



APRIL 2014

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FEEDBACK

JOHNSON COUNTY RADIO AMATEURS CLUB, Inc.

P.O. Box 93, Shawnee Mission, KS 66201

The Johnson County Radio Amateurs Club normally meets on the 2nd and 4th Fridays, 7:30 PM at the Overland Park Christian Church (north entrance), 7600 West 75th St. (75th and Conser Streets), west of the Fire Station.

PRESIDENT'S CORNER



March came in like a lion for sure. But with the windy conditions the last days of March, I'm not sure I would say it went out like a lamb. April and May are the months for severe weather in our area. It is im-

portant to keep the family safe so be sure to have a plan and check items such as batteries etc. I keep an old pair of shoes in my basement which also serves as my shelter. You need something on your feet to walk through debris.

The "Ham 101" clinic for newly licensed hams, organized by Herb, NZ0F, was well attended. The support for new Amateur Radio operators across the Kansas City Metro area by the numerous clubs is great to observe. The Amateur Radio community in the Kansas City area is very active and supportive.

The new controller for the 443.725 repeater has been received and Tom, N0GSG will be doing the programming. Once the programming is complete Bill, WA0CBW, and I am sure others, will schedule a date to install the controller. Weather should not be an issue as the repeater is housed indoors unlike the 2 Meter one.

The season for Public service events is here. Larry's list has already listed many events to volunteer for. There are several events hosted by the Shawnee Mission Parks and Rec. The Park really goes out of its way for our Field Day activities and deserves our support in return. Please look over the following dates and let Mike Bellinger know which one you can volunteer for.

Bill, KA2FNK, President

From Mike Bellinger –

Again this year I am asking if the Johnson County Radio Amateur Club would consider partnering with the Heart of America Radio Club in providing communications support for the following Johnson County Parks and Recreation District triathlons:

Saturday, May 10 – HP3 (5K, 10K, Duathlon) – Heritage Park, Olathe, KS (7:30am)

Sunday, June 15 – Kansas City Corporate Challenge Du/Tri – Shawnee Mission Park, Shawnee Mission, KS (7:00am)

Sunday, July 13 – UCP Shawnee Mission Triathlon – Shawnee Mission Park, Shawnee Mission, KS (7:00am)

Saturday, September 13 – Olathe Medical Center Women's Triathlon – Kill Creek Park, Olathe, KS (8:00am)

(ed. Contact Mike - mmbelling@aol.com)

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BIRTHDAYS

When you get a chance, say "Happy Birthday" to the club member(s) listed below. If your birthday is not listed there, it was not listed in www.grz.com/. But, you can email us the month and day (we don't publish the year!). We will add it to the list.

APRIL

29 Richard Willis, KØKUD



THIS MONTH'S MEETING SCHEDULE

Friday, April 11, 2014 7:30 pm

The program for this evening will be about JT65 a digital mode by Lon Martin, W0WJ.

Friday, April 25, 2014 7:30 pm

Program: Radio control UAVs. The American Model Association is now requiring these operators to have a ham license - by Ron Carson, KD0ZOY. Note - This program will precede the meeting to take advantage of the outdoor light.

Annex Meeting

Generally a post-meeting occurs after each club meeting. Typically this starts about 8:45pm at The Pizza Shoppe, 8915 Santa Fe Dr., Overland Park, KS 66212. A pizza buffet is served including a drink - approx. \$8.20 plus tax. Their regular menu is available and also garden salads in two sizes. All are welcome.



April						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JCRAC CLUB DUES

Remember, you have an option now on JCRAC dues; save with \$40 for TWO YEARS, as compared to the regular rate of \$24 per year. Your grandchild under the age of 18 qualifies as a member of the family for membership purposes. Dues should be received by the end of your subscription month.

Active members receive a copy of the *FEEDBACK*. Is your club membership dormant? Contact Cal, the Treasurer to bring it up to date or this can be done online - see the club website.

