

FEEDBACK

JUNE 2019

SPECIAL MEETING DATE: FRIDAY, JUNE 21



A stormy May 24 activated storm spotters, including President Bill, WA2FNK and Treasurer Cal, KCØCL, leave Vice President Jaimie, ADØAB (left) and Secretary Ted, NØTEK (right) in charge. The JCRAC voted to postpone elections to prevent the absent storm spotters from escaping reelection.



JCRAC members on foot, using a variety of techniques to hunt a fox behind the meeting site. (Photos by NØCVW)



JUNE MEETINGS

- June 14** – Raspberry PI for Hams - Bill Gery, KA2FNK
- June 21** – FIELD DAY. - On this evening, the club will meet at the Hutton Farm, on 87th Street, just west of the entrance to Shawnee Mission Park at 87th and Ridgeview Road.
- June 28** – No Meeting (as we recover from Field Day)

The Johnson County Radio Amateurs Club normally meets on the 2nd and 4th Fridays of each month at 7:00 PM at the Overland Park Christian Church (north entrance), 7600 West 75th Street (75th and Conser), west of the Fire Station.

Much of the membership travels to the Pizza Shoppe at 8915 Santa Fe Drive for pizza buffet and an informal continuation/criticism/clarification of the topics raised at the meeting ... or anything else.

LEAVE THE CHURCH, TURN RIGHT (WEST) ON 75TH. TURN LEFT (SOUTH) ON ANTIOCH. TURN RIGHT (WEST) ON SANTA FE. PIZZA SHOPPE IS JUST PAST THE SONIC ON YOUR LEFT.

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-> FEEDBACK <-

*A publication of the
Johnson County Radio Amateur Club, Inc.*

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PRESIDENT'S CORNER

Jay (WJ0X) has been working hard being sure everything is ready for Field Day 2019 for the Club. The



various stations team leaders also hve been getting thing in order. Bill (KC4TKL) will be handling the networking. Gary and Francis have volunteered to cover the welcome tent and

talk-in on 145.290.

The landscape at the Hutton farm is a little different this year. The buildings are gone, but that has opened several new antenna possibilities. As a quick reminder the Farm is just west of the 87th street entrance of Shawnee Mission Park.

We will start set up Friday at 1 pm and should have everything up and tested by 7 pm for the club's meeting. Yes the June 22 meeting will be at the Hutton Farm. John (KØIZ) will be holding a HF clinic Friday evening and again before the start of Field Day on Saturday. For a complete schedule of Field Day activities see the club web site (www.w0erh.org).

Talked to your neighbor, coworker, friend or youth group and extend them an invitation to visit the site. There will a "Get on the Air" Station set up if they would like to make some contacts.

NOTE: The second club meeting of the month will be on June 21 at the Field Day location. There will be not be meeting on June 28.

- Bill Gery - WA2FNK

Johnson County Radio Amateurs Club - May 10, 2019

Meeting Date: Friday May 10, 2019. The meeting Started at 7:00PM.

Attendance: Self introduction with name and call sign. 22 signed the check in sheet. This was followed by the Pledge of Allegiance.

The Minutes from the April 26, 2019 meeting were read and accepted with 1 opposed vote.

The Treasurer's report, as follows, was read and accepted unanimously.

Cash on Hand	\$ 86.00	Repeater Operating Reserve	\$ 1,319.83
Checking Account	\$ 623.04	Memorial Fund	\$ 310.00
Savings Account	\$ 11,393.62	Active Members	146
PayPal Account	\$ 0.00		
Total	\$ 12,102.66		

Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – All are working well.
- Field Day 2019 – Brian Short, KCØBS has put in a request for the Salvation Army Communication Van to use as the GOTA station. All other aspects of Field Day are falling into place. We will have a Club Meeting the Friday before Field Day, which is June 21. This is the 3rd Friday in June so we will not have a regular meeting on the 4th Friday in June (June 28th).
- Planning continues towards a Kit Building Project.

New Business:

- Election of Club Officers will take place at the next meeting on May 24, 2019.
- Ensor Museum volunteers are still needed.

Reports:

- 6 m – NR.
- 10 m SSB Roundtable – 3 or 4 participated on May 9.
- 40m SSB Roundtable – NR.
- Fusion Digital 440 net – 13 Check-ins on May 8 and 21 Check-ins on May 1.
- 2m Wheat Shocker net – 12 Check-ins on May 9 and 18 Check-ins on May 2.
- HF Activity – NR.

Announcements:

- Santa Fe Trail Commemorative Special Event May 18 -19.
- Aaron Boots, AAØRN former Club Vice President is graduating from Missouri S&T with a degree in Electrical Engineering. The Club will send him a card and a Club hat.
- Bill Brinker, WAØCBW reminded everyone to make sure their radios are set properly so they do not send APRS data out on the Repeater.
- See Larry's List for upcoming Events.

