The GARzette

The Official Newsletter of the Gwinnett Amateur Radio Society

July 2025 http://www.gars.org/ Volume 52, Issue 7

Inside

www.GARS.org

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

TechFest
Gwinnett Amateur Radio Society

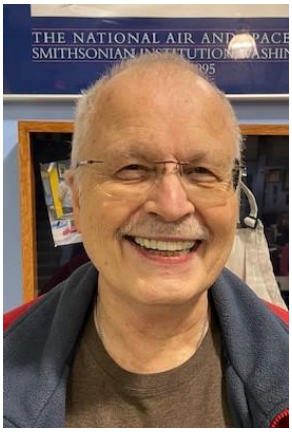
GARS January Exhibition of the Technical aspects of Amateur Radio
Held at the Gwinnett County Fairgrounds

The next TechFest is January 31, 2026

GARS Meeting: Amateur Radio on board the International Space Station (ARISS) – Ralph Pickwick, KJ4CNC
Tuesday July 8, 2025 at 7:00 PM

President's Message

From the President…



We got thru the heat of June – it included getting my truck AC running again. It did not have any changes to it, but the service station said it had 2 faults listed and when cleared, the AC started working again (the passenger side worked, but my driving side blew hot air). Now, what does this have to do with ham radio – well not much. But it points out that not everything needs to be fixed with HW changes / fixes – sometimes it only takes operating changes and starting from a clean state to get things working again – back to basics to be sure the simple things are set before putting in the more complicated things.

Back to what GARS did in June. Several of us helped out in the EAA Hangar for the EAA Aviation Summer Camp – it was a session to build a cod practice oscillator (glad I did not have one of those to bring home – the tone will get everyone's attention even if not wanted). It was a fun time and seeing the kids learn and succeed was heart lifting!

GARS also had its yearly Field Day outing. This year it was at Yellow River Park. I spent Saturday there and enjoyed the conversations I had with other GARS members and Ed (W4BSR) put together fantastic meals for the time GARS members were at the park. There are pictures in another part of the GARzette (thanks to our VP Richard Kitz for his pictures).

In August we are having another General HamCram. A few of the students that are going to sign up indicated they are going to take both the tech and general exams at the end HamCram. While the HamCram deals with the General question pool, doing self-learning of the technician questions is a great way to go from un-licensed to General in a weekend. The HamCrams have a very good success rate (over 90%) thanks to Ralph (KJ4CNC) and John (WB4QDX) who put GAR's HamCrams together multiple times a year.

73,

Bob – K4CQO
Club President / GARZette Editor

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	6M Operational in Buford 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.

When GARS meetings are available on **Zoom** the **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)

- July 8 – Amateur Radio on board the International Space Station (ARISS) – Ralph Pickwick, KJ4CNC
- August 12 – Operating Etiquette – VHF/HF, Rag Chew vs Contest – Various Speakers

---

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

- July 15 – Amateur Radio on board the International Space Station (ARISS) – Ralph Pickwick, KJ4CNC
- August 19 – Operating Etiquette – VHF/HF, Rag Chew vs Contest – Various Speakers

---

GARS Meeting – July 10, 2025
Amateur Radio on board the International Space Station (ARISS) – Ralph Pickwick, KJ4CNC

The talk will discuss the ARISS organization then go through what planning looks like leading up to the event. "A year's worth of planning for 15 minutes of sheer terror."

GARS Workshop – July 18, 2025

GARS workshops provide further information about the presentation given the week before on a one-on-one basis with the presenter and there are also Elmers present on a variety of subjects to help with any questions you may have about ham radio – including help you're your equipment that you can bring in.

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

GARS would like to thank Dallas N4DDM for his work putting together the GARS Field Day outing and also Ed W4BSR for providing the food and some of best corn on the cob during Field Day.

GARS Happenings

20 Years ago in the July 2005 GARzette:

- The GARS newsletter (GARzette) is not available for July 2005. However, all available GARzettes from 1995 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.

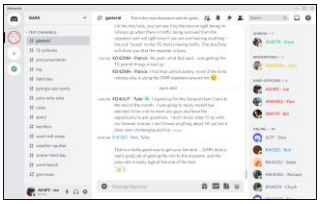
Out of almost 300 members, there are only five operators who serve as the NCS for the GARS net every Monday night. In no particular order, they are:

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!

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 Helping EAA Aviation Summer Camp

The Aviation Summer Camp spent a morning having kids build a Code Practice Kit with the kids learning and doing the soldering to put the kits together. The Summer Camp organizers give thanks to the members of GARS who supported the build teaching the kids a bit about the technique of soldering components to the circuit boards. Those GARS members where Bob Hoffmann, Ralph Pickwick, Brian Page, Randy Woolery and Joel Levine.

General HamCram August 23 and 24

WHEN: Saturday August 23rd and Sunday August 24th 2025; 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 – **690 Airport Rd, Lawrenceville, GA 30046**

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

REGISTRATION: See the registration form on the GARS website; https://www.gars.org/gars/

GARS Field Day 2025

Field Day Chair - Dallas N4DDM

Field Day, where do I begin? This was my 33rd Field Day and the first time in the hot seat as the Field Day Chairman. For those who came out and participated, I'm sure they had a great time. We had 6 HF stations on the air, plus a GOTA (Get on the Air) and a VHF/UHF station.

It's all the volunteers who stepped up that made this fun event happen.

A new site brought new challenges; logistics of parking, erecting antennas, layout of stations, networking the logging PCs, feeding, and keeping everybody hydrated. I can't thank the volunteers who helped enough. Many parts of this just fell into place which is not my typical way of over-planning things.