WHEATSHOCKER / 10M / ARES NETS

Weekly Nets

The Wheatshocker Nets are called on:

Wednesday evenings, 8 pm on 443.725 (+) PL 151.4

Thursday evenings, 8 pm on 145.29 (-) PL 151.4

10 Meter USB

On Thursday, there is usually a "round-table get-together" on or about 9:00 P.M. using 28.475 MHz USB - after the Wheatshocker Net.

ARES Net

The Amateur Radio Emergency Services (ARES) net is also called on 145.29 at 7:00 pm local, weekly on Tuesday.

NAME BADGES - W0ERH PATCHES

Name Badges

Name badges with your name, call letters, and QTH; top quality, engraved in a wide range of colors.

Contact Jim McCoy "Mac", W0LQV at 913-648-4406 or jmsmccoy85@gmail.com.

W0ERH Patches

For sale, 4" diameter multi-colored embroidered patches, with the W0ERH call sign, for sale at \$3.00 ea. This will give the club a small profit on each patch.

Contact Cal Lewandowski, KC0CL at 913-961-2175 or clewando@gmail.com.

LICENSE TESTING

Testing takes place on the third Saturday of each month, at 9:00 am at the Johnson County Public Library Blue Valley Branch, 9000 West 151st St., Overland Park, KS - just west of Antioch on north side of 151st St.

There is a \$14 fee. Pre-registration is NOT required. Walk-ins are welcome!

For more information contact Jim Lee, N0KCB 913-745-5121 or e-mail: JimLee@kc.rr.com. Commercial Radio Tests are also available.

QUARTER CENTURY WIRELESS ASSOCIATION

Come enjoy lunch with other hams. The lunch location has been updated on both the National and the Chapter 35 QCWA webpages. The icon on the local page is also a link to RC's webpage.

Local web site: www.qsl.net/qcwa35/.

National web site: www.qcwa.org/events.php.

Remember, ALL hams are invited to join with the Chapter 35 folks on Thursday, 1100 CDT, RC's, Martin City, MO. Mid-Continent Chapter 35 serves the Metro KC area in both Kansas and Missouri. Ron Wood, K0BRO is President and JCRAC club member George Yantis, K0GY is Chapter 35 Secretary and Treasurer.

Starting in January 2013 QCWA publications will be online only as one means of reducing costs. More information on QCWA and Mid-Continent Chapter events can be found at www.qcwa.org/.

ENSOR PARK AND MUSEUM

If you can visit the Ensor Park and Museum, just 5 minutes South of central Olathe but haven't, do it now and see a most interesting and original flashback to the mid-1900's. Our motto "SEE IT TO BELIEVE IT" is true.



A site map, with Ensor GPS coordinates, and much more can be seen on the website at www.w9bsp-w9ua.org/.

Larry Woodworth, W0HXS, Ensor Park and Museum Manager

Meeting Date: Friday, March 14, 2014

The meeting started at 7:30 pm.

Attendance:

Self introduction was with name and call sign. The check-in sheet had 37 signatures. This was followed by the Pledge of Allegiance. The Minutes from February 28, 2014 were read and accepted with 1 opposed vote.

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

Treasurer's Report:

Cash on Hand	\$	126.05
Checking Account	\$	592.84
Savings Account	\$	8,344.82
Total	\$	9,063.71
Repeater Operating Reserve	\$	569.05
Memorial Fund	\$	150.00
Active Members		141

Old Business:

- Repeater Update – Both are doing fine. Tom Wheeler, N0GSG will be change over the new controller on the 2m Repeater to Central Daylight Time. The new controller for the 440 Repeater has arrived and Tom Wheeler, N0GSG will be programming this controller. Once programmed, it will be installed.
- Field Day 2014 – See Jay Greenough, KD0OYQ for more details and to volunteer.
- Lon Martin, K0WJ announced the date of the "Shoot Out" competition. Friday, June 13. The Frequency will be on 40 meters.

New Business:

- WW1USA Special Events Station at WW1 Museum. The Raytown Amateur Radio Club has volunteered to coordinate the June 28-29 Event. The Santa Fe Trail Amateur Radio Club has volunteered to coordinate the August 2-3 Event. And after discussion the Johnson County Radio Amateur Club has volunteered to coordinate the September 6-7. See Herb Fiddick, NZ0F if you are interested in coordinating the September event.
- Club Meeting on March 28, 2014 – Due to another activity at the church, our meeting that night will be in the Fireside Room. Please use the entrance on the East side of the Church as the North Entrance will be locked.