Business meeting adjourned at 7:15 PM.

Johnson County Radio Amateurs Club - May 24, 2019

Meeting Date: Friday May 24, 2019. The meeting Started at 7:00PM.

Attendance: Self introduction with name and call sign. 21 signed the check in sheet. This was followed by the Pledge of Allegiance.

The Minutes from the May 10, 2019 meeting were read and accepted with 1 opposed vote.

The Treasurer's report, as follows, was read and accepted unanimously.

Cash on Hand	\$ 110.00	Repeater Operating Reserve	\$ 1,327.83
Checking Account	\$ 663.04	Memorial Fund	\$ 310.00
Savings Account	\$ 11,393.62	Active Members	147
PayPal Account	\$ 20.09		
Total	\$ 12,186.75		

Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – All are working well.
- Field Day 2019 – All aspects of Field Day are falling into place. We will have a Club Meeting the Friday before Field Day, which is June 21. This is the 3rd Friday in June so we will not have a regular meeting on the 4th Friday in June (June 28th).
- Ensor Museum Volunteers – 1 volunteer needed for Sunday May 26.

New Business:

- Election of Club Officers – Because of the severe weather taking place during the meeting several members, including the President and Treasurer, were out storm spotting so a motion was made to Table the Elections until the first meeting in June. The motion passed unanimously.

Reports:

- 6 m – NR.
- 10 m SSB Roundtable – 4 participated on May 23.
- 40m SSB Roundtable – 1 participated on May 22.
- Fusion Digital 440 net – 11 Check-ins on May 22.
- 2m Wheat Shocker net – 19 Check-ins on May 23 and 16 Check-ins on May 16.
- HF Activity – Panama on 40m CW and Italy on 40m SSB.

Announcements:

- WW1USA on July 6 – 7.
- See Larry's List for upcoming Events.

Business meeting adjourned at 7:20 PM.

Program:

- The scheduled Program for this evening was "Raspberry Pi Set-up and Application for Ham Radio" by Bill Gery, KA2FNK. However Bill was activated as a storm spotter so this Program will be presented at the next Club meeting.

Hambone and the Electric Fish Fry

The unbridled enthusiasm of teenagers is amazing. No project is too big to tackle, no obstacle is too difficult to overcome. A project can start off simple enough, but left unchecked, it can lead to some very unexpected results.

Take Field Day, for example. Hams like Field Day and most spend a large part of the year anticipating and planning for this single weekend. I've been told that the original purpose of Field Day was for hams to test their ability to operate away from their traditional stations, so that they could do so in the event of an emergency. That may be true, but Field Day has evolved to be so much more.

Today's Field Day, which I'll refer to with the ham notation of FD, is a much bigger deal. The emergency operation aspect is greater than ever with many stations operating out of go-boxes and using solar and other forms of portable power. But FD has also become a major social event. It has become a show place for hams to strut their stuff in front of family and friends, recruit new hams and compete in contests. This is where our boys come in.

Hambone, the oldest and the only ham in our trio, has just started engineering school and has joined an engineering fraternity. Dude, his younger, non-ham, but smarter brother is still in high school. Their non-ham, but very clever, pal Joey is out of high school and on the loose.



Oops! I'm sorry, I guess you already know that. But I love talking about my nephews. Back to what I what I was saying.

'Frat's Amateur Radio Transmitting Station' is the sign on the door in the back of the frat house that separates the boys' radio club from the rest of the house. The club is loosely associated with the engineering fraternity, but obviously less picky as to who they let in. I knock.

"Hi Unck, c'mon in," said Hambone as he opened the door and invited me into their shack. "We're just figuring out what we are going to do for Field Day."

"That's great. Are you going to join with our club again in the park like last year? You guys ran a dynamite FT8 station," I asked trying to stir up enthusiasm for my club's big FD event.

"Maybe, Unck," added Dude. "But we're trying to think of something really different."

Trying to be helpful, which is never a good idea when speaking to teenagers who are at least two generations your junior, I offered, "Have you thought of getting your power from solar panels?"

"Oh, Mr. Elmer, that's not different," informed Joey, never one to mince words. "Last year a couple of the old guys had a huge solar station with tents and batteries and everything. Even the Internet

guy ran his LAN off solar power, we want something different. We want to build what no ham has built before."

"Like what? Wind power, maybe?" I asked.

"I don't think so," offered Hambone. "Some guys in another club tried that and discovered that the wind didn't blow enough. They finally got a generator and hooked up a big fan to blow on their little turbine. I don't know if they were able to claim credit for wind power or not. Anyway, we don't want to just copy someone else. We want to be totally different."

"But not creepy," added Dude.

"I've got it!" hollered Hambone jumping out of his chair. "Electric fish!"

