Anderson Repeater Club, Inc.

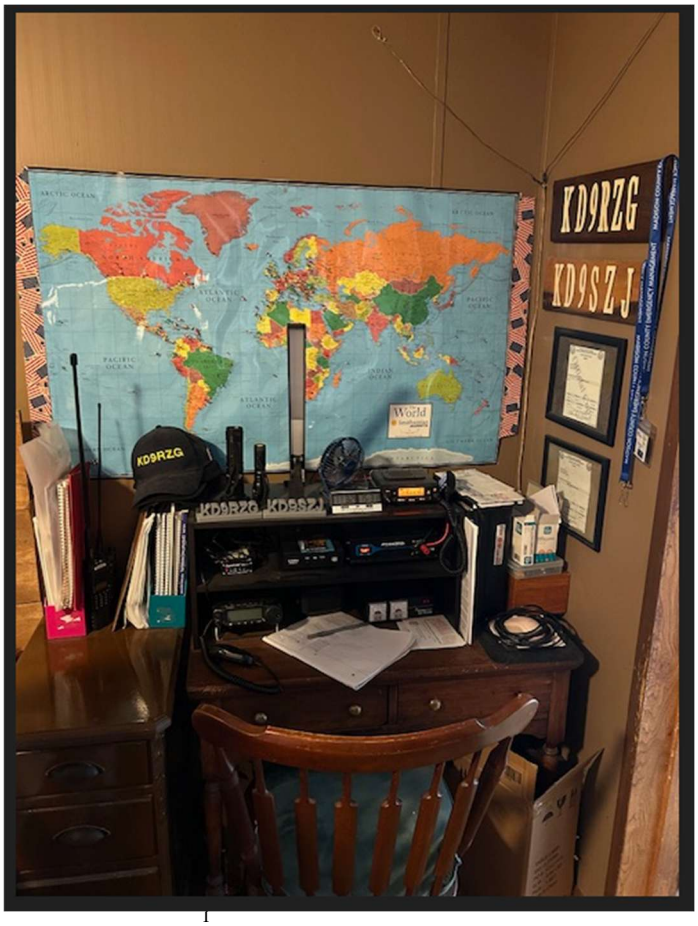
September, 2025

Our regular meeting will be Tuesday, September 2, 7PM at the EOC Training Room. Please plan to attend.

This message was distributed in early July:
"As you may have seen on social media posts or elsewhere, Roger Smallwood, N8EKG passed away on Saturday, June 28. Roger was President of Operations at R&L Electronics in Hamilton, OH. Roger's obituary can be found at https://www.browndawsonflick.com/obituaries/roger-smallwood . It remains to be seen what impact Roger's death will have on the future of R&L, literally a "Mom & Pop" operation, started by his Mom and Dad, Rita and Larry, who survive Roger. 73, Ken, KJ9B"

Many of us use R&L to get our amateur radio products. Recently I ordered a scanner and an antenna, placing the order at 11:30 on Wednesday. On Thursday at 9:30 I had it delivered. I did opt to pay an additional $3 for UPS delivery since my experience with USPS delivery hasn't been good of late. I couldn't complain about a 22-hour turnaround. I also use DX Engineering a lot and their service is great too.

In each Newsletter I am trying to hi-lite one of our members. Last time I chose an "Old-Timer", Jeff, AK9JS. This month we have newer members, Charlie, KD9RZG and XYL Paula, KD9SZJ. Here is their story:



Why amateur radio? When all else fails there is ham. This was my reason for getting my license. Mainly to stay in touch with my children if something were to happen.
I got interested in chasing parks on POTA and it kind of spiral from there. I enjoy Route 66, Code Talkers, 13 Colonies, Special Events and checking in on the net on Sunday night just to name a few. I enjoy getting through the pile ups as if I won the challenge of making contact. It is a win to get all the contacts on a special event, got to love a good challenge.
I have my general license with the hopes of getting my extra within the next year or so. I must say that some of it is clear as mud to me, as I am pretty sure the extra studying will muddy my thinking even more. But right now, I know it works and that is all that matters to me as of now. Isn't it great when things work?
KD9SZJ Paula

