The GARzette

The Official Newsletter of the Gwinnett Amateur Radio Society

October 2022 http://www.gars.org/ Volume 32, Issue 10

Inside

www.GARS.org

TechFest

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

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

GARS Meeting: GARS Show-n-Tell
Tuesday October 11, 2022 at 7:00 PM

President's Message

From the President…

JAMBOREE ON THE AIR (JOTA) will be taking place on **October 15th** from 9:00 AM – 4:00 PM at the VFW Post 5255 in Lawrenceville. Held by the Scouts BSA, this effort can always use Volunteers, Elmers, and Control Station Operators. Please see www.gars.org for more information and how to volunteer.

On Saturday and Sunday October 29 & 30 from 8:00am to 4:00pm, GARS will be holding another **HamCram Class for the Technician exam.** See our website for details.

The GARS Holiday party will be held on Saturday, December 3rd. Volunteers are needed to help with pre-party decorations, food serving and clean up. Geri Foust, K4GMF is leading this effort. Please contact any club officer to say you will help us out in some small way. https://www.gars.org/gars/officers/

We are looking for a volunteer who can video record our meeting presentations then edit and post these videos to the GARS YouTube channel. Kyle Albritton, W4KDA, will be available to train this volunteer. Would you have some time to perform this operation keeping our great presentations preserved and shared with the Amateur Radio world? Please contact any officer or Kyle himself via the Officers and committee chairmen page to inquire about this position.

Many Thanks to Kyle for serving GARS as our Audio/Visual Chairman for many years. Kyle needs to step aside from this as Kyle and Karen have a Son who is very active in school activities. Nuff said, right!?

At the September General meeting, I presented the attendees with a year-related trivia, with questions such as, "Has anyone ever used the phrase, 'far out'?" Or "Can you dig it?" or "Have you ever bought gasoline for $0.39?" Or "When did Secretariat win the Triple Crown?" All of those questions related to terms or events from 1973.

The seeds of something else formed in that year as well! **GARS!**

On our GARS History web page, https://www.gars.org/gars/history-of-gars/, the opening line states: ***"Gwinnett Amateur Radio Society was formed in 1973…."***. Yes, the Gwinnett Amateur Radio Society was formed in 1973, making our great club 50 years young next year, in 2023. So, besides our TechFest celebrating 25 years, look for more exciting things to happen next year celebrating this momentous milestone.

73,

Joe Biddle, AD4PZ

Club President

GARS Repeaters and Other Communications

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

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.

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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
Newsletter Email: editor@gars.org Editor: Bob Hoffmann, K4CQO Assistant Editor: Bill Eggers, WB2RIS

GARS HELP WANTED

Speakers Needed for GARS Workshop Presentations, 3rd Tuesday of the month – Email workshop@gars.org to volunteer. [PS— Articles to publish in the GARzette, either written by GARS members or published elsewhere, are always welcome. —Ed.]

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 events are available on Zoom

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

- Workshops and Meetings will be **recorded**. By participating you consent to being **recorded**.
- Please change your display name to Your **FirstName Call Sign**, e.g. **Hiram W1AW**
- **How to change Your Display Name in Zoom**
- Please stay muted until ready to speak. Your space bar works like a PTT for un-muting
- To be fair to everyone, there will be a three minute limit for each person during Q & A
- You may ask questions in chat; **please stay on topic while using chat.**

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

- October 11, 2022 - GARS Show-n-Tell
- November 8, 2022 - Radio Astronomy for Hams - Tom Crowley KT4XN
- December - GARS Holiday Party
- January 10, 2023 - **OPEN**
- February 14, 2023 - Pi-Star DMR Hot Spot - Mark Prichard KN2TOD

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

- October 18, 2022 - GARS Show-n-Tell
- November 15, 2022 - Radio Astronomy for Hams – Tom Crowley KT4XN
- December - GARS Holiday Party
- January 17, 2023 - **OPEN**
- February 21, 2023 – Pi-Star DMR Hot Spot - Mark Prichard KN2TOD

GARS Meeting – October 11, 2022

GARS Show-n-Tell

The GARS Show-n-Tell has become an Annual GARS Event where members share their favorite ham radio projects. 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 18, 2022

GARS Show-n-Tell

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.

This will be an in-person Workshop at the EAA 690 Hangar.

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 2022.

To submit a nomination, please fill out the form at http://www.gars.org/gars/hoty/ by **October 31st** for consideration.

GARS Holiday Party

December 3 at the EAA Hangar. Sign-up at www.gars.org on the left-hand column.

GARS Happenings

20 Years ago in the October 2002 GARzette:

- GARS held a family picnic in October
- It was announced that the following month's GARzette will contain everything that you wanted to know about QSL cards
- The GARS nets were listed: ARES on Monday, Swap/Sell/Info on Tuesday, CW on Tuesday

You can always browse the GARzette archive at http://www.gars.org/newsletters and go directly to the 2002 GARZette by clicking on the image. 73, Bob, K4CQO, GARzette Editor


THE GARZETTE

Date Set for GARS Holiday Party

Health and Wellbeing – Sandy Jackson, KJ4DRO

Look for this resource on gars.org and use it as a means to convey information about a GARS family member or Silent Key notification.

Net Managers Corner

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

GARS NEEDS MEMBERS TO SERVE AS NET CONTROL STATIONS!