Antenna Captain, Kevin W4KIB
Hospitality Captain; Edwin W4BSR

- Sat Breakfast for Antenna Crew, 12
- Sat Lunch
- Sat Dinner for members and guests, 40

Electrical Power Captain, Eddie K4AIH

Hex Beam Captain, Bill WR1TR
Tow Captain, Hal W4IGE (ARES Trailer)
Tow Captain, Harold KI4FPR (GARS Trailer)

Free Stations:

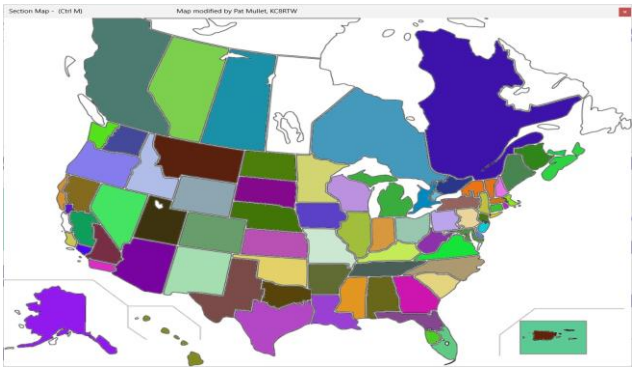
- GOTA SSB Jeff AB4HF
- VHF/UHF Kevin K4GTR

HF Stations:

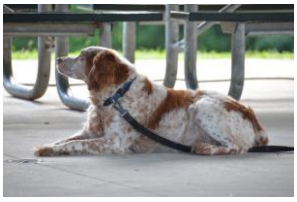
- 10m SSB Mario (Licensed in April and the 10m Station Captain with his Yaesu FT-1000)
- 15m SSB Harold (His first time as a Station Captain)
- 20m/80m CW Paul W4KLY
- 20m SSB (Various operators in the ARES Trailer)
- 40m Digital, David KA4KKF
- 40m SSB, Dallas N4DDM

QSO Statistics:

Band	CW	Phone	Digital	Total
80	0	39	0	39
40	229	43	320	592
20	130	199	0	320
15	0	79	0	79
10	0	83	5	88
6	0	0	3	3
GOTA	0	7	0	7
Total	332	450	382	1110



Pictures provided by Richard Kitx W4SWL



A note from Mary who was being introduced to ham radio at our Field Day

Ralph, it was great being at Field Day on both Saturday and Sunday.

Thank you for all the information you so willingly shared and for being patient as I asked SO many questions. I surprised myself at how much I (mostly!) understood of your answers. Everyone I met was welcoming, friendly, and kind and I was totally at ease and comfortable and appreciative.

GOTA was something I never expected to be able to do. And listening in to CW with Mac and Paul really blew me away.

I want to confirm with you that the “Ham Radio School Technician License Course 2022-2026” (from HamRadioSchool.com) would be the book you recommend as a study guide for licensing. Thank you for pointing me in this direction and advising that it will be far less intimidating than the ARRL manual. (I’m disappointed at not being available to attend your “Ham Cram” and testing at the end of September.)

I hope to get to Lawrenceville your August meeting to keep my enthusiasm alive.

Again, thanks.
Mary

The Power of “Hello!”

By Edwin Henderson, W4BSR

In our fast-paced life, here in the Metro Atlanta area, it’s hard to find the old-fashioned southern hospitality sometimes. Imagine yourself a stranger walking up to a ham radio event, where you don’t know anyone, and everyone is busy, or relaxing in their circles telling “war” stories. It can’t be easy, especially for a woman walking into a








group of men.

Saturday, I had just such an encounter at Field Day. It was early afternoon, the sun was beating down, and I had leaned back in my chair with the meat smoker's temp gauge in my view, thinking a little nap would be nice. A lady walked into the pavilion, and strolled slowly past. In my usual way, I said "hello", even though I didn't know her. She was probably looking for her husband in the sea of red and yellow shirted GARS members, I told myself.

It only took a moment for her to come back into view next to my chair and say hello back, and that since I was the first person to speak, that's why she came back over. It turns out, she is an aspiring ham operator, who has just started studying for her Technician license, and who drove up from Conyers to check out our operation. It was just a moment more before Ralph, came over and started giving a complete rundown on getting licensed, ham cram courses and study guides. Ralph took her over to a radio with Jeff and Randy, and got her on the air. She must've been there at least a couple hours, asking questions, learning, and enjoying our event.

Every encounter with a stranger at any ham radio event is an opportunity to promote the amateur radio service. Every one of us should be in the public relations state of mind. Most of the people we meet will have no idea what ham radio is, and think it's all just CB. Take a water bottle to someone sitting in the shade; share a smile with a stranger; tell others nearby what we're doing with all these wires in the trees. You never know where it will lead, and it can all start with a simple "Hello".








The Basics

Frequency Modulation vs. Phase Modulation

de: Bob Schmid, WA9FBO

In ham class we're told that FM involves modulating the *frequency* of the carrier while PM involves modulating the *phase* of the carrier. Great. But if we vary the phase, don't we vary the frequency – and vice versa? What's the real story?

FM

The RF oscillator in an FM transmitter has an audio input. When there's no audio, the oscillator's output rests at a particular frequency. When audio is applied, the frequency of the oscillator moves above and below the resting frequency as it follows the audio waveform. The higher the audio amplitude, the further the frequency moves (deviates) from the resting frequency. In most VHF and UHF ham rigs this "deviation" is ± 5 kHz ("wide") or ± 2.5 kHz ("narrow").

The oscillator can be based on a crystal, an IC, or even a simple LC in the case of vintage wireless mics and baby monitors. If the oscillator is based on a crystal, a select type of crystal is needed or its frequency won't move much – e.g., the deviation will be low.

An FM transmitter's audio response is flat because the frequency deviation depends on audio amplitude, not audio frequency. The response can go all the way down to zero: If you feed DC into the modulation input, the frequency will shift a fixed amount and stay there as long as the DC is applied.