Reports:

6m	NR	
440 Wheatshocker	17	March 5
	22	March 12
2m Wheatshocker	24	March 6
	22	March 13
10m USB Roundtable	0	March 6
	5	March 13
HF Activity		
Several contacts with W1AW/0, W1AW/4, and W1AW/KH6. 10m band is open! Netherlands on 10m PSK31. Russian DX contest this weekend. Russia, Ukraine, and Barbados on JT65..		

Announcements:

- Ham 101 Class – March 20 at Christ Church 91st and Nall. See Herb Fiddick, NZ0F for details.

Business meeting adjourned at 7:50 pm.

Program:

The program was a presentation on "Solar Weather" by Julie Adolphson (KC0ZIQ) Meteorologist in Charge, Pleasant Hill.

Submitted by Ted Knapp, NØTEK, Secretary.

Meeting Date: Friday, March 28, 2014

The meeting started at 7:30 pm.

Attendance:

Self introduction was with name and call sign. The check-in sheet had 45 signatures. This was followed by the Pledge of Allegiance. The Minutes from March 14, 2014 were read and accepted with 1 opposed vote.

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

Treasurer's Report:

Cash on Hand	\$	126.05
Checking Account	\$	420.81
Savings Account	\$	8,344.82
Total	\$	8,891.68
Repeater Operating Reserve	\$	575.05
Memorial Fund	\$	150.00
Active Members		141

Old Business:

- Repeater Update – Both are doing fine.
- Website Update – Doing fine.
- Field Day – Bill Warrington, KC4TKL and Bill Gery, KA2FNK will be working sometime next month to setup and test the logging network. Last year we had some issues and want to eliminate these prior to Field Day this year.
- Ensor Auction – We were able to recently sell one of the cabinets leftover from last year's auction. Plenty more are available.
- The Johnson County Parks and Recreation Department will have some special events this summer that need some Ham Radio assistance. The list will be published in the Feedback.
- Feedback – Due to be emailed out around Wednesday the week of March 31, 2014.

New Business:

- Ham 101 – 73 people attended with 23 of them being new Hams (less than 1 year). More Ham 101 classes are planned for Wyandotte County, Ararat Shrine Hambash, and Raytown ARC.
- Dennis baker, KE0QM has 75 amp Anderson Power Poles and Ferrite Cores for sale.
- On display was an Alexloop Magnetic Loop QRP Antenna. See David McLemore, KK4MHI.
- Eddy Paul, KY0F showed us his DXCC certificate. Congratulations Eddy!

Reports:

6m	NR	
440 Wheatshocker	20	March 19
	21	March 26
Special Net	23	March 20 Ham 101 Cls
2m Wheatshocker	19	March 20
	19	March 27
10m USB Roundtable	8	March 21
	0	March 27

HF Activity

CQ World Wide WPX Contest this weekend, 10m band is still open! Brazil on 10m, Russia and Argentina on 20m, Japan and Tanzania, Aland Islands (Swedish pronunciation: ' o? land). San Andres Island (off the coast of Nicaragua), Argentina on 12m PSK31, Mexico, South Korea, Central Russia on 10m, Estonia on 12m, China, Germany, Spain, France with the Alexloop Magnetic Loop QRP Antenna.

Announcements:

- The program for the 1st meeting in April will be on JT65 and the program for the 2nd meeting in April will be Radio Control FPV.

Business meeting adjourned at 8:00 pm.

Program:

The program was a presentation on Tesla Coils by Austin Feathers (KDOYDX).

Submitted by Ted Knapp, NØTEK, Secretary.

LARRY'S LIST



Larry Staples, WØAIB compiles, and makes available by e-mail, a list of Hamfests and Public Service Events in the metro Kansas City area. Please let WØAIB know of any ham-type events, with confirmed dates, scheduled to be held in the metro area in 2014.

Be sure to subscribe to Larry's List for "up-to-the-minute" messages on many ham-related subjects! Contact lstaples@kc.rr.com.