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

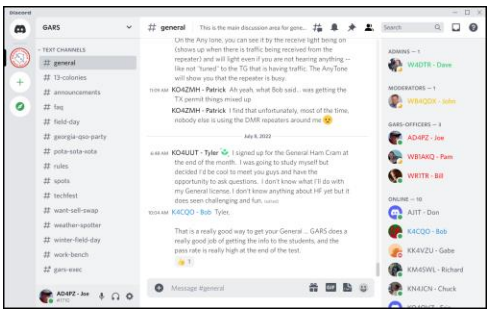
Out of almost 300 members, there are only seven operators who serve as the NCS for the GARS net every Monday night. In no particular order, they are:

Don – KW4AL	Ray – N4GYN	Bill – WG9NUW	David – KA4KKF
Glen – W3WWT	Russell – AB4QQ	Chuck – KK4TKJ	Charlie – WS4TOT

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 me (Chuck) at KK4TKJ@arrl.net. Sign up to help support the effort that makes GARS the great club that it is. 73 and 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 left side menu. This is a sample of Discord. →



Upcoming JOTA

JAMBOREE ON THE AIR (JOTA)

October 15th from 9:00 AM – 4:00 PM
VFW Post 5255, 368 Grayson Highway,
Lawrenceville, GA 30046

For directions please go to http://goo.gl/maps/8b4zx

This a free event that is open to all Cub Scouts, Scouts BSA, Venturers, Sea Scouts, Girl Scouts & the general public. We will be offering a Radio Merit Badge Classes at JOTA. Come learn and have fun at JOTA 2022. 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.

We will be offering two Radio Merit Badge Classes at JOTA. Space will be limited to 30 students. Registration is only required for the Merit Badge Class. Anyone else is free to just show up.

For Merit Badge Registration go to https://kk4bsa.info/register-for-radio-eritbadge.html

There will be a local activity at the Lawrenceville VFW Post 5255 at 368 Grayson Highway from 9:00 A.M. to 4:00 P.M. that day. To support this activity we have added the following Talk Groups to our DMR repeater (W4BOC) Stone Mountain DMR repeater:

- Color code: 1
- Frequency: 441.8125 MHz
- Offset: 5 MHz

These TGs are active NOW and you are free to use them. As we get closer to the “official” date traffic on these TGs should increase from stations around the world. If you or your own scout group would like to participate you are invited to give these TGs a try.

There are 3 new TGs:

- TG907 = Worldwide Jamboree On The Air (JOTA) calling channel
- TG9071 = JOTA TAC 1 (for extended chats)
- TG9072 = JOTA TAC 2 (for extended chats)

If you are interested in supporting this activity, you now have a way to participate via our DMR repeater.

Gwinnett Amateur Society

Gwinnett ARES

NEGA Amateur Radio Club

Tips & Tricks for Vintage Radios

Vintage Amateur Radio

de Bill Shadid, W9MXQ

Every once in a while, it is a good idea to share a few details of simple tricks learned over the years that can help keep a Vintage Amateur Radio – or an inventory of these interesting and challenging historic items – working and performing.

This month we will get into several subjects relating to things discovered over the years to make Vintage Amateur Radios work and perform better.

Replacement for Incandescent Pilot Lamps:

One of the first things that happens with a vintage radio is that one of the little light bulbs used to illuminate the frequency readout dial or the panel meter(s) is burned out. We refer to these as “lamps.” For most of us, we are referring to the #47, 6.3-volt, or the #1851, 12.6-volt, lamps that are common. The 6.3-volt or 12.6-volt operating voltage is not all that uncommon as it matches the voltage rating of most of the vacuum tubes in the radio. Some radios require such lamps to comfortably read the dial for determining frequency.

Finding suitable replacements for the common #47, #1851, or any of the other 2.5-volt, 5.0-volt, 6.3-volt, 12.6-volt, and more incandescent bulbs has become somewhat problematic. While suppliers from Asia exist and are plentiful at the present time, they lack the quality and consistency of the classic American bulbs from General Electric, Chicago Miniature, and others. The classic bulbs are available as new old stock (NOS) from the original manufacturers – but are becoming harder and harder to find. The Asian equivalent parts are inconsistent as to internal structure and can project objectionable shadows in the viewing area. The internal structure of a high-quality pilot lamp is consistent with the placement of the alignment pins in the base. The original radio manufacturers used this alignment to properly orientate the lamp mounting to provide a clear projection of light onto the panel – absent any shadowing from internal lamp parts.

A reasonably acceptable alternative to the classic incandescent lamp for use in radios comes in the form of LED Replacement Bulbs. I have found over time that the highest quality LED Replacement Bulbs come from a company called Titan Pinball. I have no association or connection with that company. However, in my opinion, they make a quality product. They can be found on eBay™ by doing a search (within eBay) for “Titan Pinball.” Look for “Warm White” color – or color temperature of about 2700-3000 Kelvin. That color target removes most of the harsh tones of the typical white LED. The light diffusion from the little LED bulbs is excellent.

Take a look at a comparison of a Titan Pinball LED Replacement Lamp and a traditional one from Chicago Miniature Lamp Company. The Titan Pinball product is a replacement for the 6.3-volt #47 Lamp. The Chicago Miniature Lamp Company lamp is an original #47 design.