PM

Unlike in an FM transmitter, the oscillator in a PM transmitter is not modulated and its frequency does not move. Instead, the oscillator feeds a stage that changes the phase of the signal in accordance with the audio. That stage is usually a *reactance modulator*.

Recall that an RC circuit has capacitive reactance (X_C), and an RL circuit has inductive reactance (X_L), and that these circuits cause a phase shift in an AC signal. Either one allows audio from the mic to vary the reactance and thus the phase of the signal.

Because X_C and X_L are dependent on frequency, PM does not have a flat frequency response like FM. A PM transmitter's deviation increases with frequency. And with PM, if you feed DC into the modulation input, a phase change will occur at the moment the DC is applied, but then the frequency and phase will revert to the previous value.

Because PM has this "emphasis" characteristic (increasing deviation with audio frequency) and FM doesn't, by convention we pre-emphasize the audio in FM transmitters. That makes the signals from PM and FM transmitters mathematically identical. The receiver has a de-emphasis circuit that results in flat audio being sent to the speaker. Since listeners can't hear any difference between PM and pre-emphasized FM, we tend to forget that two-way FM radio actually started with PM, and that there are far more PM transmitters in use today than FM.

Re-Radiators

de: Bob Schmid, WA9FBO

What's a **re-radiator**? It's any conductor (wire, trace, chassis, component, etc.) that intercepts RF energy and then emits it again, acting like an antenna—even if it's not connected to a transmitter.

An *intentional* re-radiator can be very helpful, but an *unintentional* re-radiator can cause significant interference.

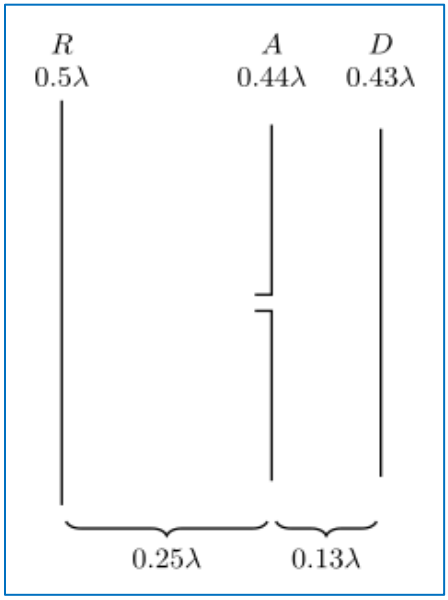


FIGURE 1 - YAGI ANTENNA

Some antennas incorporate intentional re-radiators in their design. For example, the Yagi antenna in Fig. 1 has two re-radiators, reflector R and director D. They're not connected to the feedline, but they re-radiate energy that shapes the beam.

FIGURE 2 - PASSIVE REPEATER

FM/TV broadcast, commercial, ham, and cellular systems use intentional re-radiators to make *passive repeaters*. A pair of antennas are connected together to redirect RF from one direction to another – without amplifying the signal – over obstacles like a hill, building, or corner (Fig. 2).

Want to use a cell phone or a VHF or UHF portable inside a vehicle but the metal and tinted windows block the signal? A vehicle-mounted passive repeater, which uses inside and outside antennas as re-radiators, may do the trick.

Another example of re-radiation is the system of slotted ("leaky") cables used in large buildings, tunnels, and parking garages.

So, what's an **un**intentional re-radiator?

Let's say a cable is carrying a noisy signal, rich in harmonics—perhaps due to switching spikes or digital pulses. And, there's a nearby conductor like a metal pole, stray wire, piece of coax, guy line, metal fence, gutter, or drainpipe. That nearby conductor can pick up energy by capacitive or inductive coupling and become an unintentional re-radiator *at a number of frequencies*. How so?

3.5 MHz (80m band)	1/2 λ
7 MHz (40m)	1 λ
10.5 MHz	3/2 λ
14 MHz (20m)	2 λ
17.5 MHz	5/2 λ
21 MHz (15m)	3 λ
24.5 MHz	7/2 λ
28 MHz (10m)	4 λ

A single wire antenna can radiate effectively on multiple bands. For instance, the familiar 132-foot end-fed half-wave antenna is approximately resonant on 80 meters (3.5 MHz) and also operates well on higher-order harmonics (see table).

A re-radiator near a noise source can radiate similarly. If it has floating (unconnected) ends that allow voltage to build up, it may become an accidental antenna and radiate efficiently at one-half wavelength (1/2 λ) and odd multiples (3/2 λ, 5/2 λ, 7/2 λ…). It may be less efficient at full wavelengths (1 λ, 2 λ, 3 λ…) but still contribute to unwanted emissions.

The noise source itself might be a poor radiator: lossy, non-resonant, mismatched, and surrounded by stuff that absorbs or cancels the fields. But a nearby re-radiator can become energized, be resonant, be in a better radiating location (higher up, clearer surroundings), and have directional characteristics similar to a beam antenna. As a result, the re-radiator may produce a stronger received signal than the source itself, even though it's getting less power, is entirely passive, and is only radiating what it couples from the source.

That’s why re-radiation can be tough to diagnose—the strongest signal you hear may not actually come from the noisy device or its cable, but from a nearby innocent-looking conductor.

Solutions?

If possible, remove stray conductors from the vicinity.

If there are unused wires, terminate them by connecting them to ground via resistors (e.g., 10k Ω). This can dampen standing waves and reduce re-radiation. Twist or remove unused pairs.

Clamp-on ferrite chokes may help (ferrite type 31 is suitable for 1-300 MHz and is effective for HF suppression).

Bottom line: Any wire of the right length, if left floating near an RF source, can become an unintentional re-radiator. When you encounter a noise problem, it may pay to find out whether nearby wires are acting as stealth antennas.