In addition to his emails, there is a website that lists the scheduled events such as Hamfests and Public Service Events. See www.larryslist.info.

HAMFESTS

April 19

Shrine Amateur Radio Club - Hambash - 2014

5100 Ararat Drive
Kansas City, MO 64101
<http://www.hambash.com>

May 16-18

DAYTON Hamvention

Dayton, OH
<http://www.hamvention.org/>

PUBLIC SERVICE EVENTS

Apr 5	MS Walk - Kansas City
Apr 26	The Olathe (Garmin) Marathon
May 3	Blue Creek Bike Bash
May 4	March For Babies
May 10	Jack and Coke Ride
May 10	5K, 10K, Duathlon-Heritage Park, Olathe, KS
May 25	Lone Star Century Bike Ride
Jun 6-7	Hospital Hill Run 2014
Jun 8	ADA Tour de Cure (aka Wheel to Weston)
Jun 8	Joel's Ride - "Wheels for Meals"
Jun 14	Run The Good Race
Jun 15	Ride The Fountains Bike Ride
Jun 15	Kansas City Corporate Challenge Du/Tri
Jul 12	Lenexa Moonlight Bike Ride
Jul 13	UCP Shawnee Mission Triathlon
Jul 27	Cider Mill Century Bike Ride
Aug 10	Midwest Meltdown
Aug 17	Jackson County Triathlon
Aug 24	Summer Breeze Bike Ride
Sep 01	Bike for the Brain Ride
Sep 13-14	MS-Ride
Sep 13	Olathe Medical Center Women's Triathlon
Sep 21	Bikers for Babies
Oct 31	Scare-IT - Halloween

EDITOR'S NOTE

The *FEEDBACK* is published monthly for the JCRAC active membership and delivered by email. Opinions expressed herein are not necessarily those of the club or the officers.

News items and articles for the *FEEDBACK* should be in the Editor's possession by the last week of each month for publication the following month.

Hard copy versions of the *FEEDBACK* are available by special request only (one to a household). These will be printed in B&W and be mailed shortly after the online version becomes available.

A good publication starts with plenty of material. And much of that comes, or should come, from members like you. Feel free to share news. This can be anywhere from one line news items to full articles. Let's make it easy - just email these items to the editor.

Steven, KØSLM

TIDBITS

• **CW - Speed of 200 wpm Cracked!** In a special RufzXP competition at the IARU High Speed Telegraphy World Championships seven competitors attempted to crack speed 1000 cpm (200 wpm). Even two of them finally did it! And two more copied call signs with only one character wrong. See this link: <http://www.rufzxp.net/speed1000.htm>

"Duct tape is like the force. There is a light side and a dark side and it holds the universe together."
<http://fotobooth.smugmug.com/HamRadio/Hamfest-in-Belton-Mo-102012/i-PDmj3vF>



Tesla Coil Demonstration - March 28, 2014
Austin Feathers, KD0YDX

I normally operate out of Overland Park, but I am here at our other home in Venice, Florida. The new house is in an HOA antenna restricted area. Since I had to use a stealth antenna, a MFJ-1786 Super Hi-Q Magnet Loop Antenna (ed. 10 through 30 MHz) was chosen. I wanted to be able to rotate the antenna to configure the best pattern. The available space above the garage has confined space in which to accommodate the 36 inch circular loop, due to the low angle of the truss supporting the roof. All I needed was a 90 degree sweep from side to side before striking a truss.

I found a low cost solution by mounting the MFJ-1786 on an 18 inch x 1 inch wooden circle found at the one of the two major hardware stores. The back support plate is a piece of sheet aluminum bent at 90 degrees with holes drilled to match the four mounting bolts located on the antenna. The other side is supported by a piece of scrap wood found at a new house construction site. The scrap wood piece is narrow enough to fit under the coax connection on the antenna. Molding trim is a good choice.

The garage ceiling has a pull down spring-loaded swing ladder for easy access to the narrow crawl space above the garage. The antenna is placed on cross timbers so that it will rotate in the desired direction. There was no need to install any electric remote rotor. Manually turning to any desired direction can be done easily.

