette is published each month with the assistance of Karen KI4HPP and Kyle W4KDA who print copies for distribution at meetings, etc. and Dave Bruse, W4DTR, who distributes the newsletter electronically.

Deadline for submissions is the 28th of each month for inclusion in the following month's issue.
For additional information view our Website at: http://www.gars.org [PS— Articles to publish in the GARzette, either written by GARS members or published elsewhere, are always welcome. —Ed.]
Newsletter Email: editor@gars.org Editor: Bob Hoffmann, K4CQO

GARS Personalized Mugs for sale – Bits Print and Press

Jolie Dellaneve-Brown, KO4AHI

mailto:bitsprintandpress@gmail.com

GARS Meetings & Workshops

GARS Meetings and Workshops are held in-person at the EAA 690 Hangar, 690 Airport Rd, Lawrenceville, GA 30046.

Meetings and Workshops are OPEN to all, feel free to share your invite with others.

GARS Meetings Schedule (second Tuesday @ 7:00 PM): (these are the presentations)

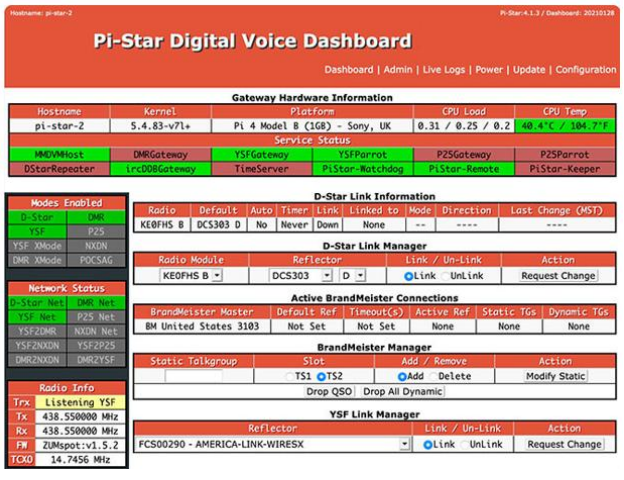
- April 11, 2023 – Pi-Star DMR Hot Spot – Mark Prichard KN2TOD
- May 9, 2023 – Fox Hunt presentation – Jim Sorenson KA4IIA & Joe Biddle AD4PZ
- June 13, 2023 – Ice Cream Social – Harbins Park
- July 11, 2023 – GARS Repeaters – David Adcock KA4KKF

Workshop Schedule (third Tuesday @ 7:00 PM): (these are the Hand-on Workshops)

- April 18, 2023 - Pi-Star DMR Hot Spot - Mark Prichard KN2TOD
- May 16, 2023 – Fox Hunt
- June 20, 2023 – Field Day – Check cables, antennas, network logging laptops, etc. All Hands
- July 18, 2023 – GARS Repeaters – David Adcock KA4KKF

GARS Meeting – April 11, 2023
Pi-Star: A Digital Repeater on your Desktop!

Presentation providing information on selecting, assembling and configuring a digital hotspot; utilizing the hotspot for QSO's and Nets; reporting and logging; creating codeplugs to connect to repeaters/talk groups/networks.



GARS Workshop – April 18, 2023
Pi-Star: A Digital Repeater on your Desktop!

Live hands-on demo covering information to help you select, assemble and configure a digital hotspot; using the hotspot for QSO's and Nets; reporting and logging; and creating codeplugs to connect to repeaters / talk groups / networks.

In addition to the planned GARS Workshop topic we also include Q&A time for your Amateur Radio projects and adventures. Feel free to bring along your show-n-tell items and questions. We typically have 5 or more Elmers at each Workshop.

GARS would like to thank Pierre Deliou, W4CKX, for his March presentation on 'Ribbit', which is a new Digital Messaging mode for VHF/UHF for recreational and emergency use. Also for bringing his expertise to our Workshop the following week for Presentation to Practice.

GARS Happenings

20 Years ago in the April 2003 GARzette:

- There is a summary write-up about the 2003 TechFest held in January
- There were volunteer requests for a March of Dimes walk & 5K Buford Road Race
- GARS helped at the McKendree Elementary school Science Fair and Exploration Night with a ham radio display

You can always browse the GARzette archive at http://www.gars.org/newsletters. 73, Bob, K4CQO, GARzette Editor


The GARZETTE

The President's Key

Health and Wellbeing – Sandy Jackson, KJ4DRO

Look for this resource on Email (https://gars.org/contact/) and use it as a means to convey information about a GARS family member or Silent Key notification.

Net Managers Corner

Monday Night 2 Meter "Want, Swap, Sell, and Information Net"

GARS NEEDS MEMBERS TO SERVE AS NET CONTROL STATIONS!

GARS is a great Amateur Radio service club with the membership and awards to prove it. Our club is very busy and active, and we use the Monday night net to get timely information out to our members. Weekly participation is needed to make our net function well. There is only a small group of very dedicated people who make the net happen each week, and we need more members to volunteer to serve as Net Control Stations (NCS) on a rotating basis.

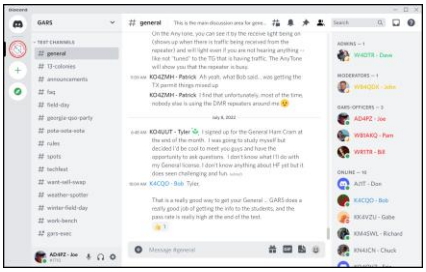
Out of almost 300 members, there are only seven operators who serve as the NCS for the GARS net every Monday night. In no particular order, they are:

Ray – N4GYN David – KA4KKF Kevin – W4KIB Fisher – W4LON Chuck – KK4TKJ

As GARS Net Manager (Chuck KK4TKJ), I would like to have more volunteers to fill NCS positions. I do plan and post the schedule months in advance. Any conditions will be accommodated that you as a rotating NCS need to place on the scheduling of your duties. If your plans change, I can make adjustments for the schedule to work, and I will make those changes happen as soon as I am notified of a problem. As Net Manager, I also send out reminders each week to let the NCS scheduled know he or she is NCS for the next Monday night net. In short, serving as a rotating NCS is a small duty but a great contribution to the club. The "Want, Swap, Sell Information Net" begins promptly at 19:30 every Monday night and runs about 30 minutes. As a scheduled NCS, you will request the assistance of a volunteer alternate NCS each time you have Net Control. Your simple duties will be to tune in to the GARS repeater, read the script, take a few notes and forward the information to me for record keeping.