I got into amateur radio during the Covid shutdown in order to keep in contact with our kids in case something serious happened. I punched my ticket as said in March of 2021, my General in July of the same year, and then got my Extra in June of 2024. My first radio was a Radioddity 2 meters, then purchased my Yaesu FT891 in the start kit on advice from one of my mentors, who I have many in both clubs. Now we have a Yaesu FTM-6000 dual band as our base 2 meter and a TYT dual band as a mobile radio. After getting the HF radio the world was opened up to us. I got started doing POTA where I have hunted over 1600 parks in a little over two years with many Hunter awards, DXed over 150 countries, numerous Special Event stations and received many certificates and QSL cards from those events and other hams. We are also connected with Storm Spotters and recently with Project Lifesaver, so it has been a lot of fun, work and pleasure to be called an Amateur Radio Operator.
KD9RZG Charlie

I have mentioned in the past that on QRZ.COM you can find "The Loggers Bark" Monthly newsletter from the Radio Club of Tacoma (W7DK). The editor Dave Ellison, W7UUU, has given me permission to copy a few pages from their August, 2025 edition. Attached to the end of this Newsletter is an ad from 1950 Esse in Indianapolis. Some of you really "old" guys may remember this place, and I remember going there with my dad. Also there is an informative article on how Vacuum Tubes work, which is a reminder to many of us and perhaps new information to those who have grown up with transistors and IC's. Enjoy!

I ran across a quote from a motivational speaker Jim Rohn: "If you really want to do something, you'll find a way. If you don't, you'll find an excuse." If you really want to upgrade your license, or get that antenna upgraded, you'll find a way. Right!

A few folks are yet to pay their dues for 2025. Please check the web site for paid up members for this year, and if you aren't on the list bring your contribution to the meeting or send it in to the PO Box.

For those of us who are Special Event chasers remember that the "Route 66 On-The-Air" event is from Sept. 6-14. There are 24 stations that will be operating, W6A to W6Y in the various states from California to Illinois. This year they also have an aeronautical station (W6Y) that will be operating on 146.490. Who knows if he'll be over our way. Working even one station entitles you to a certificate.

Lynn, K9RLE, our EMA Director has an exciting report on a recent FEMA Region event that occurred at our EOC. Come to the meeting to hear how our County "shined".

73, Steve (Secretary, ARC)

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The following article is from the Mahoning Valley Radio Asn "Voice Coil". It has some good information for our members:

Does your HT have Low-T? (Mark Haverstock, K8MSH)

It's time for the weekly club net, and you're ready to check in on the local repeater. With HT in hand, you confidently press the PTT button. "This is KE8ABC, Homer, in Springfield." Net control responds with "I heard a KE something. Try again." After several more tries, no luck. Disappointed, you set your radio on the table and listen to the rest of the check-ins. So, what's going on?

Perhaps your HT is suffering from low-t (low transmit). How do you improve its performance?

Supercharging the Duck

Almost any antenna works better than the 6-inch rubber duck that comes with most handhelds Short, flexible antennas are safer when working in close quarters around people and are durable. They're a good choice for dual-band transceivers but are usually optimized for one band and only acceptable on the other.

The National Bureau of Standards tests of Public Safety high band and amateur 2-meter antennas show that a rubber duck has negative gain up to -5dB compared to a 19-inch quarter wave antenna held at face level. Due to the design of the factory installed HT antenna, you are effectively missing half of the antenna. A rubber duck is only one leg of a vertical dipole-a short, loaded, lossy one.

So, where's the other half? Your body acts as the ground when using a handheld radio. By holding the radio, you are capacitively coupled to the radio and make the other leg of the antenna. Of course, you aren't a very good ground system.

A simple way to improve the efficiency of your handheld's antenna is attaching a counterpoise to the radio to be a better ground. There is a product called a rat tail / tiger tail designed for this purpose, but you can easily homebrew your own by attaching a piece of wire about a quarter wavelength long to the radio's case. The dangling wire isn't pretty, but it will noticeably boost your signal. Figure 1 shows how this is constructed. Use stranded insulated wire about 19 inches on 2m and 6.5 inches for 73cm.