The antenna is now situated at 10 feet above the garage floor with the coax neatly installed and passed through to the operating position in my office some 20 feet from the MFJ-1786. I have printed a compass face and posted it on the floor above the garage ceiling near the antenna so that transmission hot spots can be marked and recorded for later use. I used the compass App from my iPhone to set magnet North on my paper plotter.

Thus far I have been able to work Central America, Canada, West Coast, East Coast and Midwest with the newly installed stealth antenna. The cost of my "Lazy Susan" rotator is about \$10.00.

The nice part of the whole installation is that the antenna can be disconnected from the coax and moved in about one minute should portable operations such as a field day or camping come into play. The antenna is easily transported in my SUV and can be set on any flat, level surface of any height, be it a picnic table or perhaps on deck of a high rise condominium.

More, if not most housing developments with HOA's restrict antennas. If a Ham is in that kind of situation, the magnetic loop antenna is a possible solution for keeping a Ham on the air.

Dave Little, KDØCTC
Overland Park, KS - and now KDØCTC/4 Venice, Florida



-End-

HF Shootout Tutorial

Lon Martin, KØWJ

If you have been to any of the recent JCRAC meetings, you've heard mention of an upcoming HF Mobile Shootout. Let me provide some clarification and describe exactly what will happen at 6:00 PM on June 13th just before our regularly scheduled meeting.

First of all, I want to make a distinction between an Antenna Shootout and what we will be doing, a Mobile Shootout. An Antenna Shootout is a measuring event to compare one antenna to other antennas on a level playing field. Obviously, everyone in the club drives different vehicles, the installation of each person's antenna did not follow the same guidelines, the individual vehicles were or were not well bonded, so I think you see my point – there is no level playing field, hence the term Mobile Shootout. We WILL compare each person's mobile signal to all others.

The field behind the church, where we all park, will be the Test Range. At one end of the Test Range will be a marker that indicates to each participant where they will drive to and park for the duration of their own particular test. Once parked (you may leave your vehicle running or not) and oriented in any direction you like.

A Bird Watt Meter will be inserted between your mobile antenna and your transceiver. You will be asked to dial your power back to 20 watts as measured on the Bird Watt Meter. Once that is accomplished, you will be instructed to press the PTT button on your microphone (or how ever you wish to key your transmitter). A hand will go up indicating to the receive site coordinator that you are transmitting. When the hand goes down, you stop transmitting. This will be repeated two more times to ensure accuracy. Transmit duration will be around 3-4 seconds.

When this process is complete, the Bird Watt Meter will be removed and the next participant will drive to the line to repeat the procedure on his/her vehicle. At the receive site (approximately two wavelengths away or 260 feet) will be a Rigol Spectrum Analyzer which will measure your received signal strength. Whoever ends up with the highest recorded signal strength will be declared the Top Gun for 2014 and receive a plaque to that effect.

Now for the rules:

1. Any street-legal vehicle may be used.
2. The total height at the top of your antenna may not exceed 13' 6" at its highest point.
3. Any Capacitance Hat may be used not to exceed 8 ft. in diameter.
4. Your entire antenna system must be road-worthy and capable of operating at highway speeds. If even ONE of the other participants questions its road-worthiness, a vote will be taken of all participants as to whether or not you will be allowed to test.
5. The frequency of operation will be 7.235 MHz. If this puts an undue strain on your particular installation, please let me know well in advance of the test. Please have your antenna tuned to this frequency BEFORE you show up at the club site. You will be given a short time frame to perform a final adjustment just prior to your test. Others in the parking lot will be asked to NOT transmit during someone else's test for obvious reasons.
6. You will need to know how to transmit an unmodulated carrier at the test power of 20 watts. If you don't know how to do this, someone at the site on the evening of the test can help you. The whole point of the Shootout is, primarily, to have fun. The major benefit to entering is to gain some insight into what it takes to maximize the efficiency of your mobile installation. If you have questions before, during or after the Shootout, please feel free to ask. You may also want to visit www.k0bg.com and peruse his website to gain some knowledge about mobile operations. In addition, this link