Tuning a General Coverage Radio

Vintage Amateur Radio

de Bill Shadid, W9MXQ

Do you remember the days of the vacuum tube general coverage receiver? I certainly remember. Back when I first of these radios (a Hallicrafters SX-110, new in 1963), I quickly had to learn how to tune it properly and get maximum readout accuracy on the ham radio bands. In those days, we were talking about the HF amateur bands of 80, 40, 20, 15, and 10 meters. The 160-meter band was usually not included – for reasons I will detail a bit later in this article. Sometimes the 11-meter band was included with the tuning of the 10-meter band. Look below at the SX-110 Receiver from the time when I was studying for my first ham radio license. It is still with me, today.

Hallicrafters SX-110 General Coverage Short Wave Receiver (1963)
W9MXQ Collection

For me to tune this receiver now is very easy. But when I first unpacked it in 1963 that was not the case. By the way, I can still recall the aroma of the freshly assembled electronics as the paper wrapper around the new receiver was removed!! Warming up the eight vacuum tubes only served to enhance that pleasant experience. And, due to good care all these years, it is still apparent when the tubes heat up as I write this article and listen to the radio's smooth vacuum tube audio.

Tuning was accomplished using one switch and two controls. These included the BAND SELECTOR Switch, the MAIN Tuning Control, and the BANDSPREAD Tuning Control.

We are going to setup this receiver in this example to listen to 7.258 MCS (MHz). Those of you familiar with the bands know that this is the 40-meter, long time net called MidCARS. Generally, depending on band conditions and location, they are available from early morning to mid-afternoon. They cater to mobile operators but are open to all. I use them frequently to check a radio that I have on the bench.

First, we setup the radio to receive on in the area of 40 meters, 7.000 to 7.300 MCS (MHz). To do that, turn the BAND SELECTOR SWITCH to position 3 on the dial as shown here:

Referencing the picture on the first page of the article, see that the BAND SELECTOR switch is the second switch from the left on the lower row of controls. Position 3 allows coverage on the radio from 4.6 to 13.0 MCS (MHz). Included in that range is the 40-meter ham band of 7.0 to 7.3 MCS (MHz).

W9MXQ Picture

Next, look directly above the BAND SELECTOR switch to the round readout dial to note the placement of the 7.0 MHz area on the dial:

See the band area on the second arc from the top and the red circle that I have added to identify the location.

Observe that there is a round marker at 7.4 MCS (MHz) on the dial. That round marker, or bulge in the line between 7.0 and 8.0 MCS (MHz) indicates a setpoint that is important in the next step of this process.

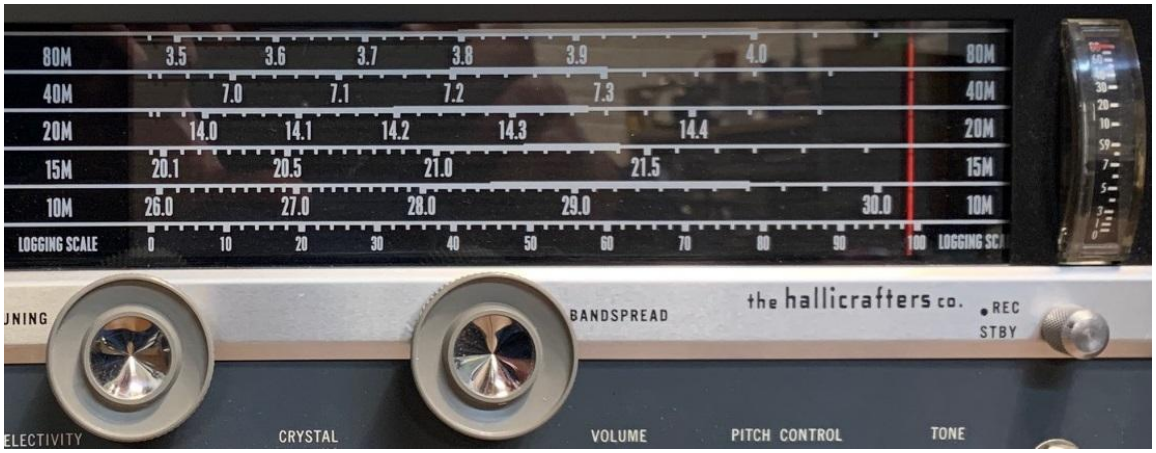
W9MXQ Picture

Next use the TUNING control to set the dial on the marker – as shown below.

Check the location of the readout indicator line (vertical white line that indicates the frequency. It is directly on the marker, or bulge, at 7.4 MCS (MHz).

W9MXQ Picture

Next, on the SX-110 Receiver, the large slide rule appearing BANDSPREAD readout and control come into play. See the picture below:



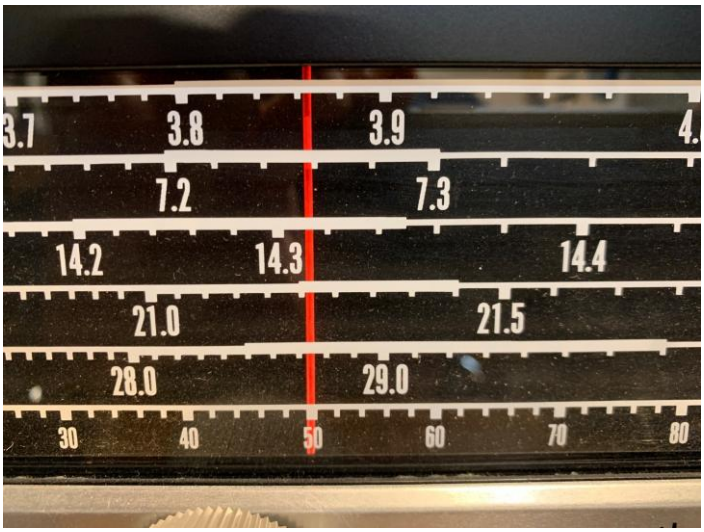
W9MXQ Picture

This is the bandspread readout panel on the SX-110. The BANDSPREAD tuning knob is below the center of the readout – clearly marked in the picture, above. Note for reference that the red dial pointer is all the way to the right (or as far as it will go) in this picture. This is how the Operating Manual for the SX-110 shows to always leave this readout when using the TUNING control. For our purposes in this article that is not important – but it IS IMPORTANT if you are operating the receiver with just the main TUNING control.