Fig. 1 HT tail counterpoise

Size Matters

To increase your range, consider an aftermarket antenna. There are many choices, including larger rubber ducks, telescoping antennas, and mobile antennas. All are larger, likely closer to ¼ wavelength, and some even include provisions for a counterpoise or ground. Telescoping antennas like the Smiley Super Stick II add length and can collapse to under 7 inches. They're available with models that include either SMA male, female or BNC connectors.

Diamond SRH77CA antennas have a 15-inch flexible radiator in SMA male, female or BNC connections. For mobile use, Diamond MR77 20-inch antenna with magnetic mount gets your antenna out of the car and onto the roof. You can also choose just about any mobile VHF/UHF antenna and add the magnet mount / cable connections.

A ¼ wave mag mount antenna is typically used on a vehicle, but can also be used portable or even at a home with a suitable improvised ground. A metal filing cabinet, refrigerator, window air conditioner, balcony railing, pizza pan or other large metal object can work as well.

If you really want to be heard from home, use an outdoor antenna-or hide one in the attic. A DIY vertical dipole can be built for less than $10 and installed just about anywhere-see Figure 2. Encase inside ½" PVC pipe to weatherproof. Not a maker? The Arrow GP 144/440 ground plane kit and Comet GP-1 base vertical are inexpensive options.

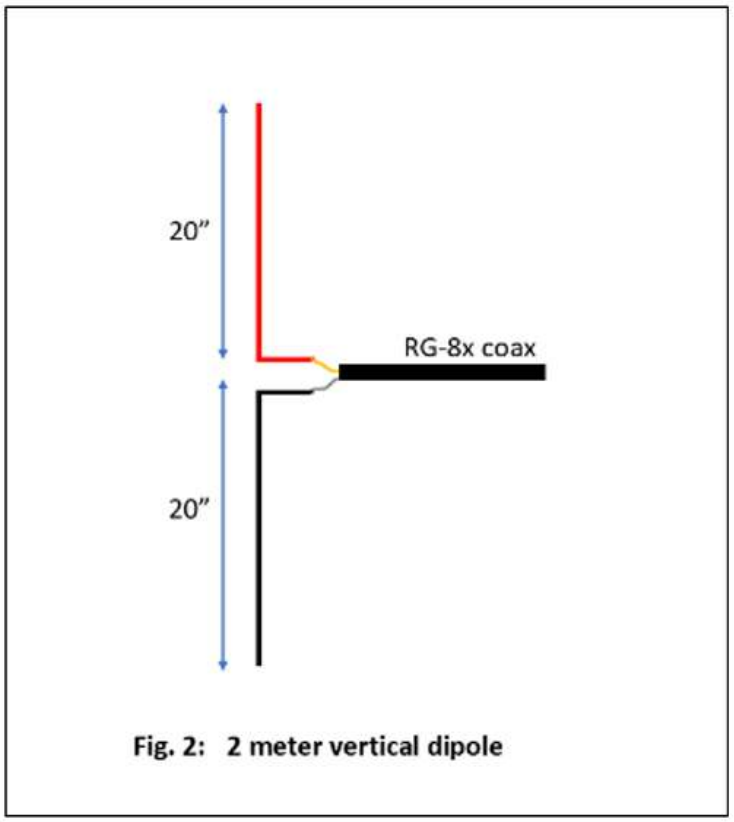

Fig. 2: 2 meter vertical dipole

No matter which you choose, keep the coax run as short as possible to minimize power losses. Use a good quality coax like DXE RG-8X for short runs, RG-8 for longer runs.

Location, Location, Location

Getting a better signal from your HT often depends on how and where you hold it. Handheld radios are built for portability, so everything about them is a compromise. The first step in getting a better signal is to get the radio off your belt and hold it at face level.

When you use a VHF/UHF hand-held radio, the signal will fluctuate as you move around, depending on the position of the antenna your body and things around you. Signals may be stronger near a window, when facing the repeater or just in a different spot. Moving a few feet can make a big difference, especially indoors. Repositioning can help transform a signal from barely intelligible to clear and concise copy.