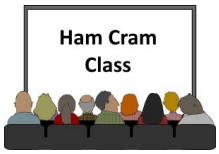
Please lend a hand and contact (Chuck) via Email (https://gars.org/contact/) to help support the effort that makes GARS the great club that it is. See you on the Nets!

Don't forget about our Discord utility for GARS announcements, news, activity spotting and more. See http://www.gars.org top of the home page. This is a sample of Discord. →



GARS Technician HamCram

We had a great exam session on 3/26/23. Everyone passed! Thanks to Ralph KJ4CNC and John WB4QDX for teaching this Ham Cram class.



⇨ 16 new Technicians (if you hear them on the air – say "hello")

- Haocheng Liao: KQ4HJD
- Shannon Wallick: KQ4HJE
- Yosef Beck: KQ4HIR
- Alison H Delaney: KQ4HIS
- Jason Johnson: KQ4HHX
- Kathy Riederich: KQ4HIJ
- John E Overley: KQ4HGO
- Thomas L Brack: KQ4HHV
- Marc Lay: KQ4HHY
- John W Hearn: KQ4HGM
- William P VanWinkle: KQ4HII
- William S Crouch: KQ4HHW
- Thomas A Rieck: KQ4HIH
- Steven Delaney**:** KQ4HKP
- Susanne Marcus: KQ4HLQ
- David Marcus: KQ4HLP

Special thanks to the Volunteer Examiners who made this special exam session possible:

W4DTR -- Dave (CVE)	AF4FG -- Earl	N4XYY -- Rick	KJ4CNC -- Ralph
WB1AKQ -- Pam	KK4TKJ -- Chuck (Co-CVE)	WB4WTN -- Bill	
NV4Q -- Bill	KM4SWL -- Richard	WB4QDX -- John	

Thanks & 73,

Dave Bruse, W4DTR (CVE)
GARS VE Team Leader
Email: exams@gars.org

GARS McConnel Middle School Testing

We had a great exam session at McConnell Middle School. Thank you Ralph, KJ4CNC for keeping the McConnell Middle School Radio Club going!!!

Exam session results:

⇨ 4 new Technicians (if you hear them on the air – say "hello")

- Andrew Beasley: KQ4HLC
- Ammon J James: KQ4HLD
- Caleb Heaton: KQ4HMW
- Abdullah A Lateef: KQ4HQG

Special thanks to the Volunteer Examiners who made this exam session possible:

Dave, W4DTR (CVE)	Ralph, KJ4CNC
Bob, K4CQO	Rick, N4XYY
Jere, K4FUM	Bill, WB4WTN
Richard, KM4SWL	

Hotspot Fix that went Awry

First off, what is a DMR hotspot? It is a HW & SW device that receives a DMR RF signal and connects that signal to the DMR Network web servers.

HT Hotspot DMR Network

When using my DMR hotspot, I noticed that the display was not showing the status correctly after being on most of the day. The hotspot was still working fine – receiving and transmitting signals. So I decided to fix what wasn't really broken and add a fan to the hotspot to keep it cooler.

I purchased a fan from Amazon that fits over the pins that connect to the DMR Hat (the MMDVM hardware that does all of the hotspot work). I installed it and found that it turned on and blew the air around the case.

However, the case had no vents in it. So the heat from the Raspberry Pi blew all around the case and heated up everything in the case to the temperature of the Raspberry Pi. As the temperature rose – up do 70º C – the DMR hat decided it was too hot for it and it died. After multiple attempts to get it resurrected, it was definitely dead.

Back to Amazon to get a new DMR Hat – and one that is a duplex unit with the antennas in the same orientation. I spent the next week getting my DMR hotspot back in business. I put in the new hat from Amazon and put it in with the fan along with some vents in the case. The fan sits on the pins that also connect the Raspberry Pi to the DMR Hat. The fan seemed to interfere with the operation of the hat. I could not get the hat to accept the FW update it needed to run. Took the fan out, and still had problems.

The hotspot appeared to work – receiving DMR traffic from the internet, but could not transmit to the radio. I even decided to return the hat and get a replacement. Today, I sat with Mark – KN2TOD (who is giving the pi-star presentation this month), and after several tries of updates, we were about to give up on this DMR Hat. When a check of the what the hardware was, it said that it was operating at 12.28 MHz. Loading the firmware for that frequency did not get the hotspot to transmit to the radio. Mark suggested to try the firmware for operating at 14.7456 MHz. I thought that I had tried that combination before during my many firmware update trials – I was in a mode of throwing everything against the wall and see what sticks! When the firmware is loaded, the last line of the update process was always "failed to initialize". Except for the last time that we tried again with the 14.7456 MHz it took and initialized.

Neither of us knew exactly why it worked – was it that the DMR Hat heated up enough so that all of the solder connections worked, was it the soft initialization instead of doing a hard reset, was it one of the other firmware tries that put the hat in the right state so that it finally took.

I was still wondering if it will still work when I shut it down and take it home and fire it up again? Well, when I got home, fired it up and it was still working – the "fix it even though it isn't really broken" were smiling on me – finally.

Bob – K4CQO

Repeater Usage and Etiquette

I was perusing a hometown Newsletter, '*Allen County* HamNews', and I came across an article shared by Brian Kibiger, AC9XU about **'ARES and Repeater Use'** written by the ARES Field Resource Manual. I thought this is an appropriate article to share for all hams to consider. So, with permission to republish it, here it is.

Thanks Brian. -- Joe Biddle, AD4PZ

ARES OPERATIONS AND REPATER USAGE

Repeaters and their usage by the ARES radio operator are a key element to a successful community event. As the ARES organization operates in emergency and non-emergency situations, there may be times when a repeater is needed/used by the ARES organization to better serve the event. Therefore, consideration should be given to the details in the proper use of the repeater so that efficient communications can be achieved.

