The GARzette

The Official Newsletter of the Gwinnett Amateur Radio Society

October 2024 http://www.gars.org/ Volume 51, Issue 10

Inside

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TechFest
Gwinnett Amateur Radio Society

GARS January Exhibition of the
Technical aspects of Amateur Radio
Held at the Gwinnett County Fairgrounds

The next TechFest is January 11, 2025

GARS Meeting: GARS Show-n-Tell, Home Brew/Favorite Projects
Tuesday October 8, 2024 at 7:00 PM

President's Message

From the President…

This article has changed significantly since I started writing it early in the month. The recent events over the last couple of weeks have prompted a lot of reflection on amateur radio, volunteerism, and personal relationships. The stories that have come out of Hurricane Helene are heartbreaking, infuriating, impactful, and inspiring.

When the amateur radio topic comes up, I often get the comments of "Oh, that is cool," and then followed by, "Why?". My response usually follows a line: it is a combination of the techno geekiness of a hobby with the seriousness of public service, citing previous natural disasters and supporting current events with qualified communicators. Unfortunately, we now have another one of those disasters to explain why amateur radio is still very relevant in our modern world. Amateur radio serves as a crucial link during emergencies when other forms of communication falter – as often said by the ARES motto – "When all else fails".

As we have just witnessed when conventional communication networks are overwhelmed, damaged, or non-existent in times of crisis, amateur radio operators step in as the unsung heroes. Hams all over the Southeast have stepped up and answered the call to support their communities. Skills honed from Field Day or Parks on the Air are used to quickly establish effective communication networks, making them invaluable in coordinating rescue and relief operations. To those who have stepped up to volunteer hours as net controls or to ensure their stations are operational so traffic can flow, I sincerely thank and admire you.

If you have ever considered joining ARES, I would encourage you to seek more information on how to get involved. If you are on the fence about volunteering for events like the upcoming Stone Mountain HamFest and GARS TechFest (or numerous other events throughout the year), please consider it. Amateur radio is top of mind for a lot of people right now, and healthy events project a healthy and strong hobby. Share your experience of why you got into the hobby, what keeps you in it, and why you still find it important – there are people listening.

On a personal note, these events reinforce the importance of the communities I am a part of and taking care of those individual relationships in a very uncertain world. We get to choose how and where our energy gets spent and the impact that it will have on others.

73,

Kevin W4KIB
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 Rd, Norcross 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	
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)	Link remote receivers being added

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.

About the GARzette

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 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.

Zoom login info will be posted to http://www.gars.org prior to the meeting.

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

- October 8 - GARS Show-n-Tell, Home Brew/Favorite Projects
- November 12 - Modulation - Steve Back WB4OGY
- December 7 – **GARS Holiday Party** and GARS Ham of the Year Announcement

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

- October 15 - GARS Show-n-Tell, Home Brew/Favorite Projects
- November 19 - Modulation - Steve Back WB4OGY
- December – No workshop in December

GARS Meeting – October 8, 2024
GARS Show-n-Tell

The GARS Show-n-Tell has become an Annual GARS Event where members share their favorite ham radio projects. It could be a rig that was restored or a kit that was built. Or experiments with a new antenna or piece of electronic test equipment.

GARS Workshop – October 15, 2024

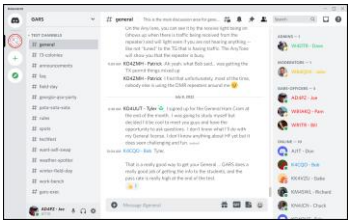
For the Workshop we will go over in detail how those Show-n-Tell items can be used in our own ham shack or antenna farm. If any of the Show-n-Tell items are brought to the Workshop we can go over them in detail.

Feel free to bring any ham related questions you have including equipment setup and usage. We typically have 5 or more Elmers at each Workshop.

GARS would like to thank Dallas Mellichamp, N4DDM, for providing an excellent overview and installation techniques of antennas at your home location.

Dallas – Everything begins to look like an antenna

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 Happenings

20 Years ago in the October 2004 GARzette:

- The GARS newsletter (GARzette) is not available for October 2004. However, all available GARzettes from 1994 can be found and browsed for your enjoyment from the GARS website.

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

GARS
GARzette

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 five 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 Bill - WD4AMC 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 (Click Here to Email our Net Manager) to help support the effort that makes GARS the great club that it is. See you on the Nets!

Fridays on 440 Net

The **"Fridays on 440 Net"** starts at 8:30pm on the 2nd and 4th Friday of the month on the 442.100 repeater. The general theme of the net will be a casual ragchew-style net with various, rotating topics of the night throughout its run. This net is also looking for additional NCS from the GARS members.

Contact Alex Kowalchuk, AK4AM or use our Net contact facility (Click Here to Email our Net Manager).

GARS Survey

Reminder to complete our Gwinnett Amateur Radio Society 2024 Member Survey. It's only 10 questions and contains a few comment boxes for your added input. All written responses will be kept confidential.

Survey Link: https://forms.gle/GtKttAR1h5sLEwZ27

GARS Request for Ham of the Year

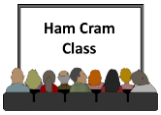
Nominations may be submitted by GARS Members about other GARS Members, for actions in which they have volunteered, served, and have given of their time and effort to our great Club.