The bandspread for the previously mentioned 7.0 to 7.3 tuning range is shown as the second readout from the top with the callout “40M” (meaning “40-Meters”) on both ends of the dial in use.

Now move the dial (using the BANDSPREAD control) to where the dial pointer is within the range of the band (7.0 to 7.3) and listen for signals on the band.

Remember that I previously mentioned MidCARS? Here is how the dial looks when tuned to that popular net:



W9MXQ Picture

Here is the BANDSPREAD dial with the red indicator just below 7.260 MCS (MHz). It is actually tuned to MidCARS at 7.258.0 MCS (MHz). Not to precise you say? Welcome to the world before digital readout!! Precise readout was better and better with increasing level models. The SX-110 was a medium-priced radio. Lower priced models were somewhat less precise to accurately callout frequency – higher priced models were better. This is a bit of a generalization – and also tied to specific brands.

For reference, note that the actual readout line is above the frequency callout numbers on each band. So, how accurate is this indication of frequency, you might ask? Not too good, I might answer. This is covered in detail in a second article on this subject.

This process is repeated for each band on the SX-110. That is, for the 80, 40, 20, 15, and 10-meter bands. For other areas, one may set any frequency on the MAIN tuning just above the selected range then use the BANDSPREAD on its Logging Scale (bottom readout) of 0-100 to indicate relative frequency. Band to band, however, this is just a relative readout which in theory could be repeated when returning to the same range. Practically speaking, however, it is not a practical, or very accurate, statement. For instance, to tune 160 meters with this receiver, set the BAND SELECTOR to 2, the MAIN tuning to 1.8 MHz, with the BANDSPREAD set to the far right. Then tune to the left with the BANDSPREAD to cover the 160-meter band. Frequency indicated on the BANDSPREAD dial will be a reference, not actual.

Now we will look at some other examples – from other manufacturers. One such receiver is a model sought after to this day, the Hammarlund HQ-180 General Coverage HF Receiver.

Hammarlund HQ-180 General Coverage Short Wave Receiver (1959)

Shown with Optional S-200 Speaker and GE Telecron™ Clock

W9MXQ Collection

Relating to the Hallicrafters SX-110 Receiver previously discussed, we will use the same functional controls on the Hammarlund HQ-180 to find the same 7.258 MCS (MHz) for MidCARS. But the controls have slightly different names. To make the initial setup, we use the MAIN TUNING RANGE MCS switch in the lower center of the panel to set the tuning range, the MAIN TUNING control to set the main frequency, and the BAND SPREAD control to tune the selected band. As with the SX-110 we discussed above, we are again tuning the 40-meter band for MidCARS on 7.258 MCS (MHz). Note the front panel MAIN TUNING RANGE MCS on the HQ-180 references “MCS,” for Megacycles. Megacycles as a term for frequency was replaced by the current term “Hertz,” after Heinrich Rudolf Hertz (1857–1894). So, in the day of the HQ-180 we would be search for 7.258 MCS and today we search for 7.258 MHz. (I have used both terms in this article.) This new terminology was adopted by the General Conferences on Weights and Measures (CGPM) in 1960. As you might expect, hams tended to ignore the new reference for some years after it was adopted – present company included!

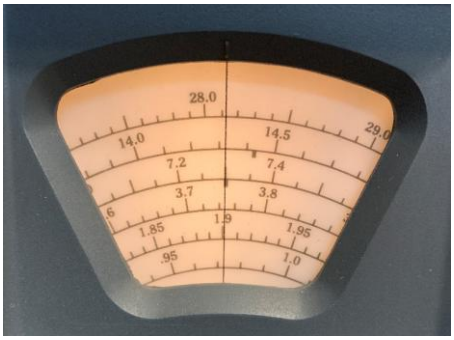
This radio carries the rather classic dual disk readout system so popular on many radios from Hammarlund, Hallicrafters, National, RME, and others that made radios from the 1930’s until not that long ago. As in the case of the also popular scheme of a main tuning disk and a slide rule band spread dial (like the Hallicrafters SX-110), the design was to set up the main tuning to be at one end (top or bottom, depending on the model) and the do fine tuning of the particular band segment using the band spread control.

Hammarlund HQ-180 Front Panel – the lower center of the Front Panel (see above) for the TUNING RANGE MCS Control. We need the range 4 – 7.85 MCS (MHZ) to cover the 40-Meter band. (Remember, you see "MCS" on this Control – but you remember that today this is MHz.)

W9MXQ Picture

This is the left readout window (reference HQ-180 photo, above). This is the readout window connected to the MAIN TUNING Control. Marked here is the middle arc that includes the range we need. Note in the middle of the circle, the arc shows a bold mark, or bulge. Move the MAIN TUNING Control so that the indicator falls right on that bold mark, as in the picture just below this one.

W9MXQ Picture



As referenced above, note that the readout is now exactly over the bold mark on the arc between 7.2 and 7.4 on the dial. This indicates that the receiver is tuned to 7.3 MCS (MHz), which is the top of the 40-Meter band. We now need to move to the next picture and to start using the BAND SPREAD readout window and Control.