Definition

Ham radio repeaters are **two-way radiocommunication devices**. They have a transmitter and receiver working simultaneously to receive weaker signals, strengthen them, and transmit them over a wider area, ensuring that the signals get better coverage without degradation. Repeater Bing Search

Key Development Points

1. ***Use minimum power.*** Otherwise, especially in heavily populated areas, you run the risk of keying more than one repeater, thus causing unnecessary interference. Low power also conserves batteries.
2. ***Use simplex, whenever possible.*** ARRL recommends 146.52 MHz, but it's a good idea to have at least one other simplex channel available. Use a gain antenna at fixed locations for simplex operation.
3. ***Observe the "pause" procedure between exchanges.*** When it is your turn to transmit, after the transmitting station stands by, count to two or three before pressing your transmit switch. This gives others with urgent traffic a chance to check in.
4. ***Listen much, transmit little.*** Announce your presence on a repeater when you are certain of being able to assist in an emergency, and don't tie it up with idle chatter.
5. ***Monitor your local ARES net frequency*** when you are ***not*** otherwise busy.
6. ***Think before you talk.*** Stick to facts, control your emotions. Remember, during an emergency is the time when you are most apt to act and speak rashly. Anyone with an inexpensive public service band receiver can monitor.
7. ***Articulate, don't slur.*** Speak close to your mike, but talk across it, not into it. Keep your voice down. In an emergency situation you may get excited and tend to shout. Talk slowly, calmly— this is the mark of an experienced communicator
   - ARES Field Resource Manual Pg 32

Summary

There are times when a repeater is needed to "strengthen weaker signals, and transmit them over a wider area, ensuring that the signal gets better coverage.." As an ARES radio operator, we may be called upon to use a selected repeater to complete the role as a support radio operator. It is the responsibility of the radio operator to use caution and care when using a repeater as they execute their duties in support of the agencies they support.

Vintage Linear Amplifiers - National NCL-2000

Vintage Amateur Radio

de Bill Shadid, W9MXQ

While most operators use barefoot stations with output between QRP levels (typically five watts) and standalone transceivers with as much as 400 watts output. But a good number of hams choose to use, or have available to use, more power up to the level of 1,500 watts PEP output by today's rules in the United States.

The current rules follow many years of the rule being stated as 1,000 watts DC input to the final amplifier. Note the word input – not output. This was complicated and may be the subject of some future article but let it be said that the rule was complicated by a further statement that input power to the final of the amplifier included the drive power. Did that mean that a 1000-watt amplifier that was driven by a 200-watt input exciter could only be loaded to 800-watts? I guess it makes no difference, today.

The post WWII move to SSB for phone operation led to a definition widely accepted that SSB was really an average of 1000 watts if modulation peaks reached twice that amount on power peaks. So, the feeling was that peak input power of 2,000-watts equaled an average of 1,000 watts – or said at the time that the power rating was "twice average DC."

So, in the 1960's it became acceptable to have a linear amplifier (by then, because the modes of choice were CW and SSB) that had a mode switch that showed CW and SSB. The amplifier was tuned in the CW mode to a power level of 1,000-watts. To operate SSB, the mode switch – without returning – was turned to SSB which significantly increased the plate voltage allowing a peak power of 2,000 watts[1].

Our discussion in this article will focus on the National Radio Company, NCL-2000 Linear Amplifier dating from the mid-1960s . . .

National NCL-2000 HF Linear Amplifier

W9MXQ

We often hear the term, "built like a battleship." That wording applies to the 62-pound NCL-2000. It commands attention in its large footprint of 7-5/8" x 16-1/2" x 12-3/4" (HWD) dimensions. That weight and size included the amplifier and high voltage power supply in a single, desktop cabinet[2].

Power tubes at the time of the NCL-2000 were varied – as were the amplifiers themselves. In this time, there older, still marketed 1,000-watt DC input amplifiers were living alongside their 2,000-watt PEP input competitors. Some examples from the day were:

1960's Linear Amplifier Examples – Showing Power Levels			
Amplifier	**Power Input (Watts)**		
	DC Rated	**SSB Peak Rated**	**SSB Capability**
Collins 30L-1 (4x 811A)	1,000	1,000	1,000
Collins 30S-1 (1x 4CX1000)	1,000	1,000	2,000
Drake L-4 (2x 3-400z)	1,000	1,000	2,000
Heathkit KW-1 (2x 4-400)	1,000	1,000	2,000
Heathkit SB-200 (2x 572B)	1,000	1,200	1,200
Heathkit SB-220 (2x 3-500z)	1,000	2,000	2,000
Hallicrafters HT-33A (PL-172)	1,000	1,000	2,000
Hallicrafters HT-45 (3-400z)	1,000	1,000	1,000

The Collins 30L-1 Linear Amplifier, for example, was a full, legal limit linear amplifier before the decision to allow "twice average DC."

The tube technology of the time was changing. The all glass tubes of the day (and still on the market today) were being joined on the market by more modern ceramic tubes as used in the NCL-2000:[3]

RCA (now Burle)
8122 Ceramic Tetrode
400 watts Plate Dissipation
(OEM in the National NCL-2000)