Submit someone and a list of reasons why this GARS member deserves this award. The Officers, who are exempt from nominations by the way, will review the submitted nominations and select the GARS Ham of the Year for 2024.

To submit a nomination, please fill out the form at http://www.gars.org/gars/hoty/ by **October 31st** for consideration. Club Officers will review the nominations based on the merits received, and select a GARS Ham of the Year which will be announced in December.

GARS Technician HamCram Results

We had a great exam session on 9/29/24. Thanks to Ralph KJ4CNC and John WB4QDX for teaching this Ham Cram class.



➔ 7 (100%) got their new Technician licenses:

- William D Douglass
- Xavier A Evans, KQ4VVI
- James W Lawrence, KQ4VUA
- Daniel J Lent, KQ4VUP
- Katrina J Lent, KQ4VUK
- Andrew Souvinette, KQ4VUL
- Kimberly A Walker, KQ4VVM

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

K4CQO, ROBERT HOFFMANN	W4SHT, Lynn Hatker	KM4SWL, RICHARD KITZ
AB4QQ, RUSSELL PREVOST	KQ4DWZ, Douglas Hooper	NV4Q, William Carmichael

Thanks & 73,

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

Upcoming JAMBOREE ON THE AIR (JOTA)

Saturday, October 19, 2024
09:00 to 16:00
(UTC-04:00) America/New York

Where: VFW Post 5255, 368 Grayson Highway, Lawrenceville, GA 30046

Description:

This is a free event that is open to all Cub Scouts, Scouts BSA, Venturers, Sea Scouts, Girl Scouts & the general public. Come learn and have fun at JOTA 2023. JOTA is an annual Scouting event that uses amateur radio to link Scouts around the world, around the nation, and in our own community. Scouts of any age can participate, from Cub Scouts to Boy Scouts, Ventures and Girl Scouts. This is the official JOTA site of the Northeast Georgia Council Amateur Radio Club KK4BSA.

For Scouts BSA interested in the Radio Merit Badge, we will be signing off on requirement 9(a). You can either bring a Blue Card or we will provide a signed certificate which can be brought to the Apalachee Advance-A-Rama where the other Merit Badge requirements will be covered.

For information contact Steve Back WB2OGY sb@sback.org.

We will have 2-3 HF stations and one VHF/UHF station. Volunteers, Elmers, and Control Station Operators, please email Steve for more information on where you can help.

Preparing for GARS TechFest 2025

The GARS TechFest Planning Committee held its first 2025 planning meeting via Zoom on Sept 18th. We had 7 members present; Dave W4DTR, David KA4KKF, Bob K4CQO, Sherryl N3MIU, Sandy KJ4DRO, Dallas N4DDM, and Jack KM4ZIA.

Our newest member of the TechFest Planning Committee is Jack McElroy KM4ZIA. Jack will be one of our Guest Speakers, "**High Altitude Balloons with Amateur Radio Onboard"**. After his presentation, he will launch a balloon at the Fairgrounds and we will track its flight on computers in the Expo Center. A follow-up of Jack's presentation will be repeated at the GARS meeting on Jan 14th and we will review the balloons flight path.

Highlights (Un-Official Minutes) of the meeting:

- We are looking for a TechFest Chair.
- The Fairgrounds Expo Center is reserved.
- We need to check with Glen W3WWT that the Raffle Permit has been filed.
- We discussed getting TechFest on the ARRL ham fest web search which has been down since their network was hacked in May.
- We are looking for a Food Chair as Sherryl N3MIU is stepping down. She is willing to help and has a lot of info to pass down to the new Chair.
- We need to get GARS Exec approval/funding for Grand Prizes.
- We may need somebody to pick up the popcorn machine for Sandy.
- We need to request permission to use the GARS call sign on the balloon from the Trustee
- We should post info about the balloon launch on the W4GR QRZ bio page.
    - W4GR - Trustee, Bill WB4WTN
    - QRZ Bio - Managed by Mike ND4V
- We need a PIO (Public Information Officer) to head up and get TV crew(s) to TechFest to capture the balloon launch and get TechFest in the news.
- We also need somebody to take the Lead and work with Jack as the Balloon Tracker.

Please Join the GARS TechFest Planning Committee on Groups.io:

- **https://groups.io/g/GARS-TechFest**
- Just follow the BIG Blue Apply for Membership button to join us.
- Our next Zoom meetings are on; Oct-17, Nov-21, and Dec-19.

All GARS members are encouraged to join the TechFest Planning Committee. As with any Ham Radio Project the more you put into it the more you get out of it.

73 Dallas N4DDM

Interesting Preparedness Article

Joe Domaleski, KI4ASK published an article in The Citizen newsletter regarding keeping in-touch when the infrastructure communication systems go down. This article seems particularly relevant due to the damage from hurricane Helene.