Titan Pinball
LED #47 Lamp Replacement
W9MXQ Photo

Chicago Miniature Lamp Company
#47 Lamp
W9MXQ Photo

There is a nasty little secret when using LED Replacement Bulbs that can spell doom for your vintage radio. Occasionally, LED devices can fail to a short rather than an open circuit. Such a short on the filament line of the radio's power transformer can very quickly burn out the filament winding and significantly damage the radio. At the very least you must then find a replacement power transformer (almost unobtainium), have a custom transformer made (guess where that falls in price??!!), or find a suitable filament only transformer and install it in the radio. The failure of these devices to a short was unknown to me but came up in a discussion with a very well-respected radio technican who is a friend, Jeff Covelli, WA8SAJ. I believe this to be a very real potential problem.

To mitigate the dangers of damaging or destroying the power transformer of the radio, I urge you to follow WA8SAJ's suggestion and install a Pico Fuse[1] between the LED Replacement Lamps and the filament circuit of your radio. Only add this fuse in line with the LED lamps – not the overall filament circuit. I suggest a 0.5 ampere fuse here for two to four lamps.

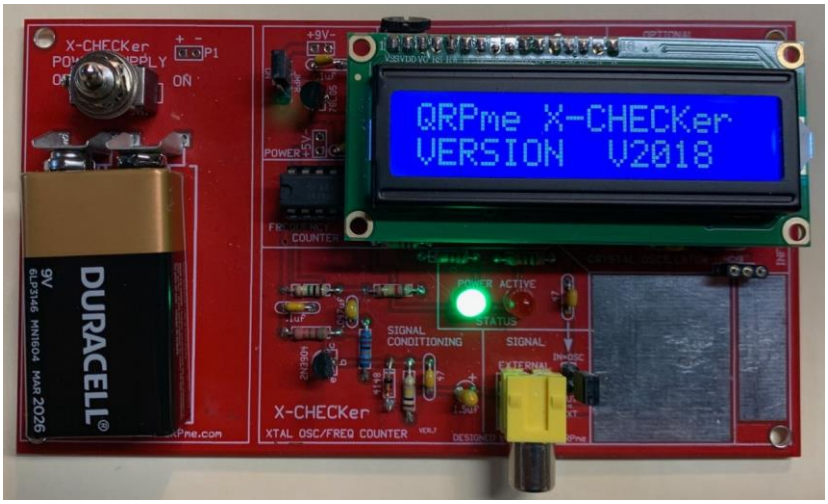
Many old radios had a fuse in such voltage feeds. If not an actual fuse, some had a small loop of fuse wire that would melt and open in over current occurrences. Also, carefully check the filament line circuit diagram. This array of voltage and current distribution often is complicated and sometimes uses the current running the incandescent pilot lamps to provide adequate loading in places within the distribution. Only if the pilot lamps are directly across the filament winding of the transformer should LED lamps be considered. When in doubt, find a replacement incandescent pilot lamp!

My personal use of LED Replacement Bulbs has run from quick adaptation to the idea and now back to refusing to use them. For this collector, the "look" of the best of the LED bulbs is not acceptable to my eye. While they truly do save energy, the savings in miniscule at best. So, I have put together what I consider a lifetime supply of high-quality new old stock (NOS) General Electric and Chicago Miniature Lamp Company pilot lamps. Your preferences may differ and if the LED look is acceptable to you (and you protect the radio's power transformer) then this is a good way to go.

Checking Crystals:

As time goes on in restoring and using Vintage Amateur Radio equipment, we are finding that crystals are not a "forever device." They age and they sometimes become inoperative or move in frequency. In my collection of radio parts, I have crystals from the 1930's right up to crystals used for heterodyne band setting in radios from the 1980's. All groups share the same faults of being inoperative, off frequency (but probably within tolerance), off frequency to the point of being worthless, or oscillating right on (or very close to) posted operating frequency. It is good to check for crystal frequency accuracy before getting too far into the process of alignment.

So, okay, how does a restorer go about testing a crystal? I imagine there are all kinds of ways, but I used a small Crystal Activity Checker, called the "X-CHECKer." This little circuit board kit is available here: http://qrpme.com/?p=product&id=Q17



X-CHECKer Crystal Activity Checker from QRPme

W9MXQ Photo

Looking at the above picture – note the power toggle switch in the upper left-hand corner of the circuit board. You can also see the boot-up screen in the two-line LCD readout. The illuminated green LED indicates that power from the 9VDC battery (lower left corner of the board) is engaged, and the little checker is awaiting a crystal to check. The checking pads are located at the lower right-hand corner of the circuit board. See below for use of the device:

Checking a Crystal on the X-CHECKer

W9MXQ Photo

Holding the crystal in one's hand and touching its connection pins on the pads is all that is required to make a test on the X-CHECKer. The crystal shown is a 160-meter band range heterodyne crystal for a Drake R-4(x) series Receiver or a Drake T-4X(x) series Transmitter. The posted reading on the crystal body shows this to be a 12.6 MHz crystal. It shows itself to be oscillating at 12,601,400 Hz, or 12.601400 MHz. This is well within tolerance, and this is a good crystal.

Using the X-CHECKer requires some thought and checking of the design of the circuit. For instance, some are used in circuits that use frequency multiplication. In such cases it is to be remembered that the crystal will be marked by the factory to show its frequency in use – not necessarily the frequency for which it actually oscillates.