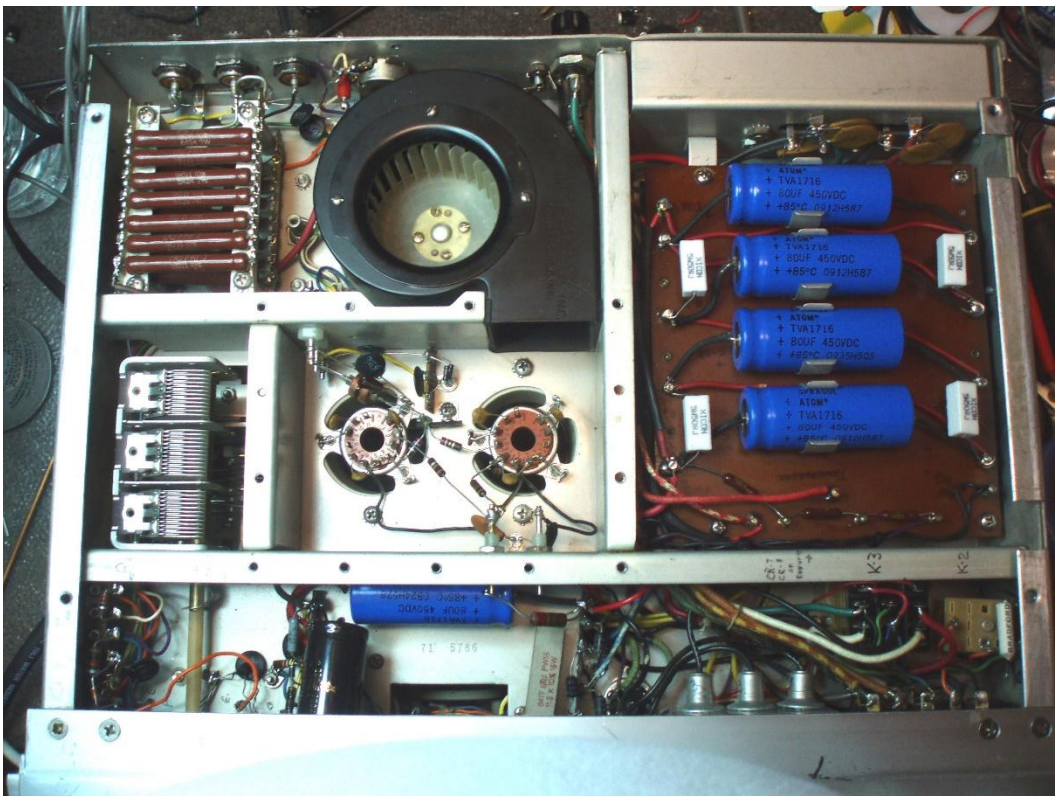
W9MXQ

Eimac
3-400z Glass Triode
400 watts Plate Dissipation
(OEM in the Drake L-4 and in the Hallicrafters HT-45)

W9MXQ

Amplifiers of this era were designed to operate with a full power duty cycle in their intended mode. The NCL-2000 was no exception. It was, for instance, designed to operate at 2,000 Watts PEP input (about 1,300 watts output) on SSB – and this it can do without a need to be in standby for significant periods any more than a person talking would need to rest. On CW and RTTY (a continuous duty mode) the amplifier is designed for continuous operation at 600-watts output. Like the Collins 30S-1, the Drake L-

4, and some others, the NCL-2000 has a pressurized cooling system to force air past or through the amplifier tubes. This insures good cooling in all modes of service. Check this under chassis layout of the amplifier:



Under chassis view of the National NCL-2000.
Front panel is toward the bottom of the picture.

W9MXQ

At the top center of the chassis is the black squirrel cage blower with its translucent plastic fan cage. The motor is out of view on the opposite side of the fan. The bottom chassis cover is removed. Note the lower tube socket chamber in the center of the chassis where you can see the two sockets for the 8122 tubes. See also the screw holes all around the top edges of this chamber. This allows a seal and forces the air from the fan to push through the slots around the tube sockets – those slots in turn, with the design of the socket, direct air through the cooling fins that surround the outer diameter of the 8122 tube.

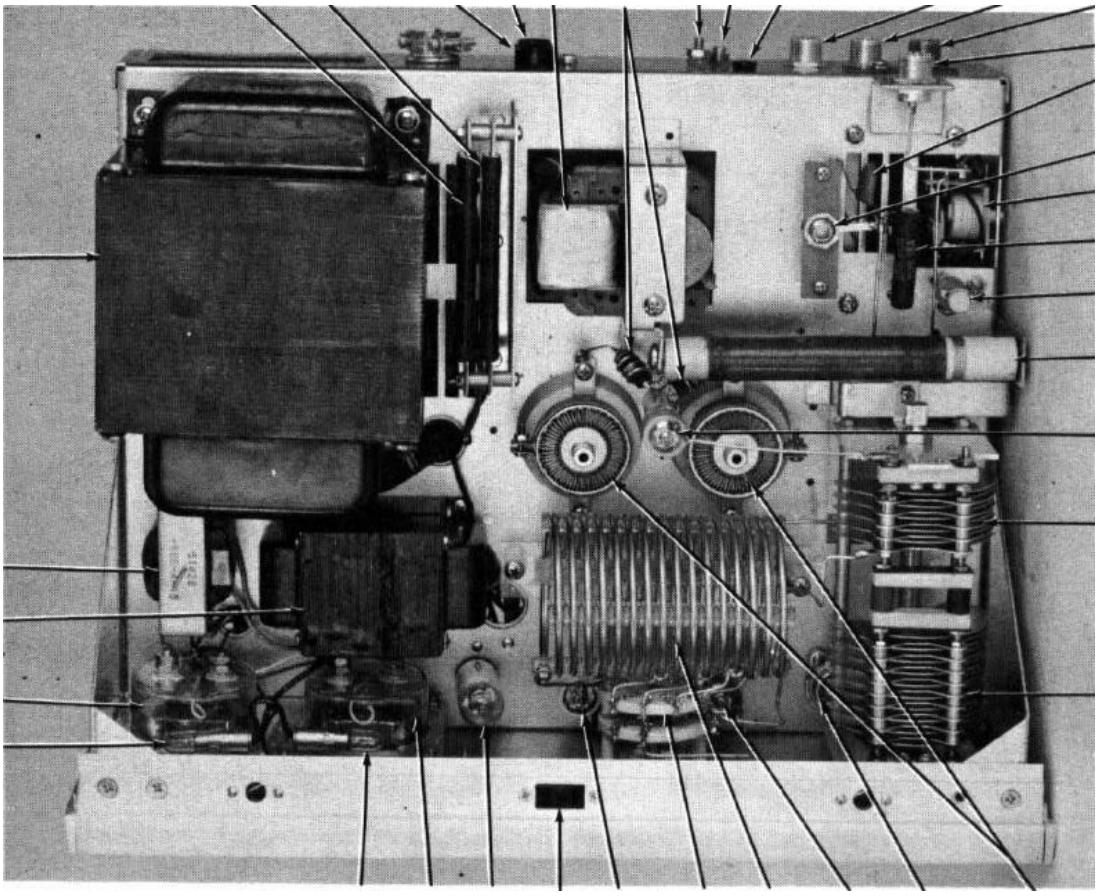
The fan cooling through the fins of the 8122 tubes allows for a total of 800 watts (400 watts per tube) dissipation. So, when the tube is running an input of 2,000 watts PEP, the tubes are putting 1,300 watts into the antenna and therefore dissipating 700 watts of heat. That is below the capability of the tubes to dissipate 800 watts – not considering that the 2,000 watts is twice average DC – meaning that the radio average power is not generating even close to the 800 watts it is designed to handle continuously. This, like many amplifiers of the time, is operating very conservatively.