How to stay in touch when the grid goes down: ham radio, Wi-Fi, and other lifelines during disasters - The Citizen

Upcoming Stone Mountain Hamfest

November 2nd & 3rd - Sat/Sun
Gwinnett County Fair Grounds
Lawrenceville, GA 30045
General Admission - Davis Rd at Plantation Blvd

Forums Posted:

- Topics, Presenters, and Synopses have been posted and most of the timeslots and rooms are locked in.
- We are still seeking Guest Speakers to fill the few open time slots.
- Review the current list; Stone Mountain Hamfest Forums
- Reply to me directly at forums@stonemountainhamfest.com to volunteer or ask questions about being a Guest Speaker, or a Workshop/Build-A-Thon Elmer.

The Ticket Booth Is Open:

- Advanced Ticket Sales, Adults $8.00 each
- At The Gate Prices, Adults $10.00 each
- 16 and under, FREE
- $5 Sunday-Only General Admission
- Tailgate Spaces, $15.00 each
- FREE Sunday-Only Tailgate Spaces (see web site for details)
- All credit card transactions are done through PayPal

North Fulton Amateur Radio League - CW Oscillator Kits

- NFARL will have plenty of Elmers to help folks build CW Oscillators. More details will be provided as we get closer to the HamFest.

HamFest Links:

- Stone Mountain HamFest
- Stone Mountain HamFest Ticket Booth.
- Stone Mountain HamFest Forums
- Stone Mountain HamFest Fleamarket

Ham Radio Exams - Both Days:

- Saturday 1:00 - 3:00 PM.
- Sunday 9:30 - 11:30 AM.
- Exam fee; $14.00 Cash Only.
- Preregistration is highly recommended, youth under 13 MUST preregister.
- More info here; https://stonemountainhamfest.com/index.php/ve-testing/

2024 Prizes:

- See https://stonemountainhamfest.com/index.php/2024-stone-mountain-hamfest-prizes-2/

The Collins 30L-1 Linear Amplifier

Vintage Amateur Radio

de Bill Shadid, W9MXQ

Some of my favorite vintage linear amplifiers have been those using 811A final amplifier tubes. Amplifiers equipped with the original 811 and subsequent 811A tubes[1] have ranged from just after World War II to current models from Ameritron[2]. This article chronicles one of the best of the breed and an amplifier that was first marketed in the 1960's with the original release of the Collins S-Line separates (75S-1 Receiver and 32S-1 Transmitter) along with the KWM-2 and KWM-2A Transceivers. I am speaking of the table-top, completely self-contained Collins 30L-1 Linear Amplifier.

At the time of its introduction in 1961[3], the Collins 30L-1 offered maximum legal power for an amateur radio operator at 1,000 watts plate input power on both CW and SSB. Like all Collins transmitters of that time, there was no published rating for AM operation.

The 811 Triode Transmitting Tube, introduced by RCA in around 1938[4], was updated to the 811A version shortly after World War II[5]. The 811A Triode has a plate dissipation of 65-watts.

The Collins 30L-1 Linear Amplifier

W9MXQ Collection

The 30L-1 lends itself to easy installation in that it has internal circuitry to switch between being in-circuit and out. This now common feature in amplifiers was not common in the 1960's. At that time, the amplifier merely accepted driving input and provided high power output. Feedline switching was totally at the discretion of the operator. This presented problems, especially with transceivers. Transceivers used the same feedline to send signal to the internal receiver or transmitter. That means that in receive the signal would be fed through the amplifier. While this could work after a fashion, there could be a lot of attenuation close to the position to which the amplifier is tuned. Also, it was not possible in that kind of setup to run the transmitter straight to the antenna, not using the amplifier.

Amateurs at the time would fabricate their own DPDT (double-pole, double throw) relay to provide proper by-pass of the amplifier. Companies at the time, including DowKey and P&H Electronics, offered commercial relays for the purpose. At that time, I was using a Hallicrafters HT-45 Linear Amplifier and homebrew switching relay setup.

Collins had the most easily adapted linear amplifier for any 70 to 100-watt output station. The 30L-1, for instance, would have been plug and play with my Hallicrafters SX-117 Receiver and HT-44 Transmitter when I acquired that Hallicrafters station in the 1960's. Here is how the Collins S-Line and KWM-2A look with the 30L-1 Linear Amplifier:

The W9MXQ Collins S-Line Station – Pictured from my QRZ Page

30L-1 Amplifier, 75S-3B Receiver, 312B-4 Console, 32S-3 Transmitter

W9MXQ Collection

You will also note the vintage radio operator in the above picture!

The W9MXQ Collins KWM-2A Station

KWM-2A Transceiver, 312B-5 Console, 30L-1 Amplifier

W9MXQ Collection

The same Collins 30L-1 Linear Amplifier is in both above photos. Color differences are from the photographs. Collins was quite good in keeping their color match from year to year. Notice the Round Emblem (later date) Collins emblems on some pieces and the Winged (earlier date) Collins emblems on others. These two emblems, and some even later ones, are covered in earlier articles on the S-Line and KWM-2/2A product lines.

And, finally, here is how the main competition looked in 1964 from Hallicrafters with the HT-45 Linear Amplifier that carried the same specifications as the 30L-1:

The W9MXQ Hallicrafters Twins Station with their Linear Amplifier

HT-45 Amplifier, HT-44 Transmitter, PS-150-120 Console, SX-117 Receiver

W9MXQ Collection

And, also from 1964, the competition from Heathkit – across Lake Michigan from Hallicrafters with the similar specification amplifier to the 30L-1 – the Heathkit SB-200:

The W9MXQ Heathkit Twins Station with their Linear Amplifier

SB-401 Transmitter, SB-600 Speaker, SB-303 Receiver, SB-200 Amplifier

W9MXQ Collection

The Collins 30L-1 was introduced shortly after its partners, the Collins S-Line Receivers and Transmitters, in 1961. A more commercial and military Linear Amplifier, the 30S-1, a large, floor mounted unit, came to market a year before.