Let's take an example of what is presented in the previous paragraph. For 160-meters the Drake radios mentioned use a 12.6 MHz heterodyne crystal that works at its fundamental (12.6 MHz) frequency. This when mixed with other mixers in the radio nets a range of 1.5 to 2.0 MHz – which includes the 160-meter band. When the desired frequency range is 28.0 to 28.5 MHz, however, the crystal required is much higher in frequency. In this case, it is 39.1 MHz. That crystal value is too high for this kind of crystal, so the circuit takes the third harmonic of the crystal. So, 39.1 MHz divided by 3 would equal 13.033 MHz. The crystal I tested for that position in my Drake R-4C Receiver shows a reading of 13,025,730 Hz, or 13.02573 MHz. That is close enough for proper operation.

When I say, "close enough for proper operation," I mean that the difference in dial readout is easily accommodated by the mechanical dial adjustment on the R-4C Receiver.

Here is another picture of the X-CHECKer shown next to several of the kinds of crystals it can test.

QRPme X-CHECKer Device

Readout is indicating it is ready to test a crystal.

W9MXQ Photo

Shown above are four crystals. The one at the left is the 12.6 MHz 160-meter range crystal first mentioned above. The next from left is a range crystal from the Swan 100MXA Transceiver at W9MXQ. The large crystal, second from the right 7930.000 kHz crystal from WWII surplus. It oscillates at 7929.79 kHz, which is acceptable. The crystal at the right is an FT-243, WWII surplus crystal marked as 5950 kHz. It checks at 5949.24 kHz. Again, it is acceptable.

Another example is the crystal in a 1961 vintage Collins KWM-2 for the 7.2 to 7.4 MHz range. It is designed to operate at 10.355 MHz. The radio proved to be way out of range and even sluggish in working at all in that band position. When testing the crystal on the X-CHECKer, I found it to be operating at 10.400006 MHz. It was way off and needed to be replaced. Clearing that issue up before digging into other circuits in the radio is very beneficial.

I was made aware of the X-CHECKer from a good friend in the hobby. He is also a seller of vintage radio equipment[2].

Operating with Excessively High Primary AC Line Voltage:

Many radios built in the 1950's and even into the 1960's are designed to operate with 110 or 115 VAC as the primary supply voltage. These radios, operating today, see 120 to as much as 127 volts (personal experience) from the AC mains. As I write this, I am seeing 123 volts from my AC line monitor. That works well with my Yaesu FTdx-101MP that specifies 100 VAC to 200 VAC that is automatically accommodated. So. all is well with a current model radio.

This is much different as we move to older equipment. I find specifications to 110, 115, and 117 VAC as required power input from AC Mains. This tends not to apply to later vacuum tube radio equipment. For instance, the Drake R-4C Receiver, made up until about 1979 or 1980 specified 120 VAC – so it is

relatively safe to use on today's AC Mains. The real problem collectable radios are the likes of the Collins S-Line Separates and the KWM-2 Transceivers using the 516F-2 AC Power Supply. It specifies, in my documentation, an AC Mains supply of 115 VAC.

These differences do not seem like much but a 6.3 VAC tube filament on a circuit design for a 115 VAC Primary will see over 6.8 volts at a 122 VAC primary. That will shorten the life of the tube. Similarly, the voltage developed by the power transformer for receiver and transmitter plate voltage will be increased to a point where they will stress the power supply components in the high voltage circuits.

Over the years, I had chosen to ignore this issue – that is, I ignored it until doing the math and understanding that in such delicate items as power amplifier tubes with their very narrow range of tolerance for over (or under) filament voltage for proper operation and tube life. The final straw for me was watching that my Collins KWS-1 Power Amplifier was significantly high in filament voltage on the 4CX250B finals and also generating enough extra plate voltage to compromise the filter components in the power supply. Equally, this was impacting many radios of that 1950's vintage Gold Dust Twins[3] setup.

So much for the problem. How do we solve it? Actually, for the 110- to 120-volt side the solution is relatively simple with readily available equipment. Handling 220 VAC equipment is more involved and will be covered a bit later. For the 110- to 120-VAC items, I use an autotransformer (generally known as a Variac™ but this one is not a trademark Variac product). These are common on eBay and can come from Bulgaria, China, or other offshore makers – all seem to look similar. The one I bought was sold on eBay, was brand new, beautifully made, and shipped from a warehouse in the United States. It was made in China and, from my experience, source by a company providing for good oversight of the manufacturing plant. Contact me (W9MXQ@TWC.com) for details.

Meter on the autotransformer ("Variac™) is reading voltage to the radio or device/load connected. Hard to read here but it is 110 VAC.
Meter on the AC Socket (on the right) is reading 122 VAC.
Shown at the top of the transformer is the voltage adjustment knob.

2000 VA Autotransformer – Variac™ Device

W9MXQ Photo

The pictured device runs cold with one of my Swan 550-watt 500cx or 750cw Transceivers, the Swan 600-watt 600-T/600-RC Transmitter/Receiver Twins. I set the secondary at about 110 volts. Output is sourced from the two outlets you see on the front of the autotransformer.

At W9MXQ, only current vintage equipment plus later vintage Drake and Cubic equipment operate without the autotransformer. The Drake and Cubic equipment are rated for 120 VAC – very close to the 123 VAC experienced here.

Now let's discuss a 220 VAC Circuit. If you can imagine the distribution of 220 VAC circuits in the United States and Canada you will note that it is not really 220 VAC – it is 110-0-110 (or, as it is here right now, more like 123-0-123 VAC. While a 0-240 VAC autotransformer would seem to work, they are intended for other locations, such as Europe. A single autotransformer will not work because in our installations (USA and Canada) we see the center-tap ground. So, rather than 0-240 volts, we like to

see 120-0-120 VAC for our 240-volt AC installations. To accomplish what is needed, a user would have to have two of the above 0-140 VAC autotransformers in tandem – one on either side of the 120-0-120 circuit. While it is possible to combine two separate 0-120 VAC units, it is better using a single assembly where the two 0-120 VAC units are mechanically connected with a common rotating shaft and therefore always matched as to voltage setting.