Some evidence of my work a couple of years ago on the NCL-2000 power circuits can be seen in the blue colored new electrolytic capacitors. The group at the upper right are four of the eight 80uf, 450-volt filter capacitors in the high voltage power supply. The single blue 80 uF, 450-volt filter capacitor at the bottom center is the filter capacitor for the screen voltage supply.

The seven, dark brown resistors at the upper left-hand part of the picture – to the left of the blower – are the load resistors (there are a total of fourteen of these) that provide a load for the exciter.

The NCL-2000 is grid driven and requires only 20 watts of drive for full power. With proper adjustment to the input circuit, drive can be anywhere from 20 to 200 watts. In fact, the input resistor network can act as a dummy load for the typical 100-watt output exciter. Competitors in the field, like the mentioned Drake L-4, were grounded grid circuits requiring at least 100 watts of drive. And, without the resistive load presented to the exciter with the NCL-2000, the L-4 required complicated tuned input circuitry with associated and synchronized band switching.

The interior view of the NCL-2000 shows the design and grouping of components, in a reverse of the bottom view:



Top chassis view of the National NCL-2000.
Front panel is toward the bottom of the picture.

W9MXQ – NCL-2000 Operating Manual

At the top left of the picture is the plate power transformer with the much smaller bias and filament transformer just below it. Below that, attached to the front panel are the two meters – the one on the left being the Plate Current Meter and the right meter being a Multimeter reading Plate Voltage, Screen Current, Grid Current, and Exciter Tune.

The tank coil is in the center, just above the front panel in the picture. Note that because of the resistive load input circuit the bandswitch does not include a synchronizing shaft to an input bandswitch – unnecessary in the NCL-2000. Above the tank coil are the two 8122 tubes with their cooling fins showing clearly. You can see the plate choke running from the left side of the chassis to the area between the tubes. Note that on the 8122 tubes the ring around the fin area is also the plate surface so the parasitic resistor/coil assemblies are clamped to the outside of the tube.

You can see the blower motor at top center. To its right you see an open chassis area that shows off

the antenna relay. That relay, detailed below, is part of an ingenious circuit that works equally well with a transceiver or with a separate transmitter and receiver. At the time of this product the transceiver was the prince in line to be the king. But in 1965 the king and queen, the transmitter and receiver, were still in their glory and their reign!

Some amplifiers of the day had no internal switching – such as the Hallicrafters HT-45 and relied totally on ham designed[4] or separately purchased switching relay(s). Not so with the NCL-2000. National provided coax connection points for connection to three different systems using these four coaxial connectors . . .

1. Transceiver Input
2. Separate Receiver and Transmitter
    - With their own antenna switch between them.
3. Separate Receiver and Transmitter
    - Without their own antenna switch between them.
    - This option does not allow the transmitter to run barefoot.
4. Station Antenna Connection

This linear amplifier works perfectly with modern radios and has run from time to time with my Drake TR7 and my Drake R-4C / T-4XC combination[5]. The NCL-2000 cannot be run, unmodified with a modern transceiver that has no relay switching for operating the T/R relay inside the amplifier[6]. Commercial units are available (the Ameritron ARB-704, for instance). However, of late I have been modifying my amplifiers so there is a transistor switch added to the amplifier to handle such switching. Schematics for such additions are widely available on the internet.

The NCL-2000 is a classic Linear Amplifier that was marketed by National Radio Company – at the time one of the oldest names in radio. Here is a duplication of an advertisement appearing in 1969. Here is not props from National – it is an operating station – W9MXQ . . .

W9MXQ

The picture duplicated with W9MXQ equipment and is based on a 1969 advertisement in both CQ and QST Magazines. Title of the advertisement was, “Live a Little.” The equipment, left to right is:

- National NCX-A AC Power Supply and Speaker Console
- National NCX-5 HF SSB/AM/CW Transceiver
- National VX-501 External VFO
- National NCL-2000 HF Linear Amplifier
- National HRO-500 HF Receiver
- Shown with:
    - Electro Voice 638 Microphone with PTT Base
    - MFJ-422C Keyer with Bencher BY-1 Mechanism.

This picture appeared in an earlier installment that chronicled the NCX-5 Transceiver.

I appreciate that you read my articles. Remember that I am open to questions and comments anytime at my email address, W9MXQ@TWC.com.

A special note of thanks to my proofreader, Bob Bailey, W9DYQ. Bob is a bit more than a proofreader as he often adds commentary that makes it into the article.

Credits and Comments:

[1] The “twice average DC” implied that the amplifier (or transmitter) was not to ever be operated in SSB mode for key down (CW) operation – which would indicate a DC input of 2,000 watts. That would have been clearly illegal.

[2] The NCL-2000 was quite heavy for the time. But it was lighter than some with a separate power supply. One competitor of the time, the Drake L-4 Linear Amplifier, weighed more at 75 pounds but that was a total of 75 pounds with 43 pounds of that weight in the separate power supply.

[3] The march of time has not been kind to the glass envelope tube. In amateur radio, new technology vacuum tube amplifiers are all ceramic with many of those tubes being made in the United States. Glass tubes are virtually impossible to source from American manufacturers today, except for New Old Stock (NOS).