"Is that some kind of a toy?" I asked.

"No. no. I mean electric eels, like in the biology lab. Last month, I was helping a guy down there measure the voltage that an electric eel produces when it's shocking something. He's working on his Master's Thesis and needed some numbers. He has a bunch of eels shocking prey in small aquariums, but didn't know how to measure their strength. I helped him out."

"Sure," snickered Dude. "What did you measure, a couple of volts and a microamp or two? Fish don't have electricity. The water would short them out. They'd be shocking themselves."

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“Not so fast, little bro. These eels live in fresh water which isn’t a very good conductor. The biggest eel cranked out nearly 500 volts at 900 milliamps. The smaller ones ran about 200 volts at slightly over 50 milliamps. There’s some real power there. If we could capture it we could run our one-watt QRP station.”

“That would be really different,” exclaimed Barron, one of the club members who had been silent until now. “But how could we capture the eels’ power, we can’t touch them, can we?”

“They’re probably wet and slimy,” added Dude.

“Well, duh,” said Joey. “Of course, they’re wet. They’re fish. They live in water!”

“I know that!” countered Baaron.

“How are you going to connect to them, with fish sticks?”

“Don’t be stupid,” snapped Joey.

Things seemed to be getting out of hand, so I stepped in. “This seems like a really interesting idea. But first you’d better get the guy in the biology lab on board. Then, figure out some way to capture the eels’ power.”

The boys agreed that fish power was a definite possibility and agreed to meet again the next day.

The next day

“Guess what?” shouted Hambone as he burst into the ham shack where the rest of us were already gathered. Not waiting for an answer, he continued, “The ichthyology student thinks we have a great idea! He was looking for a new angle for his thesis and this is it. He will do whatever we need to

pull it off. He’s even agreed to send four eels in 50-gallon aquariums to our field day site.

By the way, his name is Paul, but everyone calls him Icky. Icky says that they aren’t actually eels, but are electric fish that can breathe air. But it’s okay if we want to call them eels.”

From the back of the room near the doughnuts, Dude added, “I talked to Tim, that tall geeky guy in the club who made the special power supplies in that awesome 500 watt go-box. He liked our idea and offered to build us a power supply that will take those high voltage pulses from the eels and store them in a battery to run our QRP rig.”

“Well,” said Baaron, “It looks like we’re good to go. I’ll bring some big battery clamps to connect to the eels.”

“No need,” said Hambone. “Just stick an electrode near the water and the eel will jump right up out of the water and connect to it. It surprised the hell out of me the first time I saw it.”

Field Day – Saturday morning

It was hot. Kansas Summer hot. The sun was already boring holes through my SPF 50 releasing the sweat lying below. The boys had again joined with the larger club and staked out a spot on the main foot path in the park. Hambone and Baaron were stringing their wire antenna in the trees when a large truck with university markings arrived.

“Where do you want the tanks?” said Icky as he skillfully maneuvered a small electric fork lift out of the back of the truck and onto the path. “They should be in the shade.”

“How about here on this little hill?” asked Dude motioning to a somewhat flat spot near the walkway. The grass was kind of long and the ground a bit lumpy, but it was in the shade.

“Fine,” said Icky sliding the first aquarium and its stand off the forks and onto the exact place Dude indicated. Unfortunately, the spot wasn’t flat enough and the tank started to lean and sink into the dirt. Seeing the problem, Dude reached for the tank.

“Careful, Dude! Don’t put your hand in there!” Shouted Icky as he expertly used the forklift to straighten the aquarium and stand onto a more solid spot on the uneven ground.

“Eeew, that is one ugly and creepy fish,” exclaimed Dude as he got his first good look at the eel looking back at him through the glass wall of the tank.

“I bet he thinks the same about you,” said Icky. “I think they are amazing and beautiful creatures. They are fish, yet they breathe air. They are able to use electricity to find their way through muddy water, catch prey and even defend themselves. No other animal has their abilities. I think they’re great!”

Icky and Dude set up the remaining three tanks in a row right next to each other. Icky provided a banner identifying the university as the donor and describing the fish. Hambone thought the banner was a bit much, but let it go. After all, without Icky’s help, they’d have nothing.

“One last thing, Dude. Here’s their food,” said Icky as he handed a

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from HAMBONE on page 6

large can of worms. “In the wild they eat frogs and fish, but these guys really like worms. You can give them all they can eat, which is quite a lot.”

“Gee, a real can of worms! Thanks.”

Tim appeared and brought the power supply – or I should say, supplies – to capture the eels’ power. To no one’s surprise, Tim had gone overboard in the design. He made a separate supply and electrode for each tank and had them all feed into a central rechargeable battery. He also included sensors and monitors to indicate which eel had been ‘discharged’ last and how much voltage, current, energy and charge it provided. He also monitored tank water temperature and each eel’s feeding times.