W9MXQ Picture

The next part of the process, like with the Hallicrafters SX-110 Receiver, is to move to the BAND SPREAD readout window – to the right of the S-Meter. On the readout window, you can see that I have tuned the receiver on 40-meters (third arc from the bottom to just below 7.26 MCS (MHz) in order to tune in MidCARS at 7.258 MCS (MHz).

W9MXQ Picture

As with the Hallicrafters SX-110, this process is repeated for each of the 80, 40, 20, 15, and 10-meter bands. Again, for other areas, one may set any frequency on the MAIN TUNING just above the selected range then use the BANDSPREAD on its Logging Scale (bottom readout) of 0-100 to indicate relative frequency. Also noted again, that band to band, this is just a relative readout which in theory could be repeated when returning to the same range. 160 meters is not on the BAND SPREAD on the HQ-180 so for a better tuning rate, the same process as on the Hallicrafters SX-110 is used here.

Bandspread (some spell it band spread and some as bandspread – I used it the way the particular receiver I am discussing used the word) was generally available but sometimes more useful than others. Here it is on a very low-priced receiver – as I bought and built with paper route money – in late 1954 or early 1955 while in the fifth grade. It was (and still is with me) the Allied Knight Kit Space Spanner – the original version, not the two-tone front panel version made later.

Model S-243 Allied Knight-Kit Space Spanner Short-Wave Receiver
Tuned 6-17 MCS (MHz) Shortwave plus the Broadcast Band
W9MXQ Collection

knight-kit
"SPACE SPANNER"
BAND SWITCHING
RECEIVER KIT

Model S-243 $15.95

Thrilling Short Wave and Broadcast

Famous 2-band AC-DC receiver in easy-to-build kit form at a very low price. Pulls in thrilling short-wave (6 to 17 mc) and standard broadcast. It's fun listening to amateur, aircraft, police and marine radio. Features highly sensitive regenerative circuit. Bandswitch selects broadcast or short wave. Has 4" PM speaker and beam-power output tube for plenty of volume; headphone connectors for weak signal listening; slide switch cuts out speaker. Uses 12AT7 regenerative detector and audio amplifier, 50C5 power output, 35W4 rectifier. Six controls: Bandspread; Main Tuning; Antenna Trimmer; Bandswitch; Regeneration; Audio Gain. Includes tubes and all parts. 7 x 10½ x 6". Shpg. wt. 4½ lbs.

Model S-243. "Space Spanner" Receiver Kit. Net only..... **$15.95**

S-247. Matching Cabinet for above. 2 lbs. Net..... **$2.90**

Knight-Kit Advertisement in Popular Electronics from 1954

The Space Spanner had the same two tuning controls as the “real radios” with MAIN TUNING and BANDSPREAD. With the two position to SW, for Shortwave. (Switch has SW or BC positions for Shortwave or Broadcast band.) Set the BANDSPREAD to “100” then tune the MAIN TUNING for the highest frequency above where you wanted to tune. Then rotate the BANDSPREAD downward to catch a variety of stations. Accuracy, you ask? Very little – just fun listening to a wider world when you are nine years old.

W9MXQ Picture

The idea of a reference kind of Band Spread on the SX-110 and the HQ-180, in addition to ham band individual readouts was handy for non-ham radio listening – such as in the active shortwave broadcast area at the top end and above our 40-meter band and also the band below 10 MHz WWV from about 9.5 to 10 MCS (MHz). However, the 0-100 logging scale alone was not unique to low priced radios like the Space Spanner. Hams were a major factor in marketing short wave receivers – but we were not the only market. Some very fine radios did not include specific Band Spread for hams even though the radio might be of professional or commercial grade.

As an example, here is a Hammarlund SP-200. These receivers, dating from back before World War II and after, (1939-1945) served in many critical military operations along with other famous radios of the day, such as the Hallicrafters SX-28 and the National HRO. The SP series from Hammarlund were northing short of outstanding with a worthy reputation (much of which is lost to history except for collectors). The one below is owned by my friend Bob Bailey, W9DYQ. At least one other in the series is owned by another friend, Pat Volkmann, W9JI. Let’s just say they live today with adoring fans of their fame. But let’s see how the SP-200 does Band Spread.

Hammarlund SP-200 HF Receiver (1939)

W9DYQ Collection

The Band Spread on the SP-200 was designed for the varied uses of the radio by its military and commercial customers. So, even though greatly outclassing a radio like the Knight Kit Space Spanner in receiving capability, it shared exactly the process for using Band Spread as its later cousin, the lowly Space Spanner.

We will take a look at the two readout windows on the Hammarlund SP-200:

This is the MAIN TUNING dial – on the left side of the meter and band selector switch area. While difficult to see in this picture, the dial is tuned to 7.3 MCS (MHz). The arc you see is in its location because of the setting of the Band Selector switch covering this range of frequencies. The arc location on the readout changes according to what range is selected. You only see the range selected – with the others covered.

W9DYQ Picture

This is the BAND SPREAD dial – on the right side of the meter and band selector switch area. This dial is set on 100. Remember, the SP-200 does not have a Band Spread calibrated for the ham radio bands – it merely has a 0-100 Logging Scale. To use this scale, set it at “100” with the MAIN TUNING set at the top of the band for which you want to tune. In this case, the MAIN TUNING is set for 7.3 MCS (MHz) so the BAND SPREAD will tune downward in frequency as one adjusts the dial,

W9DYQ Picture

This has been a good review of the Main Tuning and Band Spread operating process for a cross section of vintage radios that ran from the 1930’s until the 1970’s when such radios began to be replaced by digitally tuned radios. Solid state radios, such as those available from Radio Shack™ (Realistic™) and Sony,™ and other Asian sources, did bridge the time of analog tuning (as shown in this article) to their later digital readout examples.