Height above ground improves signal, since 2m/70cm bands are line of sight. Go upstairs or move to higher ground to help your signal.

Charge!

HT's typically can transmit at a maximum of 5 watts-some do more. But this is based on a fully-charged battery. How many of us actually remember to regularly charge our HT batteries? Make it part of your weekly routine so you're not caught with a weak battery.

To you know how to check / change the output power settings? For example, the Yaesu FT-65R has three settings: 5W, 2.5W, 0.5W . Increase the power as needed to compensate for a weak signal.

In Your Face

Sometimes, I've seen hams absent-mindedly hold their radio horizontally with the microphone covered up, or worse yet, talking into the back of their radio. Not only does a covered mic muffle the audio, but with the antenna in a horizontal position, your signal becomes horizontally polarized. HT's and repeaters use vertical polarization. The difference in polarization can cause several dB of signal loss.

Keep the microphone close to your mouth, about 3 inches or so, and speak in a normal voice. Screaming into the mic doesn't improve your signal. Instead, it will cause overmodulation and distortion.

Boosting Low-T

Notice that we didn't mention adding an amplifier or buying a 50W radio. Your HT is sufficient for local communications through a local repeater-all it may need is s little boost. Pick the solution that best fits your operating habits and needs. (This article originally appeared in On All Bands, June, 2023)

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Minutes of Meeting – July 1, 2025

The regular Club meeting was called to order at 1900 by the President, Ferrin, N9VZL. Introductions were made by all in attendance and it was confirmed that all had signed the attendance sheet.

Minutes - All had received the Minutes of the May meeting in the Newsletter and upon a motion by KD9PZR and K9TJ, all voted to approve them.

Silent Keys - There were no Silent Keys or illnesses noted,

Dues - Ferrin reminded everyone to submit their dues if not already paid.

Treasurer's Report – Treasurer Jeff, AK9JS, reported an initial April balance of $4687.34 and a current (July 1) balance of $4687.34 with some cash just received to be deposited and will show up on the next meeting report. The PO box charge will be paid this month.

Correspondence – There has been no correspondence received in the PO box or by email.

New Members – William Davisson, KE9AYZ, submitted an application and upon a motion by N9RLE and second by K9TZJ all present voted in favor, and he was welcomed into the Club.

Repeater Reports –

146.820 – Trustee Tom, KA9SYP not present. Lynn, K9RLE, reported that he has heard the .82 repeater in Ohio on his handheld when propagation was good.

147.090 – Trustee Jeff, K9DYR, reported that there has been a lot of traffic on IRLP. Lynn has a new 5G hot spot to install at some point. There is a need to replace the computer with a more up-to-date one or perhaps a rasberry Pi. Jeff will put together a plan.

443.350 – Trustee Steve, WA9CWE reports is it working well and is used on Sunday evenings. Lynn reported that it is used during StormNets as a very successful backup to .82 when stations in the North can't get in. Must remember to wait on the reset beep. He can get into it with a handheld from Elwood,

145.390 – MCARC – Doug, N9DR not present, no report.

223.860 – Trustee Lynn, K9RLE reports that the activity is picking up a bit as he's hearing more folks on, We have a radio raffle with 223 capability.

Weather Report – Tom, W9EEL reported that this has been an unusual hot spell, but it should end and the dew point will drop from the high 70's to the low 60's. Moisture should come back on Friday thru the weekend. Nothing severe is expected with only random showers.

EMA Report – Director Lynn, K9RLE reports that he needs someone to take over the Outreach coordination as the current leader has left the organization. Upcoming activities include the 4-H Fair, Elwood Glass Festival and a couple others. He has posted for a Deputy Director position and has some candidates. Everything is going well, but money is tight. He was able to upgrade some of the amateur radios earlier this year. The MCEMA tower trailer has been repaired. Thanks to all who helped. Right now the Broadway gate will remain open.