At W9MXQ, I use a surplus General Radio W20G2 Dual Autotransformer 140-0-140 VAC to run Vintage Amateur Radio equipment requiring “220 VAC” primary. This includes the Collins KWS-1 Transmitter (1955 vintage), the Hallicrafters HT-45 Linear Amplifier (1963 vintage), and the National NCL-2000 Linear Amplifier (pre-1969 vintage). In all of these cases, the autotransformer is set to 110-0-110 VAC. The W20G2 Autotransformer will handle about 2,800 watts of power to the load.
Here are a couple of views of the General Radio W20G2 Autotransformer:

General Radio Dual W20G2 140-0-140 VAC Autotransformer

Showing the two identical connection panels for the tandem 0-140 VAC autotransformers.

Showing the top panel with the voltage control knob plus additional view of the mechanical construction.

W9MXQ Photos

This Autotransformer has recently been removed from service and is awaiting installation in a roller equipped floor cabinet. In this dual configuration, each of the two separate transformers are linked by a common shaft and control knob.

The W20G2 140-0-140 VAC Autotransformer weighs about 45 pounds. It was sourced from the University of Iowa in a sale of excess laboratory assets several years ago. I found it via a lead from a fellow Collins collector. These, in surplus, cost about $200.00 and then another $100.00 to pack and ship. It appears to never have been used (but was sold as a “used, like new” unit). Note some missing screws on the connection panels. Those are part of my removed cable harness that I fabricated for installation with the various radios. That cable and new connectors will be integrated into the new cabinet installation.

In closing this section, it is my suggestion that if your line voltage is close to 120-volts AC then you should be using an autotransformer with your vintage radios. If the radios are the vintage of later Drake models – then they are okay at current AC power voltage levels. I would, however, question the vintage of the AC-3 Power Supply (for the TR-3 Transceiver, the original R-4, R-4A, and R-4B Receivers and matching T-4X and T-4XB Transmitters (with early AC-4 Power Supplies). When in doubt, setup an autotransformer equipped circuit for using these radios. ANY, Hallicrafters radio should be using the autotransformer – and the same with Hammarlund, National, and others of the same period. Am I overly cautious? Probably. But being over cautious with Vintage Amateur Radios is always acceptable.

Cleaning Wrinkle Black Cabinets and Panels:

Many Vintage Amateur Radio pieces have cabinets that are painted with what is called Wrinkle Black Paint. Chemically, this paint is designed to have the top layer constrict a bit (I am not a chemist!!) when drying and thus provide an attractive finish that does not show finger marks and is remarkably durable. This is not to be confused with the smooth pebble texture finish found on many later Hallicrafters and Drake cabinets. Most will recognize this as the finish on virtually all Swan radio outer cabinets (top and sides). Going back into the 1930's through the 1950's, it was very common[4].

This finish is very attractive but since it has pockets and folded over areas from the constriction of the drying paint, it tends to attract dirt from the hands when handled and generally grim from just being in the open air. Simple cleaning can actually make it look worse than when dirt first appears. While very durable, you must be very careful when cleaning it. Some cleaners, in my experience, such as Krud-Kutter™ tend to clean but at the same time can soften the paint – and allow damage when scrubbing the surface to remove dirt[5].

For Wrinkle Paint cleaning I use one or the other of two products – 409™ or Fantastic™. I buy whichever one is the lowest price when I need to refill my supply. Spray the cleaner on the part and spread it around the surface with your fingers (unlike Krud-Kutter™, 409™ and Fantastic™ are safe to touch). After a few minutes, scrub all areas of the panel with a soft toothbrush (or similar soft bristle brush. Then rinse the part in water that is as mineral free as possible. I use Reverse Osmosis (RO) water for this purpose. You may need to repeat multiple times. The result is a very nearly band new look. The key ingredient in my two favorite cleaners is ammonia. You can use household ammonia mixed in water (following the instructions on the ammonia container) but I dislike working around ammonia in its pure state, so I prefer the commercial cleaner version[6].

There is another method – well known but not as preferred in my experience. These parts can react well to being run in a short cycle in the dishwasher. (Not the entire radio, mind you!!) I have tried this method and found that it can begin to lift the paint in some cases. Those cases are likely tied to the original preparation of the metal for painting or even the actual paint mixture in spots. Be sure that the dishwasher is on a very short cycle, all heating is off, and water temperature is just slightly warm, at the highest. I experienced some bubbling of the paint that easily pressed back in place immediately after removal with no damage apparent once dry. I have never used this method again, however. It may work well – and maybe your dishwasher has more temperature control than mine.

A beautifully clean Swan 750cw HF Transceiver

After cleaning the top and sides with Fantastic™ Cleaner, scrubbing with a soft bristle toothbrush, then flushing with water.

(Cover is removed for the process, of course!!)

W9MXQ

When flushing the final cleaned part with water, be sure to get collected water out of the areas where the metal is folded back onto itself to create a smooth edge. These folds collect water – and that can encourage rust. The thin steel of the Swan cabinets (typical of many of the time), are very susceptible to such damage.