Before closing I want to comment, as promised, on why 160-meters was not included in Band Spread on the receivers in this article. In the days these radios were on the market, 160-meters in the United

States was a confusing band due to its proximity **LORAN**, short for **LOng Range Navigation**. That was a hyperbolic radio navigation system developed in the United States during World War II. During that time, the tiny, 200 kHz 160-meter band (1.8 to 2,0 MHz – just as it is now) was subdivided into four segments with each having different power levels (including zero power), depending on your location in the United States and the time of day. Quoting Wikipedia™ here, "Loran-A used two frequency bands, at 1.85 and 1.95 MHz. These same frequencies were used by radio amateurs in the amateur radio 160-meter band, and amateur operators were under strict rules to operate at reduced power levels to avoid interference; depending on their location and distance to the shore, U.S. operators were limited to maximums of 200 to 500 watts during the day and 50 to 200 watts at night." To avoid interference, most transmitter manufacturers avoided the band. Receiver manufacturers almost never included 160-meters on the Band Spread of their General Coverage radios. More on this at:

https://en.wikipedia.org/wiki/LORAN

What remains is frequency accuracy – or, rather, the lack thereof. Stay tuned for a follow-up article on the subject of frequency dial accuracy, and how it can be attained, with these receivers.

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

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. Bob's Hammarlund SP-200 Receiver was one of the items covered in this article.

© W9MXQ

GARS Membership

New Members in June

Keith Davis (KT4KTD)
Cara Guidry (KR4CTV)
Emma Guidry (K4ECG)
Emilee Guidry
Ivy Howerton (KI7YJC)
David Ritchie (N4DJS)
Cathy Ritchie (N0IZU)

New Members: 7

Total Members as of July 1, 2025 349

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 July

Mary Ann Bazain
Becky Bentley (KK4SWI)
Kevin Biddle
Bill Cherepy (WB4WTN)
Bill Cohl (WB2PIH)
Jeff Cutchins (AB4HF)
Juan Dominguez
Randy Drescher Jr (K4HS)
Steven Francis (KQ4DSI)
Diane Gibson (N3MAD)
Alan Gideon (K5AKG)
Jon Guidry (K5JDG)
Emilee Guidry
Ed Henderson (W4BSR)
Bob Hoffmann (K4CQO)
Frank Hummel (KO4MRQ)
Alan Janssen (K4APJ)
Brian Jones (KD4UYP)
Terry Jones (W4TL)
Cathy Kelley (KN4DML)
Paul Kelley (W4KLY)
Sherwin Levinson (K4SML)
Audrey Mc Elroy (KM4BUN)
Larry Osborne (WT4XX)
Bill Pierce (K1LP)
Glenda Sandidge
Stephen Schreiman (KJ4MWF)
Frank Settle (KR4CIV)
Mark Vogt (KQ4GEL)
Don Woodward (KD4APP)

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 – www.gars.org/gars/membership/. 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

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

GARS on Social Media

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

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

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

Follow GARS on X:
https://x.com/GARS_Hams

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

GARS Mail Address:

GARS
P.O. Box 492531
Lawrenceville, GA 30049

Officers

 Bob Hoffmann, President K4CQO

 Richard Kitz, Vice President KM4SWL

 Harold Brown, Secretary KI4FPR

 Glen Wendt, Treasurer W3WWT

 Kevin Scott, Program Manager K4GTR

Managers and Committee Chairs

 Karen Albritton, Membership Chair KI4HPP

 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, Field Day Chair N4DDM

 Sandy Jackson, Health and Wellbeing KJ4DRO

 Kevin Igarashi-Ball, Multimedia Chair W4KIB

 Dallas Mellichamp, Georgia QSO Chair N4DDM

 Neil Derryberry, Elmer Manager WD4NET

 Edwin Henderson, TechFest Chair W4BSR

Open Winter Field Day Chair

Directors and Trustees

 Joe Biddle, AD4PZ

 Kyle Albritton, W4KDA

 John Davis, WB4QDX

 Bill Cherepy, WB4WTN W4GR Trustee

GARS Meeting Minutes

GARS – MEETING June 10, 2025

6PM (1800) Pre-Meeting Cookout prepared by ED Henderson W4BSR and contributions of condiments by numerous GARS members. Followed by our Ice Cream Social brought to us by Sandy Jackson KJ4DRO Health and Wellbeing Chairperson.

* 7PM (1900) Meeting opened by President Bob Hoffmann K4CQO
* We had one new ham present.
* Treasurer report by Glen Wendt W3WWT
* Education Chair Ralph Pickwick KJ4CNC
    * Ham Cram for General rescheduled for August 23-24
    * Ham Exam June 21 2025 Sunday.
    * EAA Summer Camp June 17, 2025 still need volunteers
* Echo Links they are still working on getting it up
* Field Day June 28-29, 2025 still needs operators for various bands, see Dallas N4DDM. **Check GARS Website.**

Use USB adapter for the Internet to talk to PC if it does not have a network plug-in.

* Discussed Trailer placement for GARs and ARES
* We only have 4 outlets to plug into Meeting was brief and closed at 7:45 PM (1945) Ice Cream Social YumYum.

Workshop Minutes – June 17, 2025

Attendance: 18

Workshop Topic: Networking of Field Day Laptops

Presenter: None

Brief Summary: This Workshop did not follow the GARS presentation.