VE Testing – Jeff, K9DYR reports that last Tuesday there was 1 upgrade to Extra and one failure for general. We continue to host the third Tuesday of each month. If anyone would like to become a VE get on the ARRL web site and take the open book test.

Upcoming Events – Vice-President Gary, W9GNR reviewed the regularly scheduled events and mentioned the upcoming 4-H Fair July 20-26 and the East Central Indiana Hamfest on the 26th. The Auburn Hamfest is on the 19th. Charlie, KD9RZG mentioned that he and Paula were working on the 13 Colonies event and the Chasing Cornwallis event.

Old Business – Jeff, K9DYR reminded everyone that we have a Ham-Of-The-Year award that is sometimes awarded to a ham who exhibits the spirit of ham radio. Feel free to nominate someone at the end of the year.

New Business – None

Show and Tell – Mike, KC9DJO showed an HT antenna in a small circular configuration, Lynn, K9RLE showed a portable/temporary VHF antenna for use at Outreach and other responses. It is stored with the VHF Go-Box,

Raffle – The raffle for the UV5R3 tri-band handheld went to Tony Poitras, KD9PZR. This resulted in $38 being added to the treasury.

Technical Presentation – Steve, WA9CWE presented “Antenna Polarization & Antenna Construction” that described antenna polarization and how the various antennas worked and also showed a number of antenna construction examples.

Other – Charlie, WB9KUL offered a rain gage to anyone who wanted it. Lynn, K9RLE described the NWS weather station that is mounted at the EOC and how/when data must be collected from it.

Upon a motion by K9TZJ and WA9CWE the meeting was closed at 2021. There were 17 who signed the attendance sheet.

Respectfully submitted, Steve Riley, WA9CWE Secretary, ARC

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STRAY TOPICS OF INTEREST

RADIO ADS FROM 75 YEARS AGO THIS MONTH

W7UUU

AUGUST 1950 ADS IN ALL the electronics hobbyist magazines featured mountains of surplus gear. After WWII, the hobby electronics market was flooded with rugged military radios and electronics—like the SC-456 command-set modulator, SC-AQ 249 receiver, and BC-375 tuning units—built in massive numbers for wartime communications. Beginning in 1947 and continuing for years to come, thousands of AN/ARC-5 command-sets hit surplus auctions, becoming "by far the most popular surplus item" among hams. Their heavy-duty build, standardized parts, and ease of conversion into ham radio use—not to mention the bargain prices—drove a powerful demand in the ranks of hams.

This August 1950 ad for ESSE Radio Company was from just one of hundreds of surplus resellers that popped up all around the country after the end of the war. Only a tiny percentage of such companies continued on past the 1950s—Heathkit Co. would unquestionably be the most famous of them all.

-Dave W7UUU

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email loggersbark@gmail.com

HAM TECH 101

By Dave W7UUU

Useful tech info for newer hams and old

Vacuum Tubes 101

VACUUM TUBES 101 – WHAT MAKES THEM TICK?

This month is "The Tube Issue" for *The Logger's Bark*, and I thought it would be fitting to have a (very) basic overview of vacuum tubes for the younger members of the Radio Club of Tacoma. It's very easy for some of us old timers to assume "every ham surely knows all about the tube era in ham radio" when in fact, there are a great many hams who have never even seen a tube much less worked with ham gear based on tube technology.

For many new hams, vacuum tubes probably feel like an arcane relic of a forgotten era—something out of an old sci-fi flick or a dusty shelf in a broadcast museum. And of course outside of just a handful of power amplifiers still made using tubes, there really isn't any tube gear made anymore for hams. (We're not talking about the "Audiophile" world where tubes still reign supreme).

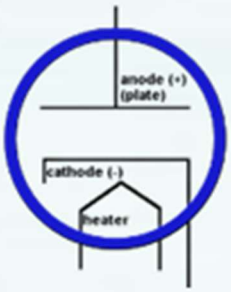
But if you're restoring classic gear or just trying to understand why your S38 you found at an antique mall glows warm in the corner, it's worth taking a moment to understand what makes these things work.