<https://www.dropbox.com/s/19ctoycdvy8rrs1/Mobile%20Installation%20Clinic%20-%20Notes.pdf>

is a presentation about HF Mobile Installation guidelines that I have developed. *[ed. Because of blank characters in this link, you may need to copy and paste this link to your browser.]*

Good luck to everyone. Let's have some fun.
Lon, KØWJ

-End-

NØGSG Adaptation of the Astatic D104 Microphone For Use with Solid-State Transceivers

Tom Wheeler, NØGSG
March, 2014

The Astatic D104 is a very popular microphone. Its mechanical design is considered classic, and it produces very high quality audio. It is a common sight at hamfests; used D104s are generally quite reasonably priced.

The original D104 microphone uses a ceramic element which has an output impedance of over 1 megohm. This is a natural match for tube-based transmitters, but a disaster for solid-state application. Connecting an original, unamplified D-104 to a modern transmitter with low input impedance (1k to 10k ohms, typically) results in on-air reports of distorted and/or tinny audio.

Astatic produced amplified versions of the D104 that are suited for solid-state application. These microphones work well, but also tend to produce a sharp, almost shrill transmitted audio quality with some radios, as Astatic did not pay much attention to the frequency response shape for these units.

The amplifier shown in Figure 1 will allow an unamplified D104 to be used with nearly any modern ham transceiver. As a bonus, this amplifier reshapes the frequency response of the microphone to be flatter and more pleasing to the ear than the original Astatic design. I've been using this microphone since 1996 with a Kenwood TS-940 transceiver, and the audio reports are universally positive