- Focused on networking the Field Day logging PCs
- Plus, 3-4 members at the DMR table

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

73 Dallas N4DDM
Workshop Chair

Events – GARS and others

ARRL CONTESTING INFO

From ARRL Contest Calendar

> For more information click the links <

January 2025
1 Straight Key Night
4 Kids Day
4-5 RTTY Roundup
18-20 January VHF

February 2025
10-14 School Club Roundup
15-16 International DX – CW

March 2025
1-2 International DX– Phone

April 2025
13 Rookie Roundup – Phone

May 2025 (no ARRL Contests)

June 2025
7-8 International Digital Contest
14-16 June VHF
21 Kids Day
28-29 Field Day

July 2025
12-13 IARU HF World Championship

August 2025
2-3 222 MHz and Up Distance Contest
16-18 10 GHz & Up – Round 1
16-17 EME - 2.3 GHz & Up
17 Rookie Roundup – RTTY

September 2025
13-15 September VHF
13-14 EME - 2.3 GHz & Up
20-22 10 GHz & Up - Round 2

October 2025
TBD Collegiate QSO Party
11-12 EME - 50 to 1296 MHz
20-24 School Club Roundup

November 2025
1-3 Nov Sweepstakes–CW
8-9 EME - 50 to 1296 MHz
15-17 Nov Sweepstakes–Phone

December 2025
5-7 160 Meter
13-14 10 Meter
21 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]

07/12/2025 - Cullman Amateur Radio Hamfest
Location: Cullman, AL
Type: ARRL Hamfest
Sponsor: Cullman Amateur Radio Club
Website: http://cullmanarc.com

07/18/2025 - 07/19/2025 - Milton Ham Fest
Location: Milton, FL
Type: ARRL Hamfest
Sponsor: Milton Amateur Radio Club
Website: http://miltonarc.org

08/16/2025 - 08/17/2025 Huntsville Hamfest, ARRL Alabama State Convention
Location: Huntsville, AL
Type: ARRL Convention
Sponsor: Huntsville Hamfest, Inc
Website: http://hamfest.org

08/23/2025 - TarcFest
Location: Tampa, FL
Type: ARRL Hamfest
Sponsor: Tampa Amateur Radio Club
Website: http://www.hamclub.org

09/06/2025 - Dalton Swapfest
Location: Dalton, GA
Type: ARRL Hamfest
Sponsor: Dalton Amateur Radio Club, Inc. (W4DRC)
Website: https://www.qrz.com/db/W4DRC

09/19/2025 - 09/20/2025 Gadsden Hamfest 2025
Location: Gadsden, AL
Type: ARRL Hamfest
Sponsor: Gadsden Amateur Radio Club
Website: http://k4jmc.com

10/03/2025 - 10/04/2025 Hamfest Chattanooga 2025
Location: Ringgold , GA
Type: ARRL Hamfest
Sponsor: Chattanooga ARC & North Georgia GMRS Network

10/10/2025 - 10/11/2025 Melbourne Hamfest, ARRL Florida State Convention
Location: Melbourne, FL
Type: ARRL Convention
Sponsor: Platinum Coast Amateur Radio Society
Website: https://pcars.org/wp/melbourne-hamfest-2025/

10/10/2025 - 10/11/2025 NOARC Annual Hamfest
Location: Crestview, FL
Type: ARRL Hamfest
Sponsor: City of Crestview Florida
Website: https://w4aaz.org/noarc/hamfest-2025/

10/18/2025 - Savannah Hamfest and Swapmeet
Location: Savannah, GA
Type: ARRL Hamfest
Sponsor: Coastal Amateur Radio Society

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 2025

TechFest	February 1 2025
Winter Field Day	January 25-26 2025
Dog Show Fundraiser	March 26-30, 2025
Spring Technician HamCram	March 29-30, 2025
Georgia QSO Party	April 12-13 2025
North metro area Fox Hunt	April 2025
Memorial Day Parade	May 26 2025
ARC/KARC Hamfest	June 7 2025
Field Day	June 28-29 2025
Summer General HamCram	August 23-24 2025
Fall Technician HamCram	September 2025
JOTA	October 2025
Stone Mt. Hamfest	November 1-2 2025
Holiday Party	December 2025

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 3 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 Chilli's
- Every Saturday at 8:00 am GARS Breakfast at Cracker Barrell

GARS Calendar for July 2025

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 **7:00 PM Exec Meeting**	2	3	4 **11:30 AM Lunch at Chili's**	5 **8:00 AM Breakfast at Cracker Barrel**
6	7 **7:30 PM 2M Net 147.075(+) MHz Tone 82.5**	8 **7:00 PM Meeting EAA 690 Hangar**	9	10	11 **11:30 AM Lunch at Chili's**	12 **8:00 AM Breakfast at Cracker Barrel**
13	14 **7:30 PM 2M Net 147.075(+) MHz Tone 82.5**	15 **7:00 PM Workshop Meeting EAA 690 Hangar**	16	17	18 **11:30 AM Lunch at Chili's**	19 **8:00 AM Breakfast at Cracker Barrel**
20 **3:00 PM Ham Radio Exams, EAA 690 Hangar**	21 **7:30 PM 2M Net 147.075(+) MHz Tone 82.5**	22	23	24	25 **11:30 AM Lunch at Chili's**	26 **8:00 AM Breakfast at Cracker Barrel**
27	28 **7:30 PM 2M Net 147.075(+) MHz Tone 82.5**	29	30	31		

More information about the above calendar events can be found on GARS.org

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 2:45pm, exams start promptly by 3:00pm
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.

June 2025 Results

The GARS VE Team exam session results from June 15th.

1 Upgrade to General:

- Keith T Davis - KT4KTD

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

K4BYE – James Cheshire
K4CQO – Bob Hoffmann
N4MPC – Pat de Loe
KC2FDU – Elmer Gappi
KM4SWL - Richard Kitz
NG4H - William Beguhn
W4SHT - Lynn Hatker

Thanks & 73, Bob Hoffmann (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

Mugs provided by Will Carson KZ4HV -- $9.99 for 11 oz, $11.99 for 15 oz.

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).

Ready to take your Ham Radio Exam?

Go to https://GARS.org/exams/ to learn more, and to register for an upcoming exam session.