[4] Relays were available on the market from Dow-Key, B&W, and P&H – but most hams fabricated their own in those days. I still do!

[5] My current NCL-2000 is in restoration. I have had a previous one that I used for many years. With my Drake TR7, TR7A, and R-4C/T-4XC

[6] The high open circuit voltage and current required for NCL-2000 relay closure will destroy the switching transistors in modern transceivers. Exceptions are relatively recent Yaesu models that include such a relay. In those radios, the relay is available as a menu option. These models include, but may not be limited to, the Yaesu FT-1000D, FT-1000MP, FT-1000MP Mark V, and FT-2000 that were and are in use at W9MXQ.

W9MXQ

GARS Membership

New Members List in March

Yosef Beck (KQ4HIR)

Paul Francis (KG4HCX) – new member and joined as a Life GARS Member

John Harris (KC4JVJ)

Lynn Hatker (W4SHT)

Gregory Job (KQ4GKT)

Jason Johnson (KQ4HHX)

Robert Keeney (KD4WOR)

Jim Marchand ( )

Nancy Marchand

New Members: 9

Total Members as of April 1, 2023

382

Join GARS members for our weekly breakfast gathering at
7:30 AM most Saturdays at
Cracker Barrel Restaurant
75 Celebration Dr.
Suwanee, GA 30024

Birthdays in April

Angelo Bione (WB9RWL)
Jim Boyd (KJ4YN)
Paul Branson (KA4YZR)
Charles Burts (K4CHB)
Mark Case (K5MTC)
Scott Deitchman (WB8ICQ)
Chet Dickenson (KM4FMO)
Ana Luz Dominguez (KF4UOC)
Lisa Fischer
Emma Guidry (K4ECG)
JoAnn Heath
Janette Janssen
David Lappen (KO4OWS)
Stan McDonald (KI4H)
Richard Morris (KG4BVU)
Stephen Orey (KQ4ECK)
Michael Parrott (N4MEP)
Gemarl Perry
Russell Prevost (AB4QQ)
Roy Rickert (KQ4DRH)
Linda Tcimpidis (W6LWT)
Isi Thanthiriwatte (KQ4BKD)
Randy Tonne (KN4DY)
Kathleen Vogt
Keith Wells (WA8B)
Evelyn Whalen (KE4PLW)

GARS MEMBERSHIP

Your current GARS membership status is shown in the monthly newsletter e-mail towards the bottom of the message. To become a GARS member, or to renew your GARS membership, please visit our website – http://www.gars.org. To make changes to your GARS membership (moved, new e-mail address, new phone number, etc.), please contact the Membership Chair at Email (https://gars.org/contact/) with any changes to your Membership information.

Membership Chair: Karen Albritton, KI4HPP **Committee Members**: Dave Bruse, W4DTR

ARRL MEMBERSHIP

To update your ARRL membership information, please visit their website - http://www.arrl.org.

MAINTAIN YOUR LICENSE

You can update your Amateur Radio license information with the FCC at their website for free - https://www.fcc.gov/wireless/universal-licensing-system. License renewal is subject to the $35 FCC fee.

Donating to GARS

Your GARS donation can be used for a certain purpose by donating to one of these funds:

- GARS SK Memorial Fund for Education
- (to remember and honor Silent Keys);
- GARS Scholarship Fund (Administered by the ARRL for awarding scholarships);
- GARS General Fund (any club purpose).

GARS has joined these rewards programs (a portion of every purchase you make through these merchants may be donated to GARS):

- Kroger Community Rewards program.

For more information on how to sign up for these rewards programs, or to donate to GARS, visit

http://gars.org/gars/donations-to-the-club

GARS on Social Media

Discord Request:
http://gars.org/discord

Groups.io:
http://gars.org/groups.io

Visit GARS on Facebook:
http://gars.org/facebook

Follow GARS on Twitter:
http://gars.org/twitter

Join GARS on YouTube:
http://gars.org/youtube

GARS Mail Address:

GARS
P.O. Box 492531
Lawrenceville, GA 30049

Officers

 Joe Biddle, President AD4PZ

 Alex Kowalchuk, Vice President AK4AM

 Bill Hawkins, Secretary WR1TR

 Pam Meridy, Treasurer WB1AKQ

 Kevin Scott, Program Manager K4GTR

Managers and Committee Chairs

 Karen Albritton, Membership Chair KI4HPP

 Dave Bruse, VE Team Leader W4DTR

 David Adcock, Webmaster, Field Day Chair, TechFest Chair KA4KKF

 Ralph Pickwick, Education Chair KJ4CNC

 Earl Whatley, Apparel Manager AF4FG

 Bob Hoffmann, GARzette Editor K4CQO

 Eddie Foust, Repeater Chair WD4JEM

 Mike Weathers, WAS / DXCC QSL Card Checker and Historian ND4V

 Chuck McCord, Net Manager KK4TKJ

 Steve Back, Technical / RFI Advisor WB2OGY

 Dallas Mellichamp, Workshop Leader N4DDM

 Don Stewart, Elmer Manager KW4AL

 Sandy Jackson, Health and Wellbeing KJ4DRO

 Kevin Igarashi-Ball, Multimedia Chair W4KIB

 Dallas Mellichamp, Georgia QSO Chair N4DDM

Open Winter Field Day Chair

Directors and Trustees

 John Davis, WB4QDX

 Rick Cobb, N4XYY

 Kyle Albritton, W4KDA

 Bill Cherepy, WB4WTN W4GR Trustee

GARS Meeting Minutes

Gwinnett Amateur Radio Society – MEETING 3/14/2023

There were 47 in-person attendees

President Joe Biddle (AD4PZ) opened the meeting at 7:00 p.m. and closed the meeting at approximately 8:45 p.m.

New hams and visitors: Joe (AD4PZ)
- First time visitors recognized.

Treasurer Report: Joe (AD4PZ)

Membership: Karen - 378 current members

Education: Ralph (KJ4CNC)
- Tech ham cram coming up last weekend of the month. Register at GARS.org
- April 29-30 we have the General Ham Cram. Cost is $25 . That covers 2 lunches and the test fee.