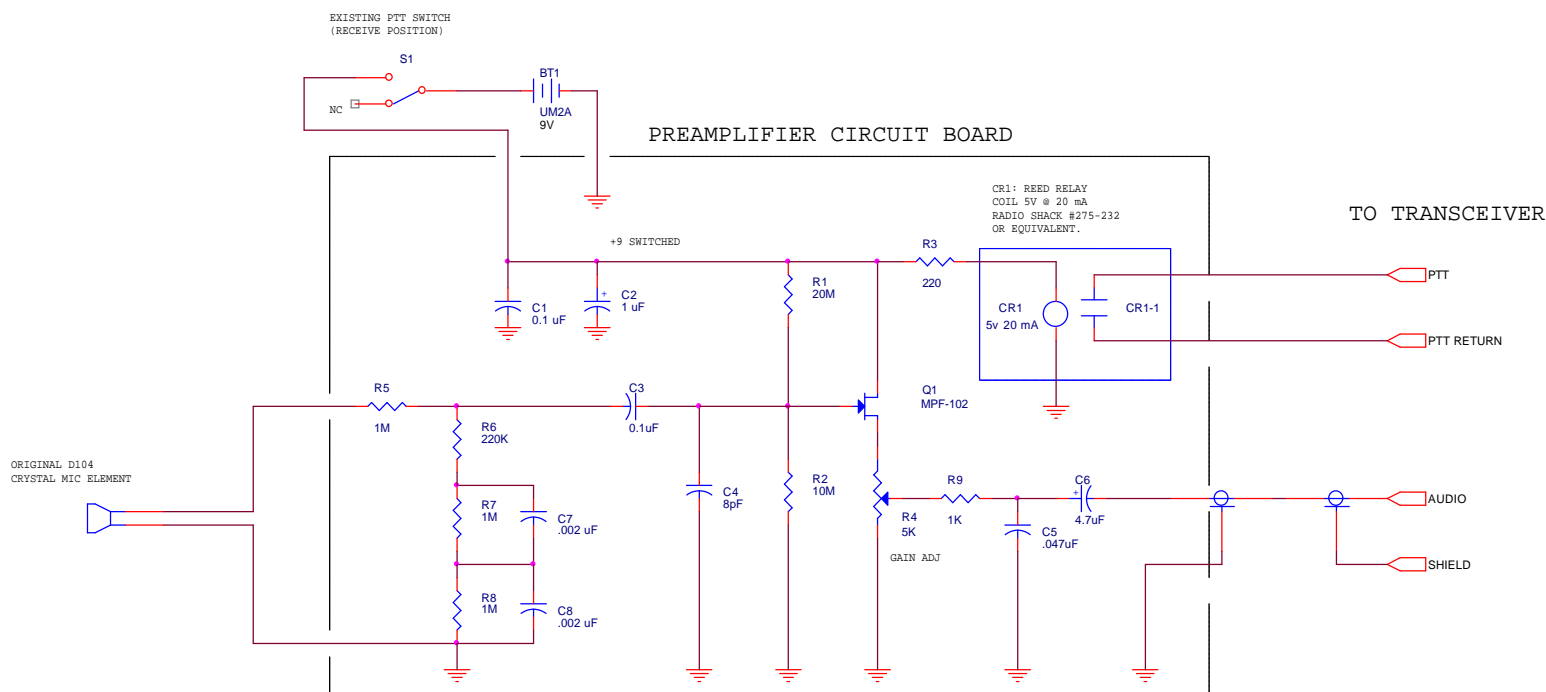


Figure 1: NØGSG D104 Amplifier Circuit

Circuit Analysis

The amplifier operates from a 9 volt transistor radio battery; it is switched on during transmit by switch S1, the push-to-talk switch in the base of the microphone. When S1 is closed, relay CR1 is also activated, which causes it to close its contacts, which will cause the transceiver to transmit. The relay isolates the PTT and microphone grounds, as required by most amateur transceivers. Many transceivers provide an 8 Volt output at the microphone jack that will operate the preamplifier, eliminating the need for the 9V battery. (If your particular microphone has an extra set of PTT contacts, you can dispense with relay CR1.)

The amplifier consists of Q1, an MPF-102 JFET in a source-follower configuration. For stable biasing, R1 and R2 form a voltage-divider for the gate; DC source bias flows through R4, the gain control.

Input signal from the microphone element is applied to the network consisting of R5, R6, R7, R8, C7, C8, C3, and C4. C3 is merely a DC block; applying DC voltage across a crystal microphone element is a no-no! The other components are a passive frequency equalizing or "shaping" filter that selectively boosts the lows (R5, R6, R7, R8, C7, and C8) and rolls off the highs (C4). C4 also provides additional RF interference resistance to reduce RF feedback problems.

The filtered signal passes into the gate of Q1, where it undergoes no voltage gain at all! Q1 merely serves to provide a buffering function, so that the low-impedance microphone input of a modern transceiver can be driven by the high-impedance crystal microphone element. No voltage gain is needed -- a crystal microphone element often produces ten times the output voltage of a comparable dynamic microphone, for the same sound pressure level. That's equivalent to a +20 dB voltage gain, which is obtained without the noise degradation that would occur in an amplifier with voltage gain.

After the signal leaves the source of Q1, it is divided down by R4, the gain control; it enters another filter, R9 and C5, for a final "tweaking" of the high frequency response. Finally, the DC is removed by C6 before the audio is sent to the radio.

Confessions of a Hi-Fi Addict

The filter design of this microphone is admittedly old-school (it was designed in 1995), and a bit unusual. The author's "method of madness" included modeling with PC-ECAP (a circuit simulator of the MS-DOS era), comparison of recorded audio from the microphone with several other microphones using several talkers and a studio grade tape recorder (Teac A2340S) to capture raw audio, and finally, on-air microphone signal comparisons (everyone sure has an opinion!) with three transceivers: A Kenwood TS-820, A Kenwood TS-120, and a Kenwood TS-940.

The talkers were instructed to identify each microphone as A, B, C, D, or E during the recording process. Listeners (who were a separate group from the talkers) then made their "favorite" choice from one of these options. The comparison microphones included a Kenwood MC-50 and MC-60, both well-respected units in their own right, an Adonis AM-303G, and a hand-mike (Kenwood MC-43S). The author did not participate in the ratings process, and the listeners did not know the coded assignments of the microphones (quasi-double-blind experimental design). Only one prototype unit was constructed, so unit-to-unit variations in quality were not observed.

Listeners of the raw tape recordings expressed a strong preference for the D104 design, with the Kenwood MC-60 coming in a close second. In on-the-air testing, other stations generally preferred the D104 and Kenwood MC-60 microphones (many could not tell the difference between the two units).