Everybody has favorite tips they have mastered for the restoration and maintenance of vintage radios. Paint and finish seem always an issue as to aging components (off tolerance or failing crystals, resistors, and capacitors). Another area of concern with vintage radios is how to make them more able to deal with today's band crowding and the noises that make their way into the speaker and headphones of today's operating. That will be one of several topics covered the next time I pen an article on operating and maintenance tips. Do you have a favorite fix or technique you would like presented? Let me know at the address in the next paragraph and I will include your thoughts, with proper credit to your work.

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. Certainly, in an article like this, it is good to have a second person review the process.

Credits and Comments:

[1] A Pico Fuse is an **axial leaded subminiature fuse. They are similar is size to a resistor.**
[2] My good friend and equipment seller is Mark Olson, KE9PQ, at Nationwide Radio & Eq. Sales LLC, Suamico, Wisconsin. He can be located at https://ke9pq.com
[3] The Collins "Gold Dust Twins," as I have often mentioned are the Collins KWS-1 Transmitter, 75A-4 Receiver, and 270G-3 Speaker Console setup. They were called the "Gold Dust Twins" because of their high selling price back in 1955, when introduced.
[4] Wrinkle Black Paint can also be known as Black Crackle Paint. As you come across this finish you should be aware of several finish appearances. Swan paint of this variety seems to have been unique – with the common variety found on military surplus equipment and several other amateur radio brands being of a more open texture than Swan.
[5] I am a faithful user of Krud-Kutter™ for many areas of cleaning up old radios. However, be very careful with it as it will tend to remove silk screen lettering on radio chassis' and panels. It softens paint, as mentioned in the article.
[6] Remember that ammonia or cleaners including ammonia can cloud clear plastic or Plexiglas™. These cleaners can ruin clear plastic covers over readouts, meter crystals/bezels, or other clear or shiny color opaque plastic parts. Beware!

Remember that these old radios are dangerous and unforgiving. High voltages that are way beyond the 12 VDC running today's radios. Keep your wits about you when you work with vacuum tube radios. Here are the scenarios:

Laugh Later

Laugh Never

GARS Membership

New Members List in September

Neil Gardner (KO4UHX)
Eddie James (WD3D)
James Otey (KB4AHI)

New Members: 3

Total Members as of October 1, 2022
360

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

Birthdays in October

Larry Andrus (KB4LWT)
Ray Bailey (N4GYN)
Scott Brown (KD4YDD)
Dale Burns (KI4MZO)
Alexis Carmona
Jonny Dorminy (KN4LGM)
Charles Eiland (WA4RVO)
Joshua Garcia-barreto (KM4OMX)
Neil Gardner (KO4UHX)
Benjamin Goings (KM4RTO)
Ellen Hawkins (KM4RRW)
Bill Kirk (N4WWK)
Kathy Kitz
Robert LaBerge (KC4BI)
Joel Levine (WA4HNL)
Hana Londono
Mac McDonald (NN4K)
Rich McMahon (KO4PVP)
William Nash (KO4ZDH)
Catherine Perry
Cathy Pierce (K1YMW)
David Price (W4QDV)
Bob Pursley (WD4KQQ)
Michael Sheaffer (W4ANO)
Allison Sullivan (KK4VLR)
Michael Weathers (ND4V)
Glen Wendt (W3WWT)
Russ Willard (KA4UUB)

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 e-mail your changes to the Membership Committee - membership@gars.org.

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):

- Amazon Smiles;
- Kroger Community Rewards program.

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

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

GARS on Social Media

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

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

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

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

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

GARS Mail Address:

GARS
P.O. Box 492531
Lawrenceville, GA 30049

Officers

 Joe Biddle, President AD4PZ

 Jamie Burns, Vice President KX4HA

 Bill Hawkins, Secretary WR1TR

 Pam Meridy, Treasurer WB1AKQ

 Kevin Scott, Program Manager K4GTR

Managers and Committee Chairs

 Karen Albritton, Membership Chair KI4HPP

 Dave Bruse, VE Team Leader W4DTR

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

 Ralph Pickwick, Education Chair KJ4CNC

 Earl Whatley, Apparel Manager AF4FG

 Bob Hoffmann, GARzette Editor K4CQO

 Eddie Foust, Repeater Chair WD4JEM

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

 Chuck McCord, Net Manager KK4TKJ

 Steve Back, Technical / RFI Advisor WB2OGY

 Dallas Mellichamp, Workshop Leader N4DDM

 Don Stewart, Elmer Manager KW4AL

 Sandy Jackson, Health and Wellbeing KJ4DRO

Open Winter Field Day Chair
Open Georgia QSO Chair
Open Multimedia Chair

Directors and Trustees

 John Davis, WB4QDX

 Rick Cobb, N4XYY

 Kyle Albritton, W4KDA

 Bill Cherepy, WB4WTN W4GR Trustee

GARS Meeting Minutes

Gwinnett Amateur Radio Society – MEETING MINUTES 9/13/2022

There were 40 in-person attendees in addition to the online participants.

President Joe Biddle (AD4PZ) opened the meeting at 7:15 p.m. and closed the meeting at approximately 8:30 p.m.

New hams and visitors: Joe (AD4PZ)

- First time visitors recognized
- New hams and upgrades recognized
- David (KA4KKF-previously holding an Amateur Advanced ticket) passed his Amateur Extra.