VE Team: Dave (W4DTR)
- This months exam session we had 3 new techs and 2 upgrades to general, and 1 upgrade to Extra.
- Next session is next month. Register on GARS.org and the cost is $14.

Programs: Kevin (K4GTR)
- March – Ribbit – digital text mode for UHF/VHF
- April – PiStar - DMR hotspots
- May – Fox hunt
- June – Ice cream social. Pre-Field Day prep meeting.
- July – GARS repeater system with David (KA4KKF)
- Check the web site for all scheduled programs.

Workshop: Dallas (N4DDN)
- Workshops mirror the monthly program.

Dog Show: Ralph (KJ4CNC)
- March 29 – April 2nd.
- Please volunteer. We need 10 to 16 on site at all times to manage traffic and parking.
- We do 4 or 8 hour shifts.
- Meals are provided.
- She show is over at 2:00 each day.
- Both ARES and GARS will be working the show.

Georgia QSO Party: Dallas (N4DDM)
- QSO party will be 8th & 9th of April at Gwinnett fire station 31 (Collins Hill Rd.)
- Two stations will be running; CW and sideband (No digital in the QSO party)
- We need volunteers to coordinate food, be safety officer, antenna setup, and much more.

Other: Joe (AD4PZ)
- Fox hunt coming up May 13,
- Dave (W3DJS) asked when EchoLink would be back online. Per Joe, we may not put it back on because of the difficulty keeping the links up.

Program: RIBBIT – Pierre (W4CKX)

Minutes prepared by club secretary Bill Hawkins (WR1TR).

Workshop Minutes - March 21, 2023

Number in Attendance: 18

Workshop Topic: Ribbit – A new digital texting mode for VHF & UHF

Presenter: Pierre Deliou W4CKX

Brief Summary: Pierre went over the steps to download and setup Ribbit then we got into testing/playing with this new texting mode. Many of us sent test messages and emojis. This was one of our best attended Workshops in quite a while. The final few minutes of the Workshop was spent talking about GARS events; Dog Show/Fund Raiser, GA QSO Party, Dacula Veterans Day Parade, and Field Day.

Events – GARS and others

ARRL CONTESTING INFO

From ARRL Contest Calendar

> For more information click the links <

2023	January
1	Straight Key Night
7	Kid's Day
7-8	RTTY Roundup
21-23	January VHF Contest
	February
13-17	School Club Roundup
18-19	International DX – CW
	March
4-5	DX Contest -- SSB
	April
16	Rookie Roundup – Phone
	May
	No planned contests
	June
3-4	International Digital Contest
10-12	June VHF
17	Kid's Day
24-25	Field Day
	July
8-9	IARU HF World Championship
	August
5-6	222 MHz and Up Dis Contest
19-20	10 GHz & Up – Round 1
20	Rookie Roundup – RTTY
	EME - 2.3 GHz & Up
	September
9-11	September VHF
16-17	EME - 2.3 GHz & Up – Rnd 2
9-10	10 GHz & Up – Wknd 1
	October
29-29	EME - 50 to 1296 MHz
16-20	School Club Roundup
	EME - 50 to 1296 MHz
	November
4-6	Nov. Sweepstakes - CW
25-26	EME - 50 to 1296 MHz
18-20	Nov. Sweepstakes - Phone
	December
1-3	160 Meter
9-10	10 Meter
17	Rookie Roundup–CW

For more information:
http://www.arrl.org/contest-calendar

HAMFEST CALENDAR

[Please confirm the status of a Hamfest before making plans to attend]

04/08/2023 - EPARS Tailgate
Location: Dade City , FL
Sponsor: East Pasco Amateur Radio Society, Inc.
Website: http://eparsonline.org

04/15/2023 - Daleville Area Hamfest
Location: Daleville , AL
Type: ARRL Hamfest
Sponsor: Daleville Area Amateur Radio Service
Website: http://www.Daleville.US

04/15/2023 - TarcFest
Location: Tampa, FL
Type: ARRL Hamfest
Sponsor: Tampa Amateur Radio Club
Website: http://www.hamclub.org

04/22/2023 - Calhoun Hamfest
Location: Resaca , GA
Type: ARRL Hamfest
Sponsor: Cherokee Capital Amateur Radio Society
Website: http://www.k4woc.com

04/22/2023 - Mobile Amateur Radio Club (MARC) Hamfest
Location: Mobile, AL
Type: ARRL Hamfest
Sponsor: Mobile Amateur Radio Club (MARC)
Website: http://www.w4iax.com

04/22/2023 - Wiregrass ARC - Spring Tailgate
Location: Headland, AL
Type: ARRL Hamfest
Sponsor: Wiregrass ARC
Website: http://w4dhn.org

04/29/2023 - DBARA Tail Gate Event
Location: Daytona Beach, FL
Type: ARRL Hamfest
Sponsor: The DBARA Ham Radio Club of Daytona Beach Florida
Website: http://dbara.org

04/29/2023 - Gulf Coast A.R.C Spring Hamfest
Location: New Port Richey, FL
Type: ARRL Hamfest
Sponsor: Gulf Coast Amateur Radio Club
Website: http://gulfcoastarc.com

04/29/2023 - Savannah Area Swap Meet Hamfest
Location: Savannah, GA
Type: ARRL Hamfest
Sponsor: Coastal Amateur Radio Society
Website: http://coastalamateurradiosociety.net

05/13/2023 - Flamingo Net Flea at U. of Miami
Location: Coral Gables , FL
Type: ARRL Hamfest
Sponsor: Flamingo Net ARC
Website: http://www. FlamingoNet.8m.net

For more information: http://www.arrl.org/hamfests-and-conventions-calendar
When searching by division, remember some states adjacent to GA are in different divisions:

Southeastern: GA, AL, FL Delta: TN Roanoke: NC, SC

GARS Events Calendar for 2023

TechFest	January 14 2023
Winter Field Day	January 28-29 2023
Spring Technician HamCram	March 25-26 2023
Dog Show Fundraiser	March 29-April 2 2023
Georgia QSO Party	April 8-9 2023
North metro area Fox Hunt	April 2023
Summer General HamCram	April 29-30 2023
Memorial Day Parade	May 29 2023
ARC/KARC Hamfest	June 3 2023
Field Day	June 24-25 2023
JOTA	October 2023
Fall Technician HamCram	October 2023
Maker Faire	TBD
Stone Mt. Hamfest	November 4-5 2023
Holiday Party	December 2 2023

GARS Recurring Calendar

- 2nd Tuesday of the month at 7 pm (except December)
  Monthly Club Meeting
  690 Airport Rd, Lawrenceville, GA 30046
- 3rd Tuesday of the month at 7 pm (except December)
  Monthly Workshop
  690 Airport Rd, Lawrenceville, GA 30046
- 2nd Sunday of the Month at 2 pm
  GARS Ham Exam Session
  690 Airport Rd
  Lawrenceville, GA 30046
- Every Monday at 7:30 pm: GARS Want, Swap, Sell, and Information Net on the GARS 147.075 MHz repeater
- Every Monday at 8:30 pm: ARES Training on the GARS 147.075 MHz repeater
- Every Friday at 11:30 am, GARS Lunch at The 5 Spot
- Every Saturday at 8:00 am GARS Breakfast at The 5 Spot

GARS CALENDAR FOR April 2023

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 **8:00 AM Breakfast at The 5 Spot**
2	3 **7:30 – 8:00 PM GARS 2M Net**	4 **7:00 PM GARS Exec Meeting**	5	6	7 **11:30 AM Lunch at The 5 Spot**	8 **8:00 AM Breakfast at The 5 Spot**
9 **2:00 PM GARS Ham Radio Exams, EAA 690 Hangar**	10 **7:30 – 8:00 PM GARS 2M Net**	11 **7:00 PM GARS Meeting EAA 690 Hangar**	12	13	14 **11:30 AM Lunch at The 5 Spot**	15 **8:00 AM Breakfast at The 5 Spot**
16	17 **7:30 – 8:00 PM GARS 2M Net**	18 **7:00 PM GARS Workshop Meeting EAA 690 Hangar**	19	20	21 **11:30 AM Lunch at The 5 Spot**	22 **8:00 AM Breakfast at The 5 Spot**
23	24 **7:30 – 8:00 PM GARS 2M Net**	25	26	27	28 **11:30 AM Lunch at The 5 Spot**	29 **8:00 AM Breakfast at The 5 Spot GARS General HamCram**
30 **GARS General HamCram**						

Local Ham Radio Exams & Meetings

GARS Ham Radio Exams

Second Sunday of the month

Doors open at 1:45pm, exams start promptly by 2:00pm

GARS VE-Team
VEC: W5YI-VEC
EAA 690 Hangar
690 Airport Rd
Lawrenceville, GA 30046

GARS VE Team Leaders
E-mail: exams@gars.org.

March 2022 Results

The GARS VE Team had another great exam session.

3 New Technicians (if you hear them on the air – say “hello”)

- Dan Bosler: KQ4GXM
- Dean H Broeker: KQ4GWG
- Jack D Jordan: KQ4GYM

2 Upgraded to General
1 Upgraded to Amateur Extra

Special thanks to the Volunteer Examiners who made this exam session possible:

W4DTR - Dave (CVE)
WB4WTN - Bill
AF4FG - Earl
WB2OGY - Steve
K4CQO - Bob
NV4Q - Bill
N4XYY - Rick
Thanks & 73,
Dave Bruse, W4DTR (CVE)
GARS VE Team Leader
https://gars.org/exams/

Local Ham Radio Exams

In order to find an exam session near you, please visit http://www.arrl.org/exam_sessions/. Contact the information in the listing for further information.

Local Ham Radio Meetings

In order to find a local Ham Radio Club meeting near you, please visit http://www.arrl.org/find-a-club. Contact the club for meeting information.

Upcoming Events

Atlanta Hamfest

CQ de W1AW/4 Georgia

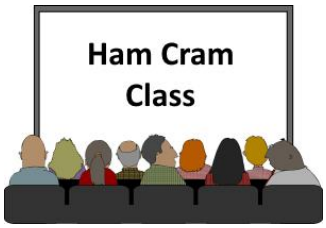
The use your call the event began on January 1st and ends on December 31st and is already underway, see the ARRL site for details.

- For us in Georgia to use the W1AW/4 call they are:
  - Oct 11th at 0000Z until 2359 on the 17th of Oct

For more info here is a link to the Google Sheet that has a tab for every day of the 7-day event. You can quickly see what time slots have been taken and which ones are open.

YEAR of the VOLUNTEERS

GARS General HamCram



WHEN: Saturday 4/29/2023 and Sunday 4/30/2023; 8:00 am to 4:00 pm each day, exams start at 4:00 pm Sunday (this is a CLOSED exam session, only open to registered students of the class).

WHERE: EAA 690 Hangar, Gwinnett County Airport – Briscoe Field, 690 Airport Rd, Lawrenceville, GA 30046

MORE INFO: To register for our 2-day HamCram Class, use our registration form below. Pre-registration is REQUIRED. No Walk-ins are accepted. This fee is non-refundable. Our $25 fee covers the class and lunch on both days and the exam fee for the exam given Sunday at 4:00 pm. Lunch will be brought in to save time.

We will be using the Ham Radio School General License Study Guide for this class. You can purchase the study guide locally at Ham Radio Outlet in Doraville, or purchase the book online at HamRadioSchool.com. We encourage you to at least look over the material in a study book and take some practice tests. We will go over every question in the question pool during the class, but remember that the test will only be 35 multiple-choice questions. If you get 26 out of the 35 questions correct, you will pass the test. We suggest that you take some practice tests prior to the class to familiarize yourself with the question format and some of the material. Go to our exam page for sample online tests towards the bottom.

QUESTIONS: Questions about the class or the exam session — **click here** to email the instructors.

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Business Card	$50
1/4 page	$125
1/2 page	$150
Full page	$200