At the time of the 30L-1 Linear Amplifier, the Federal Communications Commission defined maximum power for Amateur Radio Stations as 1,000 watts DC Power Input. This rule was to include the power from an exciter. That is, the driving transmitter used to “excite” the amplifier into operation. Forgetting for a moment[6] the “including the drive from the exciter” concept the maximum input power allowed would have been based on a calculation of Plate Voltage time Plate Current not to exceed 1,000. The resulting “1,000” in that formula would have been in watts – and could not exceed 1,000 for legal operation. Typically, the plate voltage on the 30L-1 would be 1,600 volts so the maximum current when the final amplifier is resonated would be just under 630 mA, or 0.630 Amperes.

Later in the 1960’s there seemed to be general agreement between the manufactures that the 1,000-watt maximum input could be interpreted for SSB as average power. So, on SSB one could run 2,000 watts input with a linear amplifier that operated at 50% efficiency and get an average input of 1,000 watts. The rub here was that it would be illegal for an amateur operator to tune up his/her amplifier to resonance at 2,000 watts. You see, for that instance of tuning up, the operator would be illegal. To get

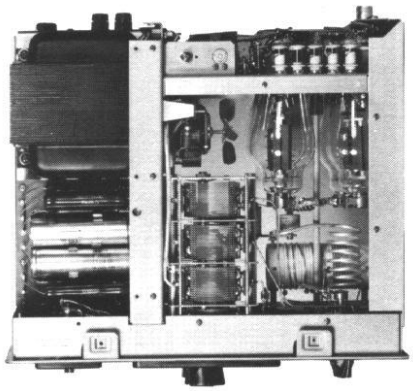
beyond this, you will notice that most older generation linear amplifiers (and older generation amplifiers still in production) have a CW and SSB mode selection. Some show that as a CW/AM mode and SSB mode. CW and AM are DC modes (as we reference it) so they are not operating as average power.

So, to tune an amplifier of the day to maximum power, one would follow the tune-up procedure in the CW mode. When complete, the operator would switch to SSB mode that would significantly increase the plate voltage. In theory, the amplifier was still tuned properly but the higher plate voltage significantly increased the power output. There is one interesting phenomenon here. My Drake L-4B and L7 Linear Amplifiers operate at a CW plate voltage of about 2,100 volts. While on SSB it operates at about 3,200 volts (somewhat less under load). So, a logical question is, why is SSB not twice the 2,100 volts – or 4,200 volts? That is mode and power supply related. Being an intermittent mode, when operating on SSB the plate voltage does not sag as much under load. The idea of average DC power provides at least 1,000-watts output. In truth, even more. Real output is more like 1,200 to 1,400-watts peak output on both mentioned Drake amplifiers. In today's flat 1,500-watts PEP Output rule that is no problem.

When introduced, the 30L-1 provided about 500-watts output and was rated at 1,000-watts DC (key down) input. Collins rated its much higher power 30S-1 Linear Amplifier at the same power level. It was marketed in the amateur market with instructions for tuning in keeping with legal amateur rules. Of course, "wink-wink," all amateurs carefully operated at that power and would never have thought of running far more power – as could easily be accommodated. For reference, the power specifications for both the 30L-1 and 30S-1 had the same power specifications. The 30L-1 was correctly rated but the 30S-1 was capable of at least twice or two and a half times more[7].

The Collins 30L-1 had a nice table-top stance compared to most all other 811A tube equipped amplifiers of the 1960's and up to the ones available today. To make the 30L-1 fit in a cabinet that matched the S-Line separates and the KWM-2/2A, they mounted the tube horizontally – not vertically like their competition. Collins 30L-1 Linear Amplifiers used RCA or Cetron tubes that were designed to be mounted vertically or horizontally. In today's world, RCA and Cetron tubes are rare and only available when new old stock is located. Svetlana, the Russian tube manufacturer up to recent times marketed 811A tubes that could be mounted vertically or horizontally. Svetlana no longer makes that line of tubes – but they can be found as new old stock here and there. The Chinese make such tubes but be sure to buy them from a distributor guaranteeing them for horizontal mounting. One such distributor is RF Parts[8].

The Collins 30L-1 Linear Amplifier seems timeless in that it operates today much like it did when new. That is, as with all older radios, assuming replacement of the aging power supply capacitors and diodes. My own Collins 30L-1's (I have one now and had a different one in the past) had their high voltage electrolytic capacitors, rectifier diodes, and by-pass resistors replaced with third party restoration boards. Both of my 30L-1's used a retrofit board from Young Kim, K6HM[9], in California. Kim is widely known with Collins collectors as having one of the best quality units. (Kim is also a vintage Collins collector.) However, another high-quality retrofit board comes from Harbach Electronics, in Ohio[10]. While I do not just flat out replace capacitors and diodes in vintage equipment – I do so in high voltage circuits.