Construction

The amplifier is easily built onto a small piece of perfboard (Figure 2). The author was able to anchor the perfboard to the base of the microphone by "borrowing" one of the bolt positions used by the microphone's terminal strip. The 9V battery and amplifier will easily fit into the microphone base. Secure the 9V battery by wrapping it in a piece of foam rubber. When replacing the microphone base plate, make sure that nothing gets shorted. Figure 2 shows the author's layout within the microphone base.

Use care when wiring the cord and connector; most transceivers provide a diagram in their owner's manual that describe how to do this.

Checkout

Before connecting the microphone to a transceiver, check to see if the amplifier is working. With the PTT button released, measure the voltage at the positive side of C2. It should read 0V. Using an

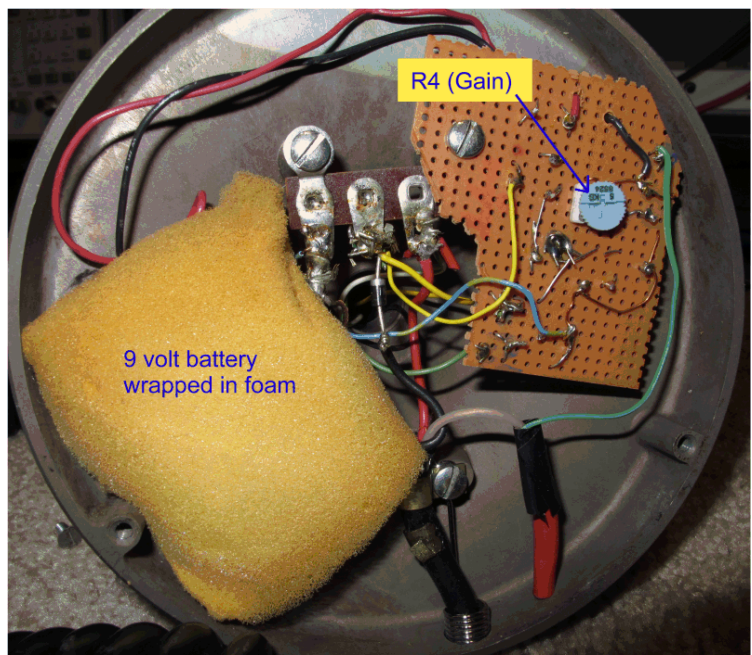


Figure 2: Layout of Components in the Base of the Microphone

ohmmeter, measure across the contacts of CR1; they should measure open-circuit.

Press PTT and again measure the voltage at C2's positive terminal. It should now read 9V. To check on the health of Q1, measure its SOURCE terminal (junction at R4). It should read 4 to 7 volts. CR1's contacts should also measure short (continuity) whenever PTT is depressed.

If these check OK, the amplifier is probably working fine, and the setup can be connected to a transceiver. Using a dummy load, adjust R4 for the desired sensitivity. *Be careful; setting R4 too high can overload the microphone amplifier in your radio, which will result in reports of distorted audio (even if the RF or ALC meters on the transmitter don't show excessive deflection).* A good way of setting R4 is to note the setting of the MICROPHONE GAIN control on your transceiver when using your current microphone; adjust R4 for similar performance with the D104 hooked up.

Troubleshooting

There isn't much to go wrong with this project! If the transmitter won't key, check the wiring of CR1. You should be able to hear CR1 softly click when the push-to-talk bar is depressed.

If there is no audio, check the voltages on Q1 and wiring of the microphone output (connectors can be confusing). Make sure the battery is good!

Battery life should be at least a year, depending on usage. No current is drawn unless the PTT bar is pressed, and then the total current draw is only about 20 mA.

Conclusion

If you've been unable to use your old D104 (or other crystal microphone) with that new solid state rig, this circuit will allow you to put the lollipop back on the air. It's simple enough to construct and test in an evening or two - - and you may already have most of the components in your junk box. Not only will your D104 have a new life, you will have greatly improved your transmitted audio quality - - which will be appreciated by everyone on the air.

-End-



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