Tim explained, in too much detail, that the power supplies each had two stages. The first was a large capacitor to capture the brief, but intense impulses from the eels. The second was a very efficient switching step-down converter to take the energy from the capacitor and use it to charge the central battery. The battery then supplied smooth power to the QRP rig. The result was a lot of wires running around, but in the end, no one was surprised when everything worked perfectly. Even the fish seemed to be happy. But, that might have been partially due to the steady supply of worms Dude was providing.

The FD site looked chaotic with dozens of hams all over the grounds setting up their tents, stringing wire antennas tuning radios and positioning porta-potties. But by

the official Field Day start time the tents were erected, the antennas strung, the batteries charged, the eels fed and Hambone was tapping out “CQ FD” with one full watt of fish-provided CW power. Yet, I couldn’t help but notice that someone had placed a gas-powered generator and a red plastic fuel can near the battery. Not everyone believed in fish power.

By midafternoon, the sun was weighing in with 93 degrees on the Fahrenheit scale. Dill, a senior club member and official FD visitor guide, was carefully explaining to a group of visitors how voice and data stations worked and the visitors nodded in polite interest. But what they really wanted to see was the eels. Dill didn’t disappoint.

With an abundance of dramatic showmanship, Dill explained how the eels’ home is the muddy bottom of the Amazon River deep in the jungles of South America. While the visitors tapped on the tanks and stared at the eels staring back, Dill explained how the eels used electricity to search out and electrocute their prey. As a grand finale, Dill fed the eels.

Actually, he let the kids in the crowd throw a worm or two into each tank. Sensing the need for a good show, the eels grabbed and electrocuted the worms and ate them. Dill’s audience went wild. The excitement was electric (pun intended) and spread throughout the park.

Meanwhile in the nearby tent, Hambone tried to explain the QRP radio and how CW worked and how he was making contacts with other hams all over the United States with only the power of a flashlight. But he only got an occasional polite

nod. After all, a few noisy beeps from a tiny radio can’t compete with wild electric fish killing and eating worms.

Dill had his spiel down pat as he amazed each group visitors and then smoothly and efficiently moved them along. That is, until one particular group arrived.

It was a small group. Just a young dad and mom, their two small boys – Michael, eight years old and Dalton, ten - and their half-grown German shepherd pup, Spaetzle, that they called ‘Spot’, for short. The open picnic-like feeling of a sunny day in the park encouraged the boys and their dog to run excitedly from one station to another but, never straying far from their parents. Until they spotted the fish.

With a speed far in excess of that attainable by any adult, the two boys and their dog descended upon the nearest tank. Neither the boys nor the dog had ever seen anything like eels and wanted to see more. They shouted and knocked on the tank pushing each other aside to get a better view. The eel in that particular tank also moved around, to get a better view.

Although the dog was still a pup, on his hind legs he was tall enough to easily reach the top of the tank and knock the cover off, which he did. Ignoring Dill’s warning shouts, the dog playfully put his right front paw deep in the water, apparently trying to touch the eel. Maybe Dill should have shouted in German.

Anxious to please, the eel came up out of the water to meet the dog. Placing its chin on the dog’s chest, the eel did what it does best. From

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the dog's mouth came a deep, primal cry of fear and pain that paralyzed all activity as it echoed across the park.

Convulsions rippled through the dog's body causing his legs to stiffen and thrust uncontrollably and push over the tank. Terrified, the boys ran for their lives. Dill, trying to control the situation, warned the screaming bystanders not to touch the eel that was writhing in the fifty gallons of water now flowing over the ground.

At this point, two design flaws became evident. The first was that the tanks were placed too close together so when one fell over, it knocked its neighbor over. In a few seconds all four tanks were on their sides with 200 gallons of water and four angry electric eels sloshing down the foot path towards the group of terrified visitors.

Hearing the pandemonium, Icky burst out of his truck to see what was happening. He went to gather up the eels but was stopped by the fire.

Yes, fire. The second design flaw was that the wires connecting the tanks and batteries were run, unprotected, under the tanks. When the heavy steel stands (remember, each tank weighs about 400 pounds) fell over, their sharp edges cut into the wires causing short circuits and sparks. That would not have been a problem, what with 200 gallons of water gushing all over the place, were it not for one more unforeseen event involving the portable generator's red plastic fuel can. It appears that baking all day in the hot sun had caused the fuel can to develop a small leak along the seam where the two halves joined together. No one noticed it, but a tiny trickle of gasoline had been working its way down the hill and pooling under the fish tanks.

To everyone's astonishment, the water seemed to burst into flame. Some claimed the eels did it with their special powers, but it was really the electrical sparks igniting the gasoline now floating on top of and moving with the spilled water. The fire quickly spread to the grass and, in a few minutes, the entire area was ablaze.