At the left here you can see in interior view of the Collins 30L-1 Linear Amplifier the Power Supply and separate RF Area shields removed. This picture, from the 30L-1 Technical Manual, does not show the more modern retro-fit power supply board installed at the lower left hand corner of the radios.

Note the horizontally mounted tubes. Two are shown with the other two just below them. See also the small cooling fan, the large Load Capacitor at the left and the tank coils. The Plate capacitor is under the Load capacitor.

To the left is the Young Kim, K6HM, retro fit HV Circuit Board. The capacitors are on the understand of the board – but you can see their outline screened on the board. The HV diodes are shown across the top and the top right, The equalizing resistors are on the left and under the capacitor rows. Other components for bias and relay power are also present.

The Harbach board is equally well designed and of excellent quality.

Here are performance numbers for the Collins 30L-1:

Collins 30L-1 Linear Amplifier Performance Specifications		
Mode	**Input**	**Output**
PEP SSB	1,000	500 – 600
CW	1,000	500 - 600

It is important to remember that Collins designed the 30L-1, the S-Line, and the KWM-2/2A to be used by the amateur, commercial, and military market. As such, they cover from 3.5 to 30 MHz

Collins advises that the input circuits may need adjustment for operating in places outside the amateur bands. However, I have successfully used my KWM-2A Transceiver with my 30L-1 Linear Amplifier on the 17-meter and 12-meter bands with no issues in the KWM-2A or the 30L-1. Your experience may be different – so be aware.

Frequency Coverage Allowed – with Alignment* of Input Coils		
Band Switch Setting	**Lower Limit Mc. (MHz)**	**Upper Limit Mc. (MHz)**
3.5	**3.4**	**5.0**
7.0	**6.5**	**9.5**
14.0	**9.5**	**16.0**
21.0	**16.0**	**22.0**
28.0	**22.0**	**30.0**

(*) Alignment only if required. **Collins 30L-1 Technical Manual, Table 4-1**

Here is another interior view of the amplifier – showing the interior shielding:

Here is a view of the 30L-1 Linear Amplifier with the cabinet cover door open. Compare this with the above interior picture and see both the Power Supply (left) and RF Compartment (right) covers in place. See also the unique punch pattern for the RF Cover that allows the model number to be silk screened in the active area of ventilation holes. The 30L-1 is an impressive mechanical design. That and the electrical design have withstood the test of time.

The Collins 30L-1 uses grounded grid RF input design and thus needs about 70-watts of RF drive from the exciter. Unlike amplifiers of the day, the input circuitry in the 30L-1 insures a 50-ohm impedance for the exciter. While this was not as critical at the time of all these products, it was critical for the Collins S-Line Transmitters and Transceivers. That point makes the 30L-1 one of the best partners to use with modern, solid-state exciters.

Speaking of partnering with modern radios, the Collins 30L-1 Linear Amplifier in this article and virtually all linear amplifiers from this era required high current at high voltages to switch between transmit and receive. This was no problem for transmitters and transceivers of that same era. However, modern exciters can only accommodate low voltages (5 to 12-volts) at low current (on the order of a few mA). Interface units are available from several manufacturers for this purpose as well as modification circuitry for the amplifier to make it compatible with modern radios. I reference but am not limiting you to the Ameritron ARB-704[11] for this purpose. Other options exist – including modifications to the amplifier itself. Some large chassis Yaesu radios have internal relays that can be activated in menu to provide interface with older amplifiers. But be sure the current draw from the amplifier is not too high for even that relay. If you do not know how to measure the required current, buy the Ameritron ARB-704, or one of the several competing units. Most of today's radios do not give you a second chance with said switching – the first time you make a mistake and draw too much current from an old amplifier's switching circuit, you WILL destroy the switching transistor in the radio. And, as if that is not bad enough, several Icom radios have an error in their instruction manual on just that point – showing a typing error indicating way more current than the little transistor can withstand. Beware!!

Here are a couple of 30L-1 operations at W9MXQ where the Collins 30L-1 is running with other brands of exciters:

Cubic Astro 103 and Collins 30L-1

W9MXQ Collection

Kenwood TS-830S with Collins 30L-1

W9MXQ Collection

In the above pictures, the Cubic Astro 103 includes an added internal relay for switching a vintage linear amplifier – as mentioned above. The previous owner added that relay. I have now removed it and use the Ameritron ARB-704 Interface with the pair shown. The Kenwood TS-830S uses a large relay internally for amplifier switching – so no interface is needed.

Pictured at the left is an Ameritron ARB-704. The unit as delivered includes most cabling for vintage radios (or any radio with cables of you own making). Ameritron offers custom cables for current transceivers on the market – and some recent models as well.

Another area involves the AC Mains wiring. The amplifier came from Collins wired for 230 VAC. If you find a used one it could come wired for 115 VAC as a convenience. When returning the amplifier to 230 VAC service, note that the manual is incorrect. My best advice is to carefully examine the circuit and wire the transformer logically, not necessarily by the manual. I have never seen a correct manual.