It all starts with a simple concept called thermionic emission. When you heat certain metals—usually a coated cathode (a piece of metal inside the tube, usually closely surrounding the hot glowing filament)—they give off electrons. This is the starting point for everything a vacuum tube does.

Inside the tube's sealed glass envelope (yes, it's actually a vacuum in there—all (well, *most of*) the air is sucked out at manufacture—hence the name vacuum tube), a heater (the part many call a filament, that makes the tube light up) warms the cathode until electrons are released.

Now, if you place a second element—a metal plate or anode—near that cathode and make it more positive, those free electrons on the cathode will jump across the vacuum toward the plate. This forms a flow of current, but only in one direction. Electrons can't jump "backward" toward a negative plate, which means this simple arrangement—called a diode—acts as a one-way valve for current. It's the most basic type of tube there is, and was extremely common and important in the era of tube electronics.

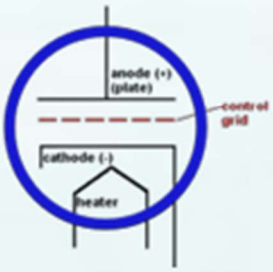
That makes the diode useful for turning AC into DC, and



Schematic of the simplest of tubes: the diode

it's why you'll find rectifier tubes like the 5U4 and 5Y3 in vintage power supplies, receivers, transmitters—just about any ham gear you can think of. They're just vacuum diodes handling the job of flipping alternating current into something the rest of the circuit can use.

To get from there to *amplification or oscillation*, we need a way to *control* that flow of electrons. The next step up is the triode. It works the same way as the diode, but with one key addition: a wire mesh called the control grid, suspended in between the cathode and the plate. By applying a small negative voltage to this "control grid",



Schematic of a triode tube where things get more interesting

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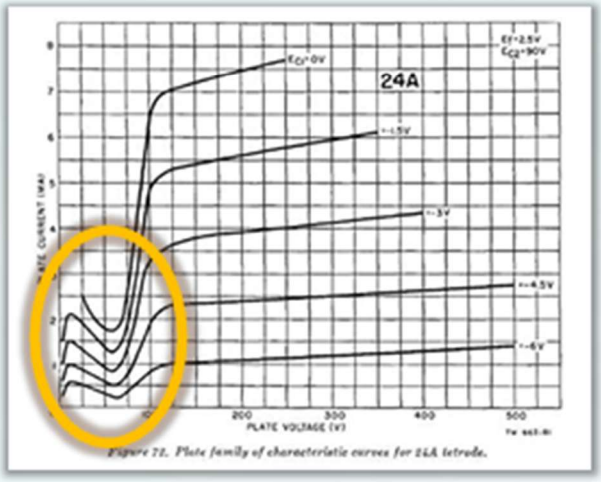
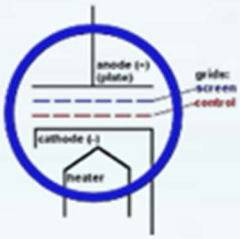
you can repel electrons from the cathode and limit or even cut off the current flowing to the plate. A very small change in grid voltage causes a much larger change in plate current, and with the right supporting circuitry, you have—*amplification*. If you feed a weak signal into the grid such as audio, at the plate it becomes a significantly stronger signal.

Tubes like the 12AX7 and 6SL7 are classic triodes used for audio stages, sidetone oscillators, and many other applications. That tiny signal at the grid gets turned into a much larger one at the plate, and as simple as it sounds, that's really the magic of tubes.

Triodes are simple and elegant, but at higher frequencies or voltages they run into problems. One of those is called secondary emission, where electrons hit the plate hard enough to knock other electrons loose—and those stray electrons can actually flow back toward the grid, throwing off your signal and making things unpredictable. Engineers fixed this by adding another grid—called a screen grid—between the control grid and the plate. This created the tetrode (since the tube now has 4 elements). The screen grid is held at a steady positive voltage and acts like an electrostatic shield, reducing the capacitive feedback from plate to grid and helping maintain stability at higher frequencies.