The Field Day crew was prepared for just such an occurrence and many hands with fire extinguishers appeared and doused the fire. The dog recovered and was cowering behind the boys and their dad. Unfortunately, the eels did not survive.

Coincidentally, the dinner that evening was fish tacos.

Author's note: There is no record of this event nor will you find anyone willing to speak of it. What happens in Field Day stays in Field Day.

>> JCRAC FEEDBACK <<

The Inside Story

Restoring a 1966 Magnavox Stereo Console - Tom Wheeler, NØGSG

Modern electronic items are pretty much disposable -- unless they're something expensive or irreplaceable. Things I see tend to fall into these categories - either it's expensive, or has special meaning to the owner (such as Grandma's stereo).

As you know, I like fixing things, and I suspect that many of you do as well. It's very interesting to look inside equipment to better understand how it works, and many of us aspire to build an ultimate station, or become "fixers" ourselves. These "Inside Story" articles will give everyone a peek

inside equipment I work on, both old and new. Our goal is to get a better appreciation for the science and art of the engineering in each product, and maybe make those "block diagrams" you studied for to pass your ham exam a little more meaningful.

Last month I picked up a 1966 Magnavox Stereo console at an estate sale. This actually was "Grandma's Stereo." The owner was a very nice senior lady who was downsizing. The set had broken some time ago and had



been relegated to the basement to rust away in peace.

The first high-fidelity equipment widely available to consumers was sold in the late 1940s. This early hi-fi gear tended to be either very expensive (such as the equipment built by McIntosh Laboratories), or very cheaply made. There was no middle ground -- hi-fi nirvana was an expensive destination in those early years.

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American brands such as RCA, Zenith, Realistic, Magnavox, and others rushed to fill that void after World War II, effectively launching the hi-fi craze in the United States. There would be a chicken in every pot, a car in every garage, and a stereo



in almost every middle-class living room. These middle-tier American sets were not inexpensive. The 1966 Magnavox pictured in Figure 1 cost about \$350 in 1966 funds -- about the same price as an average used car. That \$350 is equivalent to \$2,700 in today's dollars.

Each of the major American brands has a cult-like following. I've restored sets of every type, and have found that each brand has its own particular strengths and weaknesses. Magnavox stereos tend to sound good and live a long life for four reasons:

(1) Magnavox was a leader in aerospace electronics. As such, it shared its high-technology manufacturing methods from its military and aerospace lines with its consumer electronics products. Magnavox was among the first to employ printed circuit boards, custom thick-film integrated circuits, transistorized construction, and other other cutting-edge technologies in its hi-fi consoles.

(2) Magnavox designed their units very conservatively. They employed oversized heatsinks on power

Figure 1: The Magnavox Magically Appeared in my Shop.

transistors, well-spaced components to minimize heat build-up, heavy-gage metal chassis, and high-quality switchgear. These construction techniques have stood the test of time.

(3) Magnavox developed long-term relationships with third-party suppliers for components critical to reliability and performance. For example, every Magnavox console features a record changer made by Collaro in England. While Collaro changers were not high-end units, they were well-designed and as reliable as sunrise. Magnavox had similar relationships with Electro Voice and Astatic for supplying the ceramic phonograph cartridges used in most units.

(4) Magnavox was an early adopter of vertical integration. The company employed separate divisions to produce loudspeakers, thick-film integrated circuits, and other critical components. The use of in-house components allowed Magnavox to precisely specify the design of each part, as well as enact strong quality controls.

What's Inside?

Back in the day, consumer electronics was put together with screws. Consumers could easily peek inside a unit by simply removing the screws and lifting off the back cover. In fact, manufacturers *expected* consumers to open up units to replace vacuum tubes. With the advent of solid-state electronics, manufacturers stamped the warning "no user-serviceable parts inside" on rear panels to discourage owners from getting inside. This was with very good reason. Unlike tube equipment, transistorized gear is very unforgiving of mistakes inflicted by a misguided screwdriver.

Figure 2 (on the next page) shows the inside works of a typical 1966 Magnavox console. Most of the interior of the unit is empty space. All of the works are readily accessible, with the exception of dial lamps, which require removal of the chassis for replacement.

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Everything is clearly visible in these consoles, from the works of the record changer to the amplifier chassis and loudspeakers.

Service Data

It's always a good idea to have a schematic diagram in hand when you're going to explore something electronic.

Magnavox tended to be fairly secretive about technical information for their equipment. Typically only dealers and Magnavox-approved service centers had access to schematics. Howard W. Sams was a company specializing in service manuals for electronic gear. You may be able to find a Sams "Photofact" manual for your unit--often there are vendors on eBay who resell these. Finally, a Google search of the Magnavox model number on the rear of the unit may prove helpful. Be prepared to assemble your electronic data from multiple sources.