Whenever talking about the Collins S-Line and the associated accessories, I must repeat something I mentioned in the first article done on the original 75S-1 Receiver and 32S-1 Transmitter as these radios were introduced in 1958. These radios have a feature that was approached, but never exceeded, by their competition – "Desk Presence." Look again at the Collins station pictures at the beginning of this article and draw your own conclusions. Another subjective comment is to say that the closest of the time competition for that look were the Hallicrafters and Heathkit lines from 1964 – also shown as complete stations, earlier in this article.

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 lot more than a proofreader as he often adds commentary that makes it into the article.

Credits and Comments:

[1] Reference three earlier articles in this series on 811/811A triode final amplifier linear amplifiers in the December 2019, February 2020, and March 2020 issues.

[2] Ameritron, at the time of this writing, markets the AL-811 Linear Amplifier with three 811A tubes and the AL-811H Linear Amplifier with four 811A Tubes. You can find further details on those offerings at https://www.ameritron.com,

[3] Reference the excellent data website on many Collins Radio Company historical items from Norman Drechsel, WA3KEY. Reference http://www.collinsmuseum.com.

[4] Reference the 1938 Edition of the "Transmitting Tube Data Book" from Radio Corporation of America (RCA).

[5] Other than "after World War II," I do not know the year the 811A version of the 811 Triode was introduced. Other than nomenclature printed on the tube and power handling specifications, the difference between the two versions is limited to some extra fins on the 811A's anode structure.

[6] My first commercial Linear Amplifier was a 1,000-watt input Radio Industries Loudenboomer. Radio Industries later became the Kansas City plant for Hallicrafters and the Loudenboomer became the Hallicrafters HT-45. My long-time friend, Bob, W9DYQ, now has that original Loudenboomer. I remember carefully monitoring my power input to the final of the amplifier to hold it to 800-watts. 200-watts from the exciter plus the 800-watts – for a total of 1,000 watts input.

[7] The Radio Industries Loudenboomer and subsequent Hallicrafters HT-45 Loudenboomer Linear Amplifiers were capable of far more than 1,000 watts input. The Collins 30L-1 had a total plate dissipation of 260 watts (4 times the 65-watts for each tube). The two Loudenboomers had a total plate dissipation of 400-watts with their Eimac 3-400z tube. At the time of their manufacture, the companies kept the printed specifications compliant with the law. The Heathkit SB-200 used two of the Cetron 572B Triode with a 160-watt dissipation – a total dissipation of 320-watts. The 572B – a redesigned 811A with more than twice power capability.

[8] The proper 811A tubes for horizontal mounting are available from RF Parts. You can access them at their website, https://www.rfparts.com/. BE SURE to mention horizontal mounting.

[9] Contact Young Kim, K6HM, at this QRZ page address. I have used Kim's kits in both of my Collins 30L-1 Linear Amplifiers.

[10] Harbach Electronics is at https://harbachelectronics.com. I have used Harbach's kits in my various Drake Linear Amplifiers and Drake Transceiver/Transmitter AC-4 Power Supplies. I have one Harbach kit pending installation into a National NCL-2000 Linear Amplifier.

[11] The Ameritron ARB-704 is available for most ham radio equipment distributors, including HRO, locally. The website link is https://www.mfjenterprises.com. Go to that link and enter "ARB-704" at the time of the page to search for the product.

[12] Other brands of amplifiers mentioned in this article (Hallicrafters, Heathkit, and Radio Industries have been the subject of detailed articles by this author. Contact me for article details at W9MXQ@TWC.com.

GARS Membership

New Members in September
Donnie Foster (KQ4VNU)
New Members: 1
Total Members as of October 1, 2024 340

Join GARS members for our:

- weekly lunch bunch at 11:30 AM most Fridays
- weekly breakfast gathering at 8:00 AM most Saturdays

Friday weekly gatherings are held at the Chilli's at:

947 Lawrenceville Suwanee Rd
Lawrenceville, GA 30043

Saturday weekly gatherings are held at the Cracker Barrel at:

75 Celebration Dr
Suwanee, GA 30024

Birthdays in October

Larry Andrus (KB4LWT)
Ray Bailey (N4GYN)
Scott Brown (KD4YDD)
Dale Burns (KI4MZO)
Dad Carmona
Bill Cohron (WD4AMC)
Jonny Dorminy (KN4LGM)
Charles Eiland (WA4RVO)
Neil Gardner (KO4UHX)
Benjamin Goings (KM4RTO)
Clay Hamilton (KE8IWD)
Ellen Hawkins (KM4RRW)
Bill Kirk (N4WWK)
Kathy Kitz
Robert LaBerge (KC4BI)
Joel Levine (WA4HNL)
Hana Londono
Carol McDonald
Mac McDonald (NN4K)
Bill Nash (KO4ZDH)
Catherine Perry
Cathy Pierce (K1YMW)
Bob Pursley (WD4KQQ)
Steve Stall (N4CVC)
Pamela Stallings
Allison Sullivan (KK4VLR)
Dixie Tyson
Matthew Valitalo (KQ4LSZ)
Mike Weathers (ND4V)
Glen Wendt (W3WWT)
Allan Winn (KG6NKU)

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 X:
https://x.com/GARS_Hams

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

GARS Mail Address:

GARS
P.O. Box 492531
Lawrenceville, GA 30049

Officers

 Kevin Igarashi-Ball, President W4KIB

 Alex Kowalchuk, Vice President AK4AM

 Drew White, Secretary KQ4NUQ

 Glen Wendt, Treasurer W3WWT

 Kevin Scott, Program Manager K4GTR

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 Dave Bruse, VE Team Leader W4DTR

 David Adcock, Webmaster 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

 Sandy Jackson, Health and Wellbeing KJ4DRO

 Kevin Igarashi-Ball, Multimedia Chair W4KIB

 Dallas Mellichamp, Georgia QSO Chair N4DDM

 Neil Derryberry, Elmer Manager WD4NET

Open Winter Field Day Chair, Field Day Chair, TechFest Chair

Directors and Trustees

 Joe Biddle, AD4PZ

 Kyle Albritton, W4KDA

 John Davis, WB4QDX

 Bill Cherepy, WB4WTN W4GR Trustee

GARS Meeting Minutes

GARS – MEETING 9/10/2024

President Kevin Igarashi-Ball (W4KIB) opened the meeting at 7:00 p.m. and closed the meeting at approximately 8:20 p.m.

- 42 people in attendance (35 in person with 7 on Zoom)
- New hams and visitors: Kevin (W4KIB)
    - First time visitors recognized.

Introductions

- September birthdays listed, and congratulated.

Reports

W4KIB introduced abbreviated committee reports for general meetings and welcome members to the executive meeting for full committee reports.

- Treasurer Report: Glen (W3WWT)
- Membership: Kevin (W4KIB) Currently there are 349 members.
- Programs: Kevin (W4KIB)
    - September – Simple Get on the Air Antennas
    - October – Favorite Websites / Show & Tell
    - November – Modulation
    - Check the Site for more information.
- Education: Ralph (KJ4CNC)
    - Technician HamCram September 28th and 29th. Preregistration is required
- Call for Volunteers (W4KIB)
    - Stone Mountain Hamfest
    - TechFest
- Other:
    - Steve (WB2OGY): JOTA on October 19th
    - Dallas (N4DDM): Ballon launch at TechFest and program to follow in January
- Program: Simple Get on the Air Antennas – Dallas (N4DDM)

Workshop Minutes - September 17, 2024

Number in Attendance: 9

Workshop Topic: Get on the Air Antennas for HF, VHF, and UHF

Presenter: Dallas N4DDM

Brief Summary: Only Glen W3WWT had questions and Dallas N4DDM forgot all of the Antenna props for show-n-tell at home. So this portion of the workshop will rescheduled again in October. Other discussions were the GARS Tech HamCram (Sept 28&29), TechFest (Jan 11th) and DMR radio.

Elmers are always present at the GARS Workshops. Feel free to bring your questions to the Workshop and if your project is small enough to get to the meeting, let us know in advance via email so we can have tools, test gear, etc.

Events – GARS and others

ARRL CONTESTING INFO

From ARRL Contest Calendar

> For more information click the links <

2024	**January**
1	Straight Key Night
6	Kid's Day
6-7	RTTY Roundup
20-22	January VHF Contest
	February
12-16	School Club Roundup
17-18	International DX – CW
	March
2-3	DX Contest -- SSB
	April
21	Rookie Roundup – Phone
	May
	No planned contests
	June
1-2	International Digital Contest
8-10	June VHF
15	Kid's Day
22-23	Field Day
	July
13-14	IARU HF World Championship
	August
3-4	222 MHz and Up Dis Contest
17-18	10 GHz & Up – Round 1
18	Rookie Roundup – RTTY
24-25	EME - 2.3 GHz & Up
	September
14-16	September VHF
21-22	EME - 2.3 GHz & Up – Rnd 2
21-22	10 GHz & Up – Wknd 1
	October
19-20	EME - 50 to 1296 MHz
21-25	School Club Roundup
	November
2-4	Nov. Sweepstakes - CW
16-17	EME - 50 to 1296 MHz
16-18	Nov. Sweepstakes - Phone
	December
6-8	160 Meter
14-15	10 Meter
22	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]

10/19/2024 - MARCIFEST 2024
Location: Bradenton, FL
Type: ARRL Hamfest
Sponsor: Manatee Amateur Radio Club, Inc.

10/26/2024 - Wiregrass ARC - Fall Tailgate
Location: Headland, AL
Type: ARRL HamFest
Sponsor: Wiregrass ARC
Website: http://w4dhn.org

11/02/2024-11/03/2024 - Stone Mountain HamFest
Location: Gwinnett County Fair Grounds, Lawrenceville, GA
Type: ARRL State Convention
Sponsor: Alford Memorial Radio Club
Website: https://stonemountainhamfest.com/

11/09/2024 - Montgomery Hamfest
Location: Montgomery, AL
Type: ARRL HamFest
Sponsor: Montgomery Amateur Radio Club
Website: http://w4ap.org

11/23/2024 - Flamingo Net Flea at U. of Miami
Location: Coral Gables, FL
Type: ARRL Hamfest
Sponsor: Flamingo Net
Website: http://FlamingoNet.8m.net