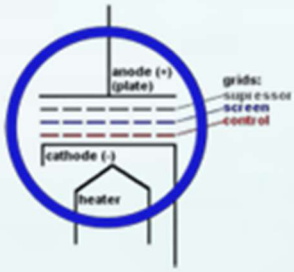


Graph illustrating the "Tetrode Kink"
Image: Wikipedia



Tetrodes can do more work but not without introducing their own issues

The tetrode helped a lot, but it wasn't perfect either. Those secondary electrons we talked about could still head toward the positively charged screen grid, rather than returning to the plate. That created humps and dips in the output curve, known as the "tetrode kink" (see the plate-curve graphic image). So once again, a fix was added—another metal mesh called a suppressor grid, placed between the screen grid and the plate, usually connected internally to the cathode. This suppressor repels those wandering electrons and steers them back where they belong, giving us the pentode. With five internal elements, the pentode delivers stable gain, reduced distortion, and smooth amplification. Tubes like the EL84, 6BQ5, and 6AU6 are all pentodes you'll still find in receiver audio stages, IF amplifiers, and modulator circuits.



Schematic of the pentode... one of the most versatile configurations

HAM TECH 101

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Vacuum Tubes 101

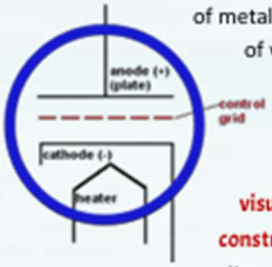
Some variations go even further. Beam power tetrodes like the 6L6 and 6146 use beam-forming plates instead of a suppressor grid to focus the electron stream into tight columns. This helps reduce screen current and boosts efficiency, making them perfect for final RF stages and power amplifiers.

There are all kinds of oddball tubes beyond these basics—Nuvistors, compactrons, dual-control pentodes, ceramic-metal transmitter tubes, and all sorts of specialized tubes seldom seen in the hobby world—but for most hams starting out, the big five are enough to know: the diode, triode, tetrode, pentode, and beam tetrode. Once you understand how electrons boil off a heated cathode, get steered and accelerated through grids, and land at the plate to create useful current, you've got the core of how vacuum tubes really work. From there, the subtleties of tubes kick in—the vast variations from one pentode to another, frequency limits, inter-element capacitance, and dozens of other factors that engineers must work out if a circuit is to perform as expected. But with just a basic knowledge of tube technology, even new hams can get their feet wet—there are literally millions of existing tube circuits from which to build, and given the billions of tubes made over the last 100 years, they are still plenty available.

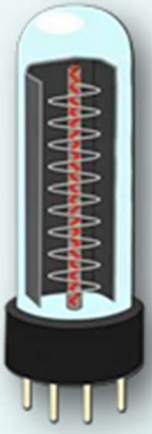
-Dave W7UUU

SIDEBAR: Schematics vs. Reality in Tubes

When I was a 13-year-old brand new ham, for the first time seeing schematics showing tube projects I might be able to build myself, I thought I understood how a tube was constructed, based solely on what I saw in the project books... after all, it's pretty obvious isn't it? The heater and cathode are on the bottom, there's a flat little metal anode at the top (a "plate" of metal), and in between was a piece of what I pictured to be a little piece of window screen—the control grid.



I'm sure I wasn't alone in this visualization of how a tube was constructed. But when I first started dissecting real tubes with broken glass, I quickly realized my simplistic view wasn't even close to the reality. How tubes are actually made is *nothing* like that. In fact, much of the innards of a tube are "tubular"! The heater is a spiral heating filament in the center of the tube. Surrounding that is another close-fitting metal tube that forms the cathode. Then arranged in one of many possible ways, another tube of mesh that is the control grid (followed by more tubes of wire mesh called the screen grid and suppressor grid). Finally the Plate (anode) is yet another tube of solid metal that surrounds the whole thing. If you ever come across an old tube that's known to be defective, carefully break open the glass (wearing gloves and eye protection) and carefully "peel the onion" and you can really see just how a tube goes together. And you'll find it's nothing like the schematic symbols seen in the old ARRL books and magazines. It may even surprise you!



-Dave W7UUU