Fortunately, Magnavox tended to stick with core electronic designs that worked well. This means that although there were many cabinet styles and options offered by Magnavox, the inside works tended to be similar between models and model years, at least up to about 1972.

Dirt is the Enemy

Figure 3 shows the amplifier chassis on the bench. Yes, that's a thick layer of crust covering the dial

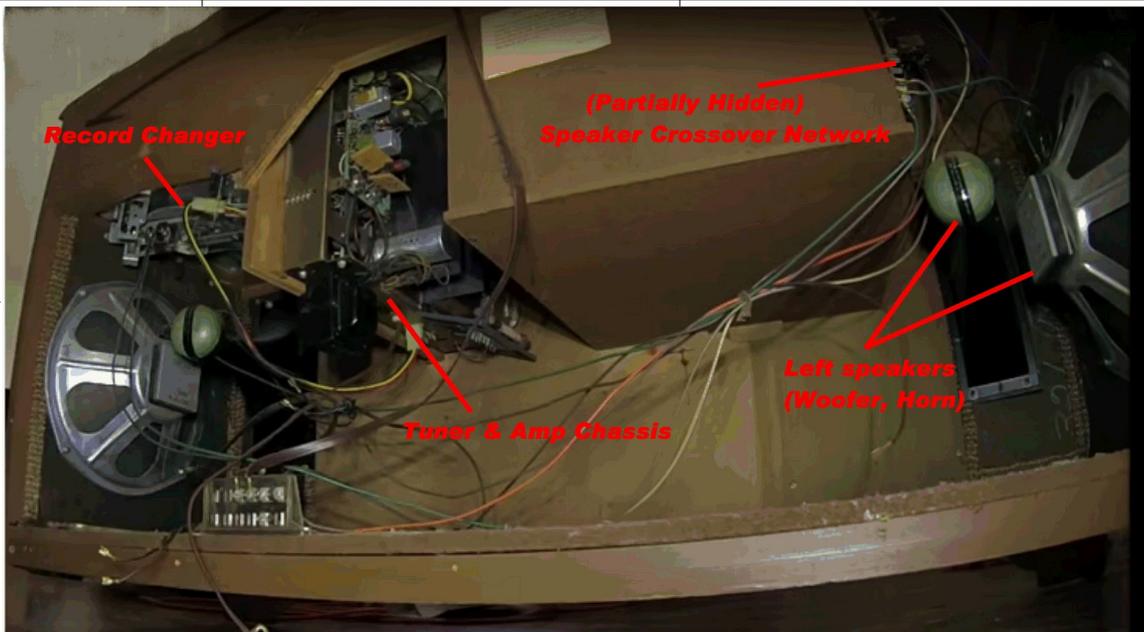


Figure 2: Inside a Magnavox Console

glass. (No, you don't want to know what's in that coating--but it did take 53 years of human companionship to accumulate it.) Although printed circuitry is used, there is a great deal of point-to-point wiring connecting the boards, controls, and input-output

terminals. The point-to-point wiring was done by hand on the production line, usually by women. Women in general were found to have better fine dexterity and patience than men, so they were often chosen for this kind of work.

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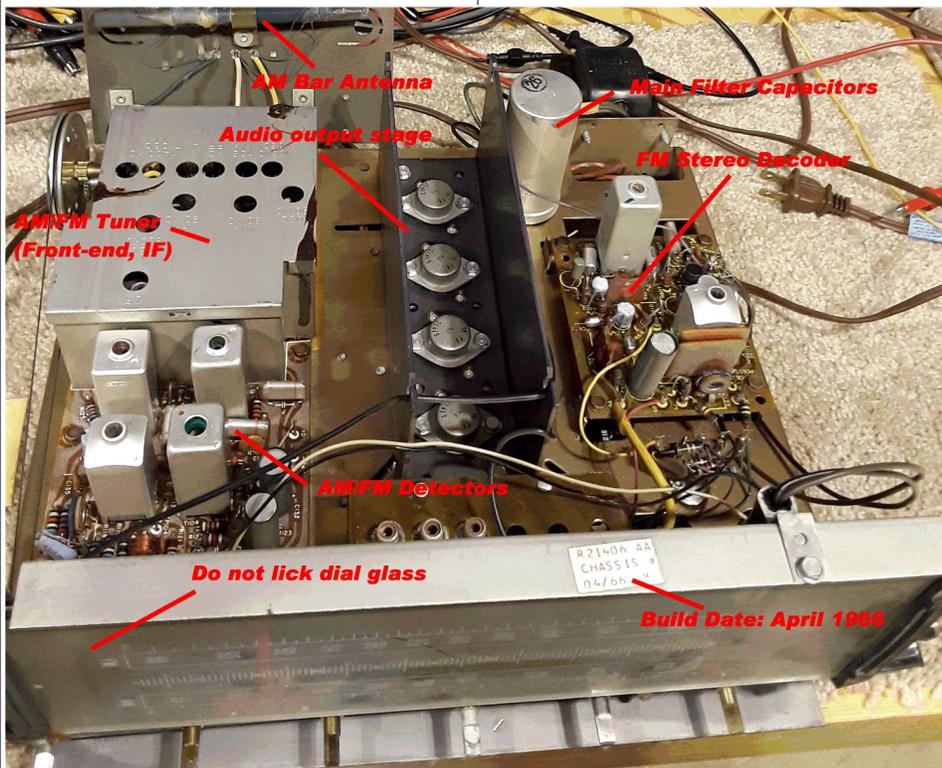