12/13/2024 - 12/14/2024
Tampa Bay Hamfest, ARRL West Central Florida Section Convention
Location: Plant City, FL
Type: ARRL Convention
Sponsor: Florida Gulf Coast Amateur Radio Council
Website: http://www.fgcarc.org/

01/11/2025 - GARS TechFest
Location: Gwinnett County Fairgrounds, GA
Type: Technical Fest
Sponsor: Gwinnett Amateur Radio Society
Website: http://www.GARS.org

01/04/2025 - BCARC Annual Freezefest
Location: Locust Fork, AL
Type: ARRL Hamfest
Sponsor: Blount County Amateur Radio Club
Website: http://www.w4blt.org

02/07/2025 - 02/09/2025
Orlando HamCation, Southeastern Division Convention
Location: Orlando, FL
Type: ARRL Convention
Sponsor: Orlando Amateur Radio Club
Website: http://www.hamcation.com

For more information: 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 2024

TechFest	January 13 2024
Winter Field Day	January 27-28 2024
Dog Show Fundraiser	March 5-6 2024
Spring Technician HamCram	March 23-24, 2024
Georgia QSO Party	April 13-14 2024
North metro area Fox Hunt	April 2024
Memorial Day Parade	May 27 2024
ARC/KARC Hamfest	June 1 2024
Field Day	June 22-23 2024
Summer General HamCram	July 27-28, 2024
Fall Technician HamCram	September 28-29 2024
JOTA	October 2024
Stone Mt. Hamfest	November 2-3 2024
Holiday Party	December 7 2024

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
- 3rd 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
- 2nd and 4th Friday at 8:30 pm. GARS 440 Talk Net
- Every Monday at 8:30 pm: ARES Training on the GARS 147.075 MHz repeater
- Every Friday at 11:30 am, GARS Lunch at Chilli's
- Every Saturday at 8:00 am GARS Breakfast at Cracker Barrell

GARS Calendar for October 2024

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 **7:00 PM Exec Meeting**	2	3	4 **11:30 AM Lunch at Chillis**	5 **8:00 AM Breakfast at Cracker Barrel**
6	7 **7:30 – 8:00 PM 2M Net**	8 **7:00 PM Meeting EAA 690 Hangar**	9	10	11 **11:30 AM Lunch at Chillis** **8:30 - 9:30 PM 70CM Talk Net**	12 **8:00 AM Breakfast at Cracker Barrel**
13	14 **7:30 – 8:00 PM 2M Net**	15 **7:00 PM Workshop Meeting EAA 690 Hangar**	16	17	18 **11:30 AM Lunch at Chillis**	19 **8:00 AM Breakfast at Cracker Barrel**
20 **2:00 PM GARS Ham Radio Exams, EAA 690 Hangar**	21 **7:30 – 8:00 PM 2M Net**	22	23	24	25 **11:30 AM Lunch at Chillis** **8:30 - 9:30 PM 70CM Talk Net**	26 **8:00 AM Breakfast at Cracker Barrel**
27	28 **7:30 – 8:00 PM 2M Net**	29	30	31		

Local Ham Radio Exams & Meetings

GARS Ham Radio Exams

GARS Exam Sessions are held the 3rd Sunday of the month

Preregistration is REQUIRED
Doors open at 1:45pm, exams start promptly by 2:00pm
For more information and to preregister, please visit https://gars.org/exams/

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

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

September 2024 Results

The GARS VE Team exam session results from September 15tht.

2 Upgrades to Extra:
- Freddy Ferrer – KQ4UDS
- David Gile Jr – KG5TX

2 New Technicians:
- Mathew Clark: KQ4VMB
- Donnie Foster: KQ4VNU

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

AB4QQ RUSSELL PREVOST
KM4SWL RICHARD KITZ
NV4Q William Carmichael
WB2OGY STEVEN BACK
W4DTR DAVID BRUSE
NG4H WILLIAM BEGUHN
WS3V WILLIAM RUDD

Thanks & 73, Bob Hoffmann K4CQO (Co-CVE)

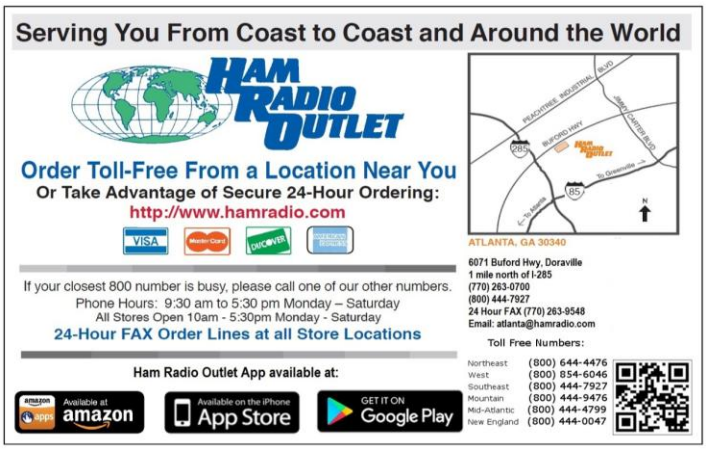
Local Ham Radio Exams

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.

GARS Supporters



In order to have your ad included, contact editor@gars.org. Current ad prices per year are:

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

For swap items, post and see items on GARS groups.io (https://groups.io/g/GARS).