Treasurer Report: Joe (AD4PZ)

Membership: Joe (AD4PZ) reported 360 members

Education: Ralph (KJ4CNC)

- The next Tech Ham Cram will be held the last weekend of October. Register at GARS.org
- The McConnell Middle School radio club started last week. If you are on the 2 meter GARS repeater around 5 to 6 p.m. Wednesdays, get on the air with the kids. The new kids have no mic fright.
- The Stone Mountain Ham Fest is the first weekend in November. Get your tickets in advance at www.stonemountainhamfest.com.

VE Team: Dave (W4DTR)

- QRZ and GigaParts are sponsoring a program for new licensees to get a free ht radio from GigaParts. The program ends Oct 31. Applicants must apply within 30 days of their first license grant as per FCC records.
- 7 of the 8 applicants passed in the regular monthly exam session

ARES: Jamie (KX4HA)

- ARES meetings are held the third Tuesday of each month at the Gwinnett County EOC.
- The annual SET training exercise will be held Saturday Oct 1. It will be a simulated weather event.

Programs: Kevin (K4GTR)

- October – show and tell
- November – Radio astronomy
- December – GARS Holiday Party
- Check the web site for all scheduled programs.

Workshop: Dallas (N4DDM)

- Workshops are generally a mirror of the monthly program.
- This month favorite apps will be added to the favorite web sites.

Techfest: David (KA4KKF

- This will the the 25th year of GARS hosting Tech Fest.
- It is essentially a big, multi-booth show and tell.
- Free food, free coffee, and lots of space.
- At the Gwinnett County Fairgrounds. Enter through the main gate on Davis Road.

Other: Joe (AD4PZ)

- GARS was formed in 1973. Next year will the the 50th so look out for some celebratory activities.
- Steve Bock (WB2OGY) – Jamboree on the air will be at the VFW post in downtown Lawrenceville on October 15th. He also thanked Kevin for the assist setting up the Rainey Mountain Camp.

Program: Favorite Ham web sites lead by Program Director Kevin (K4GTR).

Minutes prepared by club secretary Bill Hawkins (WR1TR)

Workshop Minutes - September 20, 2022

Number in Attendance: 13

Workshop Topic: Favorite Ham Radio and Related Websites

Presenter: Various GARS Members

Brief Summary: Bill WB4WTN added a few new Favorite Ham Radio websites to the list. David KA4KKF added a new Ham Cram webpage to the GARS website.

- Google Maps with counties overlaid.
- Digital Modes illustrated with waterfalls and sound examples.
- New GARS Activity webpage about our Ham Crams.

Dave W4DTR and Bob K4CQO used the Workshop to go over new VE procedures and setup of using tablets at future exam sessions versus paper exams.

Events – GARS and others

ARRL CONTESTING INFO

From ARRL Contest Calendar
> For more information click the links <

2022	2023	January
1	1	Straight Key Night
1	7	Kid's Day
8-9	7-8	RTTY Roundup
15-17	21-23	January VHF Contest
		February
14-18	13-17	School Club Roundup
19-20	18-19	International DX – CW
		March
5-6	4-5	DX Contest -- SSB
		April
10	16	Rookie Roundup – Phone
		May
		No planned contests
		June
4-5	3-4	International Digital Contest
11-13	10-12	June VHF
18	17	Kid's Day
15-26	24-25	Field Day
		July
9-10	8-9	IARU HF World Championship
		August
6-7	5-6	222 MHz and Up Distance Contest
21-22	19-20	10 GHz & Up – Round 1
21	20	Rookie Roundup – RTTY
		September
10-12	9-11	September VHF
17-18	16-17	EME - 2.3 GHz & Up – Round 2
17-18	TBA	10 GHz & Up – Wknd 1
		October
15-16	TBA	EME - 50 to 1296 MHz – Wknd 2
17-21	16-20	School Club Roundup
		November
5-7	4-6	Nov. Sweepstakes - CW
12-13	TBA	EME - 50 to 1296 MHz
19-21	18-20	Nov. Sweepstakes - Phone
		December
2-4	1-3	160 Meter
10-11	9-10	10 Meter
18	17	Rookie Roundup–CW

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

HAMFEST CALENDAR

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

10/07/2022 - 10/08/2022 Melbourne Hamfest, ARRL Florida State Convention
Location: Melbourne, FL
Type: ARRL Convention
Sponsor: Platinum Coast Amateur Radio Society(PCARS)
Website: http://pcars.org

10/15/2022 - 2nd Annual Manatee Amateur Radio Club Swapfest
Location: Bradenton, FL
Type: ARRL Hamfest
Sponsor: Manatee Amateur Radio Club, Inc.
Website: https://www.manatee-arc.org/

10/15/2022 - Annual North Okaloosa Amateur Radio Club Hamfest
Location: Crestview , FL
Type: ARRL Hamfest
Sponsor: NOARC returns for yet another great show!
Website: https://w4aaz.org/noarc-hamfest/

10/15/2022 - Flamingo Net Flea at U. of Miami
Location: Coral Gables, FL
Type: ARRL Hamfest
Sponsor: Flamingo Net ARC
Website: http://www.FlamingoNet.8m.net

10/22/2022 - Deep South Amateur Radio Club Hamfest
Location: Chickasaw, AL
Type: non-ARRL Hamfest
Sponsor: ARRL

10/22/2022 - Wiregrass ARC - Fall Tailgate
Location: Headland, AL
Type: ARRL Hamfest
Sponsor: Wiregrass ARC
Website: http://w4dhn.org