Figure 3: Top View of Amplifier Chassis

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Figure 4 shows the underside of this chassis. There is a great deal more point-to-point wiring, as well as many components hung on terminal strips. Remember that in the 1960s, printed circuitry was a new development, and many components didn't yet exist to take advantage of this construction style.

Fixing Things Up

This Magnavox console needed very little actual electronic repair--a testament to its original build quality. The following were the major items addressed:

Record Changer: Completely clean (removing old lubricants) and lubricate the unit. The only adjustments needed were change cycle lift height and set-down point. The idler tire was freshened by removing about 0.020" of material using a sanding block. The Electro Voice 275 pickup cartridge was damaged and replaced with a unit from "new old stock." (These cartridges are no longer manufactured, so replacements must come from cadaver donors.)

Amplifier Chassis: All the controls were cleaned with DeoxIT. No capacitors were replaced, as all the large electrolytics were still within specifications. Yes, even after 53 years, the electrolytic capacitors

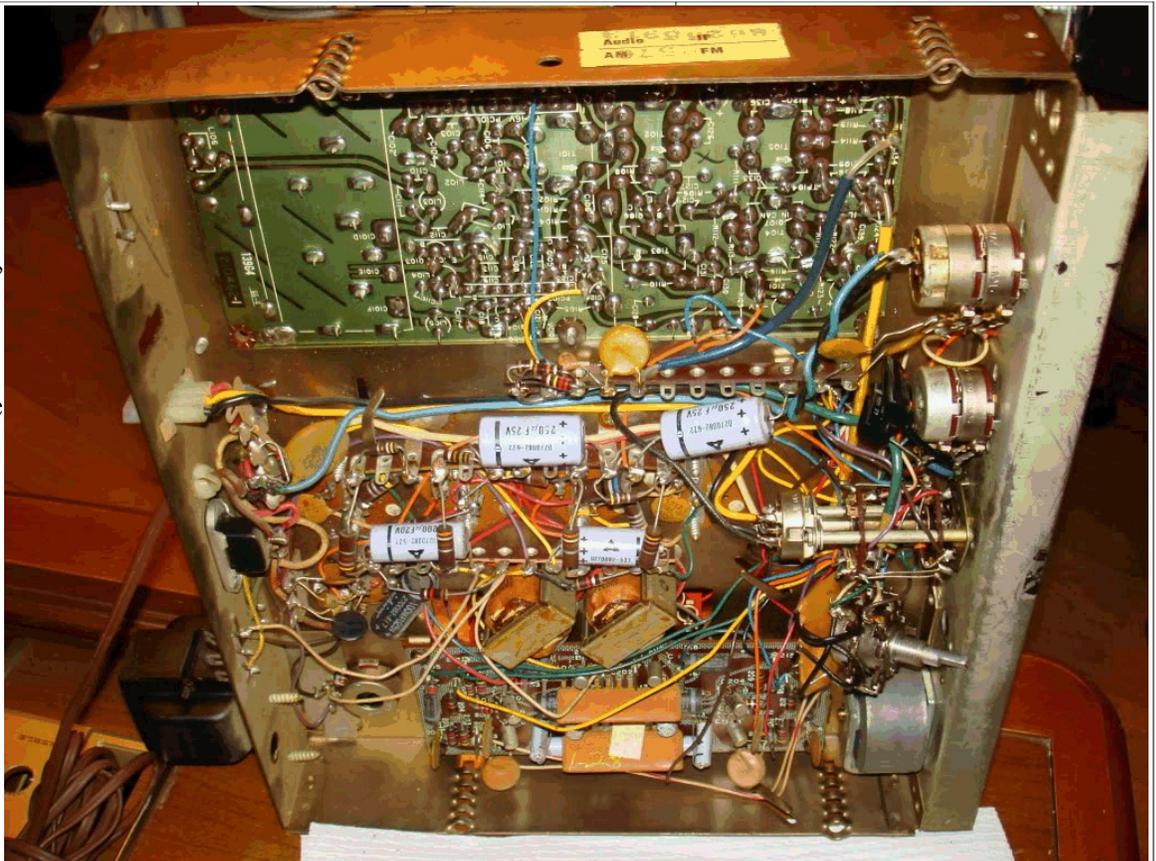


Figure 4: Bottom View of Amplifier Chassis

were fine. The power amplifier was still well within factory specifications, delivering a solid 9 watts per channel with very low distortion. The tuner required no realignment at all, which is very unusual in a unit this old. The dial glass was removed and carefully cleaned with mild dishwashing solution and warm water.

Pilot and Dial Lights: All the pilot lights were burnt out; I replaced them with LED equivalents to give the unit a fresh, sharp appearance. (The original sockets and wiring for the #47 light bulbs were left intact in the event that a future owner wishes to revert back to the legacy lighting scheme. In restoring any vintage set, you should always make it easy for someone to put things back exactly as built at the factory, if desired.) I chose blue

LEDs for the dial, and amber for the tuning meter (which had no separate lamp of its own). The Stereo indicator was originally a white light bulb, which I switched out for a red LED. The result is quite pleasing as shown (on the next page) in Figure 5.

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The details of the blue LED installation are shown in Figure 6. I used LED "fuse lamps" which are lamps intended for replacement in 1970s-vintage receivers. LED fuse lamps come in many colors (including soft white) and work on both AC and DC, handy because the lamps in this Magnavox operate from 6 volts AC. A separate harness was constructed to connect up the LED fuse lamps, and the lamps were simply hot-glued in place, then taped over to prevent light leaks. In the future, this installation can easily be reversed with no harm done to the unit.



Figure 5: New Color Scheme for the Tuner

Knobs: The plastic knobs on older radios usually end up broken. Sometimes a broken knob ends up blowing up an amplifier. Figure 7

shows why. When the user breaks the knob, its collar develops a deep crack. The steel retainer spring next falls out, usually down into the amplifier where it shorts something if the user is really unlucky.

homemade repair to the knob, usually in the form of scotch tape around the collar and/or paper shims on the control shaft. This always fails; without the steel retainer in place, the knob will be perpetually loose and ends up cracking further as it spins on the control shaft.

see INSIDE on page 13

The user never notices that the little steel spring is gone, and proceeds to apply his or her own

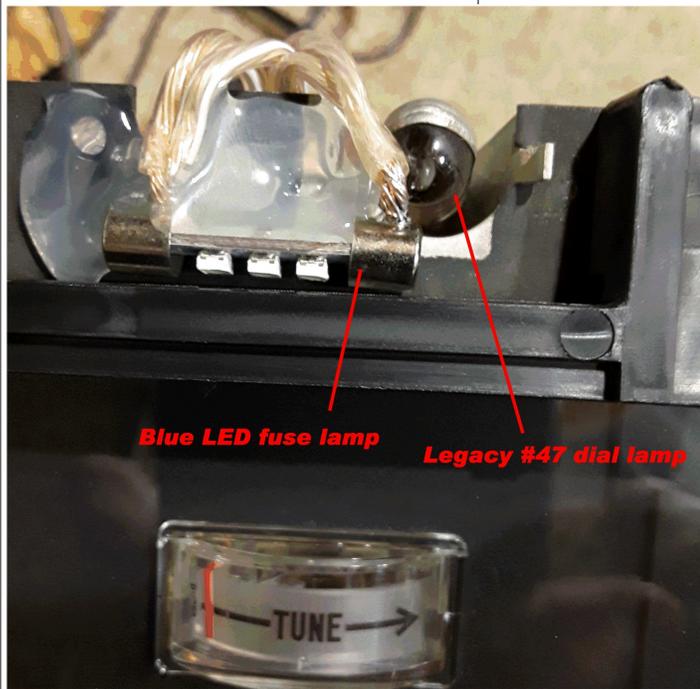


Figure 6: Blue LED Fuse Lamp Installation

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Broken knob collars are easily repaired. The collar is first tightly wrapped in 20-30 turns of 30 ga wire wrap. A small amount of JB-Weld epoxy is then pre-warmed and painted on. The epoxy wicks into the wire turns, forming a very rigid and durable support structure that's bonded to the plastic underneath. The wire turns give the assembly added tensile strength much like rebar does for concrete.

Conclusion

After a few evenings of work, this Magnavox console now looks and

sounds as it did when it was new. Is it up to modern standards for high-fidelity? Probably not quite, however, it's surprisingly good sounding and more than adequate for casual listening. The cabinetry is pretty and makes the set an attractive addition to most rooms. If you run across a unit like this and want to give restoration a try, get in touch with me and I'll be glad to help you on your way to vintage audio nirvana.

> JCRAC FEEDBACK <



Figure 7:
Busted and Repaired Control Knobs