11/05/2022 - Bahia Shriner's Tailgate
Location: Apopka, FL
Type: ARRL Hamfest
Sponsor: Bahia Shrine Radio Unit

11/05/2022 - SERC Hamfest
Location: Sarasota , FL
Type: ARRL Hamfest
Sponsor: Sarasota Emergency Radio Club
Website: http://n4ser.org

11/05/2022 - 11/06/2022 Stone Mountain Hamfest - ARRL GA Sec. Conv.
Location: Lawrenceville, GA
Type: ARRL Convention
Sponsor: Alford Memorial Radio Club
Website: http://stonemountainhamfest.com

11/12/2022 - HamJam
Location: Alpharetta, GA
Type: ARRL Hamfest
Sponsor: North Fulton Amateur Radio League
Website: http:/www.nfarl.org

For more information: http://www.arrl.org/hamfests-and-conventions-calendar
When searching by division, remember some states adjacent to GA are in different divisions:
Southeastern: GA, AL, FL Delta: TN Roanoke: NC, SC

GARS Events Calendar for 2022

TechFest	Cancelled for 2022
Winter Field Day	Jan 29-30 2022
Spring Technician HamCram	March 26-27, 2022
Dog Show Fundraiser	March 30-April 3 2022
Georgia QSO Party	April 9-10 2022
North metro area Fox Hunt	April 2022
Memorial Day Parade	May 30 2022
ARC/KARC Hamfest	June 4 2022
Field Day	June 26-27 2022
Summer General HamCram	July 30-31 2022
JOTA	October 16-17 2022
Fall Technician HamCram	October 29-30 2022
Maker Faire	TBD
Stone Mt. Hamfest	November 5-6 2022
Holiday Party	December 3 2022

GARS Recurring Calendar

- 2nd Tuesday of the month at 7 pm (except December)
  Monthly Club Meeting
  690 Airport Rd, Lawrenceville, GA 30046
- 3rd Tuesday of the month at 7 pm (except December)
  Monthly Workshop
  690 Airport Rd, Lawrenceville, GA 30046
- 2nd Sunday of the Month at 2 pm
  GARS Ham Exam Session
  690 Airport Rd
  Lawrenceville, GA 30046
- Every Monday at 7:30 pm: GARS Want, Swap, Sell, and Information Net on the GARS 147.075 MHz repeater
- Every Monday at 8:30 pm: ARES Training on the GARS 147.075 MHz repeater
- Most Saturdays at 7:30 am :
  GARS Weekly Breakfast
  Cracker Barrel Restaurant
  75 Celebration Dr., Suwanee, GA 30024

GARS CALENDAR FOR October 2022

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 **Breakfast at Cracker Barrel in Suwanee 7:30 AM**
2	3 **7:30 – 8:00 PM GARS 2M Net**	4 **7:00 PM GARS Exec Meeting EAA 690 Hangar**	5	6	7	8 **Breakfast at Cracker Barrel in Suwanee 7:30 AM**
9 **GARS VE Exam Session EAA 690 Hangar 2:00 PM**	10 **7:30 – 8:00 PM GARS 2M Net**	11 **7:00 PM GARS Meeting EAA 690 Hangar**	12	13	14	15 **Breakfast at Cracker Barrel in Suwanee 7:30 AM**
16	17 **7:30 – 8:00 PM GARS 2M Net**	18 **7:00 PM GARS Workshop Meeting**	19	20	21	22 **Breakfast at Cracker Barrel in Suwanee 7:30 AM**
23	24 **7:30 – 8:00 PM GARS 2M Net**	25	26	27	28	29 **Breakfast at Cracker Barrel in Suwanee 7:30 AM**
30	31 **7:30 – 8:00 PM GARS 2M Net**					

Local Ham Radio Exams & Meetings

GARS Ham Radio Exams

Second Sunday of the month

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

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

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

September 2022 Results

There were 2 VE sessions run in September – an all electronic VE test session, and the normal paper VE test session

Electronic Exam session results:

One upgraded to Amateur Extra

Paper Exam Results

Three new Technicians,
One new General (passed Tech and General),
Two upgrades to General,

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

- W4DTR – Dave (CVE)
- AF4FG – Earl
- K4CQO – Bob
- KM4SWL – Richard
- WB2OGY – Steve
- KK4TKJ – Chuck McCord (Co-CVE)
- N4XYY – Rick
- WR1TR – Bill
- KV4SP – Frank
- W4GOP – Nathan

Thanks & 73,
Chuck McCord, KK4TKJ (Co-CVE)
Dave Bruse, W4DTR (CVE)
GARS VE Team Leader
Email: exams@gars.org

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

FREE ADMISSION

TechFest

Gwinnett Amateur Radio Society

TECH FEST 2023

★ ★ ★ 25TH ANNIVERSARY ★ ★ ★

SATURDAY, JANUARY 14, 2023

EXHIBITORS: SET UP 7:30AM – 9:00AM

PUBLIC: 9:00AM – 3:00PM

FREE HAM EXAMS: 9:00AM – 11:00AM

FINAL PRIZE DRAWING: 3:00PM

FORUMS · EXHIBITORS

RAFFLE PRIZES · DOOR PRIZES

FREE LUNCH · FREE COFFEE

CHILI COOK-OFF · & MORE!

WWW.TECHFEST.INFO

GWINNETT COUNTY FAIRGROUNDS
EXPO CENTER BUILDING
2405 SUGARLOAF PKWY
LAWRENCEVILLE